Keeping the Faith: A Model of Cultural Transmission in Formal Organizations

J. Richard Harrison
University of Texas at Dallas
Glenn R. Carroll
University of California at Berkeley

To study the conditions under which culture can be transmitted effectively in formal organizations, where members of the system come and go rapidly and in large numbers, we develop a model of the cultural transmission process. The model includes the following variables: entry rate and exit rate of workers, growth rate of the organization, selectiveness of organizational recruiting, intensity of socialization (by managers and by coworkers), and the rate at which socialization decays if not reinforced. Findings from a computer simulation of the model show that cultural systems in organizations are highly robust and reach equilibrium even with high turnover and rapid growth. We also find that culture is stronger during decline than growth. Moreover, some alleged behavioral effects of culture might be explained by demographic processes rather than by psychological reactions to cultural content. In general, the model provides insights into the tradeoffs involved in cultural management.

No phenomenon has fascinated researchers of organizations more in the last decade than has organizational culture. Organizational behavior researchers have embraced the culture concept to study such central topics as commitment (Pascale, 1985), socialization (Schein, 1968), and turnover (O'Reilly, Caldwell, and Barnett, 1989). Organizational theorists have come to see strong culture as an alternative to formal structure (Ouchi, 1981) and have used it extensively to understand Japanese organizations (Lincoln, Hanada, and McBride, 1986). And, of course, some writers in the popular business literature have prescribed careful management of corporate culture as the panacea for America's international competitiveness problems (Deal and Kennedy, 1982; Peters and Waterman, 1982).

Despite the volumes that have been written about organizational culture, little theory or research has examined specifically cultural transmission over time in formal organizational settings. Understanding cultural transmission is important because organizational culture is often highly persistent across time (Wilson, 1989). And, since the members of organizations can enter and leave the culture rapidly and in large numbers, the demography of the cultural system must be considered along with socialization processes if we are to understand how organizations maintain cultures. For this reason, we develop here a model of the cultural transmission process in formal organizations. In the tradition of Cohen, March, and Olsen (1972) and March (1991), the analysis of the model is based on a computer simulation, but its assumptions are derived from extant theory and established empirical studies. Included in the model are the following components of the transmission process: entry rate of organizational members, individual exit rate, organizational growth rate, selectiveness of recruitment procedures, intensity of socialization practices, and the natural decay rate of socialization. Our interest lies in the effects of each of these factors on the maintenance of organizational culture over time. To understand this problem, we conduct simulation studies in which we vary systematically most of the components of the model.

0001-8392/91/3604-0552/$1.00.

The research reported here was supported in part by the Institute of Industrial Relations, University of California at Berkeley, by the National Science Foundation (grant #BNLS-870864), and by the Morris Hite Center, School of Management, University of Texas at Dallas. Carroll was a Fellow at the Center for Advanced Study in the Behavioral Sciences, Palo Alto, during early parts of the work. We appreciate the very useful advice of Charles O'Reilly and the research assistance of Marilyn Kaplan. Helpful comments on an earlier draft were provided by Jennifer Chatman, Greg Fischer, Charles O'Reilly, and Oliver Williamson. As this article was going to press, the simulation study of cultural stability in groups by Carley (1991) appeared. It addresses issues related to the one studied here, although with a very different theoretical framework and mathematical model. We look forward to evaluating Carley's model in later work and comparing it to the one developed here.

Analyzing the cultural transmission process of organizations in this way leads us to question certain commonly held beliefs about organizational culture. For instance, we will show that very rapid organizational growth sometimes facilitates rather than impedes cultural stability, when stability is viewed as the quickness with which the system reaches equilibrium or rebounds to it after perturbation. The simulations also show that some previously observed cultural patterns ascribed to behavioral processes might be accounted for entirely by demographic processes. Cultural intensity (denoted by mean level of enculturation of organizational members), for example, is found to be greater in declining organizations because of the dynamics of attrition, not because of some behavioral reaction to the decline (cf. Cameron, Kim, and Whetten, 1988; Sutton, 1988).

Organizations with persistently high cultural intensity have what are usually called "strong" cultures. According to Scott (1987: 291–292), a strong organizational culture is a belief system that sustains the commitment of individual members to the good of the organization. Understanding the cultural transmission process helps us understand how organizations maintain the allegiance and loyalty of their members—in other words, how they "keep the faith."

Why Study Cultural Transmission in Organizations?

Most analyses of organizational culture to date have focused on the substantive content of culture and its effects on behavior. Much of this research is vigorously anthropological (Smircich, 1983). Typically, the investigator enters an organization, participates in its daily life, gains an understanding of how its members think and act, and then attempts to explain why and to what end the observed behaviors exist. Emphasis is usually placed on how aspects of the culture are interpreted within the organization (see Ott, 1989, for an excellent review). Quantitative approaches to the study of organizational culture also tend to be content-oriented, although less emphasis is placed on interpretation, and different research methods are used (e.g., Hofstede et al., 1990).

Underlying any content-based analysis of organizational culture is the implicit notion that culture is somewhat persistent across time. Cultural content cannot have strong behavioral effects without a certain minimal inertia. Yet, in contrast to societies and ethnic groups, in formal organizations the participants involved come and go more quickly, in larger relative numbers, and with less overlap in their periods of membership. They also must be enculturated to the organization through a process of secondary rather than primary socialization (Berger and Luckmann, 1966). These factors mean that cultural persistence in formal organizations is particularly problematic, at least more problematic than it is in other cultural systems, and worthy of study in its own right.

Cultural persistence is essentially a question of transmission (Cavalli-Sforza and Feldman, 1981). If new members of the culture enter and leave the system slowly, then the mechanisms of transmission can be slow and diffuse. If new

members join and exit rapidly, or in large numbers relative to those who stay, then culture must be transmitted quickly and intensively if it is to be maintained. The former situation is characteristic of a society, the latter of an organization. Obviously, culture can be maintained more easily in the first than in the second. However, this does not necessarily mean that organizational culture will be weaker or that it is predisposed to collapse. Rather, the conditions under which organizational culture can be maintained are narrower and more restrictive. In the scenario presented above, maintenance is a matter of socialization intensity relative to demographic flow. If that intensity is great enough, even a strong culture can be maintained in the face of high turnover and high growth. College fraternities and sororities, whose severe hazing activities are socialization mechanisms, provide a good example: despite heavy and lumpy turnover in membership, the cultural character of local chapters often persists.

Investigating cultural transmission is thus not antithetical to studying cultural content but complementary to it. We see the two topics as related but distinct avenues for research on organizational culture, although exceptions to this division are sometimes found in rational action theories about norms, which on occasion develop content-based explanations that do not require an additional explanation for cultural persistence (e.g., Coleman, 1990: 247). Separating cultural transmission and content analytically is convenient because it allows progress to be made in one area without encountering the obstacles that might be troubling the other. For instance, we show below that cultural transmission can be modeled and understood without taking a position in the ongoing controversy over the empirical measurement of organizational culture (see Rousseau, 1990). The model we develop is potentially applicable even if organizational culture requires ethnographic effort to measure and involves several content dimensions.

There are also managerial reasons for studying cultural transmission in organizations, since organizations and their managers have some control over the main factors that apparently affect transmission: recruitment, socialization, and turnover. The recruitment process can be managed in terms of how well new employees fit with the organization's current or desired culture. Recruitment factors under management's control include search, selection, and "selling" procedures. More extensive searches for job applicants, more careful evaluation of candidates, and greater inducements for desirable applicants will generally enable the organization to find new employees who are better matched to management's cultural objectives. So, too, will efforts to promote the organization's image and reputation.

The socialization process can be managed to intensify the enculturation of employees (Schein, 1968, 1985; Ott, 1989; O'Reilly, 1989). Management can provide intensive orientations for new employees and models for exemplary behavior. Other techniques include systems of employee participation that rely on processes of incremental commitment, reliance on groups for control of members,

and comprehensive reward systems that use recognition and approval (O'Reilly, 1989). Management can also interpret organizational events for employees and send signals to reinforce cultural values; one technique includes the use of symbols such as language, logos, and organizational rituals and ceremonies (Peters, 1978; Pfeffer, 1981).

The turnover process can be managed to enhance the retention of highly socialized employees and to encourage the departure of those who have not been successfully socialized. Alternatively, if the goal is to foster innovation and creativity, then perhaps some variation is desirable and an optimal number of less socialized employees should be retained. In either case, the available management tools include evaluation procedures and promotion and compensation policies.

A seemingly reliable way to maintain an organizational culture would be to establish each of the controllable factors (highly selective recruitment, intensive socialization, and long-term membership) in extreme form, as is done in the Jesuitical clerical order. However, managing recruitment, socialization, and turnover involves real costs to the organization. For example, selectivity in recruitment results in the slower filling of positions, and the use of higher pay to attract and retain desirable employees has budgetary consequences. These costs might be offset by the organizational advantages of a strong culture, including increased productivity. But because of the costs of managing culture, it is important to understand the conditions under which the investment in cultural management is likely to influence cultural strength.

What is needed, therefore, is a good understanding of the various tradeoffs involved. More specifically, to what extent does selective recruitment diminish the need for intensive socialization? How does long-term employment obviate either process? And, perhaps most importantly, what effects do organizational growth and decline have on these tradeoffs? In other words, what are the demographic constraints on strong and weak organizational cultures?

Some of these questions have been addressed before. Management textbooks contain much advice about how homogeneity among new members to a firm reduces socialization requirements (Ott, 1989). Likewise, long-term employment is widely believed to enhance cultural persistence. Undoubtedly, some truth lies behind these claims but, in their current forms, most of these arguments lack analytical precision. Our efforts here represent an attempt to refine thinking on these matters.

MODEL

We used a formal modeling approach in this study because of its analytical rigor and because the transmission problem is suited to this approach, since its constituent parts are fairly well understood. This meant that we could write simple but defensible equations of each component of the process but concentrate our analysis on the joint outcomes. The model we developed contains three basic functions, one each for hiring practices, socialization processes, and

employee departures. In specifying each function, we aim to represent the essential mechanisms by which organizational culture gets transmitted over time. Because these mechanisms are widely believed to covary systematically across organizations, we identified and studied seven different organizational forms. Each form defines a unique configuration of parameter settings for the three basic functions. We evaluated the simulated transmission processes by examining the mean level of enculturation obtained within each organization, as well as the length of time required to reach equilibrium.

The model consists of three mathematical functions and a set of embedded parameters. The functions determine (1) the number of persons hired in a period of time, (2) the process of change in the enculturation level of each person within the organization, and (3) the number of persons departing from the organization in a period of time. The parameters of the model control the growth rate of the organization, the recruitment rate to vacancies, the cultural selectiveness of the recruitment process, the intensity of socialization, the natural decay rate of socialization, and the turnover rate. We discuss each function in turn, using the relevant parameters as necessary.

Hiring Function

Organizations hire employees to fill vacancies created by departures and to staff new positions generated by growth. Recruitment is not, however, usually matched perfectly to positions available, since search processes take time and effort. Realizing this, firms can project labor needs and "overrecruit" to the immediate situation, or they can fill positions sequentially, accepting that there will always be a gap between labor needs and staffing.

These situations can be modeled fairly easily with equations for the number of persons hired in a time period, denoted by $NH(t)$, and the number of vacancies, $NV(t)$. The hiring process can be modeled as:

$$NH(t) \sum_{j=1}^{NV(t-1)} H_j(t),$$

where

$$H_j(t) = \begin{cases} 1 & \text{if position } j \text{ is filled in period } t, \\ 0 & \text{otherwise,} \end{cases}$$

and

$$NV(t-1) = [NV(t-2) - NH(t-1) + ND(t-1)] + GR[N(t-1)],$$

and GR is the organizational growth rate associated with stochastic changes in the number of positions, $ND(t)$ represents the number of persons departing the organization at time t, $N(t)$ is the number of members of the organization at time t, and a stochastic rate of recruitment to vacant positions (RR) is used to find values of $H_j(t)$. This set of equations can be used to determine the number of persons entering the organization at any time period. By adjusting the recruitment rate and hiring selectivity (see below), different

staffing policies can be simulated. By setting the growth rate parameter appropriately, any scenario of growth, stability, or decline can be simulated.

Hiring can be selective, in that a particular type of person can be defined as needed and then sought after, or it can be more opportunistic, in the sense of using a wider segment of the population for the recruitment pool. Selectivity usually requires more time and resources than opportunism. But this presumably is balanced to some extent by the reduced socialization requirements and lower turnover associated with selectivity. In either case, hiring decisions will be imperfect, because noise is likely to obscure some relevant information about potential employees. So even under high selectivity, some individuals will require substantial efforts in socialization (or removal from the organization) if a strong culture is to be maintained.

Individual hiring can be conceived as drawing individuals from a pool of candidates. The pool has a distribution of values on the desired characteristics and the distribution is known for the pool, but the choice of any particular individual is somewhat random. In fact, the characteristics of the pool are determined by the selectiveness of the hiring policies of the organization. The candidate pool can be more or less centered on the desired characteristics, and more or less noise can be tolerated in the information.

To keep things simple, imagine that there is only a single cultural measure of interest and that it can be represented on a continuous scale from zero to one. The pool of candidates can then be defined by its mean and variance on this variable. In the case of high selectivity, this would imply a relatively high mean, say .8, and a fairly low variance, say .1. By contrast, an opportunistic hiring policy implies a much lower mean for the candidate pool and a higher variance.

We assume that an individual's propensity to embrace the values and norms of a particular organizational culture can be meaningfully represented by such a single measure indicating the degree to which an employee fits management's ideal. We refer to this measure of cultural fit as the enculturation level. Enculturation can occur before an individual joins an organization (for example, in a professional school) and, as we discuss below, employees can be further enculturated through socialization. Although managements will differ in types of factors they use to assess the level of enculturation, it includes knowledge, qualification, and willingness to embrace and comply with the culture and may reflect such factors as work experience and education. For a given individual *i,* we denote his or her enculturation level by the variable C_i, which is set to vary between 0 and 1. Representing culture by a single variable does not imply that it is inherently unidimensional but, rather, that in a specific organizational context some overall managerial assessment about one's cultural predisposition and acceptance is possible. Thus, we use the enculturation variable in much the same way that economists use the concept of utility to measure the desirability of multidimensional decision alternatives.

Although cultural content is often found to be multidimensional in empirical work (Hofstede, 1980; Hofstede et al., 1990; O'Reilly, Chatman, and Caldwell, 1991), the validity of measuring cultural desirability (from management's perspective) on a single scale rests on two simple assumptions. First, individuals must be rankable in terms of their cultural desirability to management, i.e., it is meaningful to say that person *i* actually is preferred to person *j*.[1] Second, the preference ordering needs to be transitive. That is, if *i* is preferred to *j* and *j* is preferred to *k,* then *i* is preferred to *k*. These two assumptions are sufficient to prove $C_i > C_j$ if and only if *i* is culturally preferred to *j* (Coombs, Dawes, and Tversky, 1970). This representation theorem justifies the use of a single scale (C_i) to measure cultural desirability, even though an individual's cultural characteristics are multidimensional, in the same way that economists measure the overall value of an economic good such as an automobile with a single utility scale even though automobiles vary across a wide variety of factors. A recent article in the managerial literature written by a CEO actually advocates formalizing assessments of overall cultural fit during the employee interview and evaluation process, using a single scale (Rodgers, 1990).

The assumptions of a stable preference ordering for cultural desirability may not always hold. Management's cultural preferences may change over time, or there may be inconsistency in the ways various cultural dimensions are combined to determine overall cultural desirability. Nonetheless, we think that managerial assessments and preferences on cultural grounds are fairly stable over time, certainly more stable than individual consumer preferences are for, say, automobiles. We believe that day-to-day behavior is often ignored or excused when it does not agree with the overall cultural assessment made of an individual (see Goffman, 1959); in our view, it usually takes a long pattern of inconsistent behavior or an egregious action to cause reassessment of one's cultural fit. In any case, a stable preference ordering seems to be a reasonable assumption for an initial examination of cultural transmission.

We simulate hiring on the basis of cultural criteria by drawing randomly values of C_i from parameterized distributions. The parameters of the distribution are defined by the hiring policies simulated. The average number of persons hired is determined by the $NH(t)$ equation given above. At each time period, therefore, a number of persons with a variety of dispositions toward the culture of the organization is hired.

Socialization Function

Once an individual is hired, he or she is subject to a variety of influences with respect to the culture of the organization. Management attempts to inculcate the new employee fully in the aims, ways, and whims of the organization. This might take the form of explicit orientation programs and activities or reward and punishment systems, or it might be produced through more subtle means. In any case, management has a conception of the ideal employee on the cultural dimensions it considers relevant, and the objective from its point of view

1
Implicit here is the assumption that management *as a group* has consistent preference orderings for the cultural desirability of employees. This is justified either if a superordinate cultural ideal is imposed on management (for example, by the CEO) or if the variation in managerial preferences is trivial compared to the cultural variation among employees (March, 1962), which is a sensible view, given the filtering process that tends to select individuals with similar preferences for managerial positions (March and March, 1977).

is to produce a person socialized to within some acceptable distance of this ideal. Obviously, management's clarity of thought about what constitutes an ideal employee may be more or less specific, and its efforts to produce such a person may be more or less successful.

Another important source of cultural socialization arises from the existing employees. Group and peer pressure effects are some of the best-documented phenomena in the social science world (e.g., Sherif, 1935; Asch, 1951; Kiesler and Kiesler, 1969; O'Reilly and Caldwell, 1979). So, if an individual enters an organization filled with persons more highly socialized to the norms of the culture, then it is reasonable to expect that, in the normal course of interaction and work with these persons, the individual will become more socialized. Likewise, if an individual enters an organization where the existing employees are only weakly socialized, then he or she will tend to become weakly socialized even if he or she entered in a state more accepting of the norms encouraged by management. In other words, in a simple model neglecting social distances and innate individual differences, individuals get pulled toward the mean level of socialization among others.[2]

There is also apparently a "natural" source of desocialization. Laboratory studies have shown that socialization decays over time in the absence of other stimuli (Jacobs and Campbell, 1961). So in addition to the other two pulls—toward the group mean and toward the management ideal—there is also a pull toward "zero" socialization.

Any individual's change over time with respect to socialization is a combination of the pulls from three sources: management, peers, and decay. The three forces may vary in their relative strengths. The expected change in socialization is modeled as a function of the individual's distance from the "target" for each source, multiplied by a parameter. We also introduce an error term to allow for noise in the process. The simulation uses the following function for socialization-change intensity:

$$SI_i(t) = \frac{SMR[1 - C_i(t-1)] + SNR[\overline{C} - C_i(t-1)] + SDR[0 - C_i(t-1)]}{SMR + SNR + SDR} + e,$$

where e is an error term and SMR, SNR, and SDR are parameters representing the pulls toward ideal socialization (from management), mean socialization level (from peer pressure), and zero socialization (from decay), respectively. In effect, the denominator normalizes the function $SI_i(t)$ in order to ensure that an individual's C_i score remains between 0 and 1. The error e is constructed to be normally distributed with mean zero and adjustable variance.

Individuals can be more or less susceptible to socialization, whatever its source. Previous studies have shown that susceptibility is greatest at the time of entry into the organization and then declines with tenure (Louis, 1980). An individual who escapes initial socialization thus stands a good chance of remaining unsocialized. We simulate this relationship between susceptibility to socialization forces and tenure with the following equation:

2

As an anonymous reviewer has pointed out, use of the mean socialization level of peers in this specification implies that all peers are in communication with each other and are equally influential (French, 1956). While these assumptions seem reasonable for our first experiments with the model, in many organizational settings they may be implausible. Thus, one natural direction in which to extend and refine our analysis involves the introduction of unequal patterns of communication and influence. For a social-network-based approach to these issues, see Friedkin and Johnsen (1990) and Friedkin and Cook (1990).

$$SU_i(t) = TA1 + \exp\{-TA2 - TA3[T_i(t-1)]\},$$

where T_i is individual i's tenure with the organization. This functional form, which resembles the model known as Makeham's Law (see Tuma and Hannan, 1984), allows an individual's susceptibility to cultural influence to change with tenure. With the parameter values used here ($TA1 = .02$; $TA2 = .60$; $TA3 = .30$), susceptibility begins with a value less than unity and declines exponentially with tenure toward a non-zero asymptote. It is important for the value of the function to remain between 0 and 1 because it will be used below as a multiplier. In this specification, $TA1$ is associated with the asymptotic level of susceptibility, $TA2$ with the level of susceptibility at entry (tenure equals zero), and $TA3$ with the speed of the decline in susceptibility from the entry level to the asymptotic level.

The socialization function is completed by taking an individual's prior enculturation level $C_i(t-1)$ and adding to it the effect of socialization-change intensity $SI_i(t)$ multiplied by its influence $SU_i(t)$. That is,

$$C_i(t) = C_i(t-1) + [SU_i(t)][SI_i(t)].$$

In each time period, this score is constructed for each individual. Distributional measures of these scores tell how intense the organizational culture is at any particular point in time.

Turnover Function

Individuals leave organizations for a wide variety of reasons, including better jobs, dissatisfaction, and family concerns. For present purposes, it makes sense to divide the causes of turnover into two separate factors, one associated with the culture of the organization and the other summarizing all other factors. The number of persons departing in any given time period results from the application of these factors to each person in the organization.

Turnover might be connected to organizational culture for at least two reasons. First, individuals who feel alienated because of their nonacceptance of the culture might be motivated to leave voluntarily. Second, those who do not fit in and who fail to change might be fired. In both cases, the issue may be thought of as one related to the distance between an individual's embodiment of the culture and the management ideal (Wanous, 1980). A convenient way to formalize this is with the term $AR(1 - C_i)^3$, where AR is a parameter allowing greater or less sensitivity to alienation as a cause of turnover. The value of this expression increases rapidly as C_i approaches zero, but in general the effect of alienation on turnover in our model is much smaller than the effect of noncultural factors.

Allowing all other reasons for leaving an organization to be captured in an adjustable base-turnover factor (associated with the parameter ER), the number of persons departing the organization in time period t is then given by

$$ND(t) \sum_{i=1}^{N(t-1)} D_i(t),$$

where

$$D_i(t) = \begin{cases} 1 & \text{if individual } i \text{ leaves the organization in period } t, \\ 0 & \text{otherwise,} \end{cases}$$

The stochastic rate of departure for individual *i,* used to find $D_i(t)$, is

$$RD_i(t) = ER + AR[1 - C_i(t - 1)]^3,$$

where both *ER* and *AR* are parameters of the rate. When coupled with the hiring function and the socialization function, this then completes the activities of the simulated organization for any given time period. Table 1 gives the parameters of the model and their definitions.

Table 1

Notation Used in Simulation Model

Notation	Definition
	Cultural system
$C_i(t)$	Enculturation level of person *i* at time *t;* varies from zero to one.
$\overline{C}$	Mean level of enculturation in organization.
δ_c	Standard deviation of enculturation level in organization.
t^*	Elapsed time at cultural equilibrium.
$N(t)$	Size of organization in number of persons at time *t.*
$T_i(t)$	Accumulated tenure in organization of person *i,* measured in units of simulation time.
GR	Overall growth rate of organization per time period.
	Hiring function
NV (t)	Number of vacancies at time *t.*
NH (t)	Number of persons hired at time *t.*
RR	Recruitment rate of hires to vacancies.
C^*	Mean enculturation level of recruitment pool.
δ^*	Standard deviation of enculturation level in recruitment pool.
	Socialization function
SMR	Strength of pull toward ideal socialization (management efforts).
SNR	Strength of pull toward mean level of socialization within organization (peer pressure).
SDR	Strength of natural decay in socialization.
e	Error term indicating noise in socialization (zero mean).
σ	Standard deviation of noise in socialization function.
*TA*1,2,3	Parameters associated with reduction in susceptibility to socialization forces with increasing tenure.
	Turnover function
ND (t)	Number of departures from organization at time *t.*
ER	Parameter associated with turnover from all noncultural forces.
AR	Scale factor for turnover associated with distance from ideal enculturation level (i.e., alienation).
$RD_i(t)$	Turnover rate of person *i* at time *t.*

Organizational Forms

Although we have discussed separately each functional component of the cultural transmission process, organizational research strongly suggests that they do not vary independently. Instead, factors such as recruitment

selectivity, socialization intensity, and longevity of employment are widely thought to cohere in particular combinations usually defined as organizational forms. While we continue, for analytical purposes, to separate each aspect of the cultural transmission process, we also think it worthwhile to consider our model in the context of the more important organizational forms. Orienting the simulations around stylized versions of these forms also provides some useful guidance as to parameter selection and facilitates interpretation of outcomes. Consequently, we briefly review seven organizational forms around which the simulation studies are organized conceptually. The Appendix gives the exact parameter settings used for each organizational form.[3]

Japanese-style form. The Japanese may be responsible for the recent fascination with organizational culture. Coinciding with the Japanese economy's recent dominance of international trade is the spread and visibility of their particular ways of organizing corporate organizations. While the specific features vary for any individual organization, the essential elements of Japanese organizations are (1) high recruitment selectivity, (2) intensive socialization by management, and (3) long-term employment (Ouchi, 1981). These factors are thought to produce organizations with strong cultures that can persist intact even when growth rates are extraordinarily high. As a result, Japanese-style organizations can adopt strategies aimed at maximizing market share without fear of undermining corporate culture and values (Abegglen and Stalk, 1985). Increasingly, American corporations are looking to elements of this organizational form to renew themselves.

American manufacturing form. Among many other things, the industrial revolution produced the assembly line and its associated traditional manufacturing organization. The essence of this design is standardized work and specialized division of labor. Human factors, including culture, are generally designed out of the form; one person can replace any other with ease in such a system. For this reason, recruitment selectivity is usually low in this form, and management socialization is weak or nonexistent. Fast growth and high turnover do not affect the stability of the system but run part and parcel with the other characteristics.

Governmental-bureaucratic form. The Weberian ideal of the rational bureaucracy still characterizes many governmental and other organizations. Demographic stability is a primary feature of many of these bureaucratic organizations. Growth in employment is low if not entirely stable, and turnover is low, the career being conducted mainly within the bureaucracy. Recruitment and socialization practices undoubtedly vary across bureaucratic organizations. However, rarely if ever do they reach the extremes found in the Japanese-style organization. In fact, bureaucracy was originally designed to eliminate particularistic (e.g., cultural) selection, the goal being a purely meritocratic system based on technical criteria. Few would argue this has been achieved often, so it seems best to characterize the bureaucratic organizational form as having low to moderate cultural selectivity in recruitment and low to moderate socialization intensity.

3

Analysts who prefer to think in terms of the model's components should consult the Appendix. Table 4, below, presents a regression analysis designed to assess the effects of each component of the model on equilibrium outcomes. We did not use a rigid block design in conducting the simulations because we believe the combination of theoretically guided experimentation and systematic assessment of the data is preferable.

Professional form. Organizations that are dominated by professionals, such as law firms and universities, have still different cultural and demographic features. Dominant among these, of course, is the high selectivity of recruitment—to be a professional organization means to recruit primarily from a clearly defined and already enculturated pool of professionals. Consequently, there is little socialization done by management within the organization, at least as compared with the professional socialization that has already occurred outside it (for example, in professional graduate programs). Growth and turnover may vary from low to moderate, but neither is typically high.

Entrepreneurial form. Less of an ideal form than the others, the predominant characteristic of the entrepreneurial form is high growth. This makes it particularly interesting for the study of cultural transmission: Can culture be maintained in the midst of such rapid change? Because of the many survival pressures experienced by entrepreneurial organizations, little effort is typically devoted to socialization or even selective recruitment. Turnover varies but is usually in the moderate range.

Z-type form. Many management theorists recommend that traditional American firms move closer to the Japanese model of organization. The resulting hybrid has been called a "type Z" organizational form (Ouchi, 1981). Its features include those of the traditional manufacturing form but with intensified socialization by management, greater recruitment selectivity, and reduced turnover. The hypothesized effects of these efforts hinge on an intensified and more homogeneous organizational culture.

Collectivist-democratic form. Organizations operated on a collective basis and without formal hierarchical authority usually display strong and tightly encapsulated cultures. Such organizations have been described and analyzed by Rothschild-Whitt (1979), who refers to them as collectivist-democratic organizations (not to be confused with cults, which often have a strong but covert hierarchy and are not normally considered to be formal organizations). The structural and demographic features of the collectivist-democratic organizations include extremely high selectivity in recruitment, intensive socialization by coworkers rather than by management, little turnover, and low growth. These are commonly considered ideal, if not extreme, conditions for establishing and maintaining an organization's culture.

Table 2 provides a summary of the relative settings of the parameters for each organizational form. As we have noted in our discussion of the various forms, there also are known differences among the forms in terms of cultural intensity and heterogeneity. Although the matter has not been studied directly, it is widely believed that recruitment selectivity, socialization intensity, turnover, and growth can account for many of these differences. Nothing in our model requires or forces such associations. So the first major analytical question to be addressed by the simulations concerns the model's ability to produce these known

Table 2

Stylized Organizational Forms

Organizational forms	Simulation parameter settings*
Japanese-style	High recruitment selectivity Intensive socialization by management Long-term employment High growth rate
American manufacturing	Low recruitment selectivity Weak socialization by management High turnover High growth rate
Governmental-bureaucratic	Moderate recruitment selectivity Weak socialization by management Low turnover Low growth rate
Professional	Very high recruitment selectivity Weak socialization by management Moderate turnover Low growth rate
Entrepreneurial	Moderate recruitment selectivity Moderate socialization by management Moderate turnover Very high growth rate
Z-type	Moderate recruitment selectivity Moderate socialization by management Low turnover High growth rate
Collectivist-democratic	High recruitment selectivity Intensive socialization by coworkers Low turnover No growth

* Exact parameter settings are given in Appendix A.

differences in organizational culture across forms. A good test of the model's overall validity is whether or not it can do so.

Simulation Methods

The simulation program is written in the BASIC language using MicroSoft's QuickBasic version 4.0, which allows for larger than usual arrays.[4] The simulations reported here were run on an IBM Personal System 2/Model 50 computer.

A number of the components of the simulation require drawing from probability distributions. The enculturation scores of the initial members, new recruits, and the noise term in the socialization function all use normal distributions. These were simulated with the uniform random deviate generator in the BASIC compiler by constructing random normal deviates using the polar method.

Rate parameters in the model were simulated as parameters embedded in stochastic processes. For *RR* and *RD* the rate is assumed to be part of the basic model

$$G(t) = \exp\left[-\int_0^t r(u)du\right],$$

where $G(t)$ is the stochastic survivor function and $r(t)$ is the rate. *RR* and *RD* are set at values typical of calculations

4
A copy of the program is available from the authors on diskette for a minimal charge. This offer expires two years after the publication date of this article. Direct requests to the first author at the School of Management/J05.1, U. T. Dallas, P.O. Box 830688, Richardson, TX 75083.

made on the basis of monthly data. The rates are assumed to be time-homogeneous and are used to solve for waiting times, $t = -\log G(t)/r$, which are used directly in the simulation.[5] As is conventional, the survivor function is simulated as a uniform distribution using the BASIC uniform random deviate generator (Tuma and Hannan, 1984). *GR* is defined as the organizational growth rate associated with an underlying stochastic process of growth in the number of positions. A size-dependent Poisson growth process is assumed.

The simulation is initiated with an organization size of 100, except for the entrepreneurial form, which is started at a size of 5. After each time period (simulation "month"), each individual enculturation score (C_i) is updated and the mean enculturation level for the organization ($\bar{C}$) and standard deviation (δ_c) are calculated. Enculturation levels are compared over time. When the mean enculturation level for the 12 most recent time periods differs by less than .01 from the means for the two previous sets of 12 time periods, the organization's culture system is assumed to be in equilibrium. The simulation is then stopped and the following outcome variables are examined: mean enculturation level ($\bar{C}$), time elapsed until equilibrium (t^*), and dispersion of enculturation scores (δ_c).

In conducting the simulations, we first examined some of the simulation model's basic properties by experimentally varying the mean level of enculturation of the initial employees for each organizational form. Our primary goal in these experiments was to learn how sensitive the model is to the initial setting of mean enculturation. The experiments showed that the mean level of enculturation in the initial employee base affects the time required to reach equilibrium. In all instances, the further the initial mean is from the equilibrium mean, the longer the time to equilibrium. So starting with a low mean level of enculturation usually implies a long dynamic process for strong-culture organizations. The variation in time to equilibrium was greatest for the governmental, professional, and collectivist-democratic forms. The mean enculturation level of the initial employees affected the equilibrium levels attained for some forms, but not all. The Japanese, American manufacturing, entrepreneurial, and Z-type forms all reached the same equilibrium levels regardless of the initial mean level of enculturation. Governmental, professional, and collectivist-democratic forms each depended more on the mean of the initial employee base.

The results give substantial credibility to the simulation model in that the organizational forms behave in plausible ways. The strongest cultures, as indicated by the mean level of enculturation, are found in the Japanese, professional, and Z-type forms. The weakest culture is in the American manufacturing form. Cultural heterogeneity, as given by dispersion around the equilibrium mean, is least for the professional and collectivist-democratic organizational forms, again conforming to expectations. Overall, this pattern of findings shows that the model can reproduce basic known differences in cultural intensity across organizational forms, providing validation for the model.

5

Empirical analysis of the tenure distributions generated by the specification used for $RD_i(t)$ suggests a slight time dependence (with respect to employee tenure) in the overall employee departure rate. While this time dependence varies by organizational form, the pattern is generally consistent with the findings of Petersen and Spilerman (1990), who analyzed appropriately comparable departure data from a large organization with an established internal labor market. In continuing analyses of our model, we have also experimented with specifications of $RD_i(t)$ that explicitly incorporate time dependence. While these experiments are highly preliminary, they show the outcomes reported here to be robust with respect to this issue.

Multiple simulations were conducted for each set of parameter values investigated. For ease of communication, we present below selected results in graphic form. However, we did conduct a stability analysis for a variety of models to ensure that the findings are not idiosyncratic. This effort included a sensitivity analysis to determine that the findings reported here do not depend primarily on the values of single parameters, including those held constant in the results reported here for organizational forms (such as the socialization noise term), and do not vary substantially across changes in many combinations of parameters.

We also report below a variance decomposition of the outcome variables for all the simulation data. This analysis allows an overall assessment of the effects of each parameter.

FINDINGS

We first investigated the effects of variation in (1) the base employee turnover rate, (2) recruitment selectivity, and (3) intensity of management socialization practices. As discussed earlier, these are the factors over which management usually has some direct control. For each issue, we report the equilibrium mean enculturation level, the standard deviation of enculturation at equilibrium, and the time required to reach equilibrium.

Turnover Rate

Figure 1 shows the simulation outcomes by organizational form when the base employee turnover rate is varied. The vertical axis indicates the mean enculturation level at equilibrium, while the horizontal axis gives the time to equilibrium. The radius of the circle represents the degree of dispersion of enculturation at equilibrium, as indicated by the standard deviation δ_c.

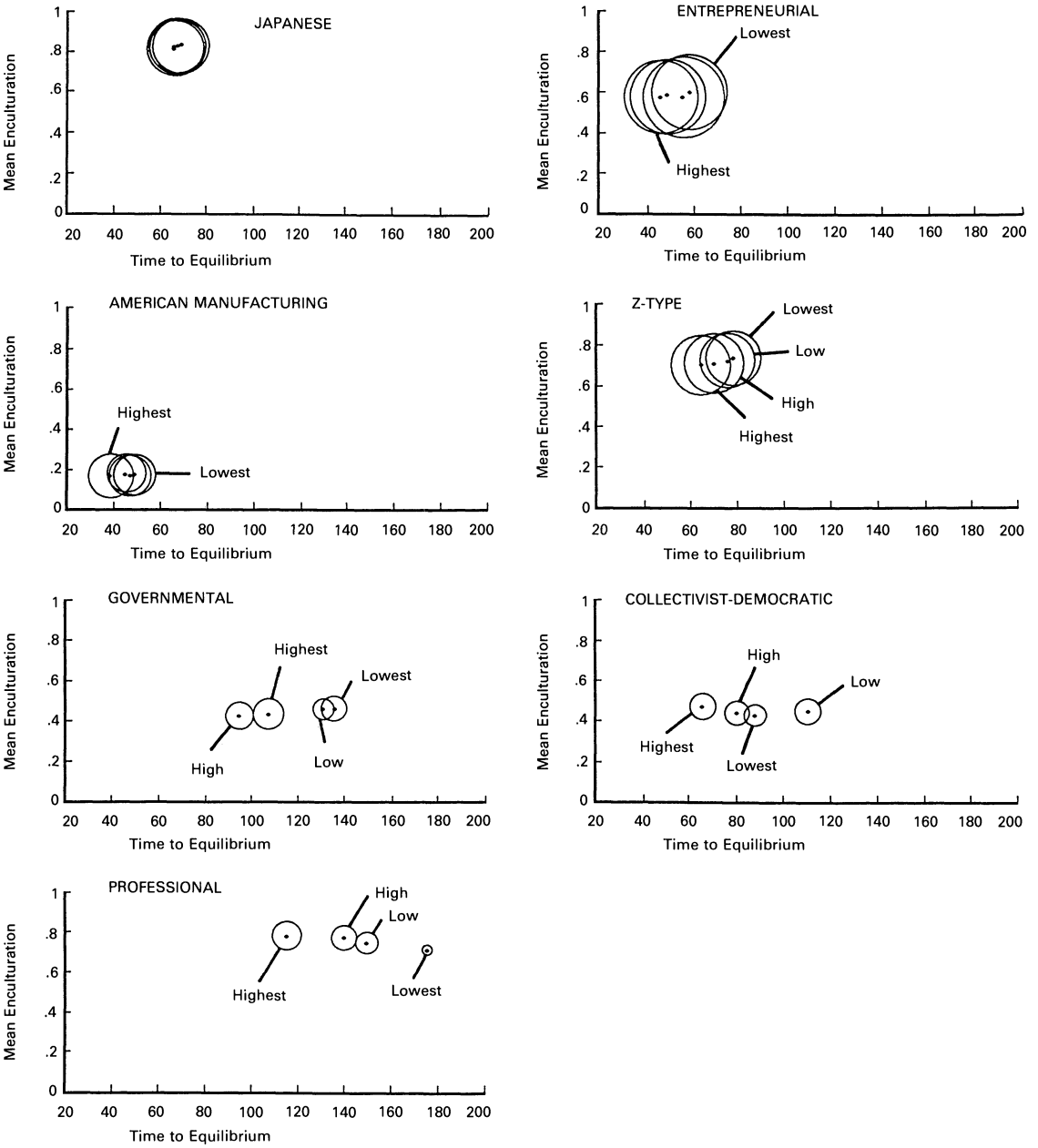
Variations in the base turnover rate affect the equilibrium levels little. However, turnover does seem to affect the time to equilibrium. In general, higher turnover rates are associated with shorter times to equilibrium. This effect is especially pronounced for the governmental, professional, and collectivist-democratic organizational forms. The greater sensitivity of these forms to turnover is somewhat surprising since they are often held to have higher inertia than some of the other forms.

Recruitment Selectivity

Figure 2 shows the results of introducing different degrees of recruitment selectivity into the simulations. We did this by varying both the mean enculturation of the recruitment pool and its variance.

Recruitment selectivity produces changes in both the equilibrium means and the times to equilibrium, although these effects are more pronounced in some organizational forms than in others. The American manufacturing and entrepreneurial forms show higher enculturation levels corresponding to greater selectivity; equilibrium times are barely affected. By contrast, the governmental, professional and collectivist-democratic forms show shorter times to

Figure 1. Equilibrium outcomes with different turnover rates.

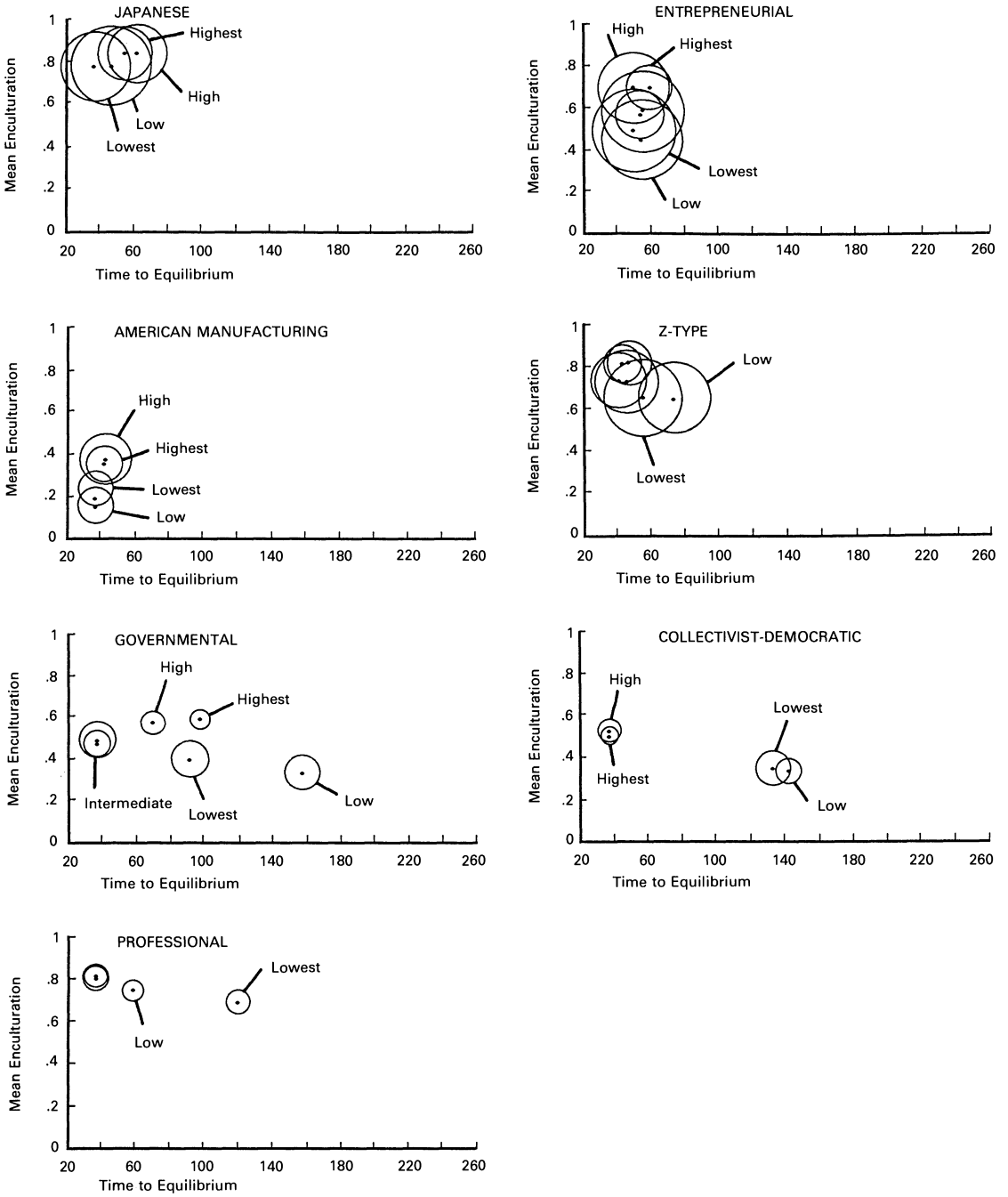


equilibrium in response to enhanced selectivity but less change in equilibrium levels. Japanese and Z-type forms show moderate amounts of both effects. These results indicate that a given approach to managing organizational culture—selective recruitment in this case—can have substantively different effects for different forms.

Management Socialization

Figure 3 presents plots of the equilibrium outcomes when the intensity of management socialization practices (parameter *SMR* relative to *SNR*) is varied. For each organizational form, there is a substantial strengthening of the culture as a result of more intensive management

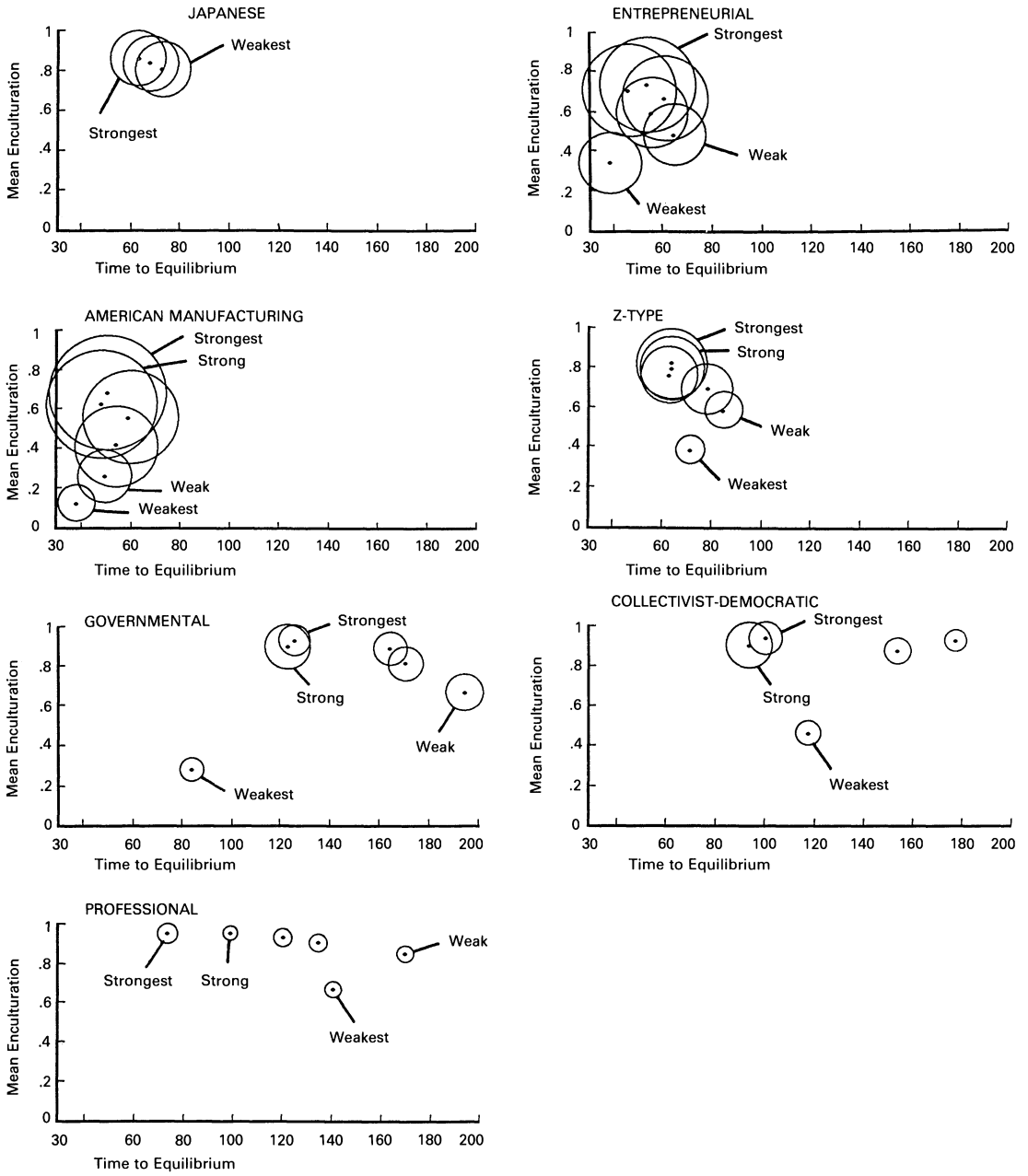
Figure 2. Equilibrium outcomes with varying degrees of recruitment selectivity.



efforts. The largest gains occur for the governmental and American manufacturing forms, although heterogeneity increases as well. The increased cultural heterogeneity likely results from the combination of low selectivity (which continually brings in ample numbers of relatively unenculturated individuals) and an internal mechanism having a strong positive effect on enculturation levels (in this instance, management socialization).

Perhaps the most interesting pattern in Figure 3 is that the greatest returns to increased management socialization

Figure 3. Equilibrium outcomes with varying intensities of management socialization.



apparently come at the variable's lower levels. That is, for each organizational form the effects of intensified management socialization on $\overline{C}$ are especially pronounced when prior management socialization efforts were minimal. This can be seen by comparing the difference in equilibrium levels between the weakest and weak socialization efforts with that between the strong and strongest efforts. When management socialization is already strong, additional efforts still do show some effects. But they are small compared to the returns associated with the same increased effort in a prior situation of weak management socialization.

Figure 4. Equilibrium outcomes with varying growth rates.

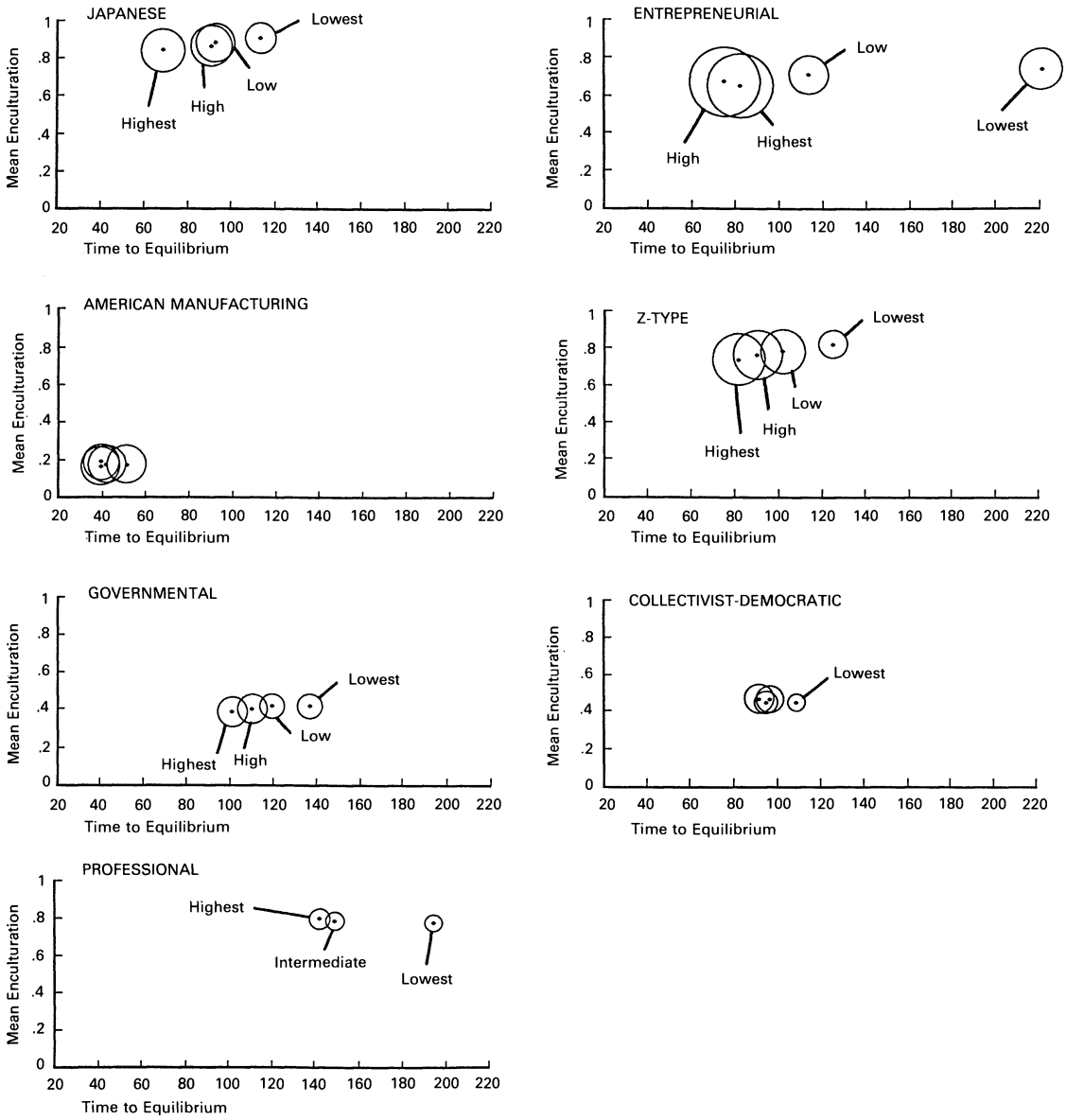


Table 3

Organizational Culture during Simulated Decline*

Organizational form	Start			25% Decline	
	N (t)	$\bar{C}$ *(t)*	δ_c	*N (t)*	*t*
Japanese	5000	.82	.12	3742	30
American manufacturing	5000	.17	.10	3741	25
Governmental	1000	.76	.04	749	28
Professional	1000	.45	.06	749	27
Entrepreneurial	5000	.59	.19	3748	29
Z-type	5000	.73	.15	3760	30
Collectivist-democratic	1000	.46	.06	754	30

* Some cells in the table are blank because the system reaches equilibrium prior to that level of decline.

Organizational Growth

Figure 4 presents the equilibrium outcomes for simulation runs in which the organizational growth rates are systematically varied for each organizational form.

Organizational forms that have not to this point shown much variation in equilibrium times do display such differences when the growth rates are varied. The Japanese, entrepreneurial, and Z-type forms all show longer equilibrium times when growth rates are lower, and other forms show the same pattern. So high growth rates apparently produce shorter equilibrium times. Since the speed with which equilibrium is attained reflects a system's ability to recover when perturbed, this finding leads, in turn, to the rather paradoxical inference that high growth is actually conducive to cultural stability, not detrimental, as is commonly assumed (cf. Elster, 1989; Coleman, 1990). Perhaps the increased cultural stability results from the relative ease in socializing new rather than long-term employees.

Organizational Decline

What happens to an organization's culture when it contracts in size? To address this question, we ran slightly different kinds of simulations. Rather than start with small organizations, we began with fairly large ones, numbering at least a thousand members. We then assumed a negative growth rate and a distribution of tenure appropriate for each organizational form at equilibrium (determined from the results described earlier). As before, employees with lowest enculturation scores were the most likely to leave, although there is no explicit seniority rule associated with departure. The cultural transmission process was then simulated until it reached equilibrium. Table 3 gives the equilibrium outcomes, as well as the values of the culture variables $\bar{C}$ and δ_c at several other benchmark points in the decline trajectory.

All organizational forms reach cultural equilibrium while in decline. Moreover, in all instances the enculturation level is higher in decline than it was initially. At equilibrium, enculturation reaches its highest levels. The difference between start level and equilibrium is especially pronounced for the Japanese, entrepreneurial, and Z-type forms.

Table 3 (*continued*)

25% Decline		50% Decline				Equilibrium			
$\bar{C}(t)$	δ_c	$N(t)$	t	$\bar{C}(t)$	δ_c	$N(t)$	t^*	$\bar{C}(t)$	δ_c
.90	.06	2512	71	.94	.03	1690	111	.96	.02
.18	.09					3299	38	.18	.09
.77	.03					679	38	.77	.03
.46	.06					680	38	.46	.05
.72	.10	2448	71	.78	.08	1059	158	.83	.10
.82	.07	2505	72	.86	.05	1363	132	.90	.05
.47	.05					688	38	.47	.04

Table 4

Regression Models of Cultural Outcome Variables

Independent variables	Equilibrium Outcome Variable			
	Mean level of enculturation $\bar{C}$	Standard deviation in enculturation δ_c	Time to equilibrium t^*	Mean tenure of equilibrium $\bar{T}$
Intercept	.267•	.070•	36.7	21.5•
Start size [*N*(0)]	−.0003	.00002	.103	−.029
Recruitment rate (*RR*)	.007	−.005	10.3	3.24
Growth rate (*GR*)	−.425	.418•	−458.•	−275.•
Turnover parameter (*ER*)	−.966•	.077	138.	−101.
Alienation parameter (*AR*)	−.068•	.025•	−85.7	−14.2•
Management socialization (*SMR*)	.527•	.069•	−28.3	11.0•
Socialization decay (*SDR*)	−.635•	.004	−209.•	−39.3
Noise in socialization (σ)	.053	.119•	−54.0	−26.3•
Reduced susceptibility to socialization with tenure (dummy)	−.101•	−.042•	38.7•	−1.50
Recruitment selectivity mean (C^*)	.636•	−.055•	82.2•	21.8•
Recruitment selectivity standard deviation (δ^*)	.386•	.206•	168.•	65.7•
R^2	.90	.86	.58	.60
N	324	324	324	324

• $p < .05$.

Components of Organizational Forms

Table 4 presents regression models of the simulation data generated in 324 trials. These trials include those reported above and also the other trials from the sensitivity analysis in which one, and sometimes two model parameters were systematically varied while the others were held constant. We focus on the equilibrium outcomes and regress these on variables representing the organizational parameters defining enculturation and the organizational forms. By examining parameter variations within a form as well as those reviewed above across forms, the regressions provide a precise comparison of the effects of the various components of the model.[6]

The regressions in Table 4 show that some components of organizational form have larger effects on equilibrium outcomes than others. Turnover, growth, and socialization decay each have strong negative effects on the mean level of enculturation; management socialization and selectivity efforts have pronounced positive effects. There is also a positive effect of variation in the recruitment pool. Table 4 also shows that the mean enculturation level would be higher if people did not develop a resistance to socialization with tenure in the organization. Other variables are less important.

Perhaps the most interesting patterns in Table 4 come from comparisons of the same variable across outcomes. Factors that diminish the mean level of enculturation, such as growth and socialization decay, often shorten the time to

6

Regressions of the outcomes on dummies for the various organizational forms simply summarize the findings shown in graphic form above. While we have done these, we do not report the estimates here, since they are redundant with results already presented. Our goal here is to decompose the outcomes on the finer-grained differences in parameter settings.

equilibrium as well. Management socialization is the only variable that shortens the time to equilibrium while significantly enhancing mean enculturation. So there is a tradeoff in most instances between strength of culture and time to equilibrium: for those factors susceptible to management influence, management must choose one or the other, since efforts to enhance, say, intensity, will likely diminish stability.

Cultural Management and Growth

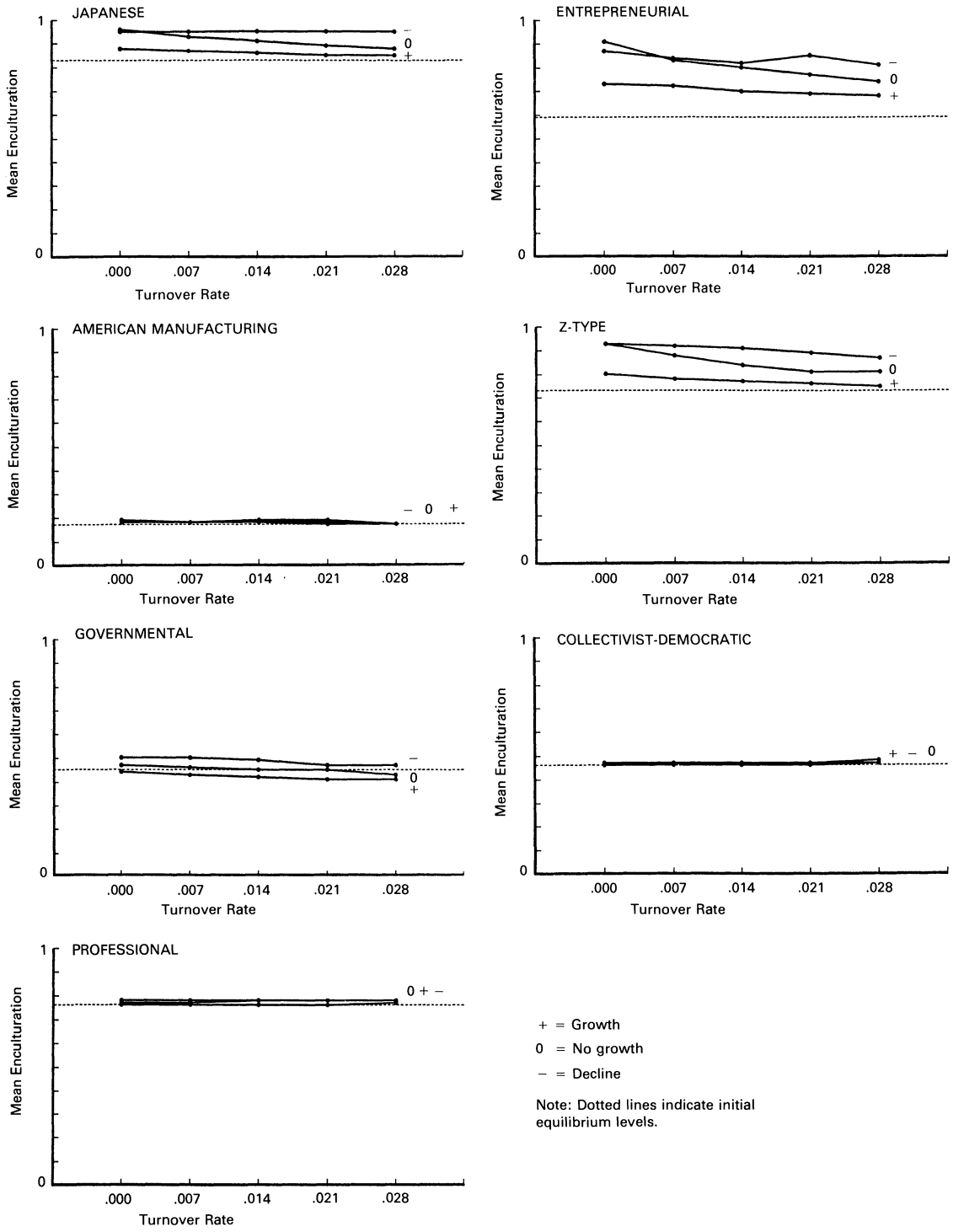
We now present a set of simulations run to examine the effects of selectivity, socialization by management, and turnover under differing growth conditions. The results of the earlier runs were used to determine the initial parameter settings for organizational size and for the enculturation scores and tenure distribution of employees. We thus started the runs with the organizational forms in their equilibrium states. The parameters corresponding to selectivity, socialization, and turnover were then systematically varied for each form for each of three conditions—growth, stability, and decline in organizational size. The new equilibrium results are shown in Figures 5, 6, and 7, which plot the equilibrium mean enculturation levels against the values of the management-controlled parameters for the three growth conditions. Equilibrium points for each growth condition are connected by solid lines. The dotted lines indicate the initial equilibrium levels.

The turnover results (Figure 5) are striking in that turnover appears to have little or no effect on cultural intensity for any organizational form, the only possible exception being the no-growth condition for the Japanese, entrepreneurial, and Z-type forms. This finding is independent of the setting for the growth parameter and is contrary to the conventional wisdom that turnover rates have important consequences for organizations (Staw, 1980), at least as far as organizational culture is concerned.

The results for selectivity (Figure 6) show that the Japanese form is relatively insensitive to recruitment selectivity. Only in the growth condition does selectivity have even a small effect on cultural intensity in Japanese organizations. A similar but less pronounced effect can be seen in type-Z organizations. By contrast, cultural intensity in the American manufacturing form rises dramatically with increased selectivity for all settings. Other forms with similar (although less severe) patterns include the professional, governmental, and entrepreneurial forms, with the highest gains occurring in the growth condition. The collectivist-democratic form has a natural equilibrium that is not sensitive to growth variations; however, the equilibrium level is elastic with respect to changes in selectivity under the growth and stability conditions. In the decline condition, equilibrium is affected by selectivity only at low selectivity levels.

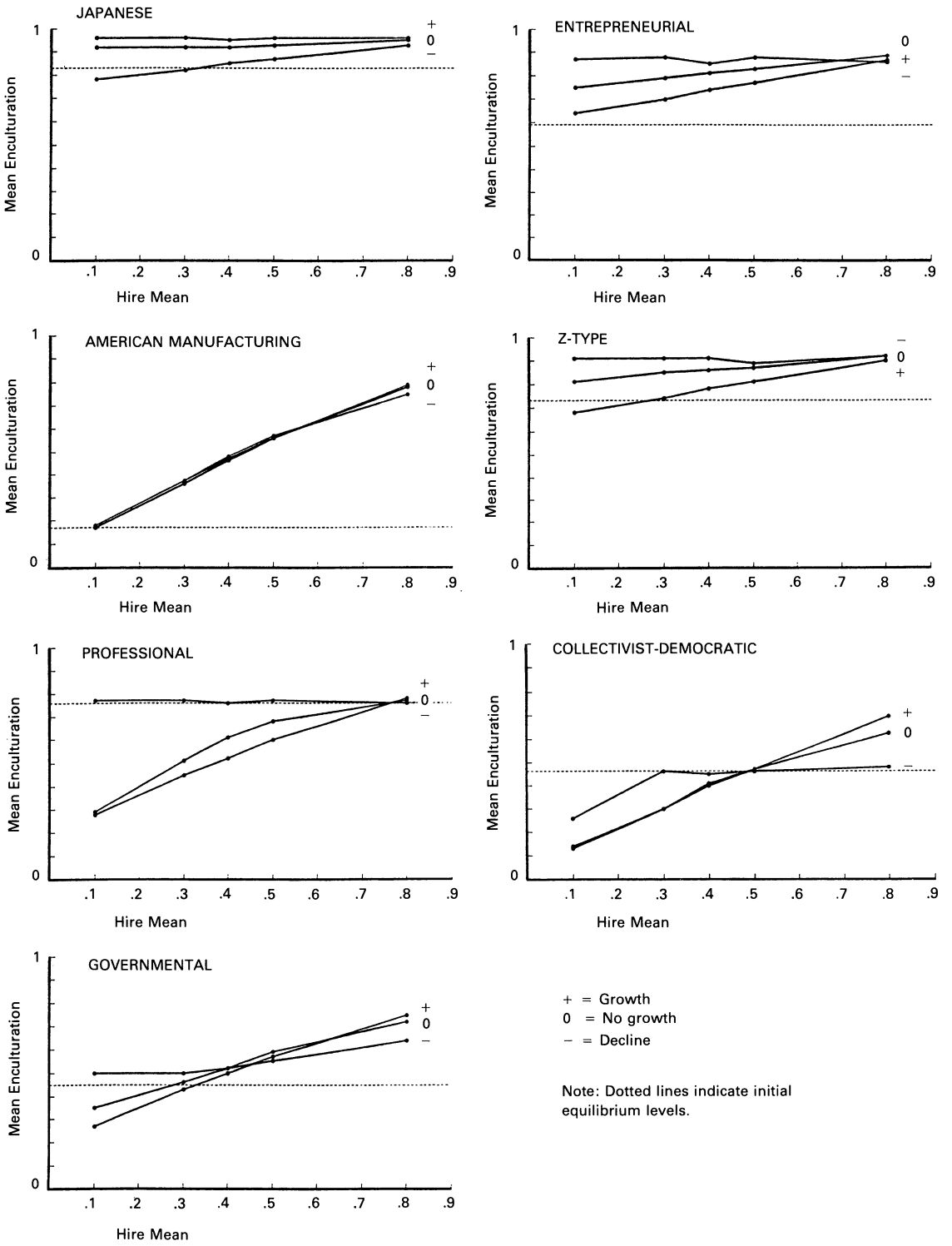
Changes in the intensity of socialization by management show the most dramatic effects for the American manufacturing form (Figure 7). Increased socialization leads to substantial increases in cultural intensity for all growth settings. To a lesser degree, the same effects hold for the other forms. For the collectivist-democratic form, small

Figure 5. Effects of turnover rate on cultural equilibrium level for growth, no growth, and decline conditions.



increases in socialization from the natural level (no management socialization) lead to stronger culture, but the effect levels off as socialization intensity continues to increase. The professional and Japanese forms show the least responsiveness to variation in socialization, although for the Japanese form the cultural intensity drops substantially

Figure 6. Effects of selectivity on cultural equilibrium levels for growth, no growth, and decline conditions.

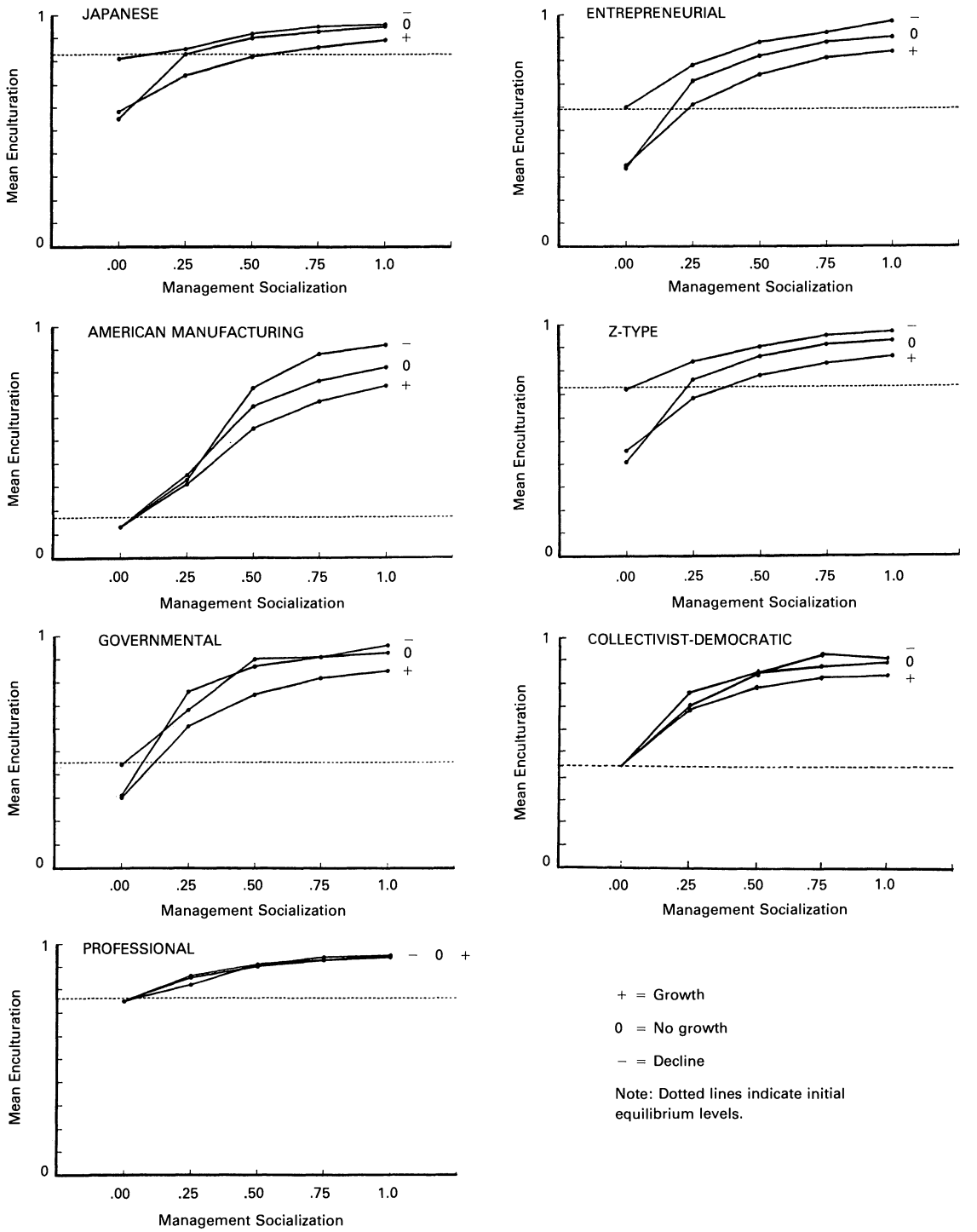


at very low socialization levels for the growth and stability conditions but not for the decline condition.

DISCUSSION AND CONCLUSIONS

Because they are based on a simulation model, the findings reviewed here are comparable to theoretical derivations. As

Figure 7. Effects of management socialization on cultural equilibrium level for growth, no growth and decline conditions.



with any theory, evaluation of the model should depend on both its plausibility and the ideas it generates. In our effort to build a plausible model of cultural transmission in organizations, we resisted the temptation to be creative and innovative. Instead, we tried to rely on established theories and available evidence in order to specify a model that most

social scientists would find plausible, minor quibbles about theories and evidence aside. Specification of this process in its entirety in mathematical form is a contribution in and of itself, especially since the model is capable of generating widely observed differences in cultural intensity across organizational forms.

We suspected that although the individual components of the model were fairly well understood, their joint operation was not. Familiarity with dynamic processes led us to think that when these components were simulated together over time, the interactions would yield new insights. We believe that this has been the case and that we now know more about the demographics of cultural transmission in organizations. Consider the following observations.

First, rapid growth and high turnover often aid in establishing cultural stability. We have already suggested that the effect of rapid growth is the result of the higher susceptibility of new employees to socialization. Conversely, the turnover effect could be the result of the exit of employees with greater resistance to socialization, particularly because employees with higher levels of alienation (lower enculturation levels) are somewhat more likely to exit.

Second, organizational culture becomes stronger as organizations decline in size. We interpret this finding as indicating that culture intensifies in declining organizations because employees with short tenure are the most likely to exit. These employees have not been exposed to organizational socialization processes for as long as long-term employees and, as a consequence, they have relatively low levels of enculturation. Once said, this explanation seems obvious. Yet, it is rarely invoked in discussions of organizational decline, which often view the change observed during these periods as emotional reactions (Sutton, 1988). The simulated declines make it clear that such explanation is not necessarily needed and that the effect can be produced by a decline in the number of employees without considering organizational performance. The effect could be enhanced by explicit seniority-based retention policies.

Third, because cultural instability is likely to foster conflict, some organizational forms appear to be inherently more conflict-prone. Governmental, professional, and collectivist-democratic forms are typically associated with higher levels of conflict, although these are usually thought to be the result of positional autonomy, long tenure durations, or tightly held values. The simulations suggest alternatives to the usual behavioral or structural explanations of conflict; the results may follow simply from the demographic dynamics, which extend the time required to reach equilibrium.

It is important to point out that we do not think these simulations have proved or disproved anything. What they have done is demonstrate that the fairly simple demographic model developed here can reproduce outcomes consistent with those previously ascribed to behavioral processes (Pfeffer, 1983). Such findings are best regarded as hypotheses and considerably more analysis and research

needs to be done before they should be considered as anything more than conjectures.

Nonetheless, we are pleased that the model generates such conjectures and see it as a useful research tool. Accordingly, we plan to continue running simulations for various parameter combinations. In future efforts, we plan to introduce both hierarchical and horizontal differentiation into the model. We hope that these refinements will produce even more unexpected insights into the cultural transmission process, including those for organizational subcultures (see Jermier et al., 1991).

Our modeling strategy could also be applied to the study of organizational competence. In some organizations, enculturation may be closely linked to the core competence of the firm (Prahalad and Hamel, 1990). Competence, like culture, is influenced by demographic processes. However, changes in individual enculturation levels are driven by a socialization process, whereas changes in individual competence levels are driven by a learning process, and the two processes differ. Socialization relies on social influence, while learning depends on performance feedback. Nonetheless, competence and other issues are critically related to the inflow and outflow of employees. With appropriate reformulation of certain equations (e.g., respecifying the socialization function as a learning function), the modeling strategy used here might be used to address questions about the acquisition and retention of organizational competence.

Implications for Cultural Management

We explore the implications of our findings for cultural management. In doing so, we focus on the three organizational forms of current policy and comparative interest—the Japanese, American manufacturing, and collectivist-democratic forms (cf. Cole, 1990).

The Japanese form shows a high degree of cultural intensity and stability across all parameter variations and under all growth settings. This suggests that the Japanese reputation for strong organizational culture is well deserved and provides support for the model's validity. It also suggests that once a strong culture is established, it develops an inertia that is resistant to a wide variety of subsequent variations in management policy and organizational growth rates. The most significant implication for Japanese managers is that once the culture of the organization is established, managerial efforts directed toward maintaining recruitment selectivity and socialization and minimizing turnover may be relaxed without fear of a noticeable impact on the organization's culture. While the cultural impact would not be noticeable, the savings accruing to the organization because of reduced costs could be.

By contrast, the cultural intensity of the American manufacturing form is highly responsive to changes in recruitment selectivity and management socialization. In practice, this form is characterized by the lack of concern for both of these processes. The advantages to be gained from investment in organizational culture may explain why culture

has recently become such a popular topic with American managers. More managerial attention to recruitment and socialization could pay big dividends in terms of cultural strength. The advantages of stronger organizational cultures could well outweigh the costs of the extra effort.

The collectivist-democratic form showed a strong cultural responsiveness to recruitment selectivity except under the decline condition. Based on these findings, it seems important for these organizations to maintain their selection standards, and they could strengthen their cultures by raising the standards. These organizations could also clearly benefit from increased management socialization. However, since the collectivist-democratic form is characterized by the lack of formal hierarchial authority, "socialization by management" requires a special interpretation for this form. Because there is no formal authority, socialization in this form refers to collectively organized, planned efforts to intensify the socialization of organizational members, rather than leaving socialization purely to informal coworker interactions.

The simulation runs indicate that the dynamics of cultural transmission vary substantially across the different forms. In circumstances for which greater recruitment selectivity is suggested, we assume that more desirable candidates exist in the labor market and can be found and recruited, given sufficient effort. It is possible that societal cultural constraints may restrict the candidate pool to the point that this assumption is not valid—for example, the American labor market may contain a scarcity of candidates with desirable cultural traits, in which case management must rely more on socialization after hiring to strengthen organizational culture. At the other extreme, the Japanese labor market may contain an abundance of desirable candidates, so that selective recruitment may not entail significant costs. Given appropriate techniques, socialization by management is controllable by the organization, but its costs are likely to be related to the characteristics of the societal pool from which new workers are drawn. The turnover findings imply that organizational emphasis on retention policies and the management of turnover may be misdirected, at least with respect to cultural management. While some differences are seen across different growth conditions, they are not as pronounced as expected. Overall, the findings provide potential guidance for managerial decisions by showing which parts of the cultural transmission process are likely to show the highest returns to investment in managing organizational culture for different organizational forms.

Implications for Research

We would like to obtain more direct empirical verification of the model and its outcomes. In this respect, we do not think that detailed micro data on individual socialization experiences and the like is necessary. The minimal data requirements needed to test the model directly seem to be some systematic assessment of the mean enculturation level of all organizational members and estimates of the set of relevant organizational level demographic parameters.

Comparing several different types of organizations across time on these dimensions should be sufficient to find some of the major outcomes predicted by the model. While these data requirements do not seem impossible, they are far from trivial (obtaining enculturation scores seems most difficult).

The study of cultural transmission in formal organizations also promises to inform other areas of social science inquiry. We note briefly two of these that seem to us especially likely to benefit from a greater understanding of cultural transmission in organizations. The first of these is the more general study of culture—for example, societal culture. As we have argued, the effects of demographic processes seem to be especially salient for organizational settings. But this observation may simply reflect the easier recognition of such processes in organizations. All cultural systems may be subject to demographic processes in similar ways; these are just more readily detectable in formal organizations. If so, understanding the demography of cultural transmission in organizations will assist in gaining insight into cultural transmission more generally—for example, in understanding how the demographic bulge created by the Baby Boom in America facilitated the development of countercultures in the 1960s. From our point of view, that would be a welcome development, because much of the recent work on cultural transmission in societies has emphasized genetic rather than social mechanisms (see Cavalli-Sforza and Feldman, 1981; Boyd and Richerson, 1985).

The second area of social science study that will likely benefit from work on cultural transmission in organizations is basic organizational theory. As is well known, one of the major debates within organizational theory over the last decade has been about the adaptability of organizations. Some theories assume or imply that formal organizations are highly adaptive while others contend that successful adaptation is rare, preferring instead an image of organizations as highly inertial. Part of what is at issue in this debate is organizational culture. How much inertia does organizational culture have? To what extent does organizational culture change in response to other types of changes, or inhibit such changes? Most theories of organization make strong assumptions about cultural adaptiveness. Clearly, the debate would be sharpened with a more analytical understanding of the dynamics of organizational culture.

REFERENCES

Abegglen, James, and George Stalk
1985 Kaisha. New York: Basic Books.

Asch, Solomon E.
1951 "Effects of group pressures upon the modification and distortion of judgments." In H. Guetzkow (ed.), Groups, Leadership and Men: 117–190. Pittsburgh: Carnegie Press.

Berger, Peter L., and Thomas Luckmann
1966 The Social Construction of Reality. New York: Doubleday.

Boyd, Robert, and Peter J. Richerson
1985 Culture and the Evolutionary Process. Chicago: University of Chicago Press.

Cameron, Kim, M. U. Kim, and D. Whetten
1988 "Organizational effects of decline and turbulence." In K. Cameron, R. Sutton, and D. Whetten (eds.), Readings in Organizational Decline: 207–225. Cambridge, MA: Ballinger.

Carley, Kathleen
1991 "A theory of group stability." American Sociological Review, 56: 331–354.

Cavalli-Sforza, Luca, and Marcus Feldman
1981 Cultural Transmission and Evolution. Princeton: Princeton University Press.

Cohen, Michael, James G. March, and Johan P. Olsen
1972 "A garbage can model of organizational choice." Administrative Science Quarterly, 17: 1–25.

Cole, Robert
1990 Strategies for Learning. Berkeley, CA: University of California Press.

Coleman, James S.
1990 Foundations of Social Theory. Cambridge, MA: Harvard University Press.

Coombs, Clyde H., Robyn M. Dawes, and Amos Tversky
1970 Mathematical Psychology. Englewood Cliffs, NJ: Prentice-Hall.

Deal, Terrence E., and Allan A. Kennedy
1982 Corporate Cultures. Reading, MA: Addison-Wesley.

Elster, Jon
1989 The Cement of Society. New York: Cambridge University Press.

French, J. R. P., Jr.
1956 "A formal theory of social power." Psychological Review, 63: 181–194.

Friedkin, Noah E., and Karen S. Cook
1990 "Peer group influence." Sociological Methods and Research, 19: 122–143.

Friedkin, Noah E., and Eugene C. Johnsen
1990 "Social influence and opinions." Journal of Mathematical Sociology, 15: 193–204.

Goffman, Erving
1959 The Presentation of Self in Everyday Life. Garden City, NY: Doubleday Anchor.

Hofstede, Geert
1980 Culture's Consequences. Beverly Hills, CA: Sage.

Hofstede, Geert, Bram Neuijen, Denise Daval Ohayv, and Geert Sanders
1990 "Measuring organizational cultures: A qualitative and quantitative study across twenty cases." Administrative Science Quarterly, 35: 286–316.

Jacobs, R. C., and P. T. Campbell
1961 "The perpetuation of an arbitrary tradition through successive generations of a laboratory microculture." Journal of Abnormal and Social Psychology, 62: 644–658.

Jermier, John M., John M. Slocum, Jr., Louis W. Fry, and Jeannie Gaines
1991 "Organizational subcultures in a soft bureaucracy: Resistance behind the myth and facade of an official culture." Organization Science (in press).

Kiesler, C. A., and S. B. Kiesler
1969 Conformity. Reading, MA: Addison-Wesley.

Lincoln, James R., Mitsuyo Hanada, and Kerry McBride
1986 "Organizational structures in Japanese and U.S. manufacturing." Administrative Science Quarterly, 31: 338–364.

Louis, Meryl Reis
1980 "Surprise and sense making: What newcomers experience in entering unfamiliar organizational settings." Administrative Science Quarterly, 25: 226–251.

March, James C., and James G. March
1977 "Almost random careers: The Wisconsin school superintendency, 1940–1972." Administrative Science Quarterly, 22: 377–409.

March, James G.
1962 "The business firm as a political coalition." Journal of Politics, 24: 662–678.
1991 "Exploration and exploitation in organizational learning." Organization Science, 2: 71–87.

O'Reilly, Charles
1989 "Corporations, culture and commitment: Motivational and social control in organizations." California Management Review, 31 (4): 9–25.

O'Reilly, Charles, and David Caldwell
1979 "Information influence as a determinant of perceived task characteristics and job satisfactions." Journal of Applied Psychology, 64: 157–165.

O'Reilly, Charles A., III, David F. Caldwell, and William P. Barnett
1989 "Work group demography, social integration and turnover." Administrative Science Quarterly, 34: 21–37.

O'Reilly, Charles A., III, Jennifer Chatman, and David Caldwell
1991 "People and organizational culture: A profile comparison approach to assessing person-organization fit." Academy of Management Journal, 34: 487–516.

Ott, Steven J.
1989 The Organizational Culture Perspective. Pacific Grove, CA: Brooks/Cole.

Ouchi, William G.
1981 Theory Z. Reading, MA: Addison-Wesley.

Pascale, Richard T.
1985 "The paradox of 'corporate culture'." California Management Review, 27 (2): 26–41.

Peters, Thomas
1978 "Symbols, patterns and settings." Organizational Dynamics, 7: 3–23.

Peters, Thomas J., and Robert H. Waterman
1982 In Search of Excellence. New York: Harper and Row.

Petersen, Trond, and Seymour Spilerman
1990 "Job quits from an internal labor market." In K. U. Mayer and N. B. Tuma (eds.), Event History Analysis in Life Course Research: 69–95. Madison, WI: University of Wisconsin Press.

Pfeffer, Jeffrey
1981 "Management as symbolic action: The creation and maintenance of organizational paradigms." In L. L. Cummings and B. M. Staw (eds.), Research in Organizational Behavior, 3: 1–52. Greenwich, CT: JAI Press.
1983 "Organizational demography." In L. L. Cummings and B. M. Staw (eds.), Research in Organizational Behavior, 5: 299–357. Greenwich, CT: JAI Press.

Prahalad, C. K., and Gary Hamel
1990 "The core competence of the corporation." Harvard Business Review (May–June): 79–91.

Rodgers, T. J.
1990 "No excuses management." Harvard Business Review (July–August): 84–98.

Rothschild-Whitt, Joyce
1979 "The collectivist organization." American Sociological Review, 44: 509–527.

Rousseau, Denise M.
1990 "Quantitative assessment of organizational culture: The case for multiple measures." In B. Schneider (ed.), Frontiers in Industrial and Organizational Psychology, 3: 153–192. San Francisco: Jossey-Bass.

Schein, Edgar H.
1968 "Organizational socialization and the profession of management." Industrial Management Review, 9: 1–15.
1985 Organizational Culture and Leadership. San Francisco: Jossey-Bass.

Scott, W. Richard
1987 Organizations: Rational, Natural, and Open Systems, 2d ed. Englewood Cliffs, NJ: Prentice-Hall.

Sherif, Muzafir
1935 "A study of some social factors in perception." Archives of Psychology, 187.

Smircich, Linda
1983 "Concepts of culture and organizational analysis." Administrative Science Quarterly, 28: 339–358.

Staw, Barry M.
1980 "The consequences of turnover." Journal of Occupational Behavior, 1: 253–273.

Sutton, Robert
1988 "Managing organizational death." In K. Cameron, R. Sutton, and D. Whetten (eds.), Readings in Organizational Decline: 381–396. Cambridge, MA: Ballinger.

Tuma, Nancy Brandon, and Michael T. Hannan
1984 Social Dynamics: Models and Methods. Orlando, FL: Academic Press.

Wanous, J. P.
1980 Organizational Entry. Reading, MA: Addison-Wesley.

Wilson, James Q.
1989 Bureaucracy. New York: Basic Books.

Appendix: Characteristic Parameter Settings by Organizational Form

	Japanese	American	Governmental	Professional	Entrepreneurial	Z-type	Collectivist-democratic
GR	.08	.08	.0035	.0035	.17	.08	.00
RR	.70	1.90	1.20	.40	1.20	.91	.70
*C**	.50	.10	.30	.80	.30	.40	.50
δ*	.15	.15	.15	.15	.30	.15	.15
SMR	.80	.08	.08	.08	.40	.50	.00
SNR	.18	.90	.90	.90	.58	.48	.98
SDR	.02	.02	.02	.02	.02	.02	.02
σ	.10	.10	.10	.10	.10	.10	.10
TA1	.02	.02	.02	.02	.02	.02	.02
TA2	.60	.60	.60	.60	.60	.60	.60
TA3	.30	.30	.30	.30	.30	.30	.30
ER	.005	.030	.005	.015	.015	.010	.010
AR	.15	.60	.15	.15	.15	.15	.15