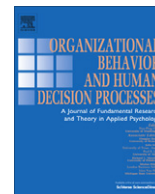




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## Why individuals in larger teams perform worse

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### ABSTRACT

Research shows that individuals in larger teams perform worse than individuals in smaller teams; however, very little field research examines why. The current study of 212 knowledge workers within 26 teams, ranging from 3 to 19 members in size, employs multi-level modeling to examine the underlying mechanisms. The current investigation expands upon Steiner's (1972) model of individual performance in group contexts identifying one missing element of process loss, namely relational loss. Drawing from the literature on stress and coping, relational loss, a unique form of individual level process, loss occurs when an employee perceives that support is less available in the team as team size increases. In the current study, relational loss mediated the negative relationship between team size and individual performance even when controlling for extrinsic motivation and perceived coordination losses. This suggests that larger teams diminish perceptions of available support which would otherwise buffer stressful experiences and promote performance.

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### Introduction

As work-groups become more widespread within organizations (Hackman, 2002), interest has also grown in designing effective teams whose productivity can be linked to long term competitive advantage (Levine & Moreland, 1998). As prior research has found that team performance is some derivation of combined individual performance (Steiner, 1972), researchers have shown much interest in better understanding factors that can influence individual performance in team contexts. One set of factors involves the structural variants related to the team itself. For example, a large body of classical psychological research has shown that team size can have important consequences for individual performance (Thomas & Fink, 1963), revealing an intriguing paradox regarding individual behavior in the context of larger teams. Namely, while individuals in larger groups have access to more resources (Hare, 1952), including a higher likelihood that one person in the group will remember an important piece of information (Horowitz & Bordens, 2002), individuals on larger teams also expend less effort (Latane, Williams, & Harkins, 1979), engage in fewer differentiated tasks, assume less responsibility for the tasks (Wicker & Mehler, 1971), and generally perform worse than individuals on smaller teams (Liden, Wayne, Jaworski, & Bennett, 2004). In sum, although greater human resource capital is available in larger teams, research has unexpectedly shown that individuals in larger teams perform worse (Hackman, 2002; Thompson, 2003).

Most of the studies that inform our understanding regarding why individuals in larger teams perform worse were conducted in the laboratory. These studies tended to involve relatively simple tasks where members experienced temporary person-group relationships rendering the generalizability of these studies to teams of workers engaging in complex tasks over time somewhat questionable. The main body of field work that demonstrates a relationship between team size and performance has primarily focused on team (as opposed to individual level) performance (Stewart, 2006), and has examined team size as a control variable (Haleblian & Finkelstein, 1993), and with few exceptions (Liden et al., 2004), has generally not examined a cross-level perspective showing the processes through which team size might influence individual performance.

A cross-level focus in the domain of team size research is critical because the literature shows that team size often positively relates to group level performance (Stewart, 2006), but negatively relates to individual level performance (Kerr & Bruun, 1983; Liden et al., 2004; Mullen, 1983; Thomas & Fink, 1963). These findings mirror the Latane et al. (1979) observation that collective performance may increase as group size increases, but this collective increase is less than the sum of individual optimal efforts. In other words, the diminished performance in larger teams is often not observable at the team level and tends to occur at the individual level. Hackman (2002) suggests that one way to expand what we know about phenomenon involves exploring a level beneath, and bracketing where the bulk of unexplained variance operates. Hence, the current study brackets the cross-level of analysis (team size to individual level performance) where the bulk of unexplained variance associated with poor performance occurs in larger teams.

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This focus allows for the discovery of new and important types of individual level processes which may account for lower levels of performance in larger teams; processes which are obscured when focusing on the group level of analysis (House, Rousseau, & Thomas-Hunt, 1995; Klein & Kozlowski, 2000).

Building on a prominent theoretical perspective – Steiner's theory of process loss (1972) – I explore why individuals in larger teams in real-world work contexts perform worse than individuals in smaller teams. Steiner suggested that individuals in larger teams perform worse because they experience lower levels of coordination and motivation. However, Steiner's original theory was developed to explain the performance of individuals working in groups engaged in single time as opposed to repeated task interactions. As such, the classical conception of team task design is very different from the modern concept actually implemented in real-world organizations, where team members work together in some cases for years, and tend to spend a great deal of time together on a daily basis. Because research shows that interpersonal relationships commonly develop when people work interdependently over time (Reis, Collins, & Berscheid, 2000), and that supportive relationships have important implications for individual level performance (Madjar, Oldham, & Pratt, 2002), the questions remains whether in real world contexts, relationships play an important role in explaining individual level performance in larger teams. Specifically, there may be process losses due to relational losses—individuals in larger teams perceive that support is less available in the team. Hence, the current paper expands the theory of group size and performance by identifying that individuals in larger teams also experience relational loss, and this additional source of process loss contributes uniquely to poor individual performance.

Understanding which individual level experiences best explain the relationship between team size and individual level performance can add to our understanding of how individuals might better use the greater resources available in larger teams. Based on current theory and research, one might infer that in larger teams the best individual performers should simply minimize the amount of time spent coordinating and increase time spent working on individual tasks to avoid coordination and motivation losses (Hackman, 1987; Steiner, 1972). However, the current paper will suggest that even if a person were to follow these recommendations he still might perform worse in large group contexts. This can be attributed to individuals in larger teams also experiencing relational loss which has important consequences for individual performance.

### Components of Steiner's process loss

Steiner (1972) developed a widely accepted theory regarding productivity loss. Steiner explained that performance losses occur primarily because of process losses, defined as the inefficiencies which detract from an individual's potential productivity. Process loss contains two general components: motivation loss and coordination loss. Steiner argued that for all task types, motivation loss occurs at the individual level when members are not optimally motivated to perform a task. For tasks that require coordination, coordination loss occurs when individual members fail to organize their efforts optimally as a group. Steiner argued that in order to understand the effect of group size on individual productivity, one needs to understand the effect of group size on the components of process loss. For tasks that require coordination, members in larger teams will experience more coordination loss or difficulty and inefficiency coordinating their activities with other teammates. Similarly, the larger the team, the more likely team members will experience motivation loss, a lower motivation to work hard on behalf of the team.

Steiner's inclusion of motivation loss as an important component of overall process loss comes from empirical evidence dating back to one of the first social psychological studies ever conducted. Specifically the “social loafing” paradigm finds that individuals working alone tend to exert more effort than individuals working in groups (Kravitz & Martin, 1986; Ringelmann, 1913). Empirical extensions of social loafing research demonstrate that an individual's propensity to loaf increases in the context of larger and larger groups (Ingham, Levinger, Graves, & Peckham, 1974; Latane et al., 1979; Liden et al., 2004). In his review of the literature, James Shepperd (1993) proposed that expectancy theory explained why individuals loafed. Shepperd stated that individual members experience declines in motivation when they perceive no contingency between their contributions to the group and achieving a desirable outcome (e.g., rewards or recognition). In the case of team size, theory suggests individuals in larger teams may feel their contribution is less identifiable (Olson, 1965), and therefore their perceived likelihood of receiving rewards and recognition for individual work and resulting motivation will decline as team size increases. This suggests that individual team members' motivation associated with extrinsic rewards and recognition should diminish as teams increase in size.

Steiner also proposed that for tasks requiring coordination, coordination losses will increase with the addition of each team-member. Steiner describes that individual members might themselves perceive greater coordination costs for two basic reasons: (1) matching a members' own and other members' expertise to specific tasks or roles becomes increasingly difficult when more members are available to perform each role, (2) executing role assignments in an organized way requires a person to exert more time, effort, and understanding of who occupies every other role as the number of members increases. Indeed, in their classic book on “Work Redesign,” Hackman and Oldham (1980) suggest that as team size increases, so does the complexity of role assignment and understanding how to gather information in an organized and efficient manner.

### Relational loss

Relational loss is a type of individual level process loss whereby an employee perceives that support, help, and assistance are less available within the team as team size increases. Relational losses draw from theory of social support which attributes perceptions of social support to the quality of interpersonal relationships experienced in one's environment (Lakey & Cohen, 2000). Relational losses specifically involve perceptions about the extent to which teammates are likely to provide help, assistance, and support in the face of struggle or difficulty (Cohen & McKay, 1984; Cohen & Wills, 1985; Frese, 1999). Building upon House (1981) relational losses can involve the perceived availability of four types of support including: emotional support (the expression of trust and positive emotion to teammates in the context of setbacks or struggle), instrumental support (help and assistance from teammates), appraisal support (advice to help teammates overcome setbacks), and informational support (information to help members solve problems). Research in the domain of organizational behavior has also examined perceptions of support available from the team as a form of psychological supportive climate which reflects an employee's perception that teammates provide caring and help to one another (Amabile & Conti, 1999; Holahan & Moos, 1982).

In interdependent team contexts, research suggests that an individual's perception that support is available from the broader team is not often a function supportive behavior received from a single teammate or subset of teammates (Mueller & Cronin, 2009; Parris, 2003). Instead, a person's perception that support is available from the broader team denotes that the member believes

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