

editor, and pass along the torch to me with the completion of this volume. I wish to congratulate Jerry on his outstanding contributions to *RPHRM*. Jerry Ferris and Ken Rowland founded this series more than 20 years ago; and after Ken retired in 1992, Jerry served as sole editor for the past ten years. Both Jerry and Ken possessed keen insight when they anticipated a need to offer HRM researchers an outlet for high-quality, monograph-length literature reviews and conceptual models. Now, more than twenty-two years later, the series continues to thrive. I have had the privilege to witness Jerry take pride in *RPHRM* and his exercise of exemplary standards. Thanks to Jerry, the series is on solid ground. I look forward to continuing his fine tradition. Best wishes, Jerry!

Joseph J. Martocchio
Gerald R. Ferris
Series Editors

THE IMPACT OF TEAM FLUIDITY AND ITS IMPLICATIONS FOR HUMAN RESOURCE MANAGEMENT RESEARCH AND PRACTICE

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ABSTRACT

Past research involving turnover in work teams has largely focused on turnover as a dependent variable. With the growing trend towards more fluid, project-based teams, the effects of team membership changes on team processes and outcomes are in need of theoretical development and systematic study. Building on previous work by others (e.g. Arrow & McGrath, 1995; Marks, Mathieu & Zaccaro, 2001), we develop a framework for understanding the effects of the rate of membership change, or team fluidity, on emergent states and processes in teams. Specifically, we: (a) discuss the theoretical underpinnings of team fluidity; (b) review past team research involving turnover; (c) make theoretically-grounded propositions about the effects of team fluidity on emergent states and process variables as well as additional propositions about boundary conditions; (d) discuss implications for human resource management practices; and (e) identify methodological challenges, including measurement issues, in studying team fluidity.

INTRODUCTION

The growth of teams in organizations is an established and continuing characteristic of contemporary business enterprise (Guzzo & Shea, 1992; Lawler, Mohrman & Ledford, 1995). The academic literature on teams in organizations has been expansive, with notable reviews outlining the progress in understanding teams (e.g. Bettenhausen, 1991; Guzzo & Dickson, 1996; Guzzo & Shea, 1992; Milliken & Martins, 1996). As teams and organizations evolve, changes in the makeup of teams and team tasks continue. For example, teams must now manage a wider range of interdependencies, constituents, and social linkages (Ancona & Caldwell, 1998; Guzzo & Dickson, 1996). Also, the fluidity of teams has increased, with members rotating in and out on a "project" or "as-needed" basis (Arrow & McGrath, 1995; Campion, Papper & Medsker, 1996; Townsend, DeMarie & Hendrickson, 1998). Two developments that have led to increased fluidity are the rise in contingent work arrangements (e.g. contract work) and a labor market that allows skilled employees to shop their services among organizations to obtain more desirable working arrangements (Muio, 2000). Virtual teams are especially likely to be fluid in the sense of rotating membership and participation (Guzzo & Dickson, 1996; Kristof, Brown, Sims & Smith, 1995; Saunders & Ahuja, 2000). In fact, some researchers assert that a lack of fluidity in teams can be detrimental to team outcomes (e.g. Guzzo & Dickson, 1996). The present paper attempts to address some of these issues by examining the influence of team fluidity on team processes, emergent states and outcomes. *Team fluidity* is defined as the rate of change in team membership over time.

Although progress in research on teams has been unmistakable, this research has largely overlooked the potential effects of fluidity on team processes and performance. For example, most work has relied on teams composed of the same members throughout the period of study, with no changes in team membership (e.g. Gersick, 1988; Harrison, Price & Bell, 1998; Watson, Kumar & Michaelsen, 1993). As Arrow and McGrath (1993) note, other researchers have controlled for or otherwise eliminated "participant mortality," treating it as a problematic source of variation in team studies. The result of treating participant mortality as error variance in teams research is that most of what we know about teams is based on a static model of team membership. We lack an understanding of how changing membership affects team processes, emergent states, and outcomes.

A number of researchers, led by Arrow, McGrath and associates (1991, 1993, 1995, 2000) have made strides towards addressing the issue of membership dynamics in teams. Specifically, these researchers have begun to study membership history and change, answering calls by others who have previously raised the issue (e.g. Guzzo & Shea, 1992; Smith, Smith, Olian, Sims, O'Bannon &

Scully, 1994; Ziller, 1965). In doing so, they have called into question well-accepted models of team stage development which rely on stable membership over time (e.g. Tuckman, 1965). Also, they have begun to differentiate between effects of voluntary versus involuntary membership change (Arrow & McGrath, 1995; Gruenfeld, Martorana & Fan, 2000). Most of these studies, however, have only looked at outcome variables such as team performance, while excluding emergent states such as team flexibility or process variables such as communication or conflict (e.g. Argote, Insko, Yovetich & Romero, 1995; Goodman & Leyden, 1991). Others (e.g. O'Connor, Gruenfeld & McGrath, 1993) have examined process variables by manipulating team membership change only at a single point in time instead of measuring change over time, or rate of member change.

This paper contributes to the team literature by proposing how team fluidity affects team processes as well as team emergent states. Specifically, we focus broadly on: (a) the theoretical underpinnings of team fluidity; (b) past team research involving turnover; (c) theoretically-grounded propositions about the effects of team fluidity on certain process variables and emergent states as well as additional propositions about boundary condition effects; (d) implications of team fluidity for human resource management (HRM) practices; and (e) a discussion of some methodological challenges and future research directions. While recognizing the distinction often drawn by researchers, we follow Guzzo and Shea (1992) in treating the terms "group" and "team" interchangeably for purposes of this work.

THEORETICAL BACKGROUND

Several theoretical perspectives are relevant to understanding how changing team membership affects team processes and emergent states. First, Arrow and McGrath's (1995) membership dynamics framework provides several general predictions about the nature and effects of group membership changes. Although not addressing relationships between membership change and specific process variables, they do differentiate between standing and acting groups (i.e. the entire group versus the part of the group actually present at a given point in time), types of work groups (i.e. task forces, teams, or crews), and outcome variables such as the well-being, support, and production of members and groups. They theorize that direction and magnitude of member change, locus of initiation of change, and the temporal patterning of change will differentially affect outcomes. We focus specifically on ongoing teams that experience periodic changes in team member makeup. Team process variables are of interest to us, in line with traditional input-process-output models of team performance (e.g. Guzzo & Shea, 1992; Hackman, 1987). In addition, consistent with recent work by Marks, Mathieu and

Zaccaro (2001), we examine team emergent states and how they might be affected by team fluidity.

Ancona and Caldwell (1998) adopted a theoretical stance that is similar to that of Arrow and McGrath (1995) in their conceptual article pertaining to team composition. Specifically, they pose three questions about team composition pertaining to different potential outcomes. These questions address whether members are assigned to a team for its entire life or for only part of a project, on a part- or full-time basis, and whether the team is comprised of everyone necessary to make decisions or whether the team relies on outside "experts" to facilitate these processes. Their basic recommendation, although not empirically substantiated, is to have a team comprised of a "core" set of unchanging members, with a "periphery" of rotating team members.

Both the similarity/attraction (Byrne, 1971) and social identity (Tajfel & Turner, 1986) theories are also relevant to discussions of team fluidity. Potential benefits as well as drawbacks of similarity in terms of team membership are likely to manifest themselves in more stable teams, whereas more fluid team members may have a difficult time feeling a sense of identity or attraction based on similarity. That is, ingroup/outgroup boundaries (Tajfel, 1982) may be harder to ascertain in more fluid teams. This becomes even more difficult when trying to become familiar with new team members who come from outside the organization compared to those who migrate from within another part of the organization.

Sociotechnical theory (e.g. Rousseau, 1977; Trist, 1981) also lends itself to the present discussion. Sociotechnical theory posits that optimization of both the social and technical sides of the work environment leads to high performance and positive social experiences at work (Guzzo & Shea, 1992). That is, an organization must account for both the technical and social sides of work when designing work interventions, and attempts to optimize one at the expense of the other will result in a decrement to the whole (Trist, 1981). It is plausible that the stability of work groups may influence the social side of work (e.g. cohesiveness), while having direct effects on the technical side of work as well (e.g. flexibility, creativity).

Another important theoretical perspective that is germane to our discussion of team fluidity is a social networks perspective. Because of its vast scope, we do not intend to conduct a thorough review of the social networks literature, but rather we will touch on how a social networks perspective might introduce important boundary conditions in developing propositions about the effects of team fluidity on team process variables. At its core, a social networks perspective suggests that process and performance in groups is at least partially associated with the patterns of relationships that exist in the group (Brass, 1995; Granovetter, 1973). For example, some groups are more tightly linked and exhibit a high degree of closeness centrality (Freeman, 1979), whereas others experience looser ties among

members. Other groups have a greater mix of central members with several links to other members, as well as members who are more peripheral and have fewer and/or weaker ties to fellow group members. Importantly, as Brass (1995) notes, "If any aspect of the network changes, the actor's relationship within the network also changes." (p. 44). Thus, there are clear implications of team fluidity on the overall social network that exists in the team. We specifically address the expected differences in effects when a more centrally close versus peripheral member of the team leaves or is replaced.

Finally, regarding the discussion of team process variables and how team fluidity may affect such variables, Marks et al. (2001) have developed a temporally based framework and taxonomy of team processes. Essentially, these scholars discriminate between team processes and emergent states. *Emergent states* are "properties of the team that are typically dynamic in nature and vary as a function of team context, inputs, processes, and outcomes" (p. 357). Team cohesiveness is a good example of an emergent state that evolves, or emerges over time, but is not an action the team engages in. Alternatively, team processes are defined by Marks et al. (2001) as "... acts that convert inputs to outcomes through cognitive, verbal, and behavioral activities directed toward organizing task work to achieve collective goals" (p. 357). For example, team communication is a team process because it represents an action that a team engages in. Marks et al. (2001) further differentiate between various types of team process variables. Specifically, they discuss transition, action, and interpersonal processes. *Transition processes* are posited to occur when a team is in transition between tasks. For example, goal specification and planning represent processes engaged in at this stage. In more fluid teams, it might be the case that transition processes occur more frequently than in more stable teams as teams realign themselves around new members and need to reorient themselves to new or ongoing tasks. *Action processes* occur as a task is accomplished and include such activities as monitoring and coordination. Finally, *interpersonal processes* occur across both transition and action phases of team cycles and include actions such as conflict management, motivation and confidence building, and affect management.

APPROACHES TO THE STUDY OF TURNOVER IN TEAMS

Turnover in teams is a frequently studied topic in the organizational literature (e.g. Milliken & Martins, 1996; O'Reilly, Caldwell & Barnett, 1989; Wiersema & Bird, 1993) with myriad antecedents identified. The effects of turnover as an independent variable, however, are studied less frequently. It is important to differentiate fluidity

from more traditional indices of turnover. Whereas turnover traditionally accounts only for those members who permanently leave the team, fluidity subsumes not only these individuals, but also individuals who may be absent from an acting team for a period of time, only to return to the team at a later date. This point is relevant to the distinction drawn by Arrow and McGrath (1995) between standing and acting groups. The standing group is composed of all members "who share an explicit and ongoing set of relations both with the group and with other members" whereas the acting group "consists of all persons involved in a particular work session or other group interaction" (p. 377). For example, if a member is still a part of the team, but only attends weekly meetings every other week, there is fluidity in the team. However, this situation would not be reflected in traditional turnover indices.

Research on the effects of turnover as it has traditionally been assessed in teams is mixed. Some research suggests that continually bringing new members into a group can be disruptive and lower performance (e.g. Ancona & Caldwell, 1998; Argote et al., 1995). Less familiarity of members, a by-product of turnover, has been shown to be related to decreased productivity (see Goodman & Leyden, 1991). Goodman and Leyden (1991) also posit that this effect would likely be enhanced for more complex work. Finally, Hollenbeck, Ilgen, Sego, Hedlund, Major and Phillips (1995) concluded that instability in decision-making team membership disrupts a leader's ability to develop effective weighing schemes (i.e. dyadic sensitivity) for each member's input to the decision. This effect is stronger when attrition takes place in teams that are already highly familiar, supporting the proposition made by Arrow and McGrath (1995) that effects of membership change would be stronger in groups with greater prior membership continuity.

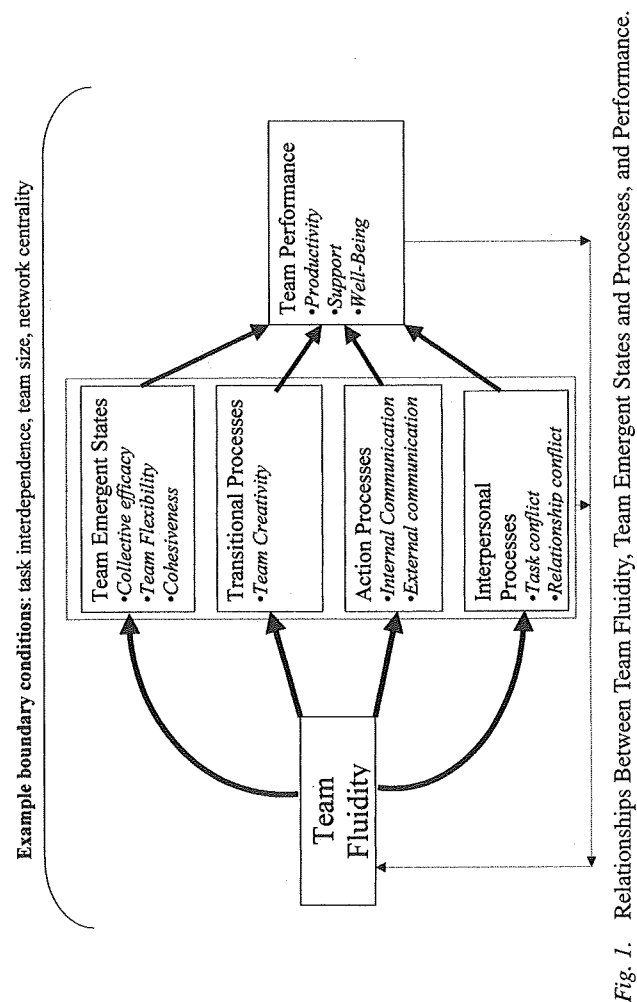
However, other researchers believe that turnover has a negligible or even a positive influence on team process and outcomes. Guzzo and Dickson (1996) state that, "turnover is usually thought of as dysfunctional for team effectiveness, though it is possible that the consequences of losing and replacing members could work to the advantage of teams in some circumstances" (p. 312). Similarly, Arrow and McGrath (1995) note that neither continuity nor changes in membership can necessarily be considered desirable or undesirable. Campion et al. (1996) found that team member permanence was not significantly related to process characteristics or effectiveness. In her study of turnover's effects on organizational learning, Carley (1992) also found inconclusive results, and suggested differences in organizational structure as a possible explanation. For example, she suggested that turnover would exhibit different effects in a hierarchical versus team-based organizational structure. Hinsz, Tindale and Vollrath (1997) suggest that group learning may not be dependent on specific group members. That is, group learning may still occur in the presence of member turnover insofar as it is likely that turnover brings more perspectives to bear on a task or problem-solving situation.

There is little continuity in findings that attempt to relate turnover in teams to team outcomes such as productivity, effectiveness, or overall performance. To systematically study the effects of team fluidity, researchers need to open the "black box" and look more closely at process issues and emergent states instead of focusing directly on performance outcomes. The propositions presented below provide the basis for researchers to empirically study the influence of team fluidity on team processes and emergent states.

A DYNAMIC APPROACH: TEAM FLUIDITY

A framework for understanding team fluidity is presented in Fig. 1. As shown in the model, we propose that team fluidity has effects on emergent team states, as well as transition, action, and interpersonal processes in teams. In line with the plethora of prior research linking process variables to performance (for reviews, see Guzzo & Dickson, 1996; Guzzo & Shea, 1992), we include performance outcomes that reflect production, well-being, and support (Arrow & McGrath, 1995). However, we make no specific predictions regarding the cumulative effects of process variables and emergent states on performance due to the differential effects those variables are likely to have. Furthermore, we do not include specific production outcomes, but instead recognize that the importance of various outcome indices (e.g. quality, efficiency, net profits) will vary by organization or team. An important part of the model is the feedback loop from processes, emergent states, and performance outcomes to team fluidity. This illustrates the dynamic nature of the model and recognizes previous research that has linked a number of these outcomes to subsequent turnover (for a review, see Griffith & Hom, 1995).

Temporal aspects of team dynamics have received increased attention from researchers (e.g. McGrath, 1991; Saunders & Ahuja, 2000). However, most prior studies that have looked at turnover's effects on teams have done so by focusing on researcher-induced member change at a single point in time (e.g. Arrow & McGrath, 1993; Gruenfeld et al., 2000; Schopler & Galinsky, 1990). These studies, although providing important contributions, only examine turnover dichotomously (i.e. teams either have or do not have an instance of turnover). Ziller, Behringer and Jansen (1961) were among the first to suggest the importance of rate of member change in their work on open versus closed groups. More recently, Arrow and McGrath (1995) recognized the need in proposing that both magnitude and direction of membership change matter and that the impact of change will depend on frequency of change. Further, as Arrow, McGrath and Berdahl (2000) write, "a group's ability to adapt to change will be affected by the rate and frequency of change . . ." (p. 197).



RELATIONSHIPS BETWEEN TEAM FLUIDITY AND EMERGENT STATES AND PROCESS VARIABLES

Figure 1 shows the relationship between team fluidity and emergent team states as well as transitional, action, and interpersonal processes. Although not necessarily comprehensive in terms of all possible states and/or processes, our discussion is meant to be illustrative of some of the factors thought to be essential in considering the effects of team fluidity. That is, our purpose is not to provide a comprehensive treatment of all possible emergent states and transitional, action, and interpersonal process variables and how they are affected by team fluidity. Rather, we introduce the reader to the concept of team fluidity and provide a sampling of proposed effects from these various categories.

Team Emergent States

Emergent states in teams are thought to evolve as a function of team context, inputs, processes, and outcomes. Thus, they rely on some type of prior interaction among team members. Social networks (Brass, 1995; Granovetter, 1973) and symbolic interactionist approaches (Joyce & Slocum, 1984) might be used to discuss how various states in teams emerge. As shown in Fig. 1, the fluidity of a team is likely to affect the development and maintenance of various states in those teams. Among the states that might be affected, Marks et al. (2001) mention collective efficacy, situational awareness, and cohesiveness. We discuss the probable effects of team fluidity on two of these suggested states, as well as a third emergent state, team flexibility.

Collective Efficacy

Collective efficacy is defined as the group's shared belief in its ability to carry out courses of action required to attain given levels of performance (e.g. Bandura, 1997; Chen & Bliese, 2002). A primary antecedent of collective efficacy is team history (Guzzo & Shea, 1992; Peterson, Mitchell, Thompson & Burr, 2000). Knowledge of past success is likely to increase a team's sense of efficacy for future events. A key element of this knowledge is familiarity among team members. Moreover, success is framed in terms of who was present during that success. Also, collective efficacy is framed in terms of current team makeup. In other words, a team feels efficacious or non-efficacious based on its current member makeup. There is inherent uncertainty surrounding introduction of new team members in terms of their personalities, performance potential, and fit with teammates, and the team's

collective sense of identity is likely to be lessened. Furthermore, the makeup of the team and longevity of teammates is uncertain. For example, a team may have a "star player," but not know how long she will stay given a high rate of turnover in the team. This uncertainty, characterized by high team fluidity, is therefore likely to reduce a team's collective efficacy.

Ziller (1965) proposed an important concept related to collective efficacy, which he termed the New Year's Eve phenomenon. The concept refers to people's tendency to view New Year's as a "fresh start," and experience reinvigoration towards goals, especially given a less-than-successful year gone by. Basically, if one has had a successful past, then change will lower collective efficacy and stability will increase it. On the other hand, change might increase efficacy for future success if the past has been less than successful, whereas stability might decrease it. For example, a baseball team may have knowledge of a prior World Championship, but may not experience collective efficacy for future championships since most of the players have switched teams. Or a baseball team that is coming off a disappointing season may experience increased collective efficacy if a number of new players have been brought onboard for the new season. This phenomenon, while compelling, was explained in the context of an isolated change in membership, with a clear past and future frame (e.g. last baseball season, the next season). It is unclear whether or not it would manifest in more fluid teams, and in fact, Campion et al. (1996) found a positive but non-significant (0.14) correlation between team member permanence and team potency (a construct similar to collective efficacy). However, on the whole, it seems as if the lack of knowledge of newer teammates would stunt any increase in collective efficacy, and most likely reduce it.

Proposition 1. Team fluidity is negatively related to collective efficacy in a team.

Team Flexibility

Team flexibility refers to the ability of team members to perform tasks interchangeably. In more flexible teams, team members can more easily substitute for each other (Campion et al., 1996), and better adapt to a changing environment. Many contemporary work arrangements call for greater flexibility to meet increased performance and efficiency demands (Townsend et al., 1998). Oftentimes managers cite increased flexibility as a reason for rotating team members among teams. It seems intuitive that a team more used to changes in membership will be more flexible and open to change in general. Ziller (1965) recognized this, stating, "strategic membership changes can be made with greater ease in groups which experience membership changes routinely" (p. 175). Moreover, the benefits

of rotating members among different teams are well recognized by knowledge transfer researchers (e.g. Argote, Ingram, Levine & Moreland, 2000).

However, the potential for team members to interchangeably perform tasks is likely to suffer as team fluidity increases. For example, Campion et al. (1996) found that teams with more permanent members tended to be more flexible. This makes sense when one considers that more familiar team members have a chance to cross-train and learn each other's tasks, whereas team members who are relatively new or expect to turn over more quickly are less likely to learn teammates' tasks. Furthermore, team members are likely to adapt more easily to changing circumstances in the environment if they know how teammates are likely to react. Such knowledge grows out of stability and familiarity among members. The concept of shared mental models has been developed to describe this familiarity amongst team members that is thought to promote predictability and coordination (e.g. Klimoski & Mohammed, 1994; Mathieu, Heffner, Goodwin, Salas & Cannon-Bowers, 2000). In addition, sociotechnical theory suggests that the technical and social sides of work must be aligned for maximum performance (Trist, 1981). However, it appears that increased fluidity is likely to diminish both technical (e.g. flexibility) and social conditions within the team.

Proposition 2. Team fluidity is negatively related to team flexibility.

Cohesiveness

Team cohesiveness is another emergent state that is likely affected by team fluidity. Although often pitted as the counterpart of conflict, cohesiveness and conflict are distinct (Pelled, 1996). Through stable team membership, team members tend to develop similar schemata based on similar past events and experiences. Such similarity should enhance cohesiveness among team members (Michel & Hambrick, 1992). This follows directly from the similarity/attraction paradigm (Byrne, 1971).

In their discussion of team composition, Ancona and Caldwell (1998) note that underbounded teams (i.e. teams without stable boundaries) may have trouble developing cohesiveness. Gruenfeld, Mannix, Williams and Neale (1996) reviewed research suggesting that teammates that are more familiar with one another are more likely to exhibit higher levels of cohesiveness. Furthermore, a number of studies have examined a proxy for familiarity and stability, team tenure. For example, O'Reilly et al. (1989) found that heterogeneity in team tenure was negatively related to team cohesiveness. However, Smith et al. (1994) found no association between team tenure and social integration, and Riordan and Shore (1997) found no relationship between similarity in tenure and cohesiveness. It should be noted, though, that tenure was measured as time in present position

(Smith et al., 1994) and time in organization (Riordan & Shore, 1997) rather than time in the team in these studies, possibly explaining the discrepant results.

Proposition 3. Team fluidity is negatively related to team cohesiveness.

Transitional Processes

Transitional processes are posited to occur when a team is in transition between tasks. Marks et al. (2001) list mission analysis formulation and planning, goal specification, and strategy formulation as key transitional processes. It can be argued that a common thread running through these various transitional processes is a need for creativity in the team. For example, in formulating strategy, creativity may enhance the team's chances of realizing the best possible approach.

Team Creativity

Research generally supports the idea that creativity in teams evolves from an availability of a variety of perspectives among team members. For example, the team diversity literature generally acclaims diversity as leading to greater creativity (e.g. Nemeth, 1986), although it also tends to lead to greater conflict (Pelled, Eisenhardt & Xin, 1999). Beyond the effects of diversity, however, team fluidity adds another important factor that may enhance creativity. New members entering a team might not only be diverse, but more importantly are likely to arrive from a former organizational or team situation, with its related ideas. This gives the team a "boundary spanning" advantage. That is, the team gains not only a new team member, but also that person's past experiential knowledge (Ancona & Caldwell, 1998). Thus, the team benefits not only from the new member, but also from all of the prior experiences and interactions of that member as well.

One of the earliest studies that linked changes in team membership to creativity grew out of Ziller and associates' (1962, 1965) open versus closed group theory. Specifically, Ziller, Behringer and Goodchilds (1962) found that groups experiencing membership changes were more creative than stable groups. However, this study included only one membership change per group, and thus was not concerned with differences in rate of member change. Similarly, Stein (1982) reviewed literature that suggested that older more established groups were lower in creativity. However, it should be emphasized that team tenure level only serves as a proxy for team fluidity.

The literature suggests that team members tend to be on "better behavior" and more inhibited in the presence of strangers (Gruenfeld et al., 2000; O'Connor et al., 1993; Shah & Jehn, 1993). That is, people may not be as comfortable expressing

disagreement either when they are relatively new to a team, or when they relate to other members who are relatively new (Gruenfeld et al., 1996). In fact, a sense of "false cohesiveness" may prevail, whereby members go out of their way to maintain good relations while getting to know one another (Longley & Pruitt, 1980). Social facilitation or evaluation apprehension dynamics also may underlie a tendency towards inhibition in teams consisting of relatively unfamiliar members (Zajonc, 1965).

However, the tendency towards greater evaluation apprehension or social facilitation effects (Gruenfeld et al., 1996; Zajonc, 1965) in the presence of strangers is more likely to result in the face of conflict rather than creativity. Although similar effects could inhibit creativity in relatively unfamiliar teams, this is unlikely because creativity carries more of a positive, acceptable meaning than conflict, and therefore should be more accepted by team members. For example, a newcomer advancing a novel pattern of ideas or thoughts that increases overall team creativity is much less likely to meet resistance than a newcomer who directly instigates conflict with currently existing ideas in the team. Therefore, evaluation apprehension effects should be minimal in the case of creative contributions.

Proposition 4. Team fluidity is positively related to team creativity.

Action Processes

Action processes occur as a task is accomplished and include such activities as monitoring and coordination. To effectively monitor and coordinate activities, it is likely that communication with internal and external sources is of prime importance to teams.

Internal Communication

Communication has been defined as "the transfer of information, ideas, understanding, or feelings" (cf. Pelled, 1996, p. 620). Communication is generally recognized as a precursor to effectiveness in teams (e.g. Katz, 1982), although some suggest that highly effective teams require less communication because members can "anticipate" each other or share mental models (Klimoski & Mohammed, 1994). Several studies have examined *internal communication* in the context of team stability. For example, Campion et al. (1996) failed to find a relationship between a measure of team member permanence and internal team communication. Mathieu et al. (2000) found that shared team- and task-based mental models related positively to team process, operationalized in terms of strategy formulation and coordination, cooperation, and internal communication. Katz (1982) showed

that teams with longer average tenure exhibited higher levels of communication with internal members. Finally, Zenger and Lawrence (1989) demonstrated that shared experience in working together makes communication easier among team members. These findings likely stem from either a familiarity or lack of familiarity with team member communication habits. Such habits are likely more difficult to ascertain when team membership is more fluid (Hightower, Sayeed, Warkentin & McHaney, 1998).

External Communication

Researchers also are recognizing the importance of boundary spanning, or interteam relationships and communication (e.g. Ancona & Caldwell, 1998). *External communication* refers to communication that occurs with outside teams or constituents. Teams with a higher level of fluidity likely consist of members who bring more outside linkages to the team. According to the social networks literature (e.g. Brass, 1995; Granovetter, 1982), this might result in a situation whereby the team gains "strength through weak ties." That is, external constituents are less likely to know one another, creating a low density, high diversity network that is rich in non-redundant information. Although few studies have specifically addressed this issue, Katz (1982) showed that teams with lower average tenure tended to communicate more with outside constituents. Based on work reviewed above in the areas of internal and external communication, we posit:

Proposition 5a. Team fluidity is negatively related to internal team communication level.

Proposition 5b. Team fluidity is positively related to external team communication level.

Interpersonal Processes

Finally, interpersonal processes occur across both transition and action phases of team cycles and include actions such as conflict management, motivation and confidence building, and affect management. We specifically address the first of these as an example of the potential effects of team fluidity.

Task Conflict

Conflict in teams has generally been treated as containing task – and relationship-related elements (e.g. Pelled, 1996; Simons & Peterson, 2000). Recently,

Jehn (1997) differentiated between task content conflict (i.e. what to do) and task process conflict (i.e. how to do it); however we develop propositions related to the more general two-factor taxonomy. First, task conflict arises when team members disagree about the nature and process of accomplishing tasks (Pelled, 1996). For example, a team of software designers may disagree about whether or not to add a specific feature to a software package, and if so, how to go about doing it. Generally, such conflict is linked to higher performance because members are forced to consider more alternatives and think through those alternatives more thoroughly (e.g. Pelled et al., 1999). An antecedent of task conflict that might derive from team fluidity is informational diversity, or the diversity in viewpoints and ideas that exist within a team (Jehn, Northcraft & Neale, 1999). Also, O'Connor et al. (1993) suggest that increased stress may result from membership change, leading to greater conflict. They do not differentiate between task and relationship conflict, however, in making this argument.

Some studies have found that team member changes might lead to *less* task conflict. For example, we earlier reviewed studies showing that team members tend to be on "better behavior" and more inhibited in the presence of strangers (e.g. Gruenfeld et al., 2000; O'Connor et al., 1993). That is, people may not be as comfortable expressing disagreement either when they are relatively new to a team, or when they relate to other members who are relatively new (Gruenfeld et al., 1996). This sense of "false cohesiveness," whereby members go out of their way to maintain good relations while getting to know one another (Longley & Pruitt, 1980), may complement social facilitation or evaluation apprehension dynamics that also may underlie a tendency towards inhibition in teams of relatively unfamiliar members (Zajonc, 1965). The degree to which this effect manifests will likely depend on when task conflict is measured, and we address measurement issues later in the paper. However, given the fact that more fluid teams will generally consist of individuals who are newer to the team, the effect is more likely to occur in this type of team than in a more stable team.

Arguments linking greater informational diversity to greater task conflict are logical, but contradicted by evidence that informational diversity may not translate into conflict over use of that information in less familiar teams. That is, the tendency for newcomers holding diverse information to be on "better behavior" and a desire to "fit in" should lead to less task conflict. Recent work by Noe, Colquitt, Simmering and Alvarez (2003) might shed some further light on this apparent controversy. In discussing the creation of intellectual capital in teams, Noe et al. suggest constructive controversy (i.e. task conflict) as an important element of intellectual capital creation. Further, in discussing the likely effects of team design characteristics on intellectual capital creation, they suggest that a moderate level of instability is likely to be optimal in fostering creative

controversy. Too much stability may lead to stagnation and tendencies towards groupthink (Janis, 1972), whereas too much instability creates a constant stream of newcomers who are likely to exhibit evaluation apprehension early on and shy away from engaging in conflict with other team members regarding the task. This suggests a curvilinear relationship between fluidity and task conflict.

Proposition 6. The relationship between team fluidity and task conflict is curvilinear, such that task conflict is greatest when there is a moderate level of fluidity.

Relationship Conflict

Relationship conflict arises as a result of disagreements over non-task related issues. Generally, such conflict is detrimental to team functioning (e.g. Jehn et al., 1999). Further, Meyerson, Weick and Kramer (1996) note that temporary teams, which are more similar to highly fluid teams than stable teams, rarely exhibit dysfunctional team dynamics (e.g. relationship conflict) since they do not have the time to do so. Arrow and her colleagues (2000) also recognize that members of less stable teams know that they probably will only be working together for a short time, and thus will avoid bothering with relationship conflict. Also, the evaluation apprehension and social facilitation arguments advanced in the preceding section may deter relationship conflict.

Despite arguments that members of changing teams may not bother with relationship conflict, Arrow et al. (2000) also recognize that high rates of member turnover translate into a situation where team members are "out of sync" with each other in terms of development stage. This, in turn, might create relationship conflict as members interact using different frames of reference. For example, a more tenured member may become impatient with a newcomer who is trying to become familiar with team norms. Supporting this suggestion, Pelled et al. (1999) found that tenure diversity was positively associated with emotional conflict. Also, whereas it might be true that members will not bother with conflict if they expect their or their teammates' tenure to be temporary, the very opposite could also be true. That is, a person may express relationship conflict knowing that they will not have to work with the others on the team for very long. Furthermore, heterogeneity in values has been linked to relationship conflict (e.g. Jehn et al., 1999). In line with ingroup/outgroup distinctions (Tajfel, 1982), it is likely that a more stable team (i.e. more familiar members) will experience more of a "melding of common values" over time, whereas a more fluid team will continue to experience changing value structures. Thus, more relationship conflict is likely to manifest. Finally, according to the similarity/attraction paradigm (Byrne, 1971), such differences may make teammates appear more unattractive, furthering the potential for relationship conflict to develop.

Proposition 7. Team fluidity is positively related to relationship conflict in a team.

Identification of Potential Boundary Conditions

Task interdependence and team size are potential boundary conditions of some of the relationships proposed in the model shown in Fig. 1. Task interdependence and team size are likely to affect the relationship between fluidity and team processes because they each relate to how much interaction takes place among individual members. In a large team, for example, interactions likely involve subsets of the team instead of the entire team.

Task Interdependence

Task interdependence refers to the degree of interaction and cooperation required among team members to accomplish their tasks. Ziller (1965) is among the researchers who suggest that the optimum rate of team membership change might depend on task demands. We propose that higher task interdependence will accentuate the relationship between team fluidity and three of the team process/emergent state variables described earlier.

Team collective efficacy is highly dependent on knowledge of how team members are likely to perform (Guzzo & Shea, 1992). Above we described how this knowledge base is reduced in a more fluid team. Such a reduction most likely leads to a decrease in collective efficacy for more fluid teams. In more task interdependent teams, such an effect is likely to be more profound in that knowledge of how team members are likely to perform is more critical. This makes a lack of such knowledge equally critical, and is likely to lead to an accentuated decrement in collective efficacy. Thus, whereas we predict a negative relationship between fluidity and collective efficacy in general, teams that are more task interdependent are likely to exhibit a stronger negative relationship between fluidity and collective efficacy in particular.

Proposition 8a. The negative relationship between team fluidity and collective efficacy will be moderated by task interdependence, such that the relationship will be stronger in more task interdependent teams.

The curvilinear relationship between team fluidity and task conflict is also likely to be accentuated in a more task interdependent team. For example, the inhibition felt by new team members (Gruenfeld et al., 2000) is likely to be greater if forced to work closely with unfamiliar team members. Similarly, the "false cohesiveness" effect whereby members go out of their way to maintain good relations (Longley &

Pruitt, 1980) may be greater when members know they must work more closely on tasks. On the other hand, at higher levels of task interdependence, the informational diversity accompanying moderate levels of fluidity should enhance task conflict to an even greater degree.

Proposition 8b. The curvilinear relationship between team fluidity and task conflict will be moderated by task interdependence, such that the relationship will be stronger in more task interdependent teams.

The positive relationship between team fluidity and relationship conflict is also likely to be accentuated in more task interdependent teams. Relationship conflict often grows out of values differences (Jehn et al., 1999) and team members being "out of sync" developmentally with one another (Arrow et al., 2000). In a more task interdependent team, such differences are easier to uncover and more likely to manifest as members interact more frequently in performing tasks. Thus, all teams should exhibit a positive relationship between fluidity and relationship conflict. However, the fluidity-relationship conflict association should be greater in more task interdependent teams.

Proposition 8c. The positive relationship between team fluidity and relationship conflict will be moderated by task interdependence, such that the relationship will be stronger in more task interdependent teams.

Task interdependence is likely to attenuate the relationships between team fluidity and three other process variables/emergent states. First, task interdependence is likely to attenuate the negative relationship between team fluidity and team cohesiveness. We proposed that team fluidity would be negatively associated with cohesiveness based on the premise that changing teams would have members who were not as familiar with each other as in more stable teams. In teams performing a highly interdependent task, however, familiarity should be facilitated more quickly, easing the negative effects of changing membership. In fact, there potentially could be greater cohesiveness on a more fluid team performing a highly interdependent task than on a stable, yet relatively independent team. Thus, whereas we predict a negative relationship between fluidity and cohesiveness for all teams, we predict that the fluidity-cohesiveness relationship will be less negative for teams performing highly interdependent tasks.

Proposition 8d. The negative relationship between team fluidity and team cohesiveness will be moderated by task interdependence, such that the relationship will be weaker in more task interdependent teams.

Similarly, the negative relationship between team fluidity and team flexibility should be attenuated in more task interdependent teams. Although rapidly

changing team membership precludes cross-training and skill sharing among teammates, task interdependence more readily exposes teammates to one another's tasks and skill-sets. This likely facilitates cross-fertilization of skills and subsequent flexibility despite changing membership. Whereas changing membership is likely to diminish such cross-fertilization, increased task interdependence will counteract this effect, making the fluidity-flexibility relationship less negative.

Proposition 8e. The negative relationship between team fluidity and team flexibility will be moderated by task interdependence, such that the relationship will be weaker in more task interdependent teams.

Finally, the negative relationship between team fluidity and internal communication also is likely to be attenuated in more task interdependent teams. Greater interdependence is likely to lead to greater information exchange as a necessity for accomplishing tasks in close proximity. While it is certainly true that changing membership is likely to impair the formation of "mental models" or anticipatory reactions among more familiar teammates (Klimoski & Mohammed, 1994), high task interdependence should facilitate information transfer even among relative strangers, as the task necessitates increased intrateam communication. Thus, the fluidity-internal team communications relationship should be similar to the previous two relationships described above (e.g. fluidity-flexibility and fluidity-cohesiveness).

Proposition 8f. The negative relationship between team fluidity and internal team communication will be moderated by task interdependence such that the relationship will be weaker in more task interdependent teams.

We make no specific propositions regarding the last two process variables, external communication and team creativity. Such variables are largely orthogonal to task interdependence.

Team Size

When studying team fluidity's effects on team process and emergent state variables, a logical boundary condition to consider is team size. Specifically, the relationships between team fluidity and team process and emergent state variables are likely to be attenuated in larger teams. Colquitt, Noe and Jackson (2002) suggest that this results from decreased psychological bond strength between team members. More specifically, higher levels of team fluidity likely reduce the bond strength among members, which in turn reduces the effects that fluidity exhibits on emergent states and process variables. Therefore, we propose that the effects of fluidity on given process and emergent state variables will be in a similar direction among all teams, but will be relatively stronger in smaller teams.

Proposition 9. The relationship between team fluidity and all of the proposed team process variables will be moderated by team size, such that the relationships will be stronger in smaller teams.

Other Potential Boundary Conditions

Arrow and McGrath (1995) have suggested several other contingent factors that may differentially influence the relationships we have proposed. The *relative standing* of those in a team who leave is likely to influence the proposed relationships differently. Losing and replacing the two highest-ranking people in the team should be different than losing and replacing the two lowest members. Related to these suggestions is the notion of social network position or *closeness centrality*. Figures 2 and 3 illustrate two scenarios that are likely to impact emergent states and process variables differently. In Fig. 2, two central team members (A and B) leave during a month period, whereas in Fig. 3, two peripheral members of the team network (I and J) leave. In Fig. 2, it is likely that the effects of fluidity on emergent states and process variables are greater compared to the scenario shown in Fig. 3. For example, the loss of two long-standing “opinion leaders” in a self-managed work team is different than the loss of two “outsiders” who have only recently joined that team. Of course, there are other aspects of the social network that should be considered, such as the overall density of the network (Brass, 1995), and the effects of fluidity in dense and loosely-connected team networks.

Another point to consider is that different *patterns* of fluidity are likely to exhibit different effects on teams. For example, losing and replacing one member a month for four months might lead to certain process effects, whereas turning over four members at once at the end of four months might lead to others. Also, the *timing*

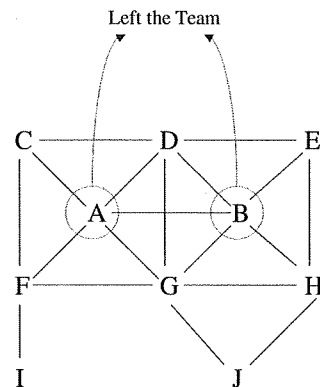


Fig. 2. Central Members Leave a Team.

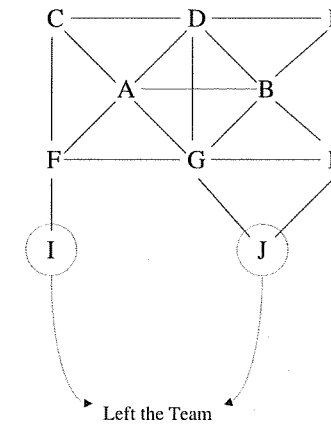


Fig. 3. Peripheral Members Leave a Team.

of fluidity is potentially important. Membership change just before a big team project deadline is likely to differ from member changes just after completion of a project. We make no specific propositions concerning the preceding possibilities, but reiterate Arrow and McGrath’s (1995) suggestion that these issues guide future team dynamics research.

IMPLICATIONS OF TEAM FLUIDITY FOR HUMAN RESOURCE MANAGEMENT PRACTICES

Few studies have directly investigated how to staff, train, manage performance, and compensate individuals in fluid teams. As noted previously, most of the HRM literature assumes that team membership is stable. Team fluidity is especially an issue in virtual organizations. Most work within a virtual organization is project-based, control and authority resides within team members, the success of the organization is dependent on collaboration and cooperation, the work environment is flexible, dynamic, and fluid, and work is conducted across time and space (Ellingson & Wiethoff, 2002). Below we discuss the implications of team fluidity for HRM practices and identify important research questions.

Staffing

A wide range of individual characteristics and skills have been suggested as predictors of team effectiveness including cognitive ability, Big Five personality

factors (openness to experience, extraversion, conscientiousness, agreeableness, neuroticism), conflict resolution, risk-tolerance, and collaborative problem solving (e.g. Ellingson & Wiethoff, 2002; Stevens & Campion, 1994). In a study of how team member ability and personality related to differences in team effectiveness, Barrick, Stewart, Neubert and Mount (1998) found that teams with higher cognitive ability and conscientiousness were better performers than teams that were lower in cognitive ability and conscientiousness. Moynihan and Peterson (2001) identified three approaches that have been used to understand the team member personality-team performance relationship. Personality is believed to influence team processes either universally across all teams, contingently by task or organizational culture, and configurationally by taking into account the integration of team member personality traits (Moynihan & Peterson, 2001). Moynihan and Peterson (2001) found support for all three approaches. For example, the configuration approach to personality in teams showed that team configurations that are high and homogeneous on levels of conscientiousness, agreeableness, and openness to experience, and heterogeneous on extroversion lead to positive team processes and outcomes. The configuration approach to studying personality in teams research assumes it is either the similarity or dissimilarity of complementary traits within a team that influence performance. Whereas these approaches have received support, they do not account for the existence of team fluidity and it would be interesting to see how the personality configurations of the teams relate to team effectiveness in more fluid teams. For example, are teams with more variability in personality traits better able to absorb and utilize the skills of a new team member than teams more homogeneous in traits that are joined by a team member whose standing on a personality trait is different from the rest of the team?

Klimoski and Jones (1995) make an important observation in noting that the traditional staffing model ignores team life-cycle issues. For example, a team having difficulty may seek to add members that bring new interpersonal and task specific skills to a team. These skills might not have been initially identified in an analysis of the team task. The selection process for a team that is forming likely relies more on the knowledge, skills, and abilities requirements uncovered in a job and task analysis. As interpersonal processes unfold in the team, however, the need for certain types of interpersonal skills might only then become salient. Klimoski and Jones (1995) suggest that to aid in the selection of new team members, assessment procedures that include employees as observers could be used to identify stable and emergent team staffing requirements. Assessment could be in the form of an assessment center or structured interview of team members. Also, specific KSAs could be identified that are more important in a fluid team arrangement as opposed to a more stable team. For example, there is a growing literature base that examines adaptability as an important KSA given the

changing nature of work and the employment contract (e.g. LePine, Colquitt & Erez, 2000; Pulakos, Arad, Donovan & Plamondon, 2000). We further develop the idea of adaptability in fluid teams in our discussion of performance management.

Performance Management

Team effectiveness is usually evaluated by looking at team outcomes such as customer service, productivity, quality, or innovativeness. In fluid teams, the importance of team members being able to work effectively despite membership changes is key. Underlying the ability to deal with changes in team membership is the concept of adaptability. Pulakos et al. (2000) developed a taxonomy of adaptive performance. They identified eight dimensions of adaptive performance including handling emergencies or crisis situations, work stress, solving problems creatively, dealing with uncertain and unpredictable work situations, learning work tasks, technologies, and procedures, and demonstrating interpersonal adaptability, cultural adaptability, and physically-oriented adaptability. They developed an instrument, the Job Adaptability Inventory (JAI), which can be used to evaluate team member performance, diagnose the adaptability requirements of jobs, and help in training team members in appropriate adaptive responses. To improve the effectiveness of selection of members to fluid teams, studies are needed to identify how individual differences relate to each of the dimensions of the JAI.

Another important consideration in managing the performance of fluid team members is in actually assessing performance of those team members. A useful example to illustrate this point is in conducting 360-degree performance appraisals, which consist of the combined evaluations of superiors, subordinates, peers, and sometimes customers and other outsiders. It is again often assumed that in carrying out such appraisal processes, the members of the group or team in question are stable, and can thus provide accurate appraisals of a member because they have consistently been around that individual. Such is not always the case in more fluid teams; therefore, determining the best sources of appraisal information is an important area for research.

Team Training

Cannon-Bowers, Tannenbaum, Salas and Volpe (1995) suggest that in teams where turnover is rapid (such as may be the case in fluid teams), task-specific competencies are critical and team-specific competencies are less important. Task-specific competencies include understanding the roles and role significance of different

positions on the team, skills in leadership or team management, feedback and performance monitoring, and coordination. They suggest that in these situations appropriate training strategies include task simulation, cross-training, guided task practice, role-playing and passive demonstration.

In a lab experiment, Marks, Sabella, Burke and Zaccaro (2002) examined the role of three different types of cross-training in developing shared team interaction models, coordination, and performance in action teams. Action teams require more specialized skill sets, rely more heavily on coordination, perform in less familiar and more challenging environments, and may be temporary. Shared mental models are believed to have a direct effect on team coordination and backup processes that lead to performance. In teams, shared mental models represent knowledge and understanding of the team's purpose and characteristics, connections among team member actions, and the roles and patterns required by team members to successfully complete collective action. These models directly relate to Cannon-Bowers et al.'s (1995) idea of task specific competencies. The types of cross-training examined included position clarification (training designed to raise awareness about team members jobs through lecture or discussion), position modeling (training involving both verbal discussion and observation of team members' roles) and position rotation (provides team members with experience carrying out team members duties through taking on their role). The results suggest that the two more in-depth types of cross-training created more shared team interaction knowledge among team members, but positional rotation was not necessary to obtain this effect. More research on cross-training and the other strategies suggested by Cannon-Bowers et al. (1995) is needed; of particular interest are studies that identify whether or not less intensive training (such as positional clarification) can help develop shared mental models in fluid teams.

Creation of Intellectual Capital

Intellectual capital is created through the combination and exchange of existing intellectual resources including tacit and explicit knowledge. Combination refers to the connection of elements previously unconnected or the development of novel ways of combining elements. For example, in crafting a new marketing campaign, one team member might provide first-hand knowledge of the general educational level of a targeted geographic area, whereas another might lend technological knowledge of the product to the prediction of whether it will be suited to individuals residing in that geographic area. Exchange refers to social interaction between individuals through teamwork, collaboration, and sharing. Nahapiet and Ghoshal (1998) model the creation of intellectual capital. They propose that structural,

cognitive, and relational dimensions of social capital influence the combination and exchange of intellectual capital, which directly affects intellectual capital creation. Trust, norms, obligation, and identification are believed to be critical elements of relations needed for combination and exchange to occur.

In teams that are charged with developing intellectual capital, the level of fluidity might work to the detriment of building trust and identification within the team. Indeed, Noe et al. (2003) posit that membership stability is an important team design characteristic when considering the development of intellectual capital, and that the relationship between membership stability and intellectual capital creation is likely to be complex. Periodic changes in the basic composition of the team can introduce new sources of individual intellectual capital, but may also detract from the team's intellectual capital, particularly when the departing member(s) possessed tacit knowledge. New members or new configurations of existing members should prevent the group from stagnating. This should be particularly true for teams who institutionalize explicit member knowledge (i.e. create a "team memory"), which can outlast individual members.

However, there is certainly a point at which membership instability will become counterproductive. Too much variation in either the standing or acting group will result in a situation where intellectual capital must repeatedly re-emerge in the new collective, as members must first decide "what they know" before concerning themselves with improving on that level of knowledge. In sum, Noe et al. (2003) suggests that there may be a threshold level of fluidity such that a lack of fluidity causes a team to stagnate in terms of task conflict (i.e. constructive controversy) and creativity but too much fluidity interferes with the development of team knowledge structures.

Compensation

In teams that experience fluidity, forms of compensation that reward flexibility and cooperation should be considered (see Heneman, Tansky & Tomlinson, 2002). Team fluidity has implications for base pay, incentives, and indirect rewards. Base pay is the amount of wages or salary provided to employees for their services. Person-based pay approaches focus on the competencies of the job incumbent rather than the job. Competencies include interests, attitudes, knowledge, skills, and abilities. In a broadbanding pay system there are a small number of pay grades but large pay ranges within and between pay bands. In broadbanding systems there is more room to reward individual differences that relate to fluid team success (e.g. team process factors, contributions to team task, seniority) than in traditional pay systems that have many narrow pay grades.

Many organizations use incentive plans that include cash bonuses that are linked to employee, team, business unit, or organizational performance. In teams, and especially fluid teams, incentive distribution should include an individual component as well as a team component. The team component would be based on the degree to which the team meets objective performance outputs (such as quality, sales, reduced scrap, etc.). The individual component would be based on a subjective evaluation (ratings) of how the individual behaviors contributed to team accomplishment. That is, both objective performance measures as well as subjective performance measures should be used in team incentive systems.

Subjective 360-degree evaluations based on self, manager, and other team members can provide a comprehensive evaluation of team members' "soft skills" (e.g. communication, cooperation, information sharing), although the potential pitfalls of 360-degree appraisals in fluid teams as discussed earlier should be considered. Also, team members should receive incentives for team outputs that are commensurate with their contribution in helping the team realize the output. This should be the case both for team members who are currently on the team as well as those who have left the team. A critical task in determining incentive pay in fluid teams is determining the contribution levels of those who quickly move in and out of a team as it completes various phases of a project. For example, Team Member A might only be on the team for one week, but might make the most substantial contribution, whereas Team Member B might only contribute incrementally, but do so over a period of a year. Such nuances will need to be considered by compensation researchers and practitioners.

Indirect rewards involve recognition and development. Recognition involves praise, gifts, awards, and time-off. Recognition confers status to members of fluid teams for individual contributions to team success as well as overall team performance. It may also be an important form of social capital because recipients become more visible to influential people in the organization. Being a member of a fluid team may also be rewarding to an individual if it is part of the individual's development plan. Job experiences are one type of employee development activity. McCauley, Ruderman, Ohlott and Morrow (1994) identified five different types of job demands that require employees to stretch their skills (e.g. forced to learn a new skill, apply skills and knowledge in a new way, and master new experiences). These demands include making transitions, creating change, having a high level of responsibility, being involved in a non-authority relationship, and facing obstacles. Membership in a fluid team may provide an opportunity to deal with all of these job demands.

Research has not adequately addressed issues of team compensation. For example, research is needed on the effectiveness of different combinations of individual, team, and higher-unit performance based pay. Also, researchers should examine

how compensation systems interact with other human resource systems (Heneman, Ledford & Gresham, 2000) in the context of a fluid team-based organization.

METHODOLOGICAL ISSUES IN STUDYING TEAM FLUIDITY

Certain methodological issues should be considered when studying the effects of team fluidity on team emergent states and processes. These include the measurement of fluidity, the measurement of interrater agreement versus reliability, measuring outcome variables, and potential reverse causality issues involving fluidity.

One of the most vital tasks researchers face is establishing a means of assessing and quantifying the level of fluidity in a team. For example, a team of eight members who experience the replacement of four of those members in two weeks is likely to differ from a similar team experiencing four replacements over a year. Traditional turnover indices only consider those members who permanently leave the team. Alternatively, fluidity can include shifts in membership that are temporary or only occur across the boundary between the standing and acting team. And, while our current measures of turnover seem inadequate from a conceptual standpoint, some of the existing turnover indices are inadequate from a methodological standpoint as well. For example, Carley (1992) defines the rate of turnover as:

$$\frac{1}{(\text{number of periods}/\text{number of members turned over})}$$

or one divided by the mean number of periods between exits of team members. Selection of a "period" is arbitrary (i.e. the measurement is relative to the period chosen). However, Cohen, Cohen, West and Aiken (2003) review fundamental problems with usage of ratio measures such as this. Specifically, one could arrive at a correlation between this index that is driven by number of periods, number of members who left the team, or the ratio of the two. Without decomposing the ratio there is no way to tell which of the three potential drivers is acting. Although the scope of this paper does not allow us to develop a specific fluidity measure, we encourage researchers to begin addressing this task.

In addition to objective measures of fluidity, recent work in the areas of relational demography and person-organization fit suggests the importance of considering perceived indices of fluidity in teams. That is, although objective measures of team membership changes are likely to relate to team processes and emergent states as we have suggested, team members' *perceptions* of the amount of fluidity in the team might be an important predictor as well. Riordan (2000) distinguishes

between actual and perceived demographic similarity in her review of the relational demography literature and notes that "the use of both actual and perceived measures of demographic characteristics can dramatically increase the amounts of variance explained in outcome measures" (p. 160). For example, Cleveland and Shore (1992) found that variance explained rose from 0.01 to 0.58 when including a measure of perceived age in addition to actual age, and Riordan (1997) found only small correlations between actual and perceived measures of demographic characteristics such as age, gender, and race. Also, similar differences in variance explained between actual and perceived measures of person-organization fit have been found in recruitment research (e.g. Dineen, Ash & Noe, 2002; Judge & Cable, 1997).

Interrater agreement is considered to be a necessary part of conducting teams research. Interrater agreement refers to a common perception among team members concerning a construct of interest, and is often measured through the use of indices such as $r_{(wg)}$ (James, Demaree & Wolf, 1984). In most traditional team studies in which members of the team stay together for the duration of the study, achieving an acceptable level of agreement among raters is common. However, studies that assess fluidity may encounter difficulties in achieving interrater agreement. Consider cohesiveness as an example. It is likely that some level of cohesiveness exists in a team. However, team members are likely to derive their "ratings" of cohesiveness from different frames of reference when their team tenures differ. For example, a longer tenured member may take into account feelings he has had over the last few months, whereas a new member may only be able to reference the five days she has been on the team.

Related to this, Klein, Conn, Smith and Sorra (2001) found that a primary antecedent of within-group agreement was the degree of social interaction in the group, although they were not able to rule out reverse causation as an explanation for this result. Indeed, social interaction may tend to be less in more fluid teams without established patterns of interaction. Also, Dansereau, Yammarino and Kohles (1999) suggest that teams can move between levels of analysis depending on their current state. For example, a highly tenured, cohesive team may be studied at a team level of analysis, but transform to an individual level of analysis following a rash of member replacements. Such movements between levels may potentially affect a researcher's ability to accurately measure team member agreement.

One possible remedy may be to utilize an additive composition model to indicate that a higher-level construct is simply a summation of lower level units, regardless of the variance among those units (Chan, 1998). For example, indices of cohesiveness in teams could be operationalized as the "total amount" of felt cohesiveness on the team, regardless of the variance in cohesiveness perceptions. Other researchers have made similar use of Chan's composition typology in team

research (e.g. Colquitt et al., 2002). A second possible remedy may be to rely more heavily on reliability indices rather than agreement indices when making aggregation decisions. Whereas agreement requires that all actors rate an item the same (e.g. a "3" on a 5-point scale), reliability requires only consistency in responses by raters (Bliese, 2000). That is, as long as responses are consistently different, reliability still exists. For example, if Rater A only uses 1-3 on a 5-point scale, whereas Rater B only uses 3-5, but they do so consistently, reliability exists. ICC(1) and ICC(2) are common reliability indices that might be more useful in assessing the potential for aggregating fluid team constructs given the potential for differing frames of reference among team members. Clearly these issues demand greater attention, and researchers need to carefully consider aggregation issues in examining team fluidity because a lack of agreement does not necessarily mean a lack of reliability or the absence of a construct, but rather might result from the level of team fluidity and differing frames of reference brought to a team by changing members.

Another methodological concern has to do with properly measuring outcomes of team fluidity. Specifically, whereas team fluidity might be conceived of as exits/entrances during a specified period of time, the proper measurement of outcomes (e.g. cohesiveness or collective efficacy) is less clear. For example, should researchers measure cohesiveness once at the end of the period in question? Or should it be measured multiple times at specified time points? Although specific measurement details are beyond the scope of this paper, one potential avenue might be to pursue the use of time series data. This strategy has a long history of use in economics, but only recently has been used in teams research (e.g. Sawyer, Latham, Pritchard & Bennett, 1999). Another possible approach is to measure team fluidity over a specified period of time, while also measuring process and emergent state variables at the beginning and end of the period, noting any changes in those variables during that time period (see Neuman, Bolin & Lonergan, 2000).

As illustrated in Fig. 1, a third important consideration when examining team fluidity is that there may be reciprocal effects between fluidity and emergent states, process or performance variables. For example, as previously described, team fluidity is likely to lead to increased relationship conflict in teams. However, it has also been suggested that relationship conflict leads to voluntary turnover (i.e. increased fluidity) as well (e.g. Pelled, 1996). Similarly, a sense of decreased collective efficacy could lead to greater fluidity, just as fluidity is likely to relate to decreased collective efficacy. Also, performance is likely to have a reciprocal effect on fluidity, although the direction of this effect is uncertain. For example, Griffeth and Hom (1995) reviewed studies that attempted to link performance to subsequent turnover, noting divergent results across these studies. Despite meta-analytic results that have demonstrated an overall negative relationship

between performance and subsequent turnover (cf. Griffeth & Hom, 1995), these authors concluded that the relationship is likely mediated by a number of subprocesses. Separating these effects is a considerable challenge for researchers, but it is especially important as team membership becomes more fluid. As a start, researchers should endeavor to engage in more longitudinal studies in order to parse out reciprocal effects (e.g. Neuman et al., 2000).

Finally, in addition to the reciprocal effects described above, we recognize that other antecedents to team fluidity likely exist on both a macro and micro level. For example, the labor market is likely to affect fluidity on a large scale, with increased fluidity predicted during a "tight" labor market (i.e., organizations are experiencing a shortage of skilled employees so team members have job opportunities readily available in other organizations). Organizational structure or norms may influence the extent to which teams are more fluid versus stable. Also, the extent to which an organizational workforce is diverse has been shown to relate to turnover (e.g. O'Reilly et al., 1989; Wiersema & Bird, 1993). Although a comprehensive treatment of team fluidity antecedents is beyond the scope of this paper, these examples highlight the importance of considering them in future research.

FUTURE RESEARCH

To gain a better understanding of the relationship between team fluidity and team processes, emergent states, and outcomes, research should address the propositions presented in this paper and seek to develop additional propositions. In addition, there are other areas of research on team fluidity that warrant attention. First, as noted at the beginning of the paper, the virtual environment is gaining recognition as a viable means of team collaboration. Research should specifically address any differences that might exist between a virtual and traditional team environment when team fluidity increases. As Townsend et al. (1998) note, virtual teams are generally more fluid, so studying the effects of fluidity in virtual teams may be even more vital. Also, because virtual teams are often composed of members from functionally diverse backgrounds, the effects of fluidity should be examined in parallel with functional diversity as well as other types of diversity. For example, it might be the case that the effects of fluidity are attenuated in an already-diverse team, such that the introduction of new members is not as much of a "shock" as it might be in a more homogeneous team.

Second, with an increasing trend towards fluidity comes a concomitant need to effectively staff work teams on a continual basis. Following research on under- and over-staffed groups (Cini, Moreland & Levin, 1993), researchers should investigate staffing issues in more fluid teams, with a focus on what, if any,

individual difference variables might help predict success when working in a more fluid team. For example, we mentioned adaptability characteristics earlier (Pulakos et al., 2000), but urge scholars to continue to uncover additional characteristics that might be important for newcomers to fluid teams as well as current members.

Next, we echo Arrow and colleagues' (2000) call for more qualitative research that attempts to break down the complex effects of team fluidity. One possible approach is naturalistic observation (Whitley, 1996), whereby the researcher observes and records process phenomena over time. Researcher involvement could vary on a continuum from direct participation as an acting member of a team to passive observer of team behavior. In addition, diaries, behavioral checklists, and palm pilots can be used in time sampling studies designed to collect data from team members as processes occur (e.g. Williams & Alliger, 1994). Such research would likely help direct future empirical investigations of team fluidity and uncover the most important variables in need of study. Time sampling studies could also help to confirm whether transition processes occur more frequently in teams experiencing high levels of fluidity.

Finally, as suggested by Arrow and McGrath (1995), the effects of temporary fluidity should be examined independent of more permanent member change. For example, changes in membership in which a team member leaves the team for good and is replaced by another are likely different from temporary absences of team members who are periodically not present but remain part of the standing team. Both situations are forms of team fluidity, but likely differ in their effects on process and emergent state variables. Gruenfeld et al. (2000) studied the influence of changing group members on the production and transfer of knowledge and experience. They measured the influence of itinerant group member's unique knowledge and experience on the team the member temporarily visited and the team they returned to. Itinerant group members refer to individuals who span team boundaries for the purpose of importing or exporting group knowledge. They tested hypotheses related to the direct and indirect influence of itinerants on team members (e.g. convincing the team to accept ideas or advice). Also, they tested hypotheses related to social perceptions of itinerants. For instance, itinerant members' involvement in and contribution to group activities should be greater in the group of origin than in the temporary group. The results suggested that the direct influence by itinerant members was reduced after they changed groups and had unique knowledge to share. Their unique ideas were used as often as those of indigenous members. Consistent with expectations, indirect influence by itinerant members was greater after they returned to their group of origin. These findings are an example of the ongoing work that needs to occur as we continue to examine fluidity in standing and acting teams.

CONCLUSION

The use of teams has grown considerably in organizations, with a paralleled growth in research aimed at increasing their effectiveness. A growing characteristic of teams is their enhanced fluidity, or likelihood of turning over members throughout their existence. Research has not been as quick to study this phenomenon, and this paper is a step towards fostering such investigation. By delving into the "black box" of team processes and emergent states resulting from team fluidity, researchers can begin to understand some of its complex effects. In doing so, they can more readily begin to predict performance outcomes and better inform both research and practice.

In closing, we recognize that Arrow and McGrath (1995) raise a compelling question in asking when exactly a group "ends" and a new group "begins." Consider a manufacturing team. At any given organization that has used manufacturing teams for a prolonged period, membership changes are inevitable. For example, such a team in 1970 is certainly different from the same team in 2003. Yet, when did the team "change?" When the supervisor left? When the last round of layoffs hit? The boundaries are unclear. For many teams or groups of people, change is a gradual, evolving process. For other teams, however, change is more rapid, such as a virtual team with members who might come and go by the week or even day. Charting the effects of team fluidity is necessary if we are to accurately measure present-day real-life team dynamics. Doing so seems especially timely given current business trends and more fluid team arrangements.

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