

THE DOWNSIDE OF SELF-MANAGEMENT: A LONGITUDINAL STUDY OF THE EFFECTS OF CONFLICT ON TRUST, AUTONOMY, AND TASK INTERDEPENDENCE IN SELF-MANAGING TEAMS

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The very flexibility and adaptability that make self-managing teams effective can also be limiting and dysfunctional. I propose that self-managing teams may unintentionally restructure themselves inefficiently in response to conflict. Although detrimental consequences of conflict are normally considered as process-related, I explore possible structure-related effects. Specifically, I suggest that increased team conflict is associated with lower intrateam trust, which in turn may influence team structure by (1) reducing individual autonomy and (2) loosening task interdependencies in teams. This combination makes for a less than ideal team design. Longitudinal data from 35 self-managing teams support these expectations.

Over the past few decades, interest in self-managing teams has increased, particularly interest in understanding their design, structure, and performance (Cohen & Bailey, 1997; Macy & Izumi, 1993). Considerable theoretical and empirical progress has been made on this topic, with an underlying focus on understanding and modeling anticipated benefits, in terms of both motivation/satisfaction and performance (Cohen & Ledford, 1994; Cohen, Ledford, & Spreitzer, 1996; Cordery, Mueller, & Smith, 1991; Langfred, 2004). Although definitions of self-management can vary (see Langfred, 2000), the central defining characteristic of a self-managing team is its freedom and discretion (Cohen & Ledford, 1994; Pearce & Ravlin, 1987) and ability to organize its internal work and structure to best accomplish goals (Hackman, 1986). Thus, an integral part of the advantage of self-managing teams is increased flexibility in adapting their structures to a variety of tasks, situations, and conditions.

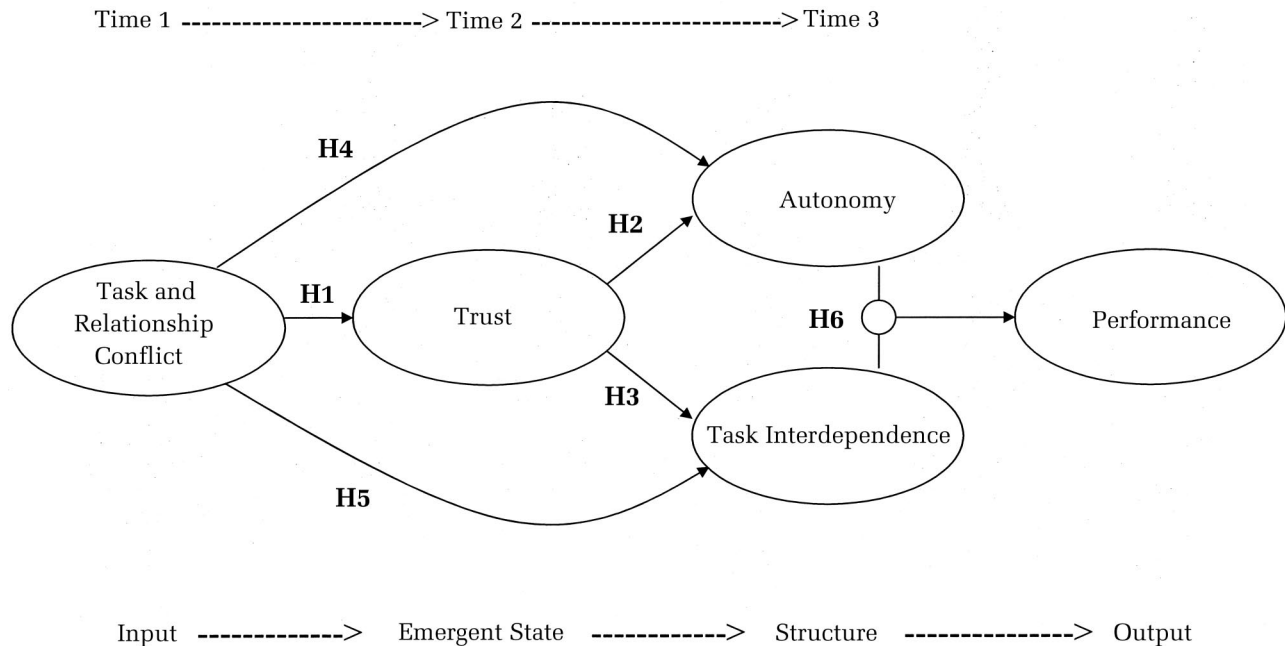
The assumption that a flexible and adaptive team structure is beneficial often holds true, yet there may be instances when it is not the case. Despite an abundance of research on teams and their processes (see Ilgen, Hollenbeck, Johnson, and Jundt [2005] and Kozlowski and Bell [2003] for reviews) and on the importance of team and task structure (e.g., Campion, Medsker, & Higgs, 1993; Cohen & Bailey, 1997; Hackman & Wageman, 2005; Hackman, 1986), little is known about how self-managing teams design and adapt themselves, and how these actions affect performance. A recent review of teams in organizations that specifically discussed adaptation did not reference any research exploring structural change as an adaptive mechanism (Ilgen

et al., 2005), nor did earlier reviews by Kozlowski and Bell (2003) and Langfred and Shanley (2001). Nonetheless, Wageman (2001) demonstrated that, particularly for self-managing teams, design features can be an important determinant of performance, and in a recent study (Langfred, 2004), I illustrated an example of teams with high trust suffering performance losses when they adopted a design with high individual autonomy. Thus, self-managing teams' ability to choose and adapt their structures has important implications for their performance. In general, flexibility and adaptability are beneficial and are often what allow teams to avoid trouble and manage problems successfully. However, I suggest this flexibility can sometimes be a liability, specifically when a self-managing team unintentionally adopts a potentially dysfunctional design.

My focus is on how task and relationship conflict in self-managing teams can cause them to restructure themselves in response. I define *task conflict* here as disagreement among group members about decisions, viewpoints, ideas, and opinions (Simons & Peterson, 2000) and as potentially including controversy over the best way to achieve a group goal or objective (Devine, 1999). *Relationship conflict* is defined as the perception of interpersonal incompatibility, and it is often characterized by animosity, tension, and annoyance among members (Simons & Peterson, 2000).¹ Specifically, I am in-

¹ A third type of conflict, process conflict (Jehn, 1995), is defined as an awareness of controversies about how task accomplishment should proceed, how to delegate

FIGURE 1
Proposed Model



interested in task interdependence and autonomy as elements of team structure, and in their indirect effects, in which intrateam trust is an intervening variable. *Autonomy* is defined as the amount of freedom and discretion an individual has in carrying out assigned tasks (Hackman, 1983); *task interdependence*, as the degree to which the interaction and coordination of team members is required to complete tasks (Guzzo & Shea, 1992); and *intrateam trust*, as a willingness to be vulnerable to the actions of another party (Mayer, Davis, & Schoorman, 1995).

In the context of self-managing teams, the issue of structure and process becomes more complex than it is for "traditional" work teams. Normally, structural, or design, variables are considered exogenous inputs in a classic input-process-output (IPO) model, but in the case of self-managing teams they can clearly be outputs as well. This characteristic raises two thorny issues, one conceptual and one methodological. First, it suggests that the study of self-managing teams should address not just the immediate effect of structure on outcomes such as performance, but also the effects on structure itself of various processes, such as conflict, and the ef-

fects of emergent states like trust. The study of self-managing teams also should examine the subsequent effects on outcomes of new structures resulting from initial process and state effects. Thus, more complicated models, such as the input-mediator-output-input (IMOI) approach suggested by Ilgen and his colleagues (2005), and Marks, Mathieu, and Zaccaro's (2001) "recurring phase model," or perhaps some hybrid approach, may be needed to accurately describe self-managing teams. Second, this logic implies that empirical studies of self-managing teams must be longitudinal in order to better explain the causes and effects of structural change over time.

I extend existing research in the following ways: First, I extend the research on conflict by studying how it can be a cause of team structure, not just an effect. Second, I break new ground in the team design research by specifying how self-managing teams redesign themselves in response to processes such as conflict. Third, I extend the literature on self-managing teams by examining how some features that are traditionally regarded as benefits (i.e., flexibility and adaptability) can sometimes result in dysfunctional outcomes. Specifically, I accomplish this by examining how task and relationship conflict influence the design-level variables of individual autonomy and task interdependence, including the indirect effects of intrateam trust, and I do so in a longitudinal context. Figure 1 summarizes my overall model.

work assignments, and who has responsibility for different group tasks (Behfar & Thompson, forthcoming). Most empirical studies in the conflict literature have focused on task and relationship conflict, and I follow in that tradition.

LITERATURE REVIEW AND HYPOTHESES

Conflict and Trust

Conflict has long been known to have the potential to harm group processes, such as coordination and cooperation, as well as performance outcomes, such as goal accomplishment (for reviews, see De Dreu and Weingart [2003] and Peterson and Behfar [2003]), and much is known about the causes and effects of conflict in teams (for reviews, see Jehn and Bendersky [2003] and Behfar and Thompson [forthcoming]). Although the benefits of sharing divergent viewpoints and discussion are clear, especially in terms of team decision-making quality, the overall effect of both task and relationship conflict on performance appears to be negative (De Dreu & Weingart, 2003; Ilgen et al., 2005).

Despite voluminous research, the effects of conflict on team structure have remained largely unexplored, representing a significant shortcoming in academic understanding of teams, particularly self-managing ones. I believe that the links between conflict and structure may not only be direct, but also indirect—through intervening variables such as intrateam trust, which has been found to be important to self-managing team performance (Langfred, 2004). Since trust can be affected by conflict (Porter & Lilly, 1996) and involves perceptions of risk and issues of dependency (Kramer & Tyler, 1996), it is likely to be involved in determining how members of self-managing teams choose to organize work and interact with one another. Thus, I expect intrateam trust to provide a possible indirect link between conflict and structure.

I expect that both relationship and task conflict will negatively affect trust. Since trust is defined as the willingness to be vulnerable to the actions of another party, it is a measure of how much risk an individual is willing to incur in relationships (Deutsch, 1958; Kramer & Tyler, 1996). Assuming that team members have an interest in team performance, greater task conflict has considerable potential to damage trust. Kramer (1999) and Grovier (1994) have both pointed out that distrust is a lack of confidence in another party. Mayer and Davis (1999) observed that ability (including perceived competence and skills) is one of the three facets of trustworthiness, and Spreitzer and Mishra (1999) noted that trust reflects a belief that another party is reliable. If individuals experiencing task conflict truly believe that their own decisions about task strategy are correct and would lead to better team performance—and the robust literature on positive illusions (Taylor & Brown, 1988) suggests that they do—they are likely to question the competence of those that disagree with them, and subsequently

trust them less. I expect that in much the same way that reductions in risk have been found to help build trust (Meyerson, Weick, & Kramer, 1996), increases in perceived risk will undermine it.

Relationship conflict will likely have similarly negative effects on trust. One source of trust within teams is identification (Kramer, 1993; Kramer & Brewer, 1986), and such identification will in part depend on strong relationships and cohesiveness within the teams. The mere presence of relationship conflict demonstrates that parties do not share mutual understanding and appreciation, and will thus undermine trust. Jones and George (1998) suggested that negative emotions can be critical in triggering the dissolution of trust, and relationship conflict clearly involves negative emotion. Furthermore, team members are likely to perceive people whom they dislike as being less likely to be helpful or cooperative when it is necessary. These factors should result in a lowered willingness to be vulnerable, which (by definition) reduces trust.

In support of my theoretical contention, several studies have empirically demonstrated a negative association between conflict and trust in groups and teams, including Porter and Lilly (1996) and Mishra (1996). The latter observed that “negative events” can be critical in undermining trust. Lewicki and Bunker (1996) supported the notion that trust can be undermined through interpersonal conflict, and Simons and Peterson (2000) found that groups with higher trust suffered less destructive relationship conflict. I therefore expect the following:

Hypothesis 1. Higher conflict, whether task or relationship, is associated with lower trust.

Trust, Autonomy, and Task Interdependence

I expect that the reductions in trust associated with increased conflict will in turn influence team structure, resulting in lowered autonomy and task interdependence. Autonomy and task interdependence both consistently stand out in the team design literature as the two primary structural factors of teams (Campion, Medsker, & Higgs, 1993; Janz, Colquitt, & Noe, 1997; Kiggundu, 1983; Langfred, 2005), and they have been studied often, under various labels (Liden, Wayne, & Bradway, 1997; Pugh, Hickson, Hinings, & Turner, 1968; Slocum & Sims, 1980). In earlier work (Langfred, 2005), I specifically explored the relationship between task interdependence and autonomy but considered task interdependence exogenous and never explored variables like conflict or trust. Furthermore, in their review, Cohen and Bailey (1997) listed

autonomy and task interdependence as the basic team design factors, as did Langfred and Shanley (2001).

Autonomy is considered a crucial part of job design (Hackman & Oldham, 1976) and a central design feature of self-managing teams (Hackman, 1986; Langfred, 2000). When considering autonomy, it is important to clarify that team-level autonomy is *not* the aggregation of individual autonomy to the team level, but rather, the amount of freedom and discretion that a team has in carrying out tasks within its organization. "Self-managing" is the label often given to teams that are high in team-level autonomy, but such teams can vary in design in terms of their levels of individual autonomy (Langfred, 2000). The other structural factor, task interdependence, is a critical variable in the team literature (Kozlowski & Bell, 2003; Saavedra, Earley, & Van Dyne, 1993; Wageman, 1995), as well as in the conflict literature (Jehn, 1995; Jehn, Northcraft, & Neale, 1999). Although task interdependence has often been assumed to be driven by task technology (Cohen & Bailey, 1997; Thompson, 1967), Wageman pointed out that, even in more traditional work groups, "tasks can be designed to be performed at varying levels of interdependence" (1995: 147). Of course, certain tasks or technologies may force particular structures or task designs upon a team, limiting the team's ability to restructure. However, Wageman and Baker (1997) observed that even teams with identical task technologies often differed widely in task interdependence, suggesting that strict exogenous cases may be rarer than commonly believed. Nonetheless, although task interdependence might be altered by teams that are not considered self-managing (Shea & Guzzo, 1989), the ability to do so is particularly pronounced in self-managing teams (Hackman & Wageman, 1995).

When discussing individual autonomy and task interdependence in teams, it is crucial to understand the conceptual difference between them (Langfred, 2005). The definitions specify one in terms of within-individual control over tasks, and the other in terms of between-individual coordination requirements. Individual autonomy in practice may often involve a lack of interaction with other team members, but it does not preclude high interdependence, nor does the absence of high interdependence mean that team members must have considerable individual autonomy. For instance, individuals in a team can work very independently, yet still be very constrained by rules and procedures in how to carry out their job (that is, task interdependence and individual autonomy are both low). Air traffic controllers, for example, work

in such low task interdependence–low individual autonomy teams. Within their teams of three to six people in "en route centers" around the country, controllers may each independently handle several planes and not need to coordinate with other team members at all (except in rare emergencies), yet they are severely constrained by rules and procedures and have little autonomy. In addition, the two constructs have been found to interact (Janz et al., 1997; Langfred, 2005), which empirically supports their distinctness and also emphasizes the importance of understanding how either construct may be affected by intrateam trust.

If team members do not trust one another, they are unlikely to want to give each other *more* freedom and discretion over individual work. Rather, a lack of trust will likely result in reductions in the level of autonomy that team members agree upon or negotiate within a team. Autonomy is often implemented to realize performance gains, but it comes at the price of an increase in risk over that typical in a tightly managed and monitored team (Gebert, Boerner, & Lanwehr, 2003). Since trust is defined as the willingness to incur risk (Mayer et al., 1995), members will be more willing to incur that risk and grant one another autonomy when they trust one another. Conversely, in the absence of trust, team members will be less willing to expose themselves to the risk of relying on others by agreeing to greater individual autonomy.

A lack of trust also implies a need for increased monitoring (Bromiley & Cummings, 1995; Langfred, 2004), which can be easier when team members have less individual autonomy—especially since rules and procedures can substitute for interaction and direction (Kerr & Jermier, 1978). These arguments are consistent with Creed and Miles's (1996) observation that a lack of trust typically results in a failure to delegate authority and grant autonomy and that managers' decisions about the trustworthiness of employees is related to "their potential for exercising responsible self-direction and self-control" (Creed & Miles, 1996: 21). This discussion suggests the following:

Hypothesis 2. Lower trust is associated with lower levels of individual autonomy in a team.

It is also likely that trust influences task interdependence. By a logic similar to that presented above, perceptions of risk may also lead team members to limit task interdependence and coordination requirements. Task interdependence is often considered the extent to which an individual's task performance depends on the efforts and skills of others (Wageman & Baker, 1997). Thus, when faced with a situation of low trust, team members will

want to limit risk by reducing dependence on potentially unreliable people. This statement is consistent with suggestions by Jones and George (1998) that trust is important for cooperation and teamwork and that the dissolution of trust leads to difficulties in sustaining cooperation and teamwork. Empirical evidence offered by McAllister (1995) and Kiffin-Petersen and Cordery's (2003) findings that team members' preference for teamwork is directly related to intrateam trust support this view. At a more general level, lower trust reduces the desire or incentive to cooperate in teams.

Hypothesis 3. Lower trust is associated with lower levels of task interdependence in a team.

Conflict, Autonomy, and Task Interdependence

In addition to the indirect effects discussed above, it is also possible for conflict to have direct effects on team structure. In terms of autonomy, such effects might result from a desire for revenge or retribution in response to task or relationship conflict; a team member might essentially withhold autonomy from another as a punitive act. According to Deci and Ryan (1985), humans desire autonomy, so withholding it from fellow team members could be a method of punishment. Fortado (2001) discussed how employees "get even" in cases of unresolved conflict, and Aquino, Tripp, and Bies (2001) demonstrated how employees sought revenge when they felt wronged. More generally, in an exploration of counterproductive work behavior, Spector (2005) argued that conflict can result in behaviors that harm an organization or its members. Team members may thus withhold autonomy from other team members, or reduce their autonomy, as punishment or retribution for conflict or as revenge for perceived personal slights or dislikes.

Hypothesis 4. Higher conflict, whether task or relationship, is associated with lower levels of individual autonomy in a team.

A direct effect of conflict on task interdependence is also possible, as team members may redesign their team to avoid interacting with one another. If relationship conflict is high, members can reduce task interdependencies to minimize their contact with team members they do not like, thus avoiding conflict. Such redesign could include reallocating highly interdependent subtask responsibilities to individuals, as opposed to among team members. It could even involve individuals performing an entire team task (if other constraints allow it), thus drastically reducing interdependence. Several empirical studies support this intu-

itive logic. For example, DeLeon (2001) observed that members of self-managing teams are reluctant to deal with conflict and often ignore or avoid it. Li and Hambrick (2005) found that relationship conflict led to avoidance, reduced interaction, and alienation of members, resulting in "behavioral disintegration." "Behavioral integration" refers to the degree to which mutual and collective interaction exists in a group (Hambrick, 1994) and, along with Wageman's (2001) "behavioral interdependence," it captures the level of interaction in which people *actually engage*, which may not be the same as the task interdependence of the team design. In a traditional team, limited in its ability to alter task interdependence, I would expect conflict to primarily depress behavioral interdependence or integration. In self-managing teams, by contrast, reduced behavioral interdependence would likely actually reduce task interdependence (aligning the two), precisely because such teams can change their structures.

The negative effects of task conflict on task interdependence may be a little more subtle than those of relationship conflict. Task conflict creates tension in a team, which often causes dissatisfaction (DeDreu & Weingart, 2003). A lack of resolution on issues related to decisions, ideas, and opinions—all of which can undermine task completion—will likely lead people to want to be less dependent on the people with whom they disagree. As evidence, both Amason (1996) and Jehn (1994) reported that task conflict leads not only to tension, but also to team members wanting to isolate their activities from one another. I expect increases in either task or relationship conflict to be associated with reductions in task interdependence in self-managing teams.

Hypothesis 5. Higher conflict, whether task or relationship, is associated with lower task interdependence.

Hypotheses 1, 2, and 3 thus suggest that trust serves as an indirect intervening variable by which trust is affected by conflict and, in turn, affects team structure. Furthermore, the overall logic of my model implies that conflict (both task and relationship) should be associated with a simultaneous lowering of *both* individual autonomy and task interdependence in self-managing teams, as a result of direct and indirect effects. Thus, I predict:

Hypothesis 6. Higher conflict, whether task or relationship, is associated with teams characterized by a combination of lower task interdependence and lower individual autonomy.

Finally, it is worth noting that such a design—low interdependence combined with low autonomy—is potentially dysfunctional. In my earlier work (Langfred, 2005), I demonstrated how “mixed” patterns of individual autonomy and task interdependence (that is, team designs in which one is high and the other is low) were associated with higher performance than the low interdependence–low autonomy design. Thus, moving slightly outside the main focus of the present study, I would also expect to find such an interactive effect of autonomy and task interdependence on team performance. In other words, design changes that are either directly or indirectly associated with conflict in a self-managing team are likely to have dysfunctional effects on performance.

METHODS

Setting

A cohort of MBA graduate students organized into self-managing teams at a private midwestern university participated in the study. These students worked in the same teams for four months across their eight different required classes. The teams undertook a wide variety of tasks, including financial analyses, marketing projects, statistical problem sets, business case write-ups, presentations, and long papers, with complete discretion in deciding how to carry out assignments, and were only evaluated on the quality of their output. Four students were assigned to each team, on the basis of criteria designed to maximize within-team heterogeneity (in gender, nationality, educational background, and work experience) and minimize between-team heterogeneity (that is, to ensure the teams were as similar as possible to one another demographically). Every team had both genders, at least two nationalities, and at least three different undergraduate majors. This study design provided a methodological control for demographic diversity (in that the even distribution eliminated the need to include such controls in the statistical analyses). The data were collected in three waves separated by intervals of approximately one month.

Respondents

There were 140 student respondents in 35 teams. Overall (over the multiple waves), the individual response rate was 71.6 percent, and the team response rate was 93.6 percent (a team was dropped from the analysis if less than half the team members responded). This response rate and exclusion yielded 33 teams in each wave of data collection,

with 31 teams over all waves. Of the respondents, 21.4 percent were female, and 65.0 percent were U.S. citizens, with the largest non-U.S. contingents made up of Chinese, Indian, Japanese, and Korean nationals. Average age was 28.9 years; the youngest respondent was 23 and the oldest, 44.

Measures

The survey questionnaires used established multi-item scales, which are summarized below. Using team-level constructs and relationships based on individual perceptual data necessitates aggregation (George & James, 1993). To estimate the appropriateness of such aggregation, I used both intraclass correlation coefficients (ICCs; Shrout & Fleiss, 1979), which are based on a within and between analysis approach (George & James, 1993), and the within-group interrater agreement measure (r_{wg} ; James, Demaree, & Wolf, 1993).

Trust. This four-item scale, based on Simons and Peterson (2000), had a mean Cronbach's alpha reliability coefficient of .89, a mean intraclass correlation ICC(2) of .71, a mean ICC(1) of .19, and a mean r_{wg} of .77. Items included, “I believe that we trust each other a lot in my team” and “I think I can count on the other team members.”

Individual autonomy in a team. This six-item scale, based on Breaugh (1989), had a mean Cronbach's alpha of .85, a mean ICC(2) of .70, a mean ICC(1) of $-.15$, and a mean r_{wg} of .71. (This measure is the average of individual autonomy reported by team members.) Items included, “I am able to choose the way to go about my work in the team” and “In the team, I decide how to do my own work.” Items did not yield a significant F -statistic in an analysis of variance (ANOVA), resulting in a negative ICC(1) value, and thus indicating greater within- than between-group variance. However, this outcome appears to be an issue of low between-group variance, not a problem of agreement, as indicated by the high r_{wg} score (one comparable to the other scales' scores). When variance is low, as is the case for autonomy here (see Table 1, below), estimates of reliability can be artificially low with statistics like the ICC (George & James, 1993). As Bliese pointed out, measures of within-group agreement and reliability are conceptually and mathematically distinct (2000: 362), and it is possible for variables to demonstrate high agreement but not reliability, which appears to be the case here. Furthermore, as the measure is not of a group-level construct (but merely the team mean of an individual-level construct), the issue of agreement is ultimately less critical (see Kozlowski & Klein, 2001) for this variable.

TABLE 1
Means, Standard Deviations, and Correlations

Variables	Mean	s.d.	1	2	3	4	5	6	7	8	9	10	11
1. Task conflict, time 1	3.60	1.46											
2. Relationship conflict, time 1	2.99	1.59	.82**										
3. Task conflict, time 2	3.53	1.57	.56**	.61**									
4. Relationship conflict, time 2	3.22	1.89	.62**	.77**	.91**								
5. Trust, time 1	7.19	1.16	-.52**	-.60**	-.50**	-.66**							
6. Trust, time 2	6.98	1.44	-.55**	-.68**	-.84**	-.88**	.68**						
7. Individual autonomy, time 2	6.52	0.73	-.28	-.29	-.58**	-.52**	.21	.42*					
8. Individual autonomy, time 3	6.70	0.68	-.21	-.33	-.41*	.48**	.29	.46**	.29				
9. Task interdependence, time 2	5.99	1.12	-.24	-.34	-.30	.47**	.59**	.51**	.23	.25			
10. Task interdependence, time 3	5.65	1.48	-.46**	-.56**	-.62**	-.68**	.55	.81**	.37*	.33	.64**		
11. Performance, time 3	6.03	1.76	-.31	-.41*	-.42*	-.39*	.18	.30	.45**	.19	.02	.19	
12. Feedback, time 1	6.50	0.99	-.14	-.08	-.09	-.05	-.02	.12	-.14	.21	-.07	-.06	-.11

* $p < .05$

** $p < .01$

Task interdependence. I used six items from Kiggundu's (1983) scale. The Cronbach's alpha was .90, the mean ICC(2) was .69, the mean ICC(1) was .29, and the mean r_{wg} was .70. Items included, "Team members frequently have to coordinate their efforts with each other" and "Team members have to work together to get team tasks done."

Task conflict. I used Jehn's (1995) four-item scale for task conflict. The Cronbach's alpha was .89, the mean ICC(2) was .68, the mean ICC(1) was .21, and the mean r_{wg} was .72. Items included, "There are a lot of differences of opinion in my team" and "There is considerable disagreement in the team about the way to work."

Relationship conflict. I used Jehn's (1995) four-item scale for relationship conflict. The Cronbach's alpha was .96, the mean ICC(2) was .73, the mean ICC(1) was .27, and the mean r_{wg} was .79. Items included, "There is a lot of personality conflict in my team" and "There is a lot of friction among members in my team."

Team performance. This was measured by the average score on several different team projects that coincided with the final wave of data collection. For a more accurate measure of generalized team performance, I used multiple types of projects, including a strategic business case analysis, an organizational behavior paper, and a finance project (none of which limited teams in their ability to structure their tasks or themselves). Each project was scored by trained third-party graders and an instructor, and average scores were converted to a nine-point scale for analysis. The mean interrater agreement statistic (r_{wg}) among graders was .73, representing within-rater agreement averaged over the three types of projects.

Feedback. This control variable represented average scores that teams received on early team

projects, providing feedback about team performance. It is represented on a nine-point scale.

Confirmatory factor analysis, using maximum-likelihood estimation, yielded a significant overall chi-square ($\chi^2 = 457.33$, $df = 242$, $p = .000$), and the model had an adequate fit to the data (CFI = .91; SRMR = .07; RMSEA = .10), with no alternative model providing a better fit. Paths representing the loading of each indicator on its latent factor were significant in all cases.

Analysis

To test the predicted relationships, I used longitudinal data allowing me to test hypotheses with dependent variables that had been measured later in time than the independent variables. I used lagged multiple regression in which the dependent variable at time t was predicted by the independent variable(s) at time $t - 1$, as is recommended by Cohen and Cohen (1983; for a recent example, see Tekleab, Takeuchi, and Taylor [2005]). When using such a technique, it is important to control for the dependent variable at time $t - 1$, a control that is often neglected in longitudinal analysis.

RESULTS

ICC and r_{wg} scores confirmed the appropriateness of aggregation for trust, task and relationship conflict, task interdependence, and individual autonomy. Variance inflation factor (VIF) scores for each variable were below 2, suggesting that multicollinearity was not a problem in the analyses (with the obvious exception of task and relationship conflict, which are highly intercorrelated with one another). Table 1 provides means, standard deviations, and correlations.

Hypothesis 1 predicts that higher task and relationship conflict are associated with lower trust in teams. The regression results displayed in Table 2 illustrate that when task and relationship conflict are entered separately, task conflict does not appear to have the expected negative relationship with trust (model 1), but relationship conflict does (model 2; $t_{29} = -2.68, p < .05$). When task and relationship conflict are entered together, the change in explained variance (ΔR^2) is significant (model 3; $\Delta F = 3.59, p < .05$). This finding provides some support for Hypothesis 1. Although it is clear that relationship conflict contributes to trust, I cannot conclude that task conflict does. The semipartial correlation coefficients (sometimes called part correlations) for task and relationship conflict support this conclusion; these coefficients indicate the extent to which the *unshared* variance of a particular independent variable contributes to the dependent variable. The coefficients of .04 and $-.25$ indicate that the unshared portion of relationship conflict uniquely accounts for 6 percent of the variance in trust, but task conflict accounts for less than 1 percent (the percentage of variance explained is calculated as the square of the semipartial coefficient).

Hypothesis 2 predicts that the resulting lower trust is associated with lower levels of individual autonomy in a team. The regression results displayed in Table 3 (model 4) show that the relationship was significant and positive ($t_{30} = 2.09, p < .05$), indicating that lower trust was associated with lower autonomy. This result provides support for Hypothesis 2.

Hypothesis 3 predicts that lower trust is also associated with lower task interdependence. The regression results in Table 4 (model 4) show that there is no detectable significant relationship be-

tween trust and task interdependence. This unexpected finding may in part be explained by the use of longitudinal analysis, in that controlling for prior task interdependence—which is highly correlated with trust ($r = .81, p < .01$)—captures most of the shared variance between trust and task interdependence, leaving insufficient unshared variance for their relationship to be significant.

Hypothesis 4 predicts that higher task and relationship conflict are associated with lower levels of individual autonomy in a team. The regression results displayed in Table 3 illustrate that when entered separately, task conflict does not have a significant relationship with autonomy, but relationship conflict does (model 2; $t_{30} = -2.34, p < .05$). When both are entered together, however, the change in R^2 is not quite significant (model 3; $\Delta F = 3.05, p = .06$). These findings provide mixed or weak support for Hypothesis 4, in that relationship conflict appears to have a separate negative influence on autonomy that is diluted when relationship conflict is entered with task conflict.

Hypothesis 5 predicts that higher task and relationship conflict are associated with lower task interdependence. The regression results displayed in Table 4 illustrate that when entered separately, both task and relationship conflict appear to have a significant, negative relationship with task interdependence (model 1; $t_{29} = -2.48, p < .05$, model 2; $t_{29} = -2.92, p < .01$). When both are entered together, the change in R^2 is significant (model 3; $\Delta F = 4.18, p < .05$). This provides strong support for Hypothesis 5, showing that both separately and together, task and relationship conflict are significantly and negatively related to task interdependence.

Hypothesis 6 predicts that greater conflict would be associated with the design combination of low

TABLE 2
Results of Lagged Regression Analysis for Trust^a

Variables	Model 1	Model 2	Model 3	Semipartial Correlation Coefficient
Prior trust	.56** (.18)	.44** (.19)	.45** (.19)	
Feedback	.09 (.19)	.09 (.17)	.11 (.18)	
Task conflict	-.24 (.15)		.09 (.22)	.04
Relationship conflict		-.40* (.14)	-.48* (.21)	-.25
Adjusted R^2	.45	.45	.45	
ΔR^2	.04	.10*	.11*	
F	10.78**	13.78**	10.10**	
df	29, 3	29, 3	28, 4	

^a Values are standardized regression coefficients with standard errors in parentheses. Trust was measured at time 2.

* $p < .05$

** $p < .01$

TABLE 3
Results of Lagged Regression Analysis for Individual Autonomy^a

	Model 1	Model 2	Model 3	Model 4	Semipartial Correlation Coefficient
Prior individual autonomy	.13 (.19)	.10 (.17)	.15 (.18)	.16 (.17)	
Feedback	.19 (.12)	.20 (.11)	.23 (.11)	.18 (.11)	
Task conflict	-.32 [†] (.09)		-.69 (.13)		-.13
Relationship conflict		-.43* (.07)	.33 (.17)		-.29
Trust				.37* (.08)	
Adjusted R^2	.13	.20	.20	.18	
ΔR^2	.06	.13*	.15 [†]	.11*	
F	2.61 [†]	3.82*	3.01*	3.40*	
df	30, 3	30, 3	29, 4	30, 3	

^a Values are standardized regression coefficients with standard errors in parentheses. Autonomy was measured at time 3.

[†] $p < .10$

* $p < .05$

TABLE 4
Results of Lagged Regression Analysis for Task Interdependence^a

Variables	Model 1	Model 2	Model 3	Model 4	Semipartial Correlation Coefficient
Prior task interdependence	.56** (.18)	.51** (.18)	.51** (.18)	.48** (.22)	
Feedback	-.05 (.19)	-.04 (.19)	-.04 (.19)	.01 (.20)	
Task conflict	-.34* (.14)		-.07 (.23)		-.04
Relationship conflict		-.39** (.12)	-.33 (.21)		-.18
Trust				.27 (.21)	
Adjusted R^2	.37	.37	.37	.37	
ΔR^2	.10*	.14**	.14*	.05	
F	10.13**	11.46**	8.36**	8.05*	
df	29, 3	29, 3	28, 4	29, 3	

^a Standardized regression coefficients are shown, with standard errors in parentheses. Task interdependence was measured at time 3.

* $p < .05$

** $p < .01$

autonomy and low task interdependence (the low-low design). The logistical regression results displayed in Table 5 illustrate that when entered separately, both task and relationship conflict appear to have a significant negative relationship with the binary variable representing the low-low design. When both task and relationship conflict are entered together, the overall model is highly significant ($\chi^2 = 13.47$, $p < .01$), but only the coefficient for relationship conflict is significant (squared semipartial correlation coefficients confirm that while most of the variance is shared, relationship conflict contributes 8.5 percent of unique variance beyond that, whereas task conflict only contributes 1.6 percent). This finding provides support for Hypothesis 6, indicating that

higher conflict is predictive of a low autonomy–low interdependence team design.

A link between conflict and a low autonomy–low interdependence team design is further supported by an examination of mean levels of conflict in teams in the different “categories.” Teams characterized by both low task interdependence and low individual autonomy had the highest levels of relationship and task conflict (4.42 and 4.26, respectively), whereas teams with high individual autonomy and high task interdependence had the lowest levels (1.52 and 2.58, respectively). This pattern is consistent with the general expectation that higher conflict will be associated with lower levels of both autonomy and task interdependence.

TABLE 5
Results of Logistical Regression Analysis for the Low-Low Category Dummy^a

Variables	Model 1	Model 2	Model 3
Feedback	-0.48 (.51)	-0.36 (.45)	-0.64 (.56)
Relationship conflict	0.81 (.28)**		1.53 (.69)*
Task conflict		0.70 (.29)*	-0.85 (.70)
Cox and Snell R^2	.32	.22	.33
Nagelkerke R^2	.45	.30	.46
Model χ^2	13.32**	8.27*	13.47**
df	31, 2	31, 2	30, 3

^a Standardized regression coefficients are shown, with standard errors in parentheses. The low autonomy–low interdependence category dummy was measured at time 3.

* $p < .05$

** $p < .01$

Finally, in order to link the structural effects to actual team performance, I replicated the autonomy-interdependence interaction found in earlier work (Langfred, 2005). The results indicated a significant disordinal interaction, which (combined with results of paired *t*-tests) indicated that the performance of teams exhibiting the low-low combination was worse than that of teams with “mixed” designs. Although not explicitly hypothesized, this finding confirms that the team structural design associated with conflict in self-managing teams was dysfunctional in terms of performance.

DISCUSSION

My basic contention is that self-managing teams can be particularly susceptible to detrimental effects of conflict as a result of their ability to alter their own structures and designs. The results have largely supported that contention. I have shown that higher levels of conflict (especially relationship conflict) in teams are associated with lower task interdependence and individual autonomy, partly because of direct effects, and partly because of indirect effects of lower trust. I also demonstrated that high conflict in teams is associated with the combination of lower autonomy and interdependence, which is a potentially dysfunctional design for a self-managing team, with lower performance than other configurations.

Theoretical Implications

My findings extend previous research in the following ways: First, I have extended the research on conflict by exploring how it may be an antecedent of team structure, not just an effect. Second, I have broken new ground in the team design literature by spec-

ifying how self-managing teams redesign themselves in response to process-related phenomena. Third, I have extended research on self-managing teams by examining how the flexibility and adaptability that are traditionally regarded as benefits may be associated with dysfunctional outcomes.

These findings are important to several research streams, including the team design literature, the conflict literature, and the growing research on the relationships between autonomy and task interdependence. This study has illustrated how self-managing teams can be harmed by conflict in an indirect and hitherto unanticipated manner. It also illustrates how the ability of self-managing teams to make changes in their task structures and designs—changes that normally occur in response to external changes in task, environment, resources, and the like—can occur in response to internal team processes or states, such as conflict and trust. This study expands the scope of conflict research by exploring the effect that conflict can exert on structure, broadening the relevance of conflict to team design research. The longitudinal approach of this study also contributes by further suggesting the iterative and continuous cause-and-effect loops that may involve conflict in teams.

Interestingly, the argument that conflict can lead to reductions in trust and subsequent limits on individual autonomy is consistent with earlier observations by Barker (1993), whose ethnographic study described the development of concertive control in a small number of self-managing teams. Barker observed how turnover and the introduction of new team members disrupted otherwise stable teams, leading to increased conflict and a redesign of control systems within the teams, resulting in the observed “concertive control.” The account is an example of self-managing teams reducing indi-

vidual autonomy and interdependence as a response to conflict, and it is consistent with my findings. When teams restricted autonomy or interdependence in my sample, some teams had consensus among all members, but other teams agreed to the restrictions only after considerable discussion, negotiation, or voting. Once new structures were clearly defined, team members generally adhered to agreed-upon rules and restrictions. The types of norms Barker observed are likely an important part of a more detailed model of how teams structure themselves. (This idea is not theorized or measured in this study and is outside the scope of my model.) Thus, an important component of future research would be studying such norms, with particular attention to the development of norms for conflict management. It is possible that, given appropriate norms, many self-managing teams will not be susceptible to the problems described in this study in the first place. This possibility further emphasizes the importance of longitudinal research.

Overall, the implications for research include an increased focus on how team process and emergent states can affect team structure. I agree with Ilgen et al. (2005) and Marks et al. (2001) that a traditional input-process-output (IPO) model may sometimes be too limiting. My model and findings are more consistent with Ilgen and colleagues' (2005) more general input-mediator-output-input (IMOI) model, or Marks and coauthors' (2001) "recurring phase model" (RPM) of team processes, in which emergent states can be both inputs and outputs. However, my attempt to integrate more structural variables into traditional models is not intended to dismiss or denigrate existing approaches. This study is intended as a refinement of existing models and as complementary to the IMOI or RPM frameworks. A fundamental underlying assumption of my model is its dynamism, and the model in Figure 1 is a static representation of an ongoing dynamic process that likely is nested within a larger recursive context or more complex arrangement of "episodes" (Mark et al., 2001: 360). As such, my approach, as well as the RPM and the IMOI model, are consistent with the principles of structuration theory (Giddens, 1984), according to which structure can both be a medium and an outcome. Interestingly, although Giddens defined structure generally, in terms of "rules and practices" (Orlikowski, 2000), he specifically mentioned autonomy and dependence when discussing systems and integration (Giddens, 1984: 28). Barley (1986) pointed out how behavior and practices resulting from structure can shape human actions that in turn modify (or reaffirm) structures.

Thus, although processes (such as conflict) can

ultimately influence structure, structure can in turn influence behavior, processes, and emergent states. It is not unrealistic to expect that some relationships between task and relationship conflict on the one hand, and autonomy and task interdependence on the other, will be recursive or part of connected input-process-output episodes. For example, reductions in autonomy and interdependence resulting from conflict may lead to more conflict as a result of blame for, and resentment about, ineffective team design or poor performance. In addition, the relationship between conflict and trust could be a downward self-reinforcing loop, in which conflict leads to lower trust, which in turn may lead to greater conflict (Jehn, 1995). Such a pattern would be reminiscent of Zand's (1972) spiral-reinforcing model of mistrust in teams. Exploring such large and small recursive causal patterns is clearly an important next step.

Practical Implications

The study also has considerable practical implications, including the observation that self-managing teams are not always good at "managing" themselves. DeLeon (2001) observed the reluctance of members of self-managing teams to properly deal with emerging conflict, and Vardi and Weitz (2004) noted that their autonomy and freedom give self-managing teams greater potential for misbehavior and conflict. I not only suggest that self-managing teams can be particularly susceptible to negative effects of conflict, but also contribute to a growing body of literature that illustrates the importance of effective conflict management. It is critical for teams to understand how to avoid conflict in the first place, whether through developing appropriate norms up front or by training team members in specific conflict management techniques. Managers need to be aware of the importance of giving self-managing teams the proper skills to manage themselves well, as opposed to letting them "sink or swim" on their own. Ironically, some management is still required when it comes to self-management, including training in conflict management techniques and giving teams an understanding of the performance implications of different team designs so that they can avoid traps like the potentially ineffective low interdependence-low autonomy team design.

The importance of providing guidance, advice, or specific training is particularly salient for the type of MBA teams in business school settings that were studied here. Since the primary purpose of such teams is to provide a learning environment, it is critical to ensure that students not only avoid the

specific pitfalls described in this study, but also develop an understanding of the principles involved. Appreciating how inputs, processes, and emergent states relate to structure and outcomes would allow graduates to apply such knowledge in their managerial careers.

Another practical implication is the possibility of restricting the ability of self-managing teams to structurally redesign themselves. Perhaps some self-managing teams are given more team autonomy and discretion than they really need, and the practical way for management to avoid dysfunctional designs may be to limit the range of design options available to teams. Although autonomy may be very important for some jobs, it may not be as critical for others—and one practical implication of this study may be a caution against the unnecessary overuse of self-management.

Limitations and Boundary Conditions

A restriction of range may exist in the data, in that means were relatively high for trust and autonomy but relatively low for conflict, reducing variance. The fact that effects were found despite low variance, however, suggests relatively robust effects. Turning to the issue of generalizability, I would note that the teams were actually quite diverse (in terms of national origin, gender, education, etc.), yet they could also be perceived as fairly homogeneous, since all team members were MBA students at the same university. Although factors such as identical team sizes and similar demographics, identical tasks, clear performance measures, and zero turnover contributed to greater statistical conclusion validity, they also potentially undermined external validity. The specific context of the study may also limit generalizability, since teams operated in a somewhat idealized context with few constraints on the ability to restructure, which in “real” organizations might be limited by technology, larger organizational structures, and other exogenous factors.

The question of whether or not measures of task interdependence and autonomy reflected real (as opposed to perceived) differences is also a valid one. Informal observations of teams indicated considerable variation in actual individual autonomy and task interdependence between teams, as well as within teams over time. Thus, I am confident that the measures reflected actual differences and that all team “types” were represented. For example, teams low on both variables of interest typically had members working independently of one another, yet very constrained by procedures, schedules, and formats. Extreme examples included

teams delegating an entire project to one member, effectively reducing interdependence to almost zero—but still constraining the individual with deadlines, specifications, and expectations. Some teams had high levels of individual freedom and relatively low levels of interdependence among team members, and yet other teams combined high coordination requirements, frequent meetings, and collaborative work with low levels of individual freedom and discretion. In teams with high levels of both autonomy and interdependence, members typically tried to exercise substantial individual discretion over their components of tasks while constantly juggling demands for coordination.

It is important to recall that “self-managing” is not necessarily a specific team type but is rather a description of a rough location on a continuum of team design characteristics (Langfred, 2000). As Wageman (1995) noted, even teams that are not self-managing may be able to alter or adjust their task interdependence, and thus I believe that my findings are relevant to teams beyond those with the descriptor “self-managing” and that likely all teams will attempt to restructure themselves in response to conflict to some degree.

Finally, I have not explored possible moderators of the effects of conflict in my model. DeDreu and Weingart (2003) noted that factors such as team norms, openness, and psychological safety may ameliorate negative effects of conflict. My model is a good starting point, illustrating how conflict can influence emergent states and structure in teams, but it is certainly not intended to be a comprehensive model that addresses all nuances of these relationships. In addition, more qualitative observation could yield a greater understanding of the underlying processes. For example, it is possible, even likely, that some teams responded to conflict by developing processes, norms, or other structures that facilitated conflict resolution or avoided conflict altogether, and thus were successful in their self-management. There certainly were teams in the data set that did not respond to conflict by limiting both autonomy and interdependence. It is extremely important to note that the purpose of this article is to highlight a particular type of dysfunctional dynamic that *can* occur in self-managing teams. Self-managing teams will not necessarily respond to conflict in this precise manner, and for some, the flexibility and adaptability of self-management may be what allows them to avoid negative effects.

In summary, I have explored how the very structural flexibility that makes self-managing teams effective may also be a liability when it comes to conflict management, in that teams can unintentionally

tionally redesign themselves in dysfunctional ways, influenced by both direct and indirect effects. In addition to my specific empirical exploration, I also draw attention to the larger question of how dynamics in a team can influence team structure.

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