

A framework for integrating diverse aspects of membership dynamics is outlined, and 10 propositions about membership change and its impact on group structure, process, and performance are presented. Data from a longitudinal study of 22 small (3- to 5-person) groups are used to test some of the propositions. Groups that had an experimentally imposed temporary member (a "guest") and groups with spontaneous membership changes, such as absences, performed better on a task requiring reflection about the group's internal processes than did groups with a stable membership. No such effect was found for performance on other types of tasks. Some evidence was found for higher cohesiveness among groups with changing attendance compared to groups with greater week-to-week stability. However, groups with a history of member change felt less positive about their groups when a guest replaced a regular member than did more stable groups. Groups with guests reported spending more time on task and less time dealing with conflict than did groups with no guests. Similar effects were found for groups meeting face-to-face and via computers. Implications for work groups and other types of small groups are discussed.

MEMBERSHIP MATTERS

How Member Change and Continuity Affect Small Group Structure, Process, and Performance

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Membership is central to the definition and identity of a small group. When the membership of a group changes—whether the change involves the arrival of new members, temporary absences, permanent departures, turnover and replacement, or the occasional participation of irregular members, such as guests—other aspects

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of the group's functioning are bound to change as well. Yet the impact of changes in small group membership has not been systematically studied.

Various aspects of member change have been the focus of extensive, but fragmented, research in social and organizational psychology. The suggestive, but scattered, findings are just beginning to be integrated into a broader theory of membership dynamics in small groups. In this article, we sketch the outlines of a theory of membership change and its effects, then report results from a longitudinal study that bear on aspects of that theory.

Typically, the units of analysis in membership studies by organizational behavior scholars have been the individual and the organization. Researchers have studied recruitment and selection (member addition), turnover (member replacement), succession (turnover in leadership positions), absenteeism and retirement (member-initiated loss), and layoffs (externally imposed member reduction), but only rarely have these been analyzed at the level of the interacting work group, where membership issues may be most potent. Although small groups in organizations are attracting increased research attention, few studies of team behavior have included membership dynamics as a specific focus.

Small group researchers in social psychology have paid considerable attention to membership in the sense of (static) group composition (see Moreland & Levine, 1992). However, studies of groups in which the members (and, thus, group composition and structure) change over time are much rarer. Some notable exceptions are studies that look at the transmission of norms and shifting leadership patterns over successive generations of small groups with changing membership (e.g., Insko et al., 1980; MacNeil & Sherif, 1976) and that focus on the impact of newcomers on groups (e.g., Ziller & Behringer, 1961).

The scarcity of empirical studies of membership change over time can be ascribed to two factors: (a) the predominance of studies using ad hoc laboratory groups that meet only once and (b) the tendency of researchers to view member change in longitudinal studies as an unwelcome and bothersome source of variation (i.e.,

subject mortality). Groups in which membership has changed are often excluded from the analyses.

MEMBERSHIP DYNAMICS AS A HOLISTIC CONSTRUCT

Recent efforts to integrate the diffuse membership literature have laid the foundation for a more holistic conception of membership dynamics. In organizational psychology, Hulin (1991) and colleagues (Hanisch & Hulin, 1991) have integrated member-initiated departures, such as absenteeism, quitting, and retirement, using the broader construct of job withdrawal. Small group researchers are also developing more comprehensive models of member change and continuity. Rose (1989), for example, has developed a typology of termination that distinguishes between planned and unplanned, abrupt and tapering, and group and individual termination. Moreland and Levine's (1982, 1988) model of group socialization pulls together the processes of member addition, socialization, resocialization, and departure. The present article is intended as a contribution to this ongoing integration of diverse "membership matters."

In the section that follows, we develop a conception of membership dynamics based on ecological and systems theory and then present 10 propositions about the nature and effects of membership dynamics, organized into three sets. The first four propositions identify dimensions of member change and continuity that we believe have differential effects on groups. They are definitional. The next three propositions identify some consequences of membership dynamics for group functioning. They represent general hypotheses that can be tested for each of a number of dependent variables. The final three propositions introduce factors expected to moderate the relationship between membership dynamics and outcome variables. They represent hypotheses about complexities or contingencies in member change and continuity. After the theoretical formulation, we present results from the longitudinal study.

MEMBERSHIP MATTERS

AN ECOLOGICAL MODEL OF MEMBERSHIP

Small groups operate within a physical, technological, temporal, and social environment. The boundary of a small group forms a "membrane" across which resources and products move in and out of the group. And the most fundamental resource of any group is the people who form the group—its *members*. The word *member* comes from the same Latin root—*membrum*—as membrane and referred at first chiefly to the various parts of a body (members) that are enclosed within the boundary of the skin, the *membrana* (Webster's Ninth, 1985). Extending this concept to the group level, *members* came to mean the distinguishable parts—the people—within the group's boundary. By a similar process of generalization, we apply an ecological theory that originally focused on individual-level boundaries to illuminate a group-level conception of membership dynamics.

Our conceptualization draws on the ecological approach to interpersonal relations developed by Altman and colleagues (Altman, 1975; Altman, Vinsel, & Brown, 1981) and later adapted to the group level (Sundstrom & Altman, 1989). Our ideas also draw on systems theories (D. Katz & Kahn, 1978) and on work that emphasizes the dynamic nature of groups (Argote & McGrath, 1993; Ziller, 1965).

Open and Closed, Stable and Variable Groups

Altman et al. (1981) emphasize two dialectic dimensions to individual boundaries, open/closed and stability/change. People may be open or closed to interaction with others, and their degree of openness may be relatively stable or may change over time. By extension to group membership, groups may be "closed," with boundaries that function as barriers, or "open," with more flexible movement of members across permeable boundaries.

Ziller (1965) combines the two dimensions of open/closed and stable/variable, defining as closed a group in which "the elemental composition remains constant." Open groups, in contrast, are defined as "an interacting set of persons in a continuous state of membership flux" (p. 165). Following Altman et al. (1981), we see the dimensions as continuous and at least partially independent variables. Rather than locating groups at fixed points along the open/closed dimension, we emphasize that groups may have relatively open or closed boundaries and that the degree of openness may change (or remain relatively stable) over time. Groups vary in the degree to which their membership changes. Groups can also be stable or highly variable in their patterns of opening and closing.

The U.S. Supreme Court, for example, has a closed, fixed-size, highly stable membership. Its members are expected to remain with the group until death or seriously declining health removes them. Only when this happens is there a temporary "opening," and this opening is itself highly constrained: Elaborate formal procedures must be followed to replace the departed member. Member changes occur typically one at a time and in a fixed sequence: departure, then member replacement.

A book discussion group illustrates the opposite extreme of openness: Anyone who is interested may come. Like the stable closed boundaries of the Supreme Court, the open boundaries of the book group may be a stable (i.e., continuing) feature of the group. Furthermore, despite the open boundaries, it may turn out that a small group of faithful members attend regularly and predictably and new members rarely join. Thus, in contrast to Ziller's (1965) conception, an open group may have a relatively stable membership and a low degree of membership flux.

A mixed case is provided by *rolling cohort* groups—students in a particular graduate program, for example—that experience substantial, but predictable and periodic, change, both in membership and in their degree of openness. Membership in a group of graduate students is inherently variable over a 5- or 6-year period but may be highly stable within a given semester. Member additions occur at the beginning of semesters; member departures typically occur at the end of semesters. Groups such as these have planned change

built into their structure. The structure of other groups (such as married couples) is based on planned membership stability.

The Environmental Context

The membership dynamics of a particular group are determined in part by the group's purpose and its relation to the embedding environment. Supreme Court membership is determined by the political context; graduate student membership is regulated by faculty and influenced by job markets; discussion group membership and attendance are affected by scheduling conflicts and the multiple commitments of existing and potential members. The environmental context in which membership operates can thus control or at least constrain the possible nature and rate of membership change.

The context and purpose of a group also determine who has the power to initiate (or prevent) a change in group membership. In friendship or other types of mutual interest groups, individual members or the group as a whole typically control membership decisions. In other groups—military teams, political bodies such as a city council, most work groups—agencies external to the group assign members to the group or remove them from it.

All of the issues touched on here—the relative openness of a group's boundaries, the type and degree of member change, the means by which member change is regulated, and the temporal patterning of change—are important in our conceptualization of membership dynamics.

Proposition 1: The arithmetic of member change matters

The simplest distinction for member change is whether it involves addition, subtraction, or replacement (Ziller, Behringer, & Goodchilds, 1962). The arrival of a new member, the departure of an old-timer, and the substitution of one member for another have different effects on group size and call for different types of adjustments.

The magnitude of a membership change is another feature of member arithmetic. One new member is a different event from two new members. Furthermore, the magnitude of membership change must be considered in relation to group size and the relative proportion of members involved. When two of four members fail to show up for a meeting, half the group is missing. Two absences in a group of eight is liable to have milder effects. A general theory of member change must take these differential effects into account, reckoning size of change in both absolute and proportional terms.

Proposition 2: The impetus for member change matters.

Membership change can be initiated by individual members, by the group as a whole, or by powerful "outsiders" in the group's larger context (see Table 1). Quitting or absenteeism are member-initiated changes. Expulsion may be initiated by the group or by people external to the group. Assignment and reassignment are often initiated by agents in the group's environment. Groups are apt to react differently to member change, depending on who initiated the change, what their rationale was, and how acceptable the rationale is to the group as a whole. Control of member change is a boundary issue that relates to the open/closed dimension of the ecological model.

Proposition 3: Temporal aspects of member change and continuity matter.

Temporal aspects of member change and continuity should influence how the group interprets change and what effects membership events have on group process and performance. The key temporal aspects are *frequency*, of both membership change and of shifts between different levels of openness; *duration*, of both change and continuity; *regularity* and *predictability* of member change and of shifts between open and closed states (as in the graduate student example); and *timing* of change in relation to group development and expected future. A group's history with change can also help

TABLE 1: Member Change—Locus of Initiation

Effect on Size	Where Change is Initiated		
	Internal		External
	(Member)	(Group)	(Outsider)
Decrease	Member quits or gets sick	Member expelled	Member promoted or laid off
Increase	Member shows up and joins	Group recruits new member	New member assigned
No net change	Member switches shifts with another member	Group replaces unsatisfactory member	Member transferred and replaced

determine both the relative impact of current changes and norms for adapting to change.

Duration refers to both the expected duration of any member change and the duration of member stability in terms of member and group tenure. One way to map this temporal dimension for member change is to adapt the distinction between a standing group and an acting group (McGrath, 1984) to membership dynamics.

Standing versus acting groups. Most definitions of groups require some degree of interaction among members (McGrath, 1984; Shaw, 1981). However, a group exists even when it is not actively in session. We belong to our work crew, friendship group, or family whether or not we are currently interacting in them. These are *standing groups*. Standing group members are those persons who belong more or less permanently to the set of people that is the group and who recognize themselves and one another as members.

A group can meet without everyone being present. In this case, the missing people are still members of the standing group but not of the *acting group*, which consists of all persons involved in a particular group interaction.

The distinction between acting and standing group is more ambiguous for groups that have technological enhancements. When a group meets face-to-face, the acting group is everyone who shows

up. Groups communicating via computer, however, may “meet” without being “present” (i.e., in the same place). Groups using asynchronous computer systems, such as electronic mail, can meet without being “in” the same time or space, thus blurring the distinction between a standing and an acting group that is so clear-cut for face-to-face interaction.

An acting group may also include a substitute or guest member who is not considered a standing group member. This person is not a “regular” member but is some kind of member, at least of the acting group. According to this typology, we can characterize the ad hoc groups of much experimental research as acting groups that have no standing group, past or future. In contrast, the groups in our experimental simulation had both a clearly defined standing membership and a weekly acting group membership that might or might not change from week to week.

The distinction between types of members can be extended to clarify different types of member change. Changes in the acting group are typically transitory and only peripherally related to group identity issues; changes in the standing group are relatively permanent and involve the renegotiation of group identity and boundaries (see Table 2).

Membership continuity, the “background” for member change, can also take many forms. We can distinguish between stability of attendance, which is a characteristic of acting groups, and stability of membership, which is a characteristic of standing groups. A group may have a stable standing membership (no new members, no departures) but a fluctuating acting membership, especially if the group is relatively large and attendance is not heavily regulated by rules and norms.

Group development and member change. It should also make a difference *when* a change occurs in relation to the life span of the group and how much experience that group has with membership change. Changes that occur when a group is first forming should have effects different from membership changes that occur in a well-established group or in one that is on the verge of disbanding. In particular, the relative influence of newcomers and continuing

TABLE 2: Member Change—Temporal Dimensions

Effect on Size	Time Dimension	
	Temporary Change	Permanent Change
	(Affects Acting Group)	(Affects Standing Group)
Decrease	Member is sick or on vacation	Member quits or retires; unit is “down-sized”
Increase	Guest sits in on a meeting; temporary person is hired	Group expands and adds new members
No net change	Substitute fills in for missing member	New recruits replace lost members

group members in negotiating or renegotiating group norms may be quite different at different stages of group development (Moreland & Levine, 1988).

Proposition 4: Who changes matters.

Members are not fully interchangeable. Almost all groups have informal role differentiation, and many have relatively fixed role patterns. The nature of the group’s activity and the basis for its role differentiation will set boundaries for how flexibly a group can adapt to a particular member change.

One dimension along which members differ is centrality. Some members are high-status, central, and important; others are more peripheral and less important to the group’s activity. Changes involving members with more central roles should have stronger effects on group interaction and performance than changes involving more peripheral members.

A full model of membership dynamics must take into account dimensions such as arithmetic (direction and magnitude of change), control of and relative permeability of group boundaries, and temporal features of change and continuity; it must also allow for differential effects based on role specialization and other individual differences among group members. These factors are the main components that we will consider in exploring the impact of membership change in small groups.

IMPACT OF MEMBER CHANGE AND CONTINUITY

The membership of a group is central to that group as a system, and thus we expect changes in membership to have pervasive effects on many aspects of group functioning, including task performance, interaction among members, and group structure.

Proposition 5: Membership dynamics will affect group performance.

Research on issues related to membership change and stability suggests that different aspects of membership dynamics will affect group task performance in complex ways. The addition and subtraction of members may change group size, for example, disrupting (or better approximating) the optimal staffing level for the task (Moreland & Levine, 1992). In terms of boundary control, construction crews that helped determine the pairing of members into "buddy-work teams" were more productive than crews that had no input into these decisions (Van Zelst, 1952). In highly trained teams whose task requires close coordination, membership change of any kind is likely to disrupt performance, at least initially (McGrath, 1991).

Membership continuity and stability is frequently presumed, from the organizational behavior perspective, to be a desirable equilibrium state. High continuity may be a mixed blessing, however. It can result in declining diversity, as long-term associates tend to become more and more similar in outlook and behavior. Not only has homogeneity of member perspectives been identified as a precondition for groupthink, but maintaining high group productivity, especially for tasks on which creativity is important, may require some degree of member change (R. Katz, 1982).

Proposition 6: Membership dynamics will affect group process.

When membership change and continuity affect the quality of group performance, this is at least partially due to changes in group interaction. It is almost inevitable, for example, that when group membership changes, the distribution and pattern of intragroup

communication, over members and over topics, will also change (McGrath, 1991). A member who returns after an absence, for example, may need to be brought up-to-date. The presence of a guest may also disrupt routines if members take the time to explain procedures that are self-evident to the standing group.

The magnitude and temporal patterning of change help determine what the effects on group process will be. New members who arrive one by one behave differently, for example, and are assimilated at different rates, from those who arrive in batches (Moreland, 1985).

Proposition 7: Membership dynamics will affect group structure.

Leadership dynamics, role structures, group cohesiveness, and group norms should also be affected by membership change and stability. Laboratory groups that went through nine "generations" of membership, with one member removed and replaced in each generation, developed role structures and leadership succession norms based on seniority rules (Insko et al., 1980). Groups in which member change is less systematic and predictable, however, may rely less on seniority and more on individual differences in ability in determining roles.

The degree of, control of, and predictability of change should also affect group cohesiveness. Although the challenge of adapting to changes in membership might well decrease group cohesiveness, some variation in membership change may help keep the group "fresh" and provide a welcome source of stimulation and variety, especially in groups with an extended life span.

MEMBERSHIP CHANGE AND CONTINUITY IN CONTEXT

The relationships hypothesized above make membership change and continuity a relatively complex domain. It becomes even more complex when considered in the full context of the group's technological, temporal, and organizational environment. Our last three propositions express some of the contextual complexities that seem crucial to a full understanding of membership dynamics.

Proposition 8: Prior conditions of task, technology, and group composition will moderate the effects of membership change.

Any effects of membership change will depend, necessarily, on the particular state of the group prior to the change. We thus expect all of the hypothesized effects to be contingent on the group's prior composition (gender, size, and mix of abilities), structure, technology, task, and operating context.

Proposition 9: Effects of membership changes will interact with effects of other types of change.

Membership changes often take place in the context of other major changes—in the group's task or in its technology, for example. The Tavistock studies of the shift from "shortface" to "longwall" coal mining illustrate a complex interaction between changes in technology, task, and group membership configuration (Trist & Bamforth, 1951). We expect that the effects of member change in natural groups will often be moderated by changes in other aspects of the group and its larger environment.

Proposition 10: Member changes both affect and are affected by group structure, process, and performance.

Propositions 5 through 8, taken together, imply that the relations considered here operate in both directions: Membership changes both affect and are affected by the group's prior composition, structure, process, and performance. Although we focus in this article on how membership change influences subsequent measures of group functioning, much research has focused instead on the antecedents of member change. Many relationships between member change and other variables may be most accurately characterized as time-lagged mutual influence.

We turn now to an empirical study designed to explore different facets of membership change and their consequences for small groups.

METHOD AND MEASUREMENTS

OVERVIEW AND DESIGN

As described in McGrath (1993 [this issue]), 22 groups of students met weekly for 13 weeks, half face-to-face and half using computer mediation. By Week 3, there were 8 four-person and 3 three-person groups in each condition. In subsequent weeks, six students dropped the course, and in any given week, between two and nine of the groups had absences.

In addition to these member-initiated losses, all groups had experimenter-initiated member replacements in Weeks 11 and 12, as one member from each group was shifted to another group in a (within-section) round-robin fashion. In Weeks 7-9, the tasks required at least three people; the eight groups that dropped below that minimum in one or more weeks were supplemented by bringing in a guest member from another group meeting in the same section. All but one group was of mixed-sex composition.

INDEXES OF MEMBER CHANGE AND CONTINUITY

The following indexes of member dynamics were developed:

Member Change Versus No-Change Index. Each group was classified for each week as either experiencing membership change or not. If a group's acting membership differed from the acting membership for the previous week, it was counted as a change group. If acting group membership differed from the standing membership, even if no change had occurred in the acting group (this was true, for example, for week 2 of the member switch manipulation), the group was also counted as experiencing change.

Group Experience With Member Change Index. For each group, each week, we counted how many different acting membership configurations a group had encountered so far (including the current week). All groups began with a score of 1; beginning with Week 2, the scores diverged. Groups with low scores in later weeks had

a high level of standing group continuity; groups with high scores had low continuity and extensive experience adjusting to changing member configurations. The correlation between the two indexes was .48.

PERFORMANCE INDEXES

Group essay scores. Starting with Week 2, all groups composed a group essay each week that related the workshop activities to concepts discussed in course lectures and readings. These were graded by the course grader on a 10-point scale. To assess reliability, the grader and course instructor both graded one set of essays independently. A coefficient of concordance was calculated, yielding a value of .95 for Kendall's *W*.

Task product scores. Every week, each group completed a group product for that week's experimentally assigned task, which was scored on appropriate criteria (for details, see McGrath, 1993 [this issue]). The tasks and scoring differed from week to week, so all product scores were converted to standardized *z* scores.

INDEXES OF GROUP PROCESS

Time spent working directly on task. The weekly questionnaire asked participants to indicate what percentage of time their group had spent working directly on the assigned task. The average of member responses was used as an index of reported time spent in the execute phase of task performance.

Time spent dealing with conflict. The average of member responses for percentage of time spent dealing with conflict among members was used as an index of reported time spent in conflict. This measure and the previous measure are at least partially interdependent. Time percentages among these and other activities, such as socializing, summed to 100%.

GROUP COHESIVENESS INDEXES

Member affect toward group. Members used a 7-point scale (1 = *very negative*, 7 = *very positive*) to respond to the question: "While working on today's project, how were you feeling about your group?" Responses were averaged to create an index of group cohesiveness for each week.

Perceived impact of week's activity on cohesiveness. Members rated the impact of the group's interaction on group morale and well-being, using a 7-point scale (1 = *strong negative*, 7 = *strong positive* effect). Ratings were averaged to create an index of perceived impact of process on cohesiveness.

ANALYSES

We conducted two sets of analyses. One examined the impact of externally initiated membership replacement on group performance, process, and cohesiveness and explored whether prior experience with member change moderated any change effects. The second set examined member-initiated change in a given week compared to groups that experienced no change.

Externally initiated change. We ran a within-group comparison for Week 10 (when only 2 of the 22 groups had absences and none had guests) versus Week 11 (when all groups had one member removed and replaced with a guest), for all outcome variable indexes except for task product scores (which were excluded because they were standardized within week and, thus, could not meaningfully be compared across weeks). Communication medium was included as a between-groups factor in the analyses.

For Week 11 and Week 12 (the two member switch weeks) we examined the degree of association between the group's past experience with change and all six outcome variables.

Member-initiated change. Our second set of analyses focused on naturally occurring, member-initiated change in Weeks 2-6

(Weeks 7-9 were excluded because they had a mix of member- and experimenter-initiated changes and because they were complicated by a major change in communication technology). Change and no-change groups were compared week by week on the performance, process, and cohesiveness indexes, in a two (change and no change) by two (communication media) analysis of variance (ANOVA) design.

In addition, we conducted a two (change vs. no change) by two (media) by five (weeks) analysis across Weeks 2-6. For this analysis, a within-group analysis was not feasible, because different groups appeared in the change and no-change categories in each week. The groups were reasonably well counterbalanced across the two categories over the 5-week period, with only 4 of the 22 groups appearing consistently in the same category.

RESULTS

EXPERIMENTER-INITIATED MEMBER CHANGE

The member switch manipulation produced significant main effects on essay scores, reported time on task, and reported time in conflict. For scores on the first week of the membership switch, compared to scores for the previous week (in which no members were switched), essay scores were significantly higher ($M = 8.8$ compared to 8.0 for the previous week), $F(1, 20) = 11.03, p < .004$; reported time on task was significantly higher ($M = 71\%$ compared to 62% for the previous week), $F(1, 20) = 8.16, p < .01$; and reported time spent dealing with conflict was lower ($M = 1\%$ compared to 6% for the previous week), $F(1, 20) = 17.66, p < .001$. The member switch manipulation had no effect on cohesiveness ($p > .5$, see Table 3 for means). Figure 1 graphs the results.

GROUP EXPERIENCE WITH CHANGE, MEMBER SWITCH WEEKS (11 AND 12)

The experience with change index, which tallied how many different acting group configurations a group had experienced so

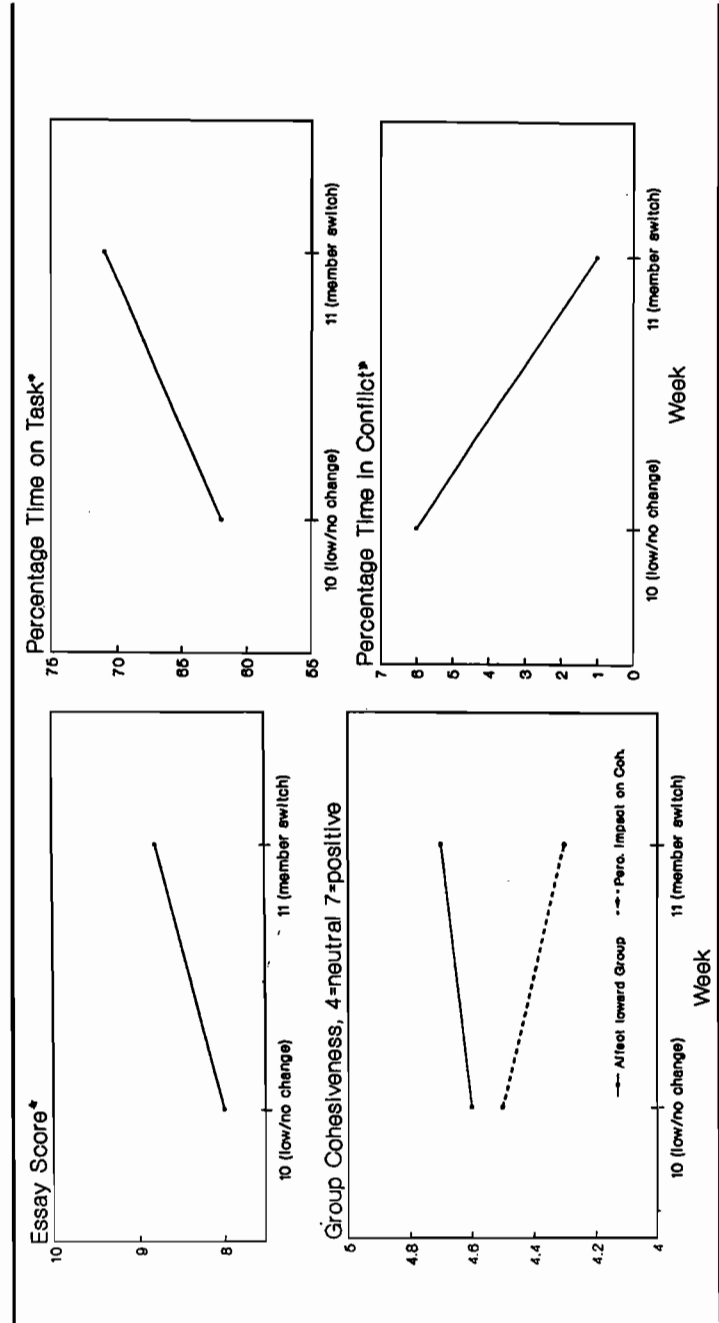


Figure 1: Effect of Externally Imposed Member Switch on Essay Scores, Time on Task, Time in Conflict, and Cohesiveness
*Significantly different, $p < .01$.

TABLE 3: Means for Low or No Member Change Versus Member Switch Manipulation (Weeks 10 and 11)^a

	Overall Means	By Communication Medium	
		Face-to-Face	Computer
Essay Score			
Low or no change	8.0*	8.0	8.1
Member switch	8.8*	8.7	8.9
Time on task			
Low or no change	62%*	60%	64%
Member switch	71%*	74%	68%
Time in conflict			
Low or no change	6%*	6%	6%
Member switch	1%*	2%	1%
Cohesiveness			
Low or no change	4.6	5.1 ^c	4.2*
Member switch	4.7	5.1	4.3
Perceived impact on cohesiveness			
Low or no change	4.5	4.8*	4.1*
Member switch	4.3	4.8	3.8

a. *N* was 22 for each week reported.

*Significant at the $p < .01$ level.

far, correlated significantly and negatively with affect toward group (cohesiveness), $r = -.58$ ($p < .01$), and with perceived impact on cohesiveness, $r = -.53$ ($p < .05$), for Week 11. Correlations were in the same direction for Week 12, but weaker and nonsignificant ($-.22, -.28$). In Week 12, change experience was positively correlated with time on task ($r = .31$) and negatively correlated with reported time in conflict ($r = -.32$). Neither relationship reached traditional levels of significance.

MEMBER-INITIATED CHANGE IN WEEKS 2-6

Performance measures. The ANOVAs comparing change versus no-change groups across weeks showed a significant main effect of member change on group essay scores, with change groups outperforming no-change groups ($M = 8.5$ versus 8.0), $F(1, 88) = 4.85$, $p < .03$. Essay scores also varied significantly across week,

$F(4, 88) = 4.89$, $p < .001$. Member change had no effect on task product scores ($p > .5$).

Week-by-week analyses of essay scores for Weeks 2-6 showed no significant main effects for change, although a substantial mean difference in Week 3 ($M = 9.3$ vs. 8.4 for change and no-change groups) approached significance ($F[1, 18] = 4.3$, $p < .06$). As Figure 2 illustrates, member-initiated change was consistently associated with higher essay scores. The failure to detect statistically reliable differences in the week-by-week comparisons may have resulted from the low statistical power afforded by the small number of groups.

Time on task and time in conflict. The ANOVAs comparing change versus no-change groups across and within weeks, showed no significant effects for either reported time on task or reported time dealing with conflict. Conflict scores did vary significantly from week to week, $F[4, 88] = 3.95$, $p < .01$, which can best be explained as a task effect (O'Connor, Gruenfeld, & McGrath, 1993 [this issue]).

Group cohesiveness and perceived impact of interaction on cohesiveness. The analyses comparing change and no-change groups across weeks showed a significant main effect on cohesiveness ($F[1, 88] = 5.79$, $p < .02$), with members of change groups reporting more positive feelings toward their groups ($M = 5.2$) than members of no-change groups ($M = 4.8$). No week-by-week comparisons reached traditional levels of significance.

EFFECTS OF COMMUNICATION MEDIUM

Communication medium showed a consistent relationship to cohesiveness, with face-to-face groups reporting more positive feelings than computer-mediated groups (see Table 3). Across Weeks 2-6, the mean cohesiveness score was 5.2 for face-to-face groups and 4.8 for computer-mediated groups; the mean perceived impact on cohesiveness was 5.0 for face-to-face groups versus 4.7

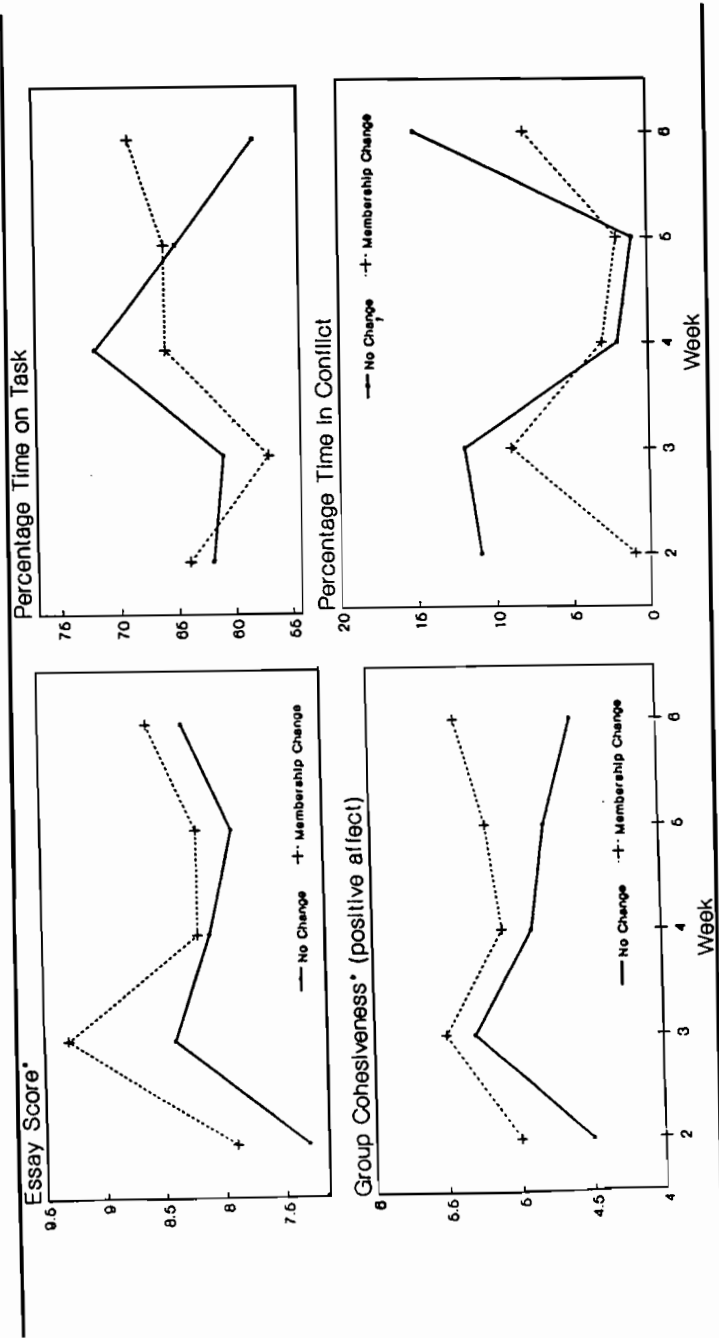


Figure 2: Effect of Member-Initiated Change on Essay Scores, Time on Task, Time in Conflict, and Cohesiveness
 *Change and no-change groups significantly different across weeks, $p < .05$.

for computer-mediated groups. Communication medium was not associated with time on task, time in conflict, or essay scores. No interactions between medium and member change were detected. For a discussion of media effects on task product scores, see Hollingshead, McGrath, and O'Connor (1993 [this issue]).

DISCUSSION

The results presented above provide evidence to support several of our propositions about the significant dimensions of member change and their effects on group functioning.

THE PROPOSED DIMENSIONS OF MEMBER CHANGE AND CONTINUITY DO MATTER

Proposition 1 (the arithmetic of change matters) and Proposition 2 (the impetus for change matters) received some support. In Weeks 2-6, when changes were primarily member-initiated subtractions (absences) and returns, the pattern of effects differed somewhat from that found for externally initiated member replacement. Both types of change were associated with higher essay scores and (to some degree) with reduced expression of conflict, but the relationship between membership change and cohesiveness was more complicated.

Member-initiated change was associated with higher cohesiveness; experimenter-initiated change produced cohesiveness scores that were virtually identical to those for the low-change comparison week. However, when we differentiated groups according to their past experience with member change, it was clear that relatively stable groups reacted more positively to the member substitution than did groups that already had a great deal of experience with naturally occurring, member-initiated change. This finding provides some support for Proposition 3 (temporal aspects of change matter), suggesting the potential importance of relative frequency and regularity of membership change.

We did not formally test the effects of member change at different stages of group development. However, despite the lack of appropriate data to feed into ANOVAs, the rich resources provided by the group essays, process records, and field notes yielded some suggestive anecdotal material.

We were surprised, for example, at how some members who dropped the class early on were memorialized. In Week 4, when members picked a name for their group, one group named itself Erin, the name of a member who had dropped after 2 weeks of attendance; another group named itself Scurvy, because "we are missing member 'C.'" Contrary to theoretical expectations (Moreland & Levine, 1988), these examples demonstrate that groups may engage in strong symbolic "remembrance" even if a member leaves during the early "forming" stage of a group.

Another surprising incident occurred in Week 3, when a member of a brand-new group was transferred almost immediately into a different brand-new group. The 10-minute-old group whose member was being transferred went through an elaborate process of saying good-bye and expressing regret at the member's departure. A naive observer might have concluded that these people were fast friends, not acquaintances of trivially brief duration. Time together seems inadequate to explain the attachment between members. Instead, we attribute the effect to the group's expectation of long-term future interaction.

Proposition 4 (who changes matters) also received anecdotal support. During the member switch weeks, "regular" members were asked whether they would prefer to keep the guest or get their old member back, and why. Most chose the latter, citing reasons such as "I am used to the previous member" or "I want the old group back together." Of the "hosts" who wished to keep their guest, several identified the missing member as marginal: [Guest is] "more beneficial to the group. . . . [Missing member] wasn't prominent." One participant who expressed indifference about the choice noted: "Sometimes he [missing member] contributes and sometimes he doesn't. . . . if we lost 'D,' the most influential member, there'd be a BIG change!"

MEMBER CHANGE AFFECTS PERFORMANCE, PROCESS, AND COHESIVENESS

As asserted in Proposition 5, membership dynamics did affect performance, but only on the group essay, not on the other types of tasks. We also found some evidence of membership change affecting process by increasing a group's focus on task performance and decreasing the expression of conflict (Proposition 6). Group cohesiveness, measured in terms of positive affect toward the group, tended to be higher when groups were experiencing member-initiated change than when membership was stable (Proposition 7).

In Week 11, when a substantial member change manipulation was imposed on the groups, reported time dealing with conflict went down, reported time on task went up, and essay scores improved. Essay scores were also higher for change groups in Weeks 2 through 6. In both cases, the size of the difference between means on essay scores (0.8 for member switch, 0.5 for Weeks 2-6) was sufficient to be meaningful to the students.

The increased time on task and decreased time in conflict found for the member switch weeks but not consistently for spontaneous absences and returns suggest several possible explanations. The presence of a guest may have been a key factor. Or perhaps groups spent more time on task and less on conflict in Week 11 (the member switch week) simply because the task was more demanding. Students did rate the difficulty of the Week 11 task higher than that of the task for Week 10, although not significantly so (5.7 versus 5.3 on a 7-point scale, $p > .1$). A third plausible explanation is that groups directed any hostility that they felt toward the "meddling" experimenters who were tampering with their boundaries, not toward one another.

Of the 26 participants who wrote comments about the level of conflict, however, none gave any support to the third supposition, and only 3 (2 of them from the same group) mentioned task demands as a factor. One of those three also noted that the guest "may have been less apt to argue with me." Of the remaining 23 comments, 4 identified a "floor" effect: "We didn't have any conflict today or any other day," and 14 mentioned a change in

interaction related to the guest: "We didn't feel as comfortable together"; "People on better behavior with newcomer"; "More polite"; "New member seemed less prone to argue." Three guests attributed the change to a different group size; the last 2 comments were "didn't want to argue" and "nothing to argue about."

The across-week comparison for change and no-change groups suggests that groups experiencing member-initiated change felt more positive about their group than did stable groups. Perhaps the coming and going of members was experienced as a welcome diversion. Alternately, groups may have worked harder at getting along when they felt they could not count on all their members. In the member switch weeks, excitement about the new member was, perhaps, offset by sadness at losing their regular member. And groups that had already weathered a substantial number of changes felt much less positive about the change than more "naive" groups. These groups might have been experiencing the stress of too much openness, with a concurrent loss of group integrity and cohesion (Sundstrom & Altman, 1989).

Group cohesiveness was found to be consistently associated with communication medium, with face-to-face groups reporting more positive affect. The three groups described above as reacting strongly to the loss of a member were all face-to-face groups. Groups who meet face-to-face may develop stronger bonds.

PERFORMANCE ON THE GROUP ESSAY

The most robust effect of membership change on the six outcome variables that we investigated was the salutary effect of member change on group essay scores. The contrasting lack of relationship between member change and the task product scores suggests that the essay effect is particular to the task. Group members were asked to reflect on their own group processes and integrate their experiences with theoretical materials presented in the course. The coming and going of absent members and guests may have assisted groups in becoming more conscious about features of their own structure and functioning.

As Levine and Moreland (1991) point out, groups develop their own culture, and culture is invisible to those who share it. The outside perspective of the visitor, the fresh eyes of an absent member returning, and even the reshuffling of duties required when a member was missing may all have helped group members reflect on how and what they were doing as groups. This situation could be interpreted as the operation of "objective self-awareness" (Wicklund, 1975) at the group level, with the guest or returning absentee providing a "mirror" for the groups.

IMPLICATIONS

As suggested by the pattern of results, the relationship between membership change and group interaction and performance is not a simple matter. A great deal of investigation lies ahead before we can draw firm conclusions.

However, we can at least speculate about possible implications for small groups. First of all, membership change is not necessarily bad. Other psychologists have proposed that traditionally undesirable events such as absenteeism and turnover may have their positive aspects (Staw, 1980). Some degree of membership change in work groups may be associated with reduced conflict, greater task focus, and higher group cohesiveness.

Second, the presence of newcomers or guest members may have distinctly positive effects on groups performing tasks that require an analysis of process and the integration of theory and experience. Quality circles, which are charged with examining existing patterns of technology, production, and performance in a self-critical way, perform a task that has elements of self-conscious reflection. A policy of deliberately rotating membership in such groups might enhance performance.

In another domain, the work of therapy groups is a kind of self-reflective integration of the theory of the therapist or group leader with the experience of group members. Many therapy groups are closed, with no new members allowed to join in midstream. Yet despite—or perhaps because of—the changes they cause, new

members might well have beneficial effects on the group's progress in self-understanding, by enhancing the group's level of arousal and objective self-awareness.

These suggestions, however, should be taken as preliminary speculations only, awaiting further study that will extend and deepen our knowledge of membership change in ongoing groups.

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