Treatment Teams That Work (and Those That Don't): An Application of Hackman's Group Effectiveness Model to Interdisciplinary Teams in Psychiatric Hospitals

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Recent studies of small work groups emphasize comprehensive models of team effectiveness. A survey-based operationalization of one such model, Hackman's Model of Group Effectiveness (Hackman, 1987, 1990), is applied to 15 interdisciplinary treatment teams working in three public psychiatric hospitals. Mental health professionals answered a self-administered questionnaire I developed (N = 98, response rate = 91%). Analysis was conducted at three levels: (a) by all respondents; (b) by team; and (c) by organizational characteristics and professional discipline, and their interaction. Through use of a structural equation model, particular initial and enabling conditions successfully predict teams' meeting standards of the required task, teams' cohesion, and members' personal well-being; standards met and cohesion of team also predict overall team effectiveness. These findings emphasize the importance of measuring the various types of organizational and group factors contributing to team effectiveness, as well as the specific aspects of team effectiveness. Implications for team training are discussed.

Many authors have noted a resurgent interest in small work groups, be they called self-managing teams, autonomous work groups, or other appellations (for recent reviews, see Sundstrom, De Meuse, & Futrell, 1990; Tannenbaum, Beard, & Salas, 1992). Bunker (1992) recently reviewed for this journal four noteworthy books on

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small groups that appeared since the mid-1980s. One book reviewed, *Groups That Work (and Those That Don't): Creating Conditions for Effective Teamwork*, edited by J. Richard Hackman (1990), presents an often-cited model of work group effectiveness (see Goodman, Ravlin, & Argote, 1986) that has been applied to a wide variety of case studies: organizational management, one-shot projects, expert assistance, performances for audiences, customer and human services, and product production. The descriptions of the various teams in that book were gathered through field observations of a team of investigators, as well as through some interviews, research, questionnaires, and printed information available from the workplaces (Hackman, p. xiv and passim). This article presents further efforts to operationalize and test this particular model of group effectiveness, using a different methodology and a new instrument.

Specifically, this study gathered data from members of 15 similar, interdisciplinary treatment teams in public psychiatric hospitals, using a self-administered questionnaire I developed. The instrument attempted to operationalize Hackman's model for this particular context. Thus, in contrast to Hackman's findings that are presented as vivid case examples followed by lucid discussion, this article emphasizes the quantitative measurement and relationships between variables measured in the proposed model.

The evaluation of these mental health teams' effectiveness may be seen in a larger context as an attempt to bridge two streams found in the scientific and professional literatures: (a) social science journals, especially those focusing on organizational, industrial, and social psychology (see Sundstrom et al., 1990; Tannenbaum et al., 1992), which have often emphasized the development and application of specific theories and models, and use of experimental methodologies when possible (e.g., Eden, 1985); and (b) the health and human service professional literature, which has profiled the attitudes of team members (Folkins, Wieselberg, & Spensley, 1981; Toseland, Palmer-Ganeles, & Chapman, 1986) and structure of teams providing outreach, assessment, and treatment in various professional sites (e.g., Garner, 1988; Lecca & McNeil, 1985a; Terem, 1991), as well as highlighted practical guidelines for interprofessional training (Casto et al., 1994; Larson & LaFasto, 1989; Lister, 1982; Shalinsky, 1989; Vinokur-Kaplan, 1993, 1995).

In summary, this article seeks to bridge these two streams by applying Hackman's Model of Group Effectiveness, drawn from the organizational psychology literature, to the performance of clinical, interdisciplinary treatment teams in public psychiatric hospitals. Because interdisciplinary teams are found in a wide range of health and human service environments, as well as in academic and other settings, the findings may be pertinent to the design of interventions in other sites as well.

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INTERDISCIPLINARY CLINICAL TREATMENT TEAMS

Teams in health care organizations have a long, established tradition. For example, Ducanis and Golin (1979), authors of a handbook for interdisciplinary health care teams, note that the need for teamwork in medical practice "was discussed in the first quarter of this century" (p. 3), especially as a way to countervail against growing professional specialization. Since that time, teams have provided (a) a structure that helped guarantee the treatment of the "whole client" in a coordinated, unfragmented approach; (b) a way for organizations to clarify the lines of communication and authority within the agency as greater professional specialization developed (e.g., in child guidance clinics and hospitals); and (c) a necessary response to external mandates, such as "legislation, government regulations, and requirements of various third party payers [that] encouraged team responsibility in assessment, diagnosis and treatment as one way to improve the quality of care and provide for professional accountability" (pp. 4-5).

More recently, the value of such teams has been noted in such "high-burnout" fields as community mental health, because the teams provide greater continuity of treatment for long-term patients and mitigate the impact of frequent staff turnover (see, for example, Bond et al., 1991). Moreover, in medical practice, higher levels of interaction and communication among a hospital's intensive care unit staff have been associated with lower patient mortality rates (Knaus, Draper, Wagner, & Zimmerman, 1986, p. 418). However, despite health teams' potential contributions to diagnosis, problem solving, and patient well-being, experienced team practitioners have warned of the teams' fragility:

> It is important to remember that teams have thin skins; there are not many forces holding them together in relation to those potentially able to pull them apart. . . . The forces that hold a team together are patient needs, institutional support, satisfaction with effective work, respect and friendship, and an understanding of the diagnostic process. The forces that tear a team apart include contradictory institutional priorities, professional rivalries, misunderstanding the role of patient splitting, personal competitiveness, and lack of understanding of the collaborative problem solving process. (Nason, 1983, pp. 42-43)

Interdisciplinary clinical treatment teams, the focus of this study, are responsible for developing and implementing the individualized treatment plans (ITPs) for each patient in a hospital. They are frequently found in psychiatric hospitals, as well as other health and human service settings. They have multidisciplinary membership, with those within psychiatric hospitals typically including activity therapists, nurses, psychiatrists, psychologists, and social workers. They may also include other professionals (such as clergy and dietitians), as well as paraprofessionals, such as resident care attendants and licensed practical nurses, whose membership and roles on the team are often unclear (Lichtenberg, Strzepek, & Zeiss, 1990).

An ecological or intergroup perspective on these teams takes into account the social system in which the group is embedded (e.g., see Alderfer, 1987, p. 195). To wit, these teams are also based in a larger hospital environment, which in turn is part of a

statewide system of publicly funded mental health care. Therein, treatment ideologies and technologies have undergone serious change since World War II, with the movement toward deinstitutionalization and greater use of new psychotropic drugs. In the current ethos of declining public resources, of cost consciousness, and of continuing emphasis on "community placement," such teams also can become important advocates or gatekeepers for hospital admission, treatment, and discharge, especially for the lower income and uninsured patients often served by public facilities.

MODELS OF TEAM EFFECTIVENESS

The more recent models of team effectiveness have gone beyond earlier laboratory and T-groups-based models, which focused more on the internal dynamics and development of groups (e.g., Tuckman & Jensen, 1977), to focus more on the organizational environment in which teams are established and must perform (e.g., Ancona & Caldwell, 1988; Wheelan, 1994). This more ecological perspective looks more closely at teams' interface with such various organizational structures as the reward and boundary systems (e.g., Sundstrom & Altman, 1989; Sundstrom et al., 1990; Vinokur-Kaplan, 1995; Vinokur-Kaplan, in press) and considers the role of the organization in supporting or undermining a team's effectiveness.

Hackman's particular framework of group effectiveness has been used to descriptively analyze various kinds of teams (see Hackman, 1990) in different types of organizational settings, including two clinical treatment teams at a psychiatric hospital (Shaw, 1990). It delineates specific types of outcomes that should be included in measuring team effectiveness (Hackman, 1987, 1990): (a) the group's production of a high-quality "product," be it a physical product, a decision, a plan, or other output, that is acceptable to those who receive or review it; (b) the continuing capability of members to work together in the future, that is, not "burning themselves out" in producing their product; and (c) the team's contribution to the well-being and growth of its members, allowing members to learn new things and to help their personal needs be satisfied. This last outcome can include professional growth, and thus is particularly appealing when studying interdisciplinary health and human services.

For groups to attain such effectiveness, teams benefit from being "set up right in the first place . . . [or having] initial conditions of group structure that promotes competent work on the task" (Hackman, 1990, p. 10). These structural features include (a) a task structure that is clear and consistent with a group's purpose and "high on what Hackman and Oldham call motivating potential . . . [the team has] a meaningful piece of work to do for which members share responsibility and accountability and that provides opportunities for the team to learn how well it is doing" (p. 10); (b) group composition that provides an appropriate size and mix of talents and interpersonal skills needed for communication and coordination with one another; and (c) core norms that regulate member behavior and promote coordination and "continuous scanning of the performance situation and pro-active planning of group performance strategies" (p. 11). These initial conditions also include an organizational context that

supports and reinforces excellence through its systems of rewards, education, and information, and makes available expert coaching and consultation assistance regarding effort, knowledge and skills, and performance strategies (pp. 11-13).

Team effectiveness is further enabled by the actual performance of team members as a group in meeting "process criteria of effectiveness" (Hackman, 1987), namely, in expending adequate effort, contributing sufficient knowledge and skill, and using task-performance strategies that are appropriate to the work at hand and to the setting in which it is being performed (see Hackman, 1990, p. 9).

MAIN CONCEPTS AND HYPOTHESES TO BE TESTED

In this study, three specific assessments of outcomes were developed, based on Hackman's model. The first of these is *standards met*. This assesses successful delivery of a product that meets the standards of the organization. Because clinical treatment teams are responsible for developing and implementing individualized treatment plans, such plans became the initial "product." Teams working on admissions units develop initial individualized treatment plans after a few days of observation, and long-term care units develop and periodically revise plans for patients who are treated for more chronic conditions and are unable to quickly return to the community. The second assessment is *cohesion of team*, which assesses the willingness of teammates to continue to work together (or "team viability," to use Sundstrom et al.'s, 1990, term). *Individual well-being* assesses the contribution of the team to the members themselves. Because the team members were all professionals, this variable included both personal well-being and growth as a mental health professional.

In addition, a fourth, more general, assessment of team effectiveness was developed to indicate team members' overall evaluation of their team's performance. The rationale for such a measure was that the team members were performing in the context of a very uncertain, stressful external environment. Thus their evaluation could take into consideration these unusual demands and stresses with which they were coping and give a global indication of how the team was doing "under the circumstances."

The independent variables in the model included initial group conditions, which captured design characteristics, such as team size and presence of members at meetings, as well as aspects of the team's organizational environment and norms. The mediating variables, enabling group conditions, invoke typical attitudes and processes that occur at team meetings and emphasize the interdisciplinary collaboration and interdependence needed to complete a successful plan. An illustration of this model applied to such teams is presented in Figure 1.

Using this model, the following hypotheses can be stated:

Hypothesis 1: The three specific outcomes of (a) standards met, (b) cohesion, and (c) individual well-being all contribute to a global attitude toward team effectiveness, and all three will be positively related to overall team effectiveness.

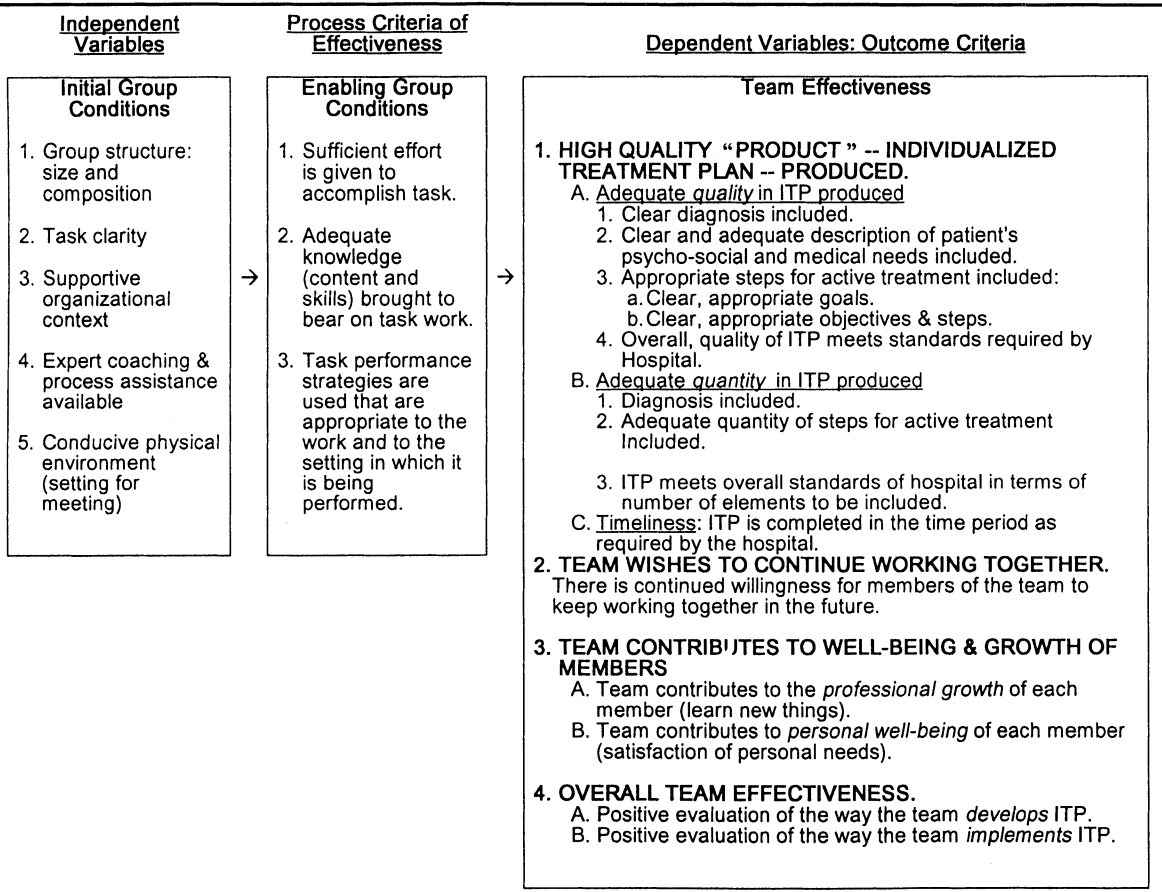

FIGURE 1: Conceptual Model of Team Effectiveness

Enhancing Team Effectiveness: Conceptual Model. Adapted from the general model presented in J. R. Hackman's (1990) *Groups That Work (and Those That Don't): Creating Conditions for Effective Teamwork*, San Francisco: Jossey-Bass (especially pp. 3-14) and previously published in a different version in Vinokur-Kaplan (1995). (Reprinted with permission of Plenum Publishing Corporation)

Hypothesis 2: These three specific outcomes measure different team outcomes and will be moderately correlated among themselves.

Hypothesis 3: Both initial and enabling group conditions are necessary for teams to work well together and will be significant predictors of the three specific outcomes.

Furthermore, historically, the literature on interdisciplinary hospital teams has noted the potential influence of differences in status and disciplinary perspectives on team effectiveness (e.g., Abramson, 1993; Lecca & McNeil, 1985b; Lister, 1982). Moreover, the ecology of the different types of task and levels of insulation from the external environment were thought potentially to influence the teams on units providing admissions as opposed to those providing long-term care (cf. Sundstrom et al., 1990). Additionally, although all hospitals were part of one state mental health system, there were various differences among them in terms of their short-term futures and the degree to which they were receiving new patients and employees during a period of consolidation and retrenchment. Thus the particular institutional environment in which the teams were embedded in each of the three hospitals was thought potentially to influence the effectiveness of teams in each hospital site (cf. Sundstrom & Altman, 1989). Therefore, the influences of these three variables—discipline, treatment unit type, and hospital site—and their interactions on the model's variables were also investigated.

METHOD

Subjects

Participants in this study were 98 mental health professionals who were part of a demonstration project aimed at enhancing active treatment in three public psychiatric hospitals. The 15 teams that were chosen in consultation with hospital administrators were thought likely to remain intact during the demonstration project—a time of retrenchment for such employees, characterized by staff changes, consolidations, and cutbacks, and the complete closure of some state facilities (see Vinokur-Kaplan & Walker-Burt, 1994). Team members were identified from staff rosters and with the help of hospital liaisons, and they represent 7 teams from one hospital and 4 teams each at two other hospitals.[1] Nine of the 15 teams (including 53 respondents) work on admissions units, preparing initial treatment plans for new admissions who might be stabilized and discharged quite quickly or transferred to another hospital unit, whereas 6 teams (45 respondents) work on long-term care units, preparing and periodically revising treatment plans for patients requiring longer periods of care.[2] The respondents are divided among activity therapists (15.3%), nurses (31.6%), psychiatrists and other physicians (18.4%),[3] psychologists (14.3%), and social workers (20.4%).

Procedure

In each hospital, either I or the medical chief of staff distributed questionnaires to the units, and staff returned them in sealed envelopes to slotted boxes or by mail.

Overall, 98 of the possible 108 professionals (91%) returned their questionnaire, and team response rates ranged from 67% to 100% of the professionals on each team. The data are drawn from assessments made prior to the teams receiving team-building training, between late 1990 and early 1992.

To assess convergent validity, an additional evaluation of the performance of 11 of the teams was obtained from a hospital official who had oversight over all teams at two of the three hospitals. This person was given a questionnaire on each team that listed the names and positions of all the regular, professional team members, followed by selected questions copied from the team's questionnaires measuring specific and overall team effectiveness outcomes. Further comments on each team were also requested.

Measures

The measures in the respondents' questionnaires required them to indicate their assessments on a variety of Likert-type scales.[4] The items for these scales and measures were selected for their relevance to the major dimensions of Hackman's team effectiveness model. The items for the measures were often based on previous studies of psychiatric and human service teams by Toseland (Toseland, Ivanoff, & Rose, 1987; Toseland et al., 1986;); Davis-Sacks (n.d.); Garner (1988); Armer and Thomas (1978); and Rendell (1988). In most instances, the study used multi-item indexes to maximize the measure's internal consistency; but to avoid possible response bias, about half of the items were initially phrased in such a way so as to avoid having all positive responses at one end of the scale, and scores were later reversed when analyzed.

Indexes were constructed by averaging the ratings of all items in the measures. The Cronbach alpha coefficients of these measures ranged in size from .65 to .89. All measures are reported with higher scores indicating greater presence of the item's content. Items used in the subsequent analysis are described below following the left-to-right order found in Figure 1.

Independent Variables: Initial Conditions

These scales and items reflect more the "set-up" of the hospital for its teams and their meetings. These initial conditions are as follows:

1. *Group Size* was a single item indicating the number of professionals on each team and ranged from 5 to 12, with a mean of 8. All teams included at least one member of the specific disciplines mentioned.
2. *Task Clarity* was assessed by the mean of four combined items (alpha = .65). Two of these items indicated how frequently the team member felt his or her team generally had "a clear idea at the beginning of the meeting of why the team was meeting" and of "what should be accomplished" (range: 1 to 5); the other two items indicated the respondents' agreement with the statements: "I have a clear idea of what the team is supposed to be planning and deciding" and of "what information I need to review in order to create an individualized treatment plan" (range: 1 to 7).

3. *Feelings of Influence on Teammates* was a two-item index that indicated the organizational core norm of "permission" to influence other team members, as opposed to influencing only one's own discipline. Respondents answered how much influence they each thought they have on both the development and the implementation of their team's treatment plans (range: 1 to 5; alpha = .69).
4. *Consultation Available* sought to capture the support and reinforcement of competent task work via the hospital's educational and informational subsystems. It was assessed by the degree of agreement with the statement "When my team can't reach a decision on a treatment plan, we turn to other resources to help us (for example, other teams, administrators, outside consultants)" (range: 1 to 7).
5. *Environmental Support* was assessed by a four-item index that gave a more general appraisal of the physical environment in which these employees worked (alpha = .81). Specifically, it indicated the frequency of having a quiet, comfortable, confidential place for meetings and adequate materials for discussion (range: 1 to 5).

The initial conditions did not include items to measure the reward system's role in the initial conditions, as described by Hackman. To my knowledge, these professionals are supervised and evaluated by their discipline's department heads, and their contributions to team efforts are not specifically included in their performance evaluations.

Mediating Variables: Enabling Conditions

These scales reflect the team members' efforts, tasks, skills, and performance strategies brought to bear on the planning of the plan. These enabling conditions were assessed as follows:

1. *Effort: Members' Presence at Meetings.* Given the many emergencies and competing demands these professionals face in this setting, especially during a period of hospital consolidation, their presence at and throughout recent team treatment planning meetings was thought to reflect an aspect of the effort expended by members. Thus this two-item index (alpha = .69) measures how often members are present and stay throughout the meeting (range: 1 to 5).
2. *Amount of Knowledge and Skills Applied to Task Work: Interdisciplinary Collaboration.* This measure was based on a 10-item index (alpha = .82) that is a shortened version of the Inter-Disciplinary Collaboration Scale originally designed by Armer and Thomas (1978), and later expanded, adapted, and used successfully in a study of teams at a children's psychiatric hospital by Rendell (1988). A subset of 15 items from Rendell's entire scale of 28 items was selected because of staff concerns about the limited time available to respondents to complete the questionnaire in the current climate of downsizing.[5] The more a team exhibited of each characteristic, the more collaborative it was seen to be. Our final measure was based on 10 items with a coefficient alpha of .82, which compares well with Rendell's reliability coefficient of .81 for the final 24-item version of the index he presented.

   The items included herein required respondents to rate the following statements on a scale from 1 to 7: "Suggestions from others improved my effectiveness . . . "; "After an issue is raised, we quickly reach a decision"; "Team decisions are controlled by 1-2 individuals" (scores reversed); "Exposure to . . . other disciplines . . . increased my awareness of their contributions to the treatment process"; "Before undertaking . . .

action, team members rarely ask for help and suggestions from others" (scores reversed); "Working closely with other team members has helped in developing (new) skills I might not have learned with people in my own professional discipline"; "My team's meetings . . . focus on clearly defined clinical issues"; "There is a low degree of participation on the part of some members . . . " (score reversed); "Members . . . work together as a team"; and "Members do not discuss important problems . . . [that] other disciplines don't fully understand" (score reversed).

3. *Appropriateness of Task Performance Strategies Used by the Group: Group Interdependence.* This three-item index (alpha = .81) measures the extent to which members depend on each other to develop and complete the treatment plan to conform to the hospital's standards, and to implement it (range: 1 to 5). This measure is intended to reflect appropriate task performance strategies in which professionals would appreciate and use the expertise of other disciplines in accordance with hospital expectations.

Dependent Variables: Specific and Overall Outcomes

The three dependent variables that measure specific outcomes suggest a descending order of relationships between team members and their environments: They begin with those most externally created (hospital and funders' standards to which the team must adhere), are followed by more internally created environments composed of relationships among group members (cohesion), and finally focus on the individual's own internal environment, his or her perception of oneself (personal well-being). The measures of these specific outcomes include the following:

1. *Standards Met.* This five-item index (alpha = .83) required respondents to rate the perceived degree to which the team's individualized treatment meets the hospital's standards of quality, quantity, timeliness, and implementation, and meets standards of relevant reimbursement agencies, using a scale from 1 to 5.
2. *Cohesion (Stay Together).* This three-item index (alpha = .83) had respondents rate their certainty of continuing as a member of the current team, the likelihood that they would keep working with all members, and their overall satisfaction with their team's performance (range: first item, 1 to 6; second two items, 1 to 5).
3. *Individual Well-Being.* This three-item index (alpha = .88) had respondents rate the degree to which the team enhances the respondent's identity as a mental health professional, helps the respondent to learn new things and ideas, and contributes to his or her personal sense of well-being, using a scale from 1 to 5.
4. *Team Effectiveness.* In addition, this overall outcome measure, a two-item index (alpha = .89), rated overall performance of the team in developing and in implementing individualized treatment plans (range: 1 [*not good at all*] to 5 [*very good*]). It is a more global assessment of the effectiveness of a member's team in this particular context.

RESULTS

Overview of the Analysis

The data analyses were conducted in three stages: (a) individual-level analyses, which examine the entire sample of 98 professionals combined from all the teams;

TABLE 1
Means and Standard Deviations of Model's Variables

	n	*Minimum Score Possible*	*Maximum Score Possible*	*Mean*[a]	*Standard Deviation*[a]
Outcomes					
Team effectiveness	92	1.00	5.00	66.50	21.75
Standards	86	1.00	5.00	77.50	16.75
Cohesion	91	1.00	5.30	81.00	23.31
Well-being	91	1.00	5.00	57.75	25.25
Enabling conditions					
Interdependence	92	1.00	5.00	68.00	20.25
Interdisciplinary collaboration	91	1.00	7.00	64.33	17.67
Presence	90	1.00	5.00	72.75	21.25
Initial conditions					
Size of team	98	5.00	12.00	48.29	35.71
Clarity	91	1.00	6.00	86.00	13.40
Feelings of influence	92	1.00	5.00	63.25	18.00
Consultation available	88	1.00	7.00	49.67	33.33
Environmental support	91	1.00	5.00	81.50	22.00

a. Original scores transformed to a scale ranging from 1 to 100.

(b) group-level analyses, which examine the hypotheses using the mean of the individual scores within each team to represent the group as the unit of analysis and are based on the 15 groups as data points; and (c) intergroup-level analyses, which attempt to identify systematic differences among group members as a function of other memberships they hold, such as professional discipline, the type of treatment unit in which they perform (admissions vs. long-term care), the three institutional environments (hospital sites) in which they are employed, and the interactions of these three factors.

Stage 1: Individual-Level Analyses

Means. The mean scores and standard deviations of the model's variables are displayed in Table 1. Because the response scales of the measures used in this study had different numbers of response categories, all means and standard deviations were transformed to a 100-point scale to ease interpretation.

The mean scores suggest that the professionals in these teams had a positive but moderate evaluation of their teams' overall effectiveness ($M = 66.50$); they had higher scores in the outcomes of meeting standards ($M = 77.5$) and group cohesion ($M = 81.00$) than they had positive feelings of individual well-being ($M = 57.75$). Regarding enabling conditions, these respondents report some feelings of interdependence ($M = 68.00$) and interdisciplinary collaboration ($M = 64.33$) and are present frequently at team meetings ($M = 72.75$; corresponding to about 75% of the time). Regarding initial conditions, the means show considerable range in group size, from 5 to 12 professionals on a team ($M = 8.38$). Overall, members report frequent confidence in clear understanding of their task ($M = 86.00$) but only "some influence" on their teammates

(M = 63.25). They perceive their environment as being frequently supportive (M = 81.50) and are neutral regarding the availability of other resources to them, outside their own team, when they cannot reach a treatment plan decision (M = 49.67).

Intercorrelations. To look further at the relationship among these 12 variables, their intercorrelations were computed and are presented in Table 2.

As predicted in Hypothesis 1, there are strong positive relationships between overall team effectiveness and the three specific outcomes of standards met, cohesion, and personal well-being (r = .70 to .78, all $p < .01$). Moreover, as predicted in Hypothesis 2, these three outcomes are all significantly correlated with one another, ranging from r = .47 to r = .73 ($p < .01$). In comparison, the correlations among the enabling conditions are somewhat smaller, although still statistically significant, ranging from r = .36 to r = .71 (all $p < .01$). The independent, initial conditions are the most distinct and have low, sometimes nonsignificant correlations ranging from $r = -.22$ ($p > .05$) to r = .38 ($p < .01$). When the intercorrelations are calculated using team means (n = 15), rather than individual data, a fairly similar pattern emerges, but with fewer significant relationships, mostly as a function of the smaller number of cases.

Testing the Proposed Model of Team Effectiveness

A structural equation modeling analysis (Bollen, 1989; Byrne, 1994) was performed according to the conceptual model specified in Figure 1. The final results of this analysis are presented in Figure 2. These results also pertain to Hypothesis 3, regarding the prediction of team effectiveness outcomes from initial and enabling conditions. In testing the model, overall team effectiveness was predicted from all the antecedent variables. Thereafter, each variable to the left of team effectiveness was modeled as a dependent variable, with the antecedent variables to the left included as independent variables.

In addition to the 12 conceptual latent factors proposed in this model, a latent common method factor was also modeled in the analysis because both the independent and dependent variables' data were collected at the same time. The modeling of this common method factor was used to control for all pervasive common effects that influence the respondents' ratings of all variables, such as generalized positive or negative attitude toward their group. It is often used in studies concerned with the common biasing effects of responses obtained from the same measuring instruments, type of scales, or respondents (e.g., Andrews, 1984; Bagozzi, 1991, 1993).

The application of structural equation analysis provides a way to model a common method effect and observe whether this effect has an impact (a) on each measured variable and (b) on the relationship among the variables. It also provides adjustments for the relative unreliability of the measures used in the analysis so that the results do not confound the strength-of-measurement issue with the substantive issue under investigation. Finally, it provides an overall goodness-of-fit measure that indicates (a) the strength of the model's fit and (b) whether the data provide a statistically reasonable fit to the model.

TABLE 2

Intercorrelations of Model's 12 Variables for Respondents ($N = 82$ complete cases) and for Teams ($N = 15$)

	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*
Respondents											
1. Team effectiveness	1.00										
2. Standards met	.70**	1.00									
3. Cohesion of team	.78**	.52**	1.00								
4. Individual well-being	.70**	.47**	.73**	1.00							
5. Presence at meetings	.54**	.35**	.56**	.48**	1.00						
6. Group interdependence	.72**	.54**	.71**	.72**	.36**	1.00					
7. Interdisciplinary collaboration	.77**	.47**	.82**	.69**	.61**	.71**	1.00				
8. Group size	−.10	.18	−.08	−.15	−.04	.02	−.11	1.00			
9. Task clarity	.50**	.38**	.42**	.36**	−.47**	.35**	.42**	−.06	1.00		
10. Influence on teammates	.62**	.42**	.54**	.57**	.30*	.66**	.61**	−.22	.37**	1.00	
11. Environmental support	.42**	.20	.42**	.35**	.40**	.44**	.48**	−.16	.15	.29*	1.00
12. Consultation available	.48**	.18	.48**	.58**	.33*	.49**	.49**	−.14	.38**	.35**	.37*
Teams											
1. Team effectiveness	1.00										
2. Standards met	.65*	1.00									
3. Cohesion of team	.81**	.45	1.00								
4. Individual well-being	.55	.05	.61*	1.00							
5. Presence at meetings	.54	.55	.58	.35	1.00						
6. Group interdependence	.43	.33	.71*	.72*	.50	1.00					
7. Interdisciplinary collaboration	.81**	.46	.90**	.56	.67*	.61*	1.00				
8. Group size	−.21	.30	−.11	−.32	.10	.08	−.05	1.00			
9. Task clarity	.50	.08	.32	.52	.25	.25	.38	−.13	1.00		
10. Influence on teammates	.83*	.54	.75**	.71*	.57	.69*	.72*	−.26	.50	1.00	
11. Environmental support	.32	.35	.47	.06	.38	.35	.48	.01	−.21	.46	1.00
12. Consultation available	.32	.03	.45	.36	.21	.34	.55	.05	.29	.38	.52

*$p < .05$; **$p < .01$.

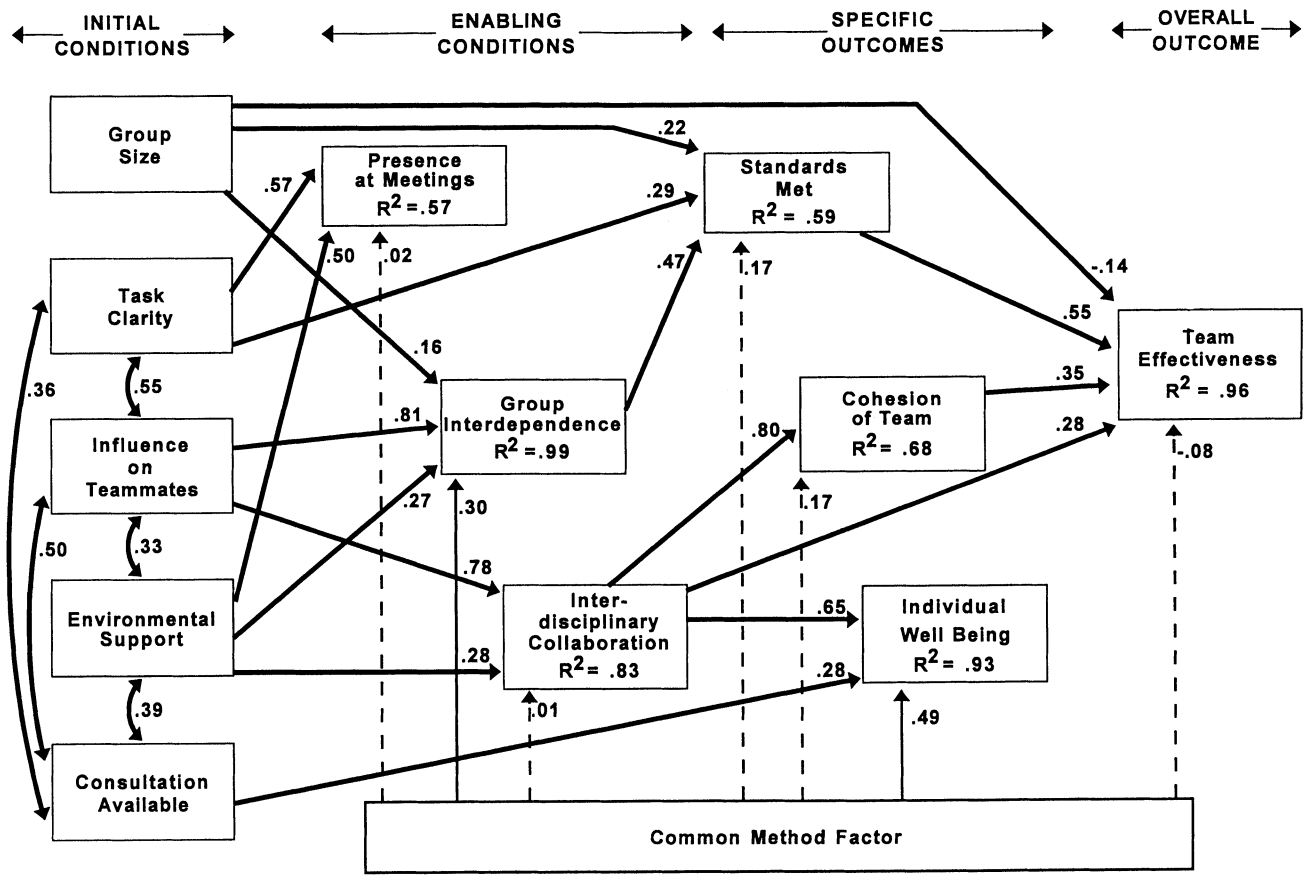

FIGURE 2: Structural Equation Model (12 conceptual factors) and Common Method Factor

Structural equation model of the effects of initial and enabling conditions and of specific outcomes on team effectiveness (individual-level analysis), based on Hackman's model of team effectiveness. $\chi^2(38, N = 82) = 44.43$ ($p < .21$), Normed Fit Index = .93, Non-Normed Fit Index = .98, and Comparative Fit Index = .98. Solid and broken lines represent, respectively, statistically significant ($p < .05$) and nonsignificant paths that were included in the model. Thin lines indicate effects of common method. All R^2s are significant at $p < .05$.

Because of the small number of respondents ($N = 98$), it was necessary to limit the number of indicators for each latent factor in the model to one, and the scale value was taken as the indicator for the latent factor. Because only one indicator per factor is used, the correction for random measurement error (i.e., unreliability of the scale) was handled by setting the random error variance associated with each construct to its variance multiplied by the quantity one minus its estimated reliability (Bollen, 1989), that is, Variance $\times (1 - \alpha)$.[6] As recommended by Hayduk (1987), the analysis was based on the covariance matrix generated by a listwise procedure, and therefore the actual number of respondents dropped from 98 to the 82 who provided complete data on all variables.

Figure 2 displays the standardized path coefficients (beta weights, βs), as well as the variance of each dependent variable that is accounted for by its respective predictors (R^2). All of the R^2s and all βs that are displayed with solid paths are statistically significant at the level of $p < .05$. Nonsignificant paths (indicated by broken lines) are included only for paths between the common method factor and the seven dependent variables to more clearly document the relative influence of common method effects on the model's dependent variables.[7]

As can be readily seen, the results of the structural analysis provide very strong support for the model. First, the chi-square ($\chi^2(38) = 44.43$) is statistically not significant ($p < .21$), indicating that the deviation of the data from the model is not large enough to warrant rejecting the model. Second, all of the goodness-of-fit measures (Normed Fit Index, Non-Normed Fit Index, Comparative Fit Index) exceed the minimum .90 value considered to be the threshold for model acceptance (Byrne, 1994; Raykov, Tomer, & Nesselroade, 1991). Finally, the common method factor has a statistically significant influence on only two of the seven dependent variables to which it was related—group interdependence and individual well-being. Most important, the addition of the common method factor did not alter the relationships and effects of most other variables in the model that were previously found before this factor was included.

Focusing first on overall team effectiveness, this variable is well accounted for by the conceptual model ($R^2 = .96$), and four variables appeared as significant predictors, suggesting that overall team effectiveness is enhanced when the group is smaller ($\beta = -.14$), standards are met more ($\beta = .55$), and the cohesion and interdisciplinary collaboration are higher (βs = .35 and .28, respectively). It is not predicted by individual well-being, the most personal of the specific outcomes.

Regarding the specific outcome of standards met ($R^2 = .59$), the results suggest that this outcome is enhanced by larger group size ($\beta = .22$), greater task clarity ($\beta = .29$), and greater group interdependence ($\beta = .47$). In comparison, the specific outcome of team cohesion ($R^2 = .68$) is strongly predicted by a different variable, interdisciplinary collaboration ($\beta = .80$). The third specific outcome, individual well-being ($R^2 = .93$), is also strongly predicted by greater interdisciplinary collaboration ($\beta = .65$) and, to a lesser extent, by the greater availability of consultation ($\beta = .28$). However, this latter specific outcome is also significantly influenced by the common method factor ($\beta =$

.49), suggesting that there is some additional, broadly shared characteristic that influences this most personal outcome.

The results also indicate that the enabling conditions are influenced by the initial conditions, as suggested by Hackman's theory. Presence at meetings ($R^2 = .57$), which is used to represent respondents' effort, is strongly influenced by both task clarity ($\beta = .57$) and environmental support ($\beta = .50$). Group interdependence ($R^2 = .99$) is most influenced by other initial conditions, namely, by group size, ($\beta = .16$), strongly by influence on teammates ($\beta = .81$), somewhat by environment support ($\beta = .27$), and also by the common method factor ($\beta = .30$). Similarly, interdisciplinary collaboration ($R^2 = .83$) is greatly influenced by greater influence on teammates ($\beta = .78$) and somewhat by environmental support ($\beta = .28$), but not significantly by the common method factor or group size.

Stage 2: Group-Level Analyses Based on the 15 Groups as Units

Next, the model presented in Figure 2 was further analyzed using a group-level analysis. In this analysis, the mean scores of the members of each team were used to represent the group as the unit of analysis, with a total of 15 scores ($N = 15$). Because of the small number of cases, it was not possible to repeat the structural equation analysis at this level of analysis. Instead, only the significant paths found in the structural equation model (Figure 2) were used. The results of this group-level path analysis are presented in Figure 3, with the squared multiple regression coefficients (corrected for attenuation) appearing inside the boxes.

Obviously, the vast reduction in the number of cases in this analysis (from 98 to 15) resulted in a reduction in the statistical power of the tests, and consequently most of the individual beta coefficients are statistically not significant. Nevertheless, the pattern of the results in terms of the magnitudes of the betas and their relative magnitude for each dependent variable remains nearly the same in both analyses. Finally, of the seven dependent variables, five demonstrated statistically significant multiple regression coefficients of about the same magnitude as those produced in the earlier analyses.

These results are also strengthened by the additional evaluations, provided by a hospital official, of 11 of the teams. First, when each of the seven items measuring observable team outcomes (i.e., standards, cohesion, overall team effectiveness) was assessed both by the official's evaluation of the team and the mean score of the team, positive correlations were obtained in each case that ranged from $r = .33$ ($p = .17$) to $r = .60$ ($p = .03$), and averaged $r = .45$. Second, the correlation of the teams' key index measuring overall team effectiveness with the hospital official's rating on the same index was $r = .43$ ($p = .10$, one-tail). Third, all but two of the seven correlations produced between the official's rating of the seven items and the teams' index of team effectiveness were significant at $p < .10$ (one-tail), and all are significantly correlated at the level of $p = .12$ (r range = .41 to .69). In summary, despite the small number of cases, and the limitations imposed by having only one judge available, the magnitude of all of the cited correlations was moderate to high (rs = .33 to .69), and they were

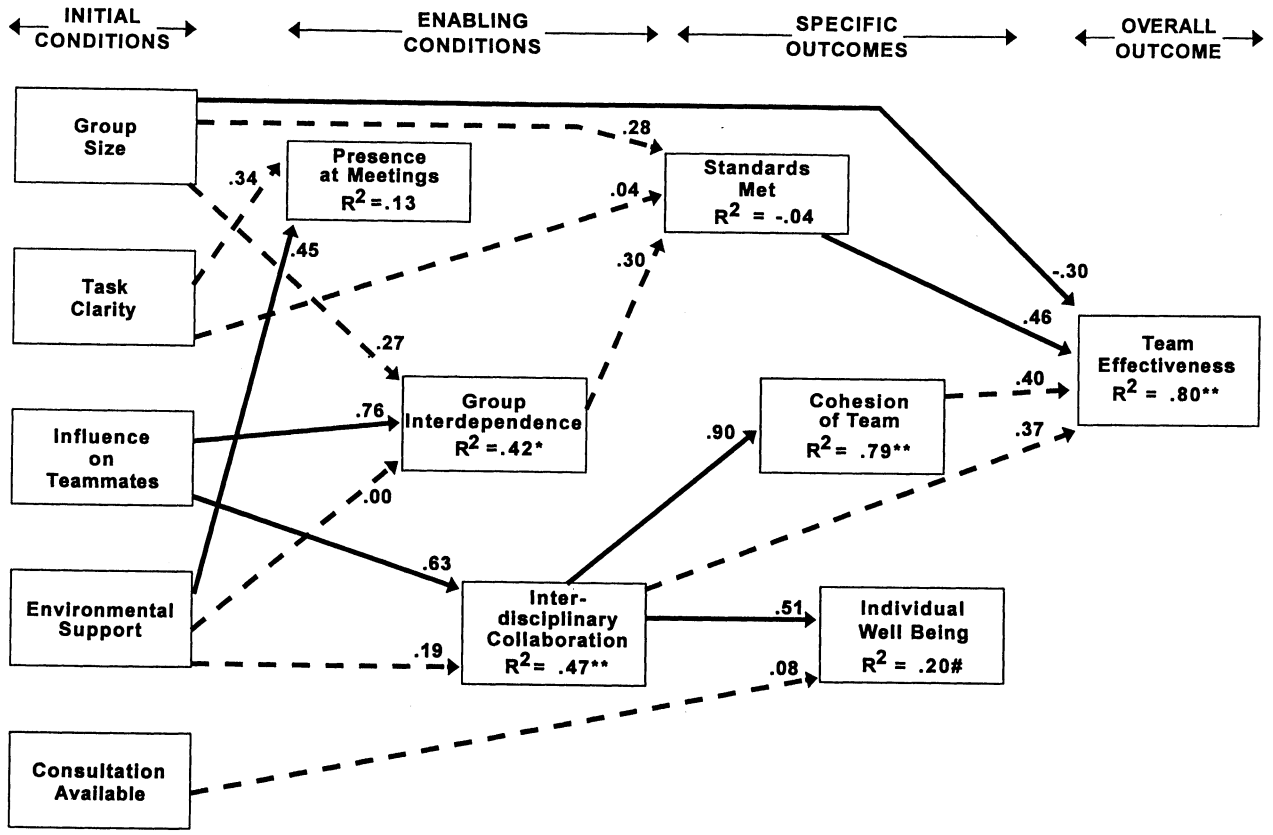

FIGURE 3: Path Analysis of Conceptual Model (12 variables) Based on Significant Paths Found in Figure 2

Multiple regression path model of team-level analysis (n = 15) of the effects of initial and enabling conditions and of specific outcomes on team effectiveness. Solid and broken lines represent, respectively, statistically significant paths ($p < .05$ one-tail test) and nonsignificant paths that were included in the model. R^2s are corrected for attenuation, and their level of significance is indicated by #$p < .10$; *$p < .05$; and **$p < .01$.

consistent with the findings obtained in the earlier analyses. Thus these findings provided by an independent source contribute further convergent validity to the teams' evaluations.

Stage 3: Identifying Sources of Differences by Professional Discipline, Unit Type, and Hospital Site, and by Their Interaction Effects

Herein, professional affiliation, type of treatment unit, and institutional influences were examined for their individual and interactional contributions to understanding team effectiveness. A series of one-way analyses of variance were conducted to identify sources of differences by discipline, unit type (admissions vs. long-term care), and hospital site, followed by two-way analyses of variance to examine their possible interaction effects (see Table 3).

Differences by professional discipline. The effects of professional discipline were found to be statistically significant on only two variables: interdisciplinary collaboration ($F = 3.83, p < .01$)—with a significant gap between psychiatrists and psychologists (Scheffé procedure, $p < .05$)—and influence on team ($F = 2.43, p < .05$), where no two particular groups were significantly different at the level of $p < .05$.

Differences by treatment unit type. The effects of treatment unit type were found to be statistically significant on only one variable, group interdependence, with respondents on long-term care units reporting higher interdependence than those on admissions units ($M = 3.91$ vs. $M = 3.57$, respectively; $F = 4.07, p < .05$).

Differences by hospital site. The effects of the three hospital sites were found to be statistically significant on only 3 of the 12 variables included in the model: group size ($F = 118.23, p < .001$), consultation available ($F = 5.27, p < .01$), and standards met ($F = 8.49, p < .001$).

Interaction effects of professional discipline, treatment unit type, and hospital site. As shown in Table 3, there was only one statistically significant interaction effect found between professional discipline and treatment unit type—task clarity, $F(1, 81) = 2.60$, $p < .05$. Whereas nurses', psychiatrists', and social workers' means were quite close in task clarity (0.2 or less difference in means), psychologists on admissions units and activity therapists on long-term care units scored 0.8 or more lower in mean task clarity than their counterparts on the other type of unit. The absence of any other interactions between professional discipline and unit type suggests that there is no particular pattern of joint influence of these variables on professional disciplines' "occupational subcultures" (cf. Trice, 1993) vis-à-vis the model's variables.

However, significant interactions between treatment unit type and hospital site were produced on seven of the model's variables, thus emphasizing more complex, structural influences on team members' evaluations and attitudes. Specifically, these interactions included effects on the overall outcome of team effectiveness, standards met, cohesion of team, interdisciplinary collaboration, group size, environmental support, and consultation available.

TABLE 3

One-Way ANOVAs (by Team, Discipline, Unit Type, and Hospital Site) and Interaction Effects of Two-Way ANOVA

	Teams	*Disciplines—Means*						*Type of Hospital Unit*			*Hospitals*				*Two-Way ANOVA Interactions*		
Variables	F *Ratio One-Way ANOVA* (n = *15*)	*Registered Nurse* (n = *31*)	*Psychiatrist* (n = *18*)	*Psychologist* (n = *14*)	*Activity Therapist* (n = *15*)	*Social Worker* (n = *20*)	F *Ratio One-Way ANOVA* (n *range = 86 to 98*)	*Admissions Unit* (n = *53*)	*Long-Term Care Unit* (n = *45*)	F *Ratio One-Way* ANOVA	*Hospital A* (n = *31*)	*Hospital B* (n = *37*)	*Hospital C* (n = *30*)	F *Ratio One-Way ANOVA*	*Unit Type by Discipline Effect*	*Hospital by Discipline Effect*	*Hospital by Unit Type Effect*
Overall outcome																	
Team satisfaction	1.83*	3.50	4.16	3.50	3.57	3.66	1.74	3.60	3.73	0.53	3.68	3.72	3.54	0.33	—		$F = 5.28$**
Specific outcomes																	
Standards met	3.63***	4.15	4.20	3.94	3.92	4.21	0.67	4.08	4.12	0.10	3.89	4.43	3.86	8.49***	—	—	$F = 8.99$***
Cohesion of team	2.00*	4.30	5.07	4.43	4.73	4.26	1.99	4.35	4.70	2.73	4.56	4.34	4.69	0.95	—	—	$F = 6.12$**
Individual well-being	1.59	3.34	3.60	3.19	3.15	3.24	0.46	3.15	3.50	2.75	3.52	3.07	3.40	1.78	—	—	—
Enabling conditions																	
Presence at meetings	0.97	3.89	4.31	3.58	4.03	3.71	1.80	3.78	4.06	2.42	3.84	3.93	3.94	0.11	—	—	—
Group inter-dependence	1.64	3.77	3.92	3.59	3.59	3.68	0.44	3.57	3.91	4.07	3.74	3.59	3.89	1.01	—	—	—
Interdisciplinary Collaboration	1.29	4.68	5.66	4.41	5.04	4.63	3.83**	4.72	5.03	1.95	4.82	4.78	5.02	0.42	—	—	$F = 3.49$*
Initial conditions																	
Group size	—	8.65	8.11	7.57	9.07	8.25	0.79	7.94	8.89	3.57	5.29	9.70	9.93	118.23**	—	—	$F = 222.40$***
Task clarity	1.15	5.14	5.58	5.20	5.08	5.53	2.24	5.36	5.22	0.93	5.32	5.38	5.16	0.81	$F = 2.60$*	—	—
Influence on team	1.12	3.50	4.00	3.46	3.40	3.31	2.43*	3.44	3.63	1.64	3.56	3.56	3.44	0.25	—	—	—
Environmental support	3.55***	4.22	4.44	4.16	4.42	4.10	0.47	4.14	4.41	2.22	4.15	4.17	4.51	1.43	—	—	$F = 3.65$*
Consultation available	2.70**	4.15	4.60	3.77	3.33	3.89	0.84	3.88	4.10	0.27	3.76	3.41	5.00	5.27**	—	—	$F = 3.29$*

*$p < .05$; **$p < .01$; ***$p < .001$.

No significant interaction effects were found on the joint influence of hospital site and professional discipline.

DISCUSSION

All told, this rendering of Hackman's model of group effectiveness was helpful in distinguishing the variety of factors that clinical treatment team members perceive as contributing to their overall team effectiveness in developing and implementing treatment plans. As shown in Figure 2, overall team effectiveness is best predicted by fulfillment of the task according to prescribed standards; but, it is also strongly influenced by a combination of more intergroup factors (cohesion and interdisciplinary collaboration), and to a much smaller extent, the availability of external consultation. This general pattern of findings was found on both the individual and team level.

Further investigation of the different professional disciplines represented on the teams, and of the treatment unit and institutional contexts in which they perform, highlighted the influence of other differences among the team members on their evaluation of their performance. Although past literature has emphasized the differences in the orientations, values, and training of different disciplines, it is noteworthy that few differences emerged by discipline alone, as shown in the one-way ANOVA in Table 3. Moreover, ANOVAs examining the effects of treatment unit type (admissions vs. long-term care) and the three hospital sites also revealed few significant findings. It is only when interaction effects produced by the mutual influence of treatment unit type and hospital site are examined that we discover statistically significant interactions among more than half of the model's variables.

This finding emphasizing the influence of interactions of the treatment unit and institutional environments underscores the respective contexts in which these teams worked. For example, group size was one of the few variables that emerged as significantly different between hospitals. These different team sizes appear to be a function of the different ways in which staff participated in teams at each hospital. In Hospital A, teams were composed of 5 to 6 members, each representing a different discipline or role, and each team worked quite autonomously from another, even though the teams might be geographically close to each other. In Hospitals B and C, where teams were composed of 7 to 12 members, there were often two individuals from the same discipline on a team, thus enlarging the overall size; so, for example, one of two social workers present might be assigned primary responsibility for a particular patient for which treatment was being planned, but both were present at team meetings and could participate in the planning and be aware of the patient's plan.

Indeed, such "two-on-one" arrangements were quite functional for these hospitals at that particular time, because there were considerable numbers of retirement buyouts, staff changes, and interhospital transfers due to state-level efforts to close and consolidate psychiatric hospitals in the public mental health system (see Vinokur-Kaplan & Walker-Burt, 1994). The effects of the retrenchment were especially salient in Hospitals B and C, which were at lower risk of closing but in which employee turnover and reassignment were quite high; as some employees there and elsewhere retired or left

the system, others exercised state-guaranteed "bumping" rights to move to other positions in the state hospital system. In comparison, Hospital A—which had been downsizing for several years and was rumored to be at high risk of closing—maintained its small, distinct team identities.

Similarly, the greater perceived availability of consultation for the teams at Hospital C might have been facilitated by its physical arrangement. All of its wards and administrative services were more proximate, whereas the other two hospitals' facilities were more geographically dispersed on the hospitals' campuses. Likewise, the perceived differences in standards being met by staff of the three hospitals may well reflect their institutions' varied experiences with recent periodic reviews by national health care oversight organizations.

Moreover, a closer examination of the pattern of significant interactions effects displays a fairly consistent pattern of results; at Hospital A, the admissions units scored higher than the long-term care units, whereas at Hospitals B and C, the long-term care units scored higher than the admission units on four of these seven variables of the model: team effectiveness, standards met, cohesion, and interdisciplinary collaboration. Again, the lower pressures of admissions to Hospital A, and the actual or anticipated transfer of patients for admission to hospitals B and C, along with the more separate physical location of the long-term care units at Hospital B, may have contributed to this pattern of interaction effects.

CONCLUSIONS

This research represents a first effort to investigate the effectiveness of clinical treatment teams in psychiatric hospitals by applying Hackman's group effectiveness conceptualization in a quantitative fashion. The findings described in this article echo Hackman's caution, which states that for groups to be effective, they need to be set up right, as well as run well. He recommends that "those who create and lead work groups might most appropriately focus their efforts on the creation of conditions that support effective team performance [as opposed to] attempting to manage group behavior in real time" (Hackman, 1990, p. 9).

The positive contributions of both initial conditions and enabling conditions to team outcomes should encourage organizational consultants and educators to address a comprehensive range of organizational, professional, ecological, and intergroup factors to enhance team effectiveness (e.g., see Vinokur-Kaplan, 1993). For example, professionals need more than didactic training to meet the institution's required standards; they also need to learn productive group strategies (e.g., see Abramson, 1993) and receive organizational support and consultation that facilitate the development and implementation of the team's product.[8]

Indeed, some recent quality improvement programs in hospitals have implicitly incorporated attention to various components of Hackman's model. For example, the Total Quality Management Program at the University of Michigan Hospitals has invested heavily in enhancing interpersonal and intergroup skills through team member training of staff and availability of internal consultants to aid group processes,

while also promoting high and ever-improving standards of the delivery of care (Gaucher & Coffey, 1993).

Moreover, the relationships of initial conditions to enabling conditions should be noted. The initial condition of task clarity, for instance, is predictive of both members' presence at team meetings and of successful interdisciplinary collaboration. It suggests that when team members believe they know what they are supposed to do, and know how to work well together, they are less likely to be absent from the group, and thus ultimately more likely to enhance the group's cohesion. However, their mere presence at a meeting (and their past educational preparation) do not automatically predict performance of the task according to the standards required for the treatment plan; such actions require additional effort and skills, usually requiring specific training.

Furthermore, interdisciplinary collaboration has a significant impact on cohesion, as well as on enhancing overall team effectiveness; but it does not have an influence on meeting standards. Thus both the task's requirements and the team's interpersonal processes need to be scrutinized; team members—and especially team leaders or facilitators—need to monitor and analyze the status of all these conditions, as suggested by Walton and Hackman (1986), and use this information to avoid problems and overcome the bottlenecks that may arise.

Altogether, the findings of this study underscore the importance of attending to ecological concerns and conditions (cf. Ancona & Caldwell, 1988; Sundstrom & Altman, 1989), in addition to the traditional focus on the team's dynamics. To fully capture the richness and complexity inherent in Hackman's conceptualization, and an appropriate emphasis on the organizational context, it is recommended that larger studies be designed and undertaken, which allow wider representation of these contextual variables, group-level analysis with greater statistical power, and longitudinal designs to focus on changes as the groups—and their organizations—develop. Such steps would further advance the integration of organizational, psychological, and management theory with the important work and experience provided by these mental health professionals and members of other such teams.

NOTES

1. In a few cases, paraprofessionals (licensed practical nurses, residential care attendants) were regular or occasional members of the teams, whereas in most other cases, they were not included in treatment planning meetings. Given this variability, and the frequent changes in assignments these paraprofessionals were receiving at the time, they (and two dietitians who floated among teams at one of the hospitals) were not included in this analysis.

2. At least two teams representing admissions and long-term care for patients were chosen from each hospital as part of the original experimental design of the demonstration project (see Vinokur-Kaplan, 1992).

3. At two hospitals, physicians providing general medical care, as opposed to psychiatric care, were included in some teams that handled medically frail patients. Two such teams are included in this study, and there is one such respondent.

4. Copies of the questionnaire are available from the author.

5. I selected among the items on each subscale used by Rendell (1988) and adapted from Armer and Thomas (1978), considering the length, clarity, and relevance of the item to the current hospital sites, and also considering that there would be an array of both negatively and positively formulated items to help

avoid possible response bias. The scale also initially included at least two items from each of seven subscales (equality of influence, flexibility of roles, sharing of suggestions, joint planning and decision making, reciprocal teaching and learning, problem centered, and acceptance of leadership) (see Rendell, p. 64). Rendell also eliminated acceptance of leadership, after finding it correlated negatively with all other subscales.

6. Also see Liang, Lawrence, Bennett, and Whitelaw (1990) for discussion of this approach, and the following studies for recent applications using smaller data sets: Bacharach, Bamberger, and Conley, 1991; Farkas and Tetrick, 1989; Frone, Russell, and Cooper, 1992; Netemeyer, Johnston, and Burton, 1990; Schaubroeck, Cotton, and Jennings, 1989; Wayne and Ferris, 1990.

7. It is statistically not appropriate to model the effects of a common method factor on the independent variables (in our case, the variables that define the initial conditions), because such effects, when modeled on independent variables, change the meaning of the variable and create unstable, artifactual estimates.

8. Indeed, the demonstration project, of which this research is a part, subsequently provided two days of teambuilding training for most of the teams involved, after these questionnaires were completed. These teambuilding sessions focused on motivation, shared leadership, competing values, and individual and team performance, and they ended with each team establishing an action plan to enhance their future work together (see Vinokur-Kaplan, 1995).

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