

DYNAMICS OF PLANNED ORGANIZATIONAL CHANGE: ASSESSING EMPIRICAL SUPPORT FOR A THEORETICAL MODEL

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This study employed meta-analytic procedures to evaluate the potential validity of a model of planned organizational change. Hypotheses derived from this model focus on the relationships among planned change interventions and three classes of organizational variables, assessing work settings, individual behavior, and organizational outcomes. The aggregated results of 52 evaluations of planned change interventions were largely consistent with the hypotheses, providing considerable support for the model as a whole. Recommendations are made for future research on organizational change evaluation.

The inadequate level of theory development in the field of planned organizational change has been noted often (e.g., Golembiewski, 1979; Sashkin & Burke, 1987). General theoretical formulations of the dynamics of planned change processes—formulations not tied to specific types of interventions—remain particularly underdeveloped (Porras & Robertson, 1987). In contrast, the quality of empirical research in the field has improved over time (Beer & Walton, 1987; Nicholas & Katz, 1985). However, this research typically has not been directed toward the evaluation of theories of change. Hence, relatively little effort has been devoted to the task of empirically validating such theoretical models.

This study examined the potential validity of one model of the dynamics of planned organizational change (Porras, 1987; Porras & Robertson, 1992). We assessed the support previous empirical research on planned change interventions provided for the model. Specifically, we used meta-

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analytic techniques (Hunter, Schmidt, & Jackson, 1982) to evaluate a set of hypotheses, derived from the model, regarding the dynamics of organizational change. Both the model and the meta-analysis focused on planned interventions based on behavioral science.

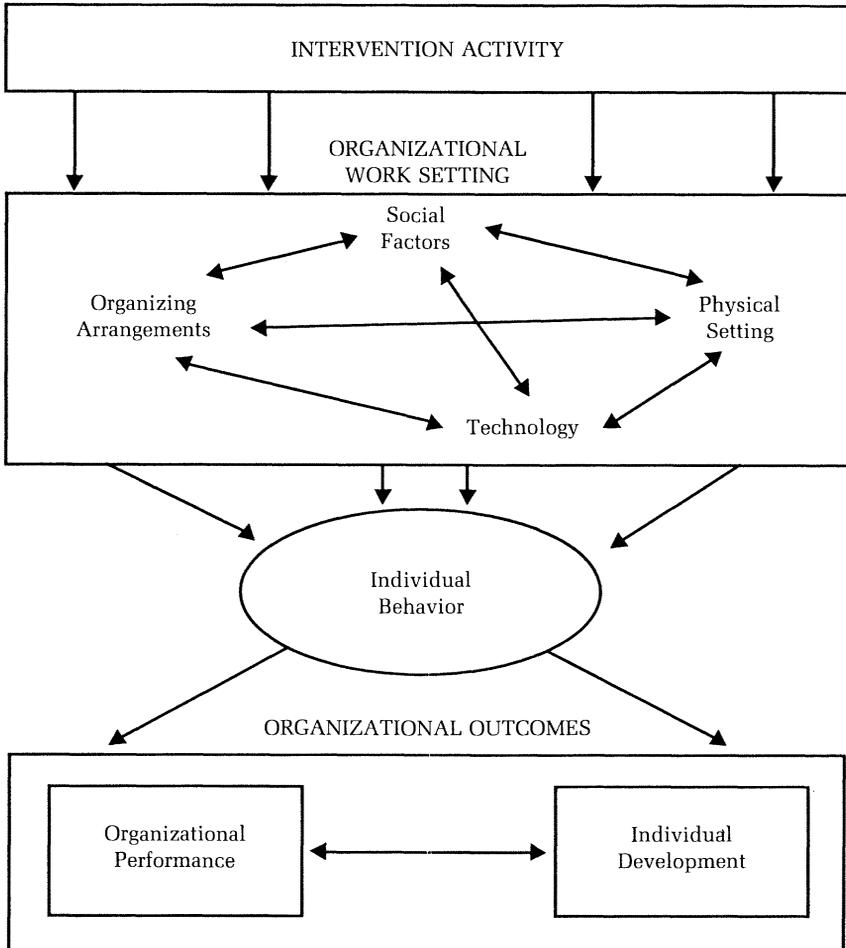
THEORY AND HYPOTHESES

Figure 1 depicts the theoretical framework. Developed from a change perspective, its assumption is that organizations are contexts within which individuals behave. An organizational work setting comprises four major interrelated subsystems: organizing arrangements, social factors, technology, and physical setting (Porras, 1987; Porras & Robertson, 1992). We define these subsystems later in this section. Each subsystem consists of specific elements that strongly influence the work behavior of individual organization members. In turn, individual behavior is a primary determinant of two categories of organizational outcomes: the level of organizational performance and the level of organization members' individual development. From a research perspective, then, interventions constitute independent variables, and work setting changes, individual behavior, and organizational outcomes are dependent variables.

From the standpoint of this model, interventions can be viewed as the activity through which changes in elements of an organizational work setting are implemented. Since work setting characteristics strongly influence individual behavior, interventions should be designed to change organizational components that will in turn encourage desired behavior changes. Behavior change must be the primary focus of intervention activity since it is necessary in order for organizational outcomes to improve. Although we recognized that the one-way arrows in Figure 1 simplify reality, we focused on the flow of change from the work setting to individual behavior to organizational outcomes because the model concerns planned change, the ultimate goal of which is to change organizational outcomes. We also recognized that effective planned change may require more than one cycle of collaborative diagnosis, action, data gathering, data analysis, and rediagnosis. Consistent with action research (Sussman & Evered, 1978), the evaluation of changes taking place throughout a system in behavior and organizational outcomes can serve as input into a new round of intervention activity designed to create additional changes in a work setting.

We defined the four subsystems of work settings as follows: (1) organizing arrangements are formal elements of organizations developed to provide the coordination and control necessary for organized activity; examples are formal structures and reward systems; (2) social factors are the individual and group characteristics of the people in an organization, their patterns and processes of interaction, and the organizational culture; (3) technology refers to everything directly associated with the transformation of organizational inputs into outputs, such as work flow design and job design; (4) physical setting is the characteristics of the physical space in which organizational

FIGURE 1
A Theoretical Model of the Dynamics of Planned Organizational Change



activity occurred. Porras and Robertson (1992) provided a detailed discussion of the four subsystems, each of which is composed of a set of specific elements that shape and guide the work behavior of organization members. If changed, these elements can induce change in member behavior. Thus, they comprise a set of “manipulable variables” (Porras & Robertson, 1987: 30) that can trigger organizational change.

The four organizational subsystems are highly interdependent. As a result, intervention activity can result in changes both to the element or elements of a work setting directly changed by the intervention and to other elements of the work setting as well (Nadler, 1981). These additional changes can affect variables in the same category as the intervention or those in other categories, or both. For example, a technology intervention entailing

the redesign of an organization's work flow may result in changes in organization members' job designs, an element in the technology subsystem. In addition, culture change, an element in the social factors category, may occur as an adaptation to the new technology. Theoretically, an intervention in any category could cause changes in work setting features in any of the four categories. Of course, change in a work setting or in the other dependent variable categories can be negative, occurring in a direction opposite to that intended, or nonexistent. However, because the use of most interventions is based on experience and research, we expected that behavioral science-based interventions would tend to lead to positive change across all the work setting variables measured.

Hypothesis 1: Planned organizational change interventions will generate positive change in work setting variables.

Since an organization's functioning depends on the actions of its members, the organization can change only when members' behavior changes (Goodman & Dean, 1982; Tannenbaum, 1971). Altering the work setting is a potent lever for inducing change in member behavior. This notion is rooted in social cognitive models of behavior (Bandura, 1986; Porter & Lawler, 1968), which identify an individual's environment as an important source of information about appropriate behaviors. Through processes of perception and attribution, individuals form beliefs regarding their organizational environment. These beliefs energize, direct, and regulate behavior (Bernstein & Burke, 1989). Hence, organizations can be designed to encourage constructive member behavior (cf. Hackman, 1981; Pierce, Dunham, & Cummings, 1984).

From such a perspective, all effective intervention activity must generate change in the way targeted individuals actually behave on the job. Actual behavior entails not only the quality of individual performance, which can be viewed as a summary measure of work behavior, but also the specific tasks and activities individuals engage in as they carry out their role responsibilities. These can include the decisions they make, the information they share, the care with which they do their work, the creativity they bring to their activities, and the initiatives they take. Porras and Hoffer (1986) identified a set of work behaviors that experts in planned organizational change indicated would be a consequence of successful change activity. Examples of these behaviors include open communication, collaboration, taking responsibility, and so forth. Organizational citizenship and "prosocial" behaviors (Brief & Motowidlo, 1986; Smith, Organ, & Near, 1983) also fall into this category. Among the studies included in this meta-analysis, Luthans, Kemerer, Paul, and Taylor (1987) provided a good example of the measurement of specific work behaviors.

Like change in the other dependent variables in the model, individual behavior change is not always easy to achieve. We recognized that individual work behavior is driven by factors outside an organization, such as personal goals and social networks, as well as by organizational factors.

However, since change agents typically have more influence over the organizational than the external, a model used to guide change efforts should focus on what can be most effectively altered—the organizational work setting. Our prediction is that as interventions change elements of an organizational work setting, new signals are sent to members regarding desirable behavior patterns. In response, members will tend to adopt new behaviors to meet new expectations and constraints.

Hypothesis 2: The relationship between the amount of positive change in work setting variables and the amount of positive change in individual behavior will be positive.

Behavior change is not the ultimate goal of planned change activity; it is a key focus because it mediates the relationship between changes in a work setting and both organizational performance and individual development. Organizational performance consists of a wide variety of both economic outcomes, such as profits, market share, market position, and productivity, and human relations outcomes, including rates of turnover, absenteeism, and grievances. Indicators of individual development include level of self-actualization, psychological or mental health, level of realization of personal abilities, and job satisfaction.

Individuals can allocate energy among a variety of activities, only some of which are productive (Naylor, Pritchard, & Ilgen, 1980). Just as the directions in which they channel their effort can contribute to job performance (Katerberg & Blau, 1983), the nature of the behaviors organization members engage in can have an important influence on organizational performance. Assessing that relationship, Hoffer (1986) found significant, positive relationships between the frequency with which the set of work behaviors identified by Porras and Hoffer (1986) occurred, and objective performance indicators, including revenue, profit, and market share.

As for individual development, it has long been argued that people are psychologically affected by their involvement in organizations (e.g., Argyris, 1957; Ouchi & Johnson, 1978). According to this argument, organizational characteristics designed to control members' behavior can generate behavioral reactions such as aggression, withdrawal, apathy, and minimization of the amount of work performed (Strauss, 1963). Such behaviors may in turn result in anxiety or alienation and limit personal development. In contrast, organizational qualities such as decentralization, job enlargement, and participative management can promote behaviors that result in beneficial experiences for organization members (e.g., Likert, 1967; McGregor, 1960). Especially over the long term, the quality of individuals' work behavior strongly influences the level of development they experience through their work. Thus, invoking the same caveats as for the above hypotheses, we propose:

Hypothesis 3: The relationship between the amount of positive change in individual behavior and the amount of positive change in organizational outcomes will be positive.

METHODS

We used three criteria to decide which studies to include in the meta-analysis reported here. First, as is common practice in meta-analyses (Gooding & Wagner, 1985), only published studies were included. Second, only evaluations of interventions occurring in ongoing organizational settings were included, since previous meta-analyses have demonstrated differences between results from field settings and those from other settings (e.g., Miller & Monge, 1986; Tubbs, 1986). Third, studies were included only if they reported quantitative data on measures of dependent variables that were statistically analyzed and tested.

Studies were obtained primarily from Porras and Berg's (1978) review of the literature on organization development evaluation from 1959 to 1975 and from Porras and Robertson's (1992) review of the evaluation literature from 1975 to 1988. We also checked the bibliographies of other recent organization development reviews and located six additional studies. A total of 58 studies met the criteria for inclusion in the analysis. However, 11 of them did not provide sufficient statistical information for calculation of effect sizes and thus had to be excluded. Of the 47 studies included, 3 reported data on two independent samples, and 1 reported data on three independent samples. We treated these independent samples as separate studies. Thus, the total number of studies analyzed is 52. Table 1 lists the studies.

The next step was to code the category of intervention used in each study. According to the theoretical framework, change efforts could be classified as intervening primarily in any of four subsystems. On the basis of the description of the change activities provided in the study, each intervention was coded as belonging to one of these four categories: organizing arrangements (e.g., flextime, incentive programs), social factors (e.g., team building), technology (e.g., job enrichment-redesign), and physical setting (e.g., change to an open office plan). In five cases, the interventions clearly consisted of a dual thrust, targeting variables in two of the subsystems, and thus they were coded as multifaceted interventions.

Next, we coded the dependent variables in each study. Each variable was coded as belonging to one of the three classes of dependent variables described earlier: variables assessing work setting, individual behavior, or organizational outcomes. We should note that the level of detail in Figure 1 is for illustrative purposes; we do not present results separately for the four categories of work setting dependent variables, or for the two categories of organizational outcomes.

Three raters, the first two authors and a doctoral student familiar with the theoretical framework, were involved in the coding process. After generating a list of decision rules, two raters coded the intervention (or interventions) and dependent variables of each study. Initial interrater agreement was 90 percent for the interventions and 83 percent for the dependent variables. Initial disagreements were resolved through discussion among all three raters.

TABLE 1
Studies Analyzed

Arvey, Dewhirst, & Brown (1978)	Luthans, Kemmerer, Paul, & Taylor (1987)
Bartunek & Keys (1982)	Mathieu & Leonard (1987)
Bhagat & Chassie (1980)	Miller & Schuster (1987)
Bragg & Andrews (1973)	Mitchell (1986)
Buller & Bell (1986)	Morrison & Sturges (1980)
Cohen & Turney (1978)	Murphy & Sorenson (1988)
Cooke & Coughlan (1979)	Nadler, Cammann, & Mirvis (1980)
Culbert (1972)	Narayanan & Nath (1984)
Cummings & Srivastva (1977)	Oldham & Brass (1979)
Eden (1986)	Ondrack & Evans (1986)
Friedlander (1967)	Orpen (1979)
Hackman, Pearce, & Wolfe (1978)	Pasmore & King (1978)
Hautaluoma & Gavin (1975)	Pate, Nielsen, & Mowday (1977)
Head, Molleston, Sorenson, & Gargano (1986)	Paul & Gross (1981)
Hicks & Klimoski (1981)	Porras, Hargis, Patterson, Maxfield, Roberts, & Bies (1982)
Hughes, Rosenbach, & Clover (1983)	Ralston, Anthony, & Gustafson (1985)
Ivancevich & Lyon (1977)	Schuster (1984)
Jackson (1983)	Steel, Mento, Dilla, Ovalle, & Lloyd (1985)
Jordan (1986)	Sundstrom, Herbert, & Brown (1982)
Keller (1978)	Szilagyi & Holland (1980)
Keys & Bartunek (1979)	Wall, Kemp, Jackson, & Clegg (1986)
Kim & Campagna (1981)	Zalesny & Farace (1987)
Kimberly & Nielsen (1975)	Zand, Steele & Zalkind (1969)
Locke, Sirota, & Wolfson (1976)	

Following procedures described by Hunter and colleagues (1982), we calculated an effect size (r) for each dependent variable for which appropriate data existed. The effect size is a common metric that assesses the amount of change occurring in the dependent variables. The 52 studies yielded a total of 555 effect sizes. The effect sizes, weighted by sample size, were then cumulated across studies. Multiple dependent variables from the same study were treated as independent and entered separately into the analysis.

The variance of the distribution of sample effect sizes was corrected for sampling error. Correction for other potential sources of error identified by Hunter and colleagues (1982) was impossible because the necessary information was too frequently absent from the original publications. Finally, we computed the 95 percent confidence intervals for the effect size estimates. If the confidence interval for a mean effect size does not include .00, it can be concluded that the effect size is significantly different from zero.

The confidence intervals reported were calculated using the corrected variance, a procedure commonly used (e.g., Guzzo, Jette, & Katzell, 1985). However, since there has recently been controversy concerning the calculation of confidence intervals in meta-analysis (Whitener, 1990), we also calculated intervals using a standard error formula proposed by Whitener (1990: 317, equation 3). The Whitener procedure yielded confidence intervals that were the same to two decimal places for seven effect sizes and

wider by .01 to .04 for nine effect sizes. In only one case was there a difference in significance—the effect size for technology interventions—individual behavior dependent variables is nonsignificant when the Whitener formula is used and significantly negative when it is not.

RESULTS

Table 2 presents the average effect sizes for the three classes of dependent variables for all interventions combined. To provide greater detail regarding the impact of different categories of interventions, these three average effect sizes are also reported for the five separate intervention categories. Looking first at the impact of all interventions on work setting variables, the data support the prediction (Hypothesis 1) of positive change, with a significant effect size of .10. Effect sizes are also positive for all intervention categories except physical setting.

In Hypothesis 2, we predicted that work setting change would be positively associated with individual behavior change. To assess this relationship, we took the eight studies that measured at least one work setting variable and one individual behavior variable. For each study, we calculated the average effect size across all individual behavior variables measured. We then correlated the work setting variable effect sizes ($N = 71$) with the

TABLE 2
Impact of Interventions on Dependent Variables^a

Category of Intervention	Dependent Variable	Effect Size	N	K	Corrected Variance	95 Percent Confidence Interval	
All combined	Work setting	.10 ^e	29,611	302	.042	.08	.12
	Individual behavior	.15 ^e	4,149	29	.022	.10	.20
	Organizational outcomes	.09 ^e	26,477	224	.040	.06	.12
Organizing arrangements	Work setting ^b	.11 ^e	9,296	110	.020	.08	.14
	Individual behavior	.13 ^e	1,859	8	.004	.09	.17
	Organizational outcomes	.17 ^e	12,678	108	.023	.14	.20
Social factors	Work setting ^b	.21 ^e	5,036	59	.020	.17	.25
	Individual behavior	.24 ^e	1,910	12	-.002	.24	.24
	Organizational outcomes	.12 ^e	3,492	49	.075	.04	.20
Technology	Work setting ^b	.10 ^e	9,567	55	.053	.04	.16
	Individual behavior	-.20 ^e	380	9	.079	-.38	-.02
	Organizational outcomes	-.03	9,416	54	.022	-.07	.01
Physical setting	Work setting ^c	-.06	3,743	31	.038	-.13	.01
	Organizational outcomes ^d	-.09	564	6	.062	-.29	.11
Multifaceted	Work setting	.15 ^e	1,969	47	.066	.08	.22
	Organizational outcomes	.33 ^e	327	7	.058	.15	.51

^a N represents total sample size; K represents the number of effect sizes.

^b No physical setting variables were measured.

^c No organizing arrangements variables were measured.

^d No organizational performance variables were measured.

^e The 95 percent confidence interval does not include zero.

corresponding (from the same study) average individual behavior effect size, obtaining a correlation coefficient of .15. This coefficient was in the predicted direction but nonsignificant ($p = .22$). The pattern of results for those intervention categories measuring both work setting and individual behavior variables (organizing arrangements, social factors, and technology) is also relevant for this hypothesis. Social factors and organizing arrangements interventions have significant, positive effects on both work setting and individual behavior, which is consistent with the hypothesis. However, the fact that technology interventions have a significant, positive impact on work setting variables, but a significant, negative impact on individual behavior variables, is inconsistent with the hypothesis. Thus, the overall pattern of findings provides mixed support for Hypothesis 2.

Hypothesis 3 predicts that individual behavior change will be positively associated with organizational outcome change. As with Hypothesis 2, we tested this hypothesis by identifying the ten studies that measured at least one variable of each type. We calculated the average effect size across the individual behavior variables within each study and then correlated all organizational outcome variables in the ten studies ($N = 66$) with the corresponding individual behavior effect size. This produced a significant, positive correlation coefficient of .53 ($p < .001$), thus supporting the hypothesis. As with Hypothesis 2, the pattern of results across categories is also relevant. Social factors and organizing arrangements interventions both yielded significant, positive change in individual behavior and organizational outcomes, which is consistent with Hypothesis 3. As with Hypothesis 2, however, the results for technology interventions were not as straightforward, with a significant, negative impact on individual behavior and a nonsignificant impact on organizational outcomes. In sum, the overall pattern of findings provides considerable support for the hypothesis.

DISCUSSION

Overall, the results support the basic viability of this model of planned organizational change, and this is the primary contribution of this research. Interventions generated positive change in work setting variables, consistent with Hypothesis 1. There was mixed support for Hypothesis 2, which predicts that work setting change and individual behavior change are positively related. And, consistent with Hypothesis 3, there was a positive relationship between individual behavior change and organizational outcome change. Finally, except for technology interventions, the pattern of results among the specific intervention categories was consistent with the model. Thus, our results suggest that the model is potentially useful for both guiding and evaluating planned change efforts.

Certainly, however, this analysis does not serve as proof of the model's validity. Aggregating results across studies is not without its problems. For example, although recent research suggests that there is no consistent bias in effect sizes as a function of methodological rigor (Roberts & Robertson,

1992), it is still true that the results of this meta-analysis are only as valid as the original data upon which the meta-analysis is based. Another consideration is that the evaluations included in our analysis were not explicitly designed to assess this model. As a result, very few studies measured variables in all three classes of dependent variables comprising the causal links in the framework. Hence, the research designs of these evaluations typically did not allow a direct test of these relationships.

Despite these limitations, the meta-analysis suggests that further investigation of the model, in research specifically designed to test it, is warranted. To adequately test the model, organizational change evaluations would have to consistently collect data on (1) intervention activity and associated changes in an organizational work setting, (2) changes in individual work behavior, and (3) changes in organizational outcomes. Furthermore, researchers should perform analyses appropriate for assessing causality in the relationships between variables in these three categories.

Individual behavior in particular deserves more frequent and explicit attention as a dependent variable in change evaluations. The need to affect behavior in the process of planned change has been noted previously (e.g., Nadler, Cammann, & Mirvis, 1980), and the present study found a positive relationship between individual behavior change and organizational outcome change. However, specific work behaviors often are not even mentioned in reports of large-scale change projects. In the studies providing our data, 29 individual behavior variables were measured, yet most of these were summary measures of job performance rather than specific on-the-job behaviors. We argue that evaluations of planned change should regularly assess changes in specific work behaviors such as those identified by Porras and Hoffer (1986). Two correlational studies have focused on these behaviors (Hoffer, 1986; Robertson, 1990), but they have not yet been assessed in the context of a planned organizational change evaluation. Focusing on a common set of behaviors would provide a common denominator for research in the field, thus enhancing comparisons and integration of findings across studies. It would also facilitate finer-grained analyses of the relationships among changes in specific work setting, individual behavior, and organizational outcome variables.

Future research should also address three findings that were inconsistent with the model. First, we did not find a significant, positive correlation between work setting change and individual behavior change. One explanation is that change in the work setting is a necessary but not sufficient condition for individual behavior change. Also, some evaluations in our data may not have included a sufficiently long measurement period for behavior change to become evident. Thus, it would be useful to include time as a variable in future analyses.

Second, the pattern of findings for technology interventions—positive change in the work setting, negative change in individual behavior, and no significant change in organizational outcomes—is inconsistent with the model. One possible explanation for this inconsistency is that the introduc-

tion of new technological features can easily lead to a short-term decrease in individual performance as organization members learn or adapt to the new requirements of their jobs. Thus, time may again be an important variable. Also, further analyses may reveal important differences in the effects of specific technology interventions on specific individual behavior and organizational outcome variables.

Third, the results for physical setting interventions provide mixed support for the model. On the one hand, no change occurred in the work setting, in contrast to predictions. On the other hand, given that there was no work setting change, the fact that there was no change in organizational outcomes is consistent with the framework. One reason for the lack of change may be that practitioners have less experience with physical setting interventions than with the other types of interventions and are thus less skilled in designing and implementing the former. The fact that the impacts of these interventions are assessed by a relatively small number of effect sizes is consistent with this explanation. Future analyses of specific physical setting interventions and associated changes would be helpful as well.

Research of this nature would enable clarification, elaboration, and revision of the theoretical framework as such refinements were supported by empirical analysis. For example, if results suggest that there are key differences between short-term and long-term effects, the model should be modified to explicitly include this distinction. Similarly, analyses of specific interventions and associated changes would allow the model to become richer and more useful for planning change. Further research specifically designed to test the model may also suggest additional refinements. In this way, rigorous evaluations of planned change could contribute significantly to the development of change process theory. Development of such theory, which describes the underlying dynamics through which organizational change occurs, is the most important theoretical work needed in the field of organization development (Porras & Robertson, 1987).

We suggest three key implications relevant to the practice of planned organizational change. First, change agents should focus on systematic change in work settings as the starting point in change efforts and on individual behavior change as a key mediator associated with organizational outcome change. Because intervention activity affects parts of a work setting other than those changed directly by the intervention, practitioners must insure that the various work setting changes are congruent with each other, sending consistent signals to organization members about the new behaviors desired.

Second, the results for technology interventions indicate that negative behavior change does not necessarily lead to negative organizational outcome change. As suggested above, a negative change in behavior may be a short-term result of a change in technology (and may occur for other interventions as well). If so, an important implication for anyone making decisions about the continuation or expansion of change projects is that initial negative effects on individual behavior should not be weighted too heavily

in such decisions. To the extent that organizational outcomes remain unaffected, the organization can wait out the negative behavior change until individuals "move up the learning curve," or successfully adapt to the implemented changes. Eventually, behavioral problems may be overcome, generating improvements in organizational outcomes as well.

Third, efforts to extend this model would help increase the efficacy of planned change implementation. Well-developed theory would provide practitioners with a better basis for choosing interventions than simply their personal preferences, values, and styles. It would enable them to more effectively monitor change efforts, indicating where breakdowns have occurred and providing guidance as to the adjustments necessary to get the programs back on track. In short, the ability to consistently intervene in organizational systems to enhance an organization's functioning or individuals' well-being could become more systematic and effective (Porras & Robertson, 1987).

This meta-analytic evaluation of one theoretical model is a step toward the development of a viable and useful change process theory. By establishing that previous research findings yield considerable support for the model's validity, our analysis provides justification for further efforts to test and develop the framework.

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