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Heidi K. Gardner

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**Heidi K. Gardner**
Assistant Professor of Business Administration
Harvard Business School
Morgan Hall 339
Soldiers Field
Boston, MA 02163
Tel: 617-495-6485
hgardner@hbs.edu

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## ABSTRACT

In this paper, I develop and empirically test the proposition that performance pressure acts as a double-edged sword for teams, providing positive effects by enhancing team motivation to achieve good results while simultaneously triggering process losses. I conducted a multi-method field study of 78 audit and consulting teams from two global professional firms, revealing an irony of team life: Even though motivated to perform well on a high-stakes project, pressured teams are more likely to engage in performance-detracting behaviors. Survey results show that, as performance pressure increases, team members begin to over-rely on general expertise while discounting domain-specific expertise, leading to suboptimal performance. I use longitudinal qualitative case studies to explore the underlying behavioral mechanisms that generate this outcome. Results also show that only domain-specific expertise—the kind that teams under-use when facing higher pressure—increases client-rated team performance. I thus find, paradoxically, that when teams need domain-specific expertise the most, they tend to use it the least, despite evidence suggesting they are highly motivated to do well on their task.

*We were seriously feeling the heat … it was a make-or-break project for us. We threw our best and brightest against the problem, but the more we rallied our team, the worse it got. I still don't know what went wrong." (Partner, Big Four accounting firm)*

Make-or-break projects demand exceptional performance. Organizations increasingly deploy teams of experts on high-stakes projects, expecting team members to draw on each other's complementary knowledge and expertise to achieve results beyond the ability of any single individual (Argote, Gruenfeld, and Naquin, 2001; Thomas-Hunt and Phillips, 2003). The more important the outcome, the more important it is that the team can make the most of its knowledge resources (e.g., Hackman and Morris, 1975; Bunderson and Sutcliffe, 2002). Yet, teams consistently fail to use their members' expertise to the fullest, resulting in lower-quality decisions and outcomes (Baumann and Bonner, 2004; Bunderson, 2003; Hackman 2011). The question of why some teams are more effective than others at using their members' expertise remains a core puzzle in small groups research (Bunderson, 2003; Hackman, 2011; Gardner, Gino, and Staats, 2012).

Small groups research has suggested elements of team and task design that can improve knowledge-use processes—such as a clear and compelling purpose (Hackman 2002), a stable set of members (Lewis 2003), suitable functional diversity (Bunderson and Sutcliffe, 2002), and interdependent tasks (Wageman, 2001). Surprisingly, research has largely overlooked how another factor—holding teams accountable for delivering high-quality results—can affect knowledge use, yet this factor is a nearly ubiquitous condition for real-world work groups (DeZoort, Harrison, and Taylor, 2003; Frink and Klimosky, 1998; Hackman, 2011; Tetlock, 1985), has been shown to significantly affect individuals' use of knowledge (Lerner and Tetlock, 1999), and is a core component of the pressure associated with high-stakes projects (Tetlock, 1985; DeZoort, Harrison, and Taylor, 2006). This paper introduces the concept of performance pressure—defined as a set of interrelated factors that increases a team's accountability for high-quality performance—as a key force influencing team knowledge-use processes and therefore team effectiveness. In examining the effects of performance pressure on knowledge-use processes, I begin to uncover why teams may fail to effectively use members' recognized expertise precisely at the moments when they need it the most.

The fairly limited research on teams facing high-pressure situations paints a complex picture. On the one hand, research is consistent with the opening quote, suggesting that high-pressure projects can cripple teams. For example, teams facing high-stakes assignments—important complex tasks performed under heightened scrutiny—perform more poorly because of diminished cognitive functioning (Ellis, 2006), a reduced focus on collective performance (Driskell, Salas, and Johnston, 1999), disrupted team routines (Morgeson and DeRue, 2006), and members' psychological withdrawal from the task (Pearsall, Ellis, and Stein, 2009). On the other hand, some research suggests that high-pressure situations can provide important contexts for teams to create and use knowledge (Cannon and Edmondson, 2001) and for team members to demonstrate their capabilities (James and Wooten, 2010). The possibility that these positive and negative effects might occur in tandem, driving a team's performance while undermining its expertise-use processes, has yet to be explored. Developing a theoretical model to explain performance pressure's dual effects will allow us to better understand why teams vary in their use of expertise.

The present study integrates findings from research on individual accountability with those from small groups research to present and test the theoretical argument that performance pressure acts as a double-edged sword for teams' knowledge use and effectiveness. On the positive side, I propose that performance pressure can act as a motivational force, enhancing a team's performance through increased task engagement and effort-directing actions. On the negative side, I propose that it can lead to suboptimal performance by focusing teams on only a subset of available knowledge. I test my predictions in longitudinal surveys of 72 audit and consulting teams from a global Big Four accounting firm and find that performance pressure differentially affects teams' use of different kinds of expertise and that the ensuing patterns of expertise use result in suboptimal outcomes. Then, using observational case studies of six additional project teams drawn from two firms (one audit and one consulting), I elaborate the behavioral mechanisms underlying my predictions, explaining why some teams shy away from using specific expertise precisely during the high-pressure projects when they need it the most. Through the lens of performance pressure, I develop a more comprehensive conceptual model to guide future research on teams' knowledge use and effectiveness.

**CONCEPTUALING "PERFORMANCE PRESSURE"**

Baumeister (1984: 610) defines pressure as "any factor or combination of factors that increases the importance of performing well on a particular occasion." Building on this concept, I define performance pressure as a set of three interrelated factors that increase the importance of a team delivering a superior outcome: shared outcome accountability, heightened scrutiny and evaluation of their work, and significant consequences associated with its performance.

Consistent with prior research, I conceptualize pressure as an external force imposed on the team. Those who exert performance pressure and who are the ultimate judges of a team's products are its "clients"—the customers or bosses who receive, review, or use its output (Hackman, 1986). The more the clients deem high-quality performance to be absolutely essential, the more performance pressure they are likely to exert on the team.

Performance pressure differs from other types of external pressure, such as time pressure and crisis pressure. First, the objective of the team facing performance pressure is excellent performance, distinct from meeting a deadline (Durham et al., 2000) or surviving a crisis (Nystrom and Starbuck, 1984; Pangarkar, 2007). Understanding this distinction is crucial for predicting team process because as Frink and Klimoski (1998:20) note, "What we are accountable for may be the paramount issue in predicting behavior, rather than simply that we are or are not accountable." Second, whereas a crisis tends to be surprising and disruptive, significantly altering the team's task (Hamblin, 1958; Pearson and Clair, 1998), performance pressure can be anticipated and planned for. These conceptual differences suggest that it is important to explore, both theoretically and empirically, how performance pressure affects actual work groups' use of the expertise that is essential for achieving the required high-quality outcome.

## PERFORMANCE PRESSURE AND TEAM EFFECTIVENESS

Performance pressure involves a team's accountability for delivering high-quality outcomes. In general, people in formal organizations are motivated to gain the approval and respect of those to whom they are accountable (Emby and Gibbins, 1988; Lerner and Tetlock, 1999). In knowledge-intensive environments, team members may be especially motivated to achieve high performance because it offers them the opportunity to demonstrate their knowledge and abilities (Crown and Rosse, 1995). Research on individual accountability shows that this motivation translates into effort and task engagement: When held accountable for their outcome, people tend to spend more time and effort on their tasks and report greater motivation than their non-accountable counterparts (Koonce, Anderson, and Marchant, 1995).

Performance pressure also involves heightened evaluation and consequences, factors known to increase arousal (Forward and Zander, 1971; Humphreys and Revelle, 1984) of the sort that leads to the exertion of greater physical and mental effort and to greater persistence in the face of difficulties (Ronan, Latham, and Kinne, 1973; Matsui, Kakuyama, and Onglatco, 1987; Weldon, Jehn, and Pradhan, 1991; Weingart, 1992). Such efforts result in higher-quality team outcomes (Hackman and Morris, 1975; Matsui, Kakuyama, and Onglatco, 1987), especially on complex knowledge-intensive tasks (Pritchard et al., 1988; Hackman 2011). In light of these effects, I predict the following:

***Hypothesis 1a: Higher performance pressure will be associated with higher team performance.***

When teams are motivated to achieve high performance, they engage in activities to advance them toward that objective (McGrath, 1984; Weldon, Jehn, and Pradhan, 1991). From a young age, people learn that if they focus their attention on a task, work hard at it, and persist, they stand a better chance of achieving their goals (cf. Locke and Latham, 1990). Inasmuch as team members facing performance pressure are motivated to achieve high quality performance, I might expect that they will take actions to focus, engage, and prolong their members' efforts.

*Task planning* is one process that focuses a team's efforts on its present task (Hackman and Morris, 1975; Wageman, 1995; Durham, Knight, and Locke, 1997). Performance-driven teams are likely to engage in extensive *knowledge-coordination* processes because complex problem-solving tasks require team members to work hard to integrate their knowledge (Lewis, 2003; Littlepage et al., 2008; Gupta and Hollingshead, 2010). Finally, intra-team *morale-building communications* encourage persistence in the face of challenges (Gladstein, 1984; Weldon, Jehn, and Pradhan, 1991; Weldon and Weingart, 1993 ). Each of these three team-level processes also has a demonstrated link to improving team performance. I therefore propose that, as performance pressure increases, team members will increase the frequency of effort-directing actions such as task planning, knowledge coordination, and morale-building communications.

***Hypothesis 1b: The positive effects of performance pressure on team performance will be partially meditated by teams' increased effort-directing actions.***

**EFFECTS OF PERFORMANCE PRESSURE ON TEAM KNOWLEDGE USE**

I have just argued that performance pressure motivates teams to achieve higher performance. Yet some research suggests that, even when small groups have a clear performance goal and are motivated to perform well, they may undermine their own efforts by engaging in suboptimal processes such as failing to integrate members' relevant knowledge into their collective work (e.g., Bunderson and Sutcliffe, 2002; Durham et al., 2000). For example, Baumann and Bonner (2004) found that, even after groups accurately identified their best expert, they relied on that expert only 62 percent of the time. Similar findings have emerged from studies of ad hoc experimental groups (Durham et al., 2000) and intact teams of knowledge workers engaged in task simulations (Libby, Trotman, and Zimmer, 1987). Given that knowledge use is the key to achieving the high performance demanded by performance pressure, these results suggests the need to think more deeply and theoretically about how performance demands influence the actual use of knowledge in work teams.

With outcome accountability comes the anticipated need to justify one's actions, which can lead individuals to opt for simplified solutions that satisfy stereotypical standards (Gordon, Rozelle, and Baxter, 1988) or to engage in self-protective behavior (Adelberg and Batson, 1978). Outcome accountability also leads people to selectively process cues, favoring those which are more defensible (Lerner and Tetlock, 1999). For the most part, studies investigating the effects of outcome accountability on knowledge use have been experimental studies of individuals (Lerner and Tetlock, 1999; for an exception see Stewart, Billings and Stasser, 1998). The effect of performance pressure on team knowledge use and on outcomes becomes especially critical as we turn our focus from individuals or ad hoc groups in controlled laboratory settings to actual work groups handling high-pressure projects in organizational settings, where team success hinges on the effective use of member expertise.

This understanding in turn requires a nuanced exploration of the varieties of team knowledge. So far, studies of accountability and of small groups' knowledge use typically conceptualize knowledge as a simple one-dimensional construct. For example, some studies conceptualize expertise simply as the quantity of task-related decision cues each individual possesses (e.g., Hollenbeck et al., 1995; Stasser, Stewart, and Wittenbaum, 1995) or operationalize expertise as an individual's prior performance on a similar task (e.g., Littlepage, Robison, and Reddington, 1997). Some field studies assess team members' overall expertise; for example, by asking for indications of which team members "have the most knowledge and expertise in the work that [their] team performs" (Bunderson, 2003: 571). This approach likely captures multiple knowledge dimensions, but since it does not specify them, it does not allow further examination of them. But achieving high performance on complex problems requires teams to integrate members' specialized and complementary knowledge (Bunderson and Sutcliffe, 2002; Hackman and Katz, 2010), suggesting the need for a thorough examination of groups' differential use of different types of knowledge.

**Types of Expertise**

Economics research distinguishes two types of human capital. General human capital includes expertise, such as literacy, that is useful across a wide range of firms, while specific human capital includes expertise, such as understanding the informal decision rights in a company, that is useful only in a particular organization (Becker, 1964).

General professional expertise, a subset of general human capital, is the expertise that professionals acquire through formal training, together with the capabilities and judgment they develop over time that enable them to deliver their service effectively and profitably (Maister, 1993; Morris and Empson, 1998). Formal training can include higher education (e.g., law school) or certification (e.g., Microsoft certification programs) and facilitates the development of professional competencies such as a shared vocabulary, an understanding of performance requirements, and knowledge of general professional practices. Professional associations (e.g., the Institute of Chartered Accountants in England and Wales) determine and enforce standards of necessary professional expertise in their sector and provide opportunities for continued professional development. In professions that lack accrediting bodies or dedicated degree programs, many professionals earn more general degrees in their field (e.g., MIS for computer consultants). Professional degrees and affiliations are sometimes treated as minimum requirements for hire and, even long after they have been earned, are typically treated as signals both of current expertise and of the capacity to gain even greater expertise (Hitt et al., 2001).

Individuals also gain general professional expertise through experience. It is common for professionals to "learn by doing" (Lowendahl, Revang, and Fosstenlokken, 2001), experiencing client problems and developing client handling skills under the guidance of a senior professional (Morris and Empson, 1998). Through experience, professionals also become familiar with common analytical frameworks and professional jargon, a knowledge base that is likely to prove useful across clients and over time (D'Aveni, 1996).

In contrast, domain-specific expertise is a subset of firm-specific human capital and is idiosyncratic to a single organization (Levinthal and Fichman, 1988). Domain-specific expertise might encompass knowledge about a single organization's proprietary technology or systems and its unique work practices, about the availability and reliability of information, and about the trustworthiness, power, or preferences of particular people (Huckman and Pisano, 2006). Whereas organization-specific expertise typically refers to knowledge about one's employer (Becker, 1964), domain-specific expertise encompasses knowledge about the place where one actually conducts one's work, such as the particular hospital in which surgeons employed by an outside physician's group perform surgeries (Huckman and Pisano, 2006) or the client company for which an accountant employed by an audit firm delivers services (Levinthal and Fichman, 1988). In contrast to general professional expertise, domain-specific expertise emerges over time through repeated interactions with the client (Levinthal and Fichman, 1988) and is less likely to be found in the professional firm's knowledge-management databases (Hansen and Haas, 2001).

**Performance Pressure's Effects on Team Use of General and Specific Expertise**

To use a team member's expertise—of whatever kind—effectively, the team must first recognize that expertise as valuable to its task (Stasser, Stewart, and Wittenbaum, 1995; Bunderson, 2003). Expertise recognition is the correspondence between a team member's true capabilities and other members' perceptions of those capabilities (Libby, Trotman, and Zimmer, 1987). The more accurate the perception, the more a team can allocate influence in accordance with true expertise (Bunderson 2003). But even accurate recognition is not a perfect predictor of effective application of expertise (Littlepage et al., 1995).  Teams often fail to grant higher influence to members recognized as most expert (Baumann and Bonner, 2004; Hackman, 2010).

I propose that performance pressure will affect the link between teams' recognizing expertise and using it.

Heightened performance pressure involves the team's accountability for delivering high-quality outcomes. Outcome accountability leads people to opt for less-risky approaches that they can easily defend and justify (Adelberg and Batson, 1978; Kroon, Hart, and Kreveld, 1991). Such choices tend to be more cautious and conventional (Tetlock, 1985; Gordon, Rozelle, and Baxter, 1988; Frink and Klimoski, 1998). Outcome accountability also makes individuals prone to engage in more heuristic information processing; that is, they rely on knowledge that is socially acceptable and comes to mind quickly (Tetlock, 1985). I reason that as individual team members engage in these behaviors, an analogous dynamic will emerge at the team level: as teams face increasing performance pressure, they will gravitate toward knowledge that is salient and appears to be lower-risk because it has been proven across a variety of settings, is viewed as a legitimate solution, and is shared among the team members.

General professional expertise matches these criteria. By definition, it has been validated with multiple clients and is thus a core component of professionals' repertoires (Weiss and Ilgen, 1985; Gersick and Hackman, 1990; Locke and Latham, 1990). It gains legitimacy by being a part of the professional's formal training and by being included in widely accepted standards, processes, and templates (Gibbins, 1984; Locke and Latham, 1990; Morris and Empson, 1998). Lastly, it is shared among team members who have experienced similar formal training and who have applied common methodologies across client settings (Weiss and Ilgen, 1985; Gersick and Hackman, 1990). The more that information is shared amongst the team, the more it is generally perceived as task-relevant and accurate (Postmes, Spears, and Cihangir, 2001; Wittenbaum, Hubbell, and Zuckerman, 1999); repetition is likely to make it seem more socially acceptable and more salient. In general, groups are more likely to share and use commonly held knowledge, especially when motivated to rely on safe information. Overall, I argue that, for teams experiencing heightened performance pressure, general professional expertise is likely to seem safe and is likely to be salient through repeated use across multiple professional contexts. Therefore, once teams have recognized general professional expertise, performance pressure increases the extent to which they use this expertise.

***Hypothesis 2: Performance pressure moderates the link between expertise recognition and use, such that the higher the performance pressure, the more a team uses recognized general expertise.***

In contrast to general professional expertise, domain-specific expertise is germane to a single client setting and only held by those who have spent enough time with that particular client to acquire it. For teams to use domain-specific expertise to customize their work for the client, they must be able to deviate from the standard templates, scripts, and practices all members have in common. Team members must elicit, share, and integrate relevant domain-specific contributions in their problem-solving discussions, possibly in defiance of traditional approaches.

As performance pressure increases, however, the salience of impending evaluation and consequences also increases (Cottrell, 1968; Amabile, 1979). Evaluation apprehension focuses people on meeting explicit and narrowly defined performance objectives rather than generating alternatives or considering a broader range of nuanced information that would allow them to create an even better outcome (Amabile, DeJong, and Lepper, 1976; Siegel-Jacobs and Yates, 1996). Similarly, heightened outcome accountability focuses people on the need to produce justifiable, easily defensible work (Lerner and Tetlock, 1999). Together, these facets of performance pressure are likely to focus individuals on achieving a good-enough-and-defensible outcome rather than a riskier, potentially superior outcome. Team members are likely to resist making difficult decisions that are perceived as unsafe (Adelberg and Batson, 1978).

Team members might view domain-specific expertise as unsafe because it requires deviation from generally accepted tried-and-true practices or frameworks. Expertise that is possessed by some team members but unfamiliar to others will unlikely be salient at the team level (Postmes, Spears, and Cihangir, 2001; Wittenbaum, Hubbell, and Zuckerman, 1999). With an instrumental mindset, teams may not see the value in experimenting with innovative approaches or simply may not appreciate the relevance of novel expertise—even their own and even if they are genuinely inclined to work collectively toward the group goal and have previously recognized that very expertise. As an externally imposed standard, performance pressure undermines open decision making and impairs a team's capacity for expansive thinking (e.g., Amabile, 1979; Oldham and Cummings, 1996). Therefore, even after the team has recognized its members' domain-specific expertise, performance pressure makes it less likely that the team will use that expertise.

> ***Hypothesis 3: Performance pressure moderates the link between expertise recognition and use, such that the higher the performance pressure, the less a team uses recognized domain-specific expertise.***

## TEAM KNOWLEDGE USE AND PERFORMANCE

Teams perform better when the members with the greatest expertise relevant to the task exert the most influence (Libby, Trotman, and Zimmer, 1987; Hollenbeck et al., 1995; Bunderson, 2003). Both dominance by non-experts and its converse, under-reliance on the true experts, typically result in worse performance (Maier, 1963; Durham et al., 2000). Even extreme over-reliance on an expert can lower team performance (Burris and Thomas-Hunt, 2002), because the team consequently makes too little use of other members' relevant expertise (Hackman, 2010).

Although groups research provides little guidance about performance outcomes for teams' use of different kinds of expertise, research on human capital suggests that both general expertise and domain-specific expertise matter for performance (Huckman and Pisano, 2006). In professional service firms, higher average levels of general expertise are associated with higher firm performance via effects on diversification (Hitt et al., 2001) and internationalization (Hitt et al., 2006), while domain-specific expertise has been found to enhance performance (Danos and Eichenseher, 1982), in part by helping firms retain clients (Levinthal and Fichman, 1988; Broschak, 2004).

Even so, we can develop predictions about which of the two is *more* important for performance. In a meta-analysis of team information-sharing research, Mesmer-Magnus and DeChurch (2009) found that the uniqueness of information exchanged during team interactions was a stronger predictor of performance than the openness of the team's interaction processes, suggesting a differential value for the unique contributions of a domain-specific expert. In a professional setting somewhat analogous to my own empirical setting, Huckman and Pisano (2006) demonstrated that domain-specific expertise has an even greater positive effect on performance than general expertise does. A freelance cardiac surgeon's performance at a particular hospital benefitted more from having performed the same operation a certain number of times at the same hospital than from having performed the same operation the same number of times at a variety of hospitals. They argue that a surgeon develops domain-specific expertise through extensive experience in a particular hospital, which allows him or her to operate more effectively and efficiently in that specific setting. Similarly, Groysberg and colleagues (2008,

2010) demonstrated that domain-specific expertise plays a significantly greater role in equity research analysts' career success than does general professional knowledge. Further, a professional firm's knowledge of a client's business and its idiosyncratic policies and practices allows the firm to customize its service (Haas and Hansen, 2005; Hitt et al., 2006) by tailoring it not only to the client's instrumental requirements but also to its values, ethics, and culture (Sharma, 1997).

Applying domain-specific expertise also signals competence to clients. Professional services such as accounting and consulting have long been considered highly "opaque" environments (Von Nordenflycht, 2010), where output quality is hard for clients to evaluate, even after the output is delivered (Lowendahl et al., 2001). For example, a client encountering bankruptcy may question how much blame to place on auditors' (lack of) oversight. Likewise, a client may not know whether or how much to attribute a successful product launch to a consultant's input. In such opaque environments, clients seeking an indicator of quality and competence are more likely to seize on customization (Skaggs and Snow, 2004; Haas and Hansen, 2007) and to judge a team's output by whether the team did it "our way, using our methods," as Hackman (2010: 38) writes. In general, this sort of evaluation is used to assess the quality of decisions whose eventual outcome cannot be known until considerable time has passed (Janis and Mann, 1977). In environments in which a team's client cannot easily judge the quality of the team's output, there is likely to be much greater emphasis on the degree to which a team has used domain-specific expertise to customize the project to the client's situation.

To summarize, both general professional expertise and domain-specific expertise benefit team performance. Nevertheless, the more domain-specific expertise a team employs, the more it is able to customize its output for a particular client and the more that client perceives the team to be competent and its output to be of high quality.

***Hypothesis 4a: Use of team members' general expertise will be associated with higher team performance.***

***Hypothesis 4b: Use of team members' domain-specific expertise will be associated with higher team performance.***

***Hypothesis 4c: Use of domain-specific expertise will have stronger positive effects on team performance than use of general expertise.***

## RESEARCH DESIGN AND SETTING

I conducted a two-study field investigation of project teams in two knowledge-intensive organizations that rely extensively on such teams to generate most of their revenues. Study 1 combines multi-source surveys with archival data to test my hypotheses. Study 2 relies on longitudinal observational cases to understand how knowledge-use processes unfold over time in teams. The combination of quantitative and qualitative methods is ideal to "generate greater understanding of the mechanisms underlying quantitative results in at least partially new territory" (Edmondson and McManus, 2007: 1157). By using a mixed-method research design, I aim not only to document the extent to which performance pressure affects team-level expertise use, but also to examine the behavioral mechanisms underlying the effects.

Two professional service firms participated in my research. "AuditCo" is a Big Four accounting firm that provides audit and related business advisory services, such as consulting on supply-chain issues and developing a risk-management strategy; AuditCo teams are included in both Study 1 and Study 2. "ConsultCo" is a global top-tier strategy consulting firm; its teams are included only in Study 2.

Preliminary interviews (see details below) suggested a number of similarities between these firms that are important for my research. First, both firms use teams as the main way to deliver client projects, which typically last from several weeks to several months. Second, both firms use a staffing group to match team members with client projects, based on members' availability and preferences and on the required expertise (usually specified by the partner responsible for the project). When a project is finished, teams disband and members are re-assigned to new projects. Third, both AuditCo and ConsultCo use an "up-or-out" performance-management system whereby employees must progress up the hierarchy or be dismissed (Sherer and Lee, 2002). Fourth, it is customary in both firms for teams to begin a new client assignment with a "kick-off meeting" during which members discuss the project's objectives, the division of work, and the desired team norms (e.g., how and when to provide each other with feedback). Finally, across firms, the more senior the professionals, the more they tended to work on several projects at once. Under such circumstances, more junior team members might have considerably more direct experience with any particular client.

In preparation for my field work, I conducted a series of preliminary interviews across both participating firms with the following goals: (1) determining how the theoretical constructs of performance pressure, expertise recognition, and expertise use could each be operationalized, (2) verifying that the constructs were likely to vary significantly between teams, (3) identifying the parameters for the sample of teams to participate in both studies, and (4) understanding relevant contextual factors. To these ends I interviewed 19 people at AuditCo and 12 at ConsultCo, including partners who were heads of divisions, practice areas, or key-account groups; senior personnel in staffing and human resources functions; and project managers. These interviews confirmed that teams in both organizations varied considerably in the extent to which they consistently relied on members' expertise and in the degree of performance pressure they were likely to face, making these organizations appropriate sites in which to study team-level expertise-use processes.

## STUDY 1: METHODS AND MEASURES

### Data Collection and Sample

For Study 1, I empirically tested my set of hypotheses by focusing on AuditCo (Survey 1) so that I could examine a range of both audit and consulting project teams while controlling for organization-level factors. I sent a survey to 110 teams at AuditCo with the aim of assessing teams with a wide range of upcoming projects. Following advice from interviewees in the preliminary study, I selected teams that varied on three dimensions: (1) client's governance category (publicly listed firm, subsidiary of an international corporation, or privately held firm) as an indicator of the complexity (most to least, respectively) of the firm's financial reporting requirements; (2) client's length of relationship with AuditCo as an indicator of project uncertainty (the shorter the relationship, the more uncertain); and (3) size of the team's office as an indicator of interpersonal familiarity.

For each of the selected teams, a staffing manager provided a roster of the team members' names and email addresses. I considered members to be part of the "core" team if they were expected to devote at least 50 percent of their working time to the focal project. Each core team member received two Web-based surveys via email. The first, Survey 1, sent within the team's first three days on the project, assessed the degree to which team members recognized teammates' general and domain-specific expertise. The second, Survey 2, administered during the team's final week on the project, assessed expertise use. In general, people responded within four days of receiving the survey. The response rate (i.e., people who answered at least one survey) was 82 percent, for a total of 592 individuals, representing 104 teams (69 audit, 35 consulting). Five hundred people answered both surveys. Following standard practice in teams research (e.g., Gladstein, 1984), I included a team in my study only if at least half its members responded, applying an even more rigorous cut-off for teams with fewer than five members (requiring at least three valid responses). I disqualified five teams on this basis, leaving me with 99 teams.

For these 99 teams, respondents' mean age was 30 and 66 percent were male. Auditors had an average of three to four years of work experience at AuditCo, with just a slightly higher total average of years working since university. Consultants' average tenure at AuditCo was nearly two years, with about six years of post-university work experience. For both audit and consulting teams, at the start of a project, team members had previously worked with each other for less than two months on average.

For each participating team, I conducted a follow-up interview and a survey with the senior partner who had been responsible for the relationship with the client but who had not been involved in the team's day-to-day work and had not been included as a team member for survey purposes. These data provided input for "performance pressure" and were collected within one month of the project's completion.

The senior partner for each team was asked to provide the name of up to three key contacts at the client organization who could evaluate the team's performance. Key contacts were defined as those the partners considered to be one of the "main" clients (e.g., CFO, finance director, or audit committee chair for audit teams; managing director, head of strategy, or business unit vice president for consulting teams).

To measure team performance, I conducted a client survey for 70 of the 99 teams. Data for two other teams were collected as part of AuditCo's formal client-service review process, conducted by a professional agency that added the exact questions from my surveys to its standard protocol and sent me the responses. I was unable to collect performance data from the remaining 27 clients for various reasons.[1]

The 72 teams (50 audit and 22 consulting) with complete team and performance data constitute my final sample. To check for possible bias between the 72 teams that were included and the 32 that were excluded, I ran independent sample t-tests on the following variables (all for the team-level means): performance pressure, general expertise, domain-specific expertise, team performance as rated by members on Survey 2, and team performance as rated by partners. Results confirmed that there was no significant difference between the two sets of teams.

Finally, I collected archival data from AuditCo. The database of timesheet records provided information on professionals' experience at the focal client and the business development department supplied information on the firm's years of service with each client.

**Measures**

*Performance pressure.* On a five-point Likert-type agreement scale, each team's partner rated the level of pressure that the team faced from each of three sources: the firm's leaders ("This engagement has a lot of visibility with senior members of AuditCo's client service team"), the client ("Future engagements with this client depend on the client's satisfaction with this audit [project]"), and the project manager ("Success on this audit [project] will significantly

[1] Among the reasons were the unavailability of client personnel (e.g., maternity/paternity leave, extended illness, or vacation), client involvement in sensitive issues (e.g., merger, acquisition, or lawsuit) that prohibited discussion with external parties, and AuditCo's own reluctance to include six client organizations that had recently been surveyed for an internal research project. Of the clients we contacted, only five declined to participate. No systematic bias is evident based on these reasons.

affect the (Senior) Manager's prospects for advancement within AuditCo"). Confirmatory factor analysis suggested the appropriateness of averaging the three items for a single scale ($\alpha$=.76).

As a reliability check, the performance pressure data were also collected from team members (Survey 2). Correlations between partners' and teams' responses to these items confirmed that team members did perceive the performance pressure ($r$=.68, $p$<.001), but to minimize same-source bias the partner scores were used in the analyses reported below. I acknowledge that levels of performance pressure might vary at different points during a project and that my measures only capture that level on average across the whole project, but the correlation between team members' and partners' scores on this construct suggest that the items capture a reliable average score for the team.

*Team performance.* The extent to which a team's output meets or exceeds its client's standards is a core indicator of team effectiveness (Hackman and Walton, 1986). I therefore used assessments from each project team's client as the basis for evaluating team performance. Using five-point agreement scales, clients for each team responded to three survey items: "Our organization was 100% satisfied with the outcome of this audit"; "Based on this project's outcome (i.e., quality, robustness, timeliness, met expectations), we will almost certainly engage [AuditCo] for future audits"; and "Based on our satisfaction with this year's audit, we are very likely to recommend [AuditCo] to other companies." Item scores were averaged to create a single scale ($\alpha$=.82).[2]

*Team effort-directing actions.* Data to examine teams' effort-directing actions (the proposed mediator between performance pressure and team performance) were drawn from responses to an open-ended question on Survey 1: "Name several things that this team does

[2] Where necessary, items were phrased to capture information about the "audit" for audit teams and "project" for the consulting teams.

especially well (compared to your experience in other AuditCo teams) and some areas where it could improve." Two independent research associates coded responses for use of effort-directing actions, using definitions from prior research on task planning (McGrath, 1984), knowledge coordination (Rico et al., 2008), and morale-building communications (Weldon and Weingart, 1993). Inter-rater reliability was acceptably high ($\alpha$. >80) (Krippendorff, 2004); disagreements were resolved by the first author. I discarded data from the nine teams in which fewer than half the respondents provided a sufficiently detailed response to this question. Respondents received one point for mentioning each effort-directing action (up to three points per response). I tallied scores by team and divided by the total number of team members to create an overall measure of team effort-directing action.

*General professional expertise.* Consistent with prior research (Hitt et al., 2006), I used objective indicators to capture general professional expertise: level of professional/technical qualifications (i.e., level of technical certification/degree) and professional tenure (i.e., number of years in accounting for auditors, in consulting for consultants). Team members completed these items as part of a larger set of demographic questions at the end of Survey 1. They were standardized separately for audit and consulting teams, then averaged to create a composite score for each person. The individual-level general expertise measure was used as the basis for the measure of recognition of general expertise (discussed below); team members' scores were averaged to create a team-level measure of general expertise.

*Domain-specific expertise.* Archival data from AuditCo's timesheet database indicated how many hours each team member had booked to that particular client for each of the three fiscal years prior to the project's start. Time spent at the client is a proxy for domain-specific expertise, consistent with prior research showing that professionals learn by doing (Itami, 1987;

Lowendahl, Revang, and Fosstenlokken, 2001). Although individuals may learn at different rates, this approach provides a clean measure of each person's prior opportunity to acquire domain-specific expertise. Each individual's data were summed across years and then standardized separately for audit and for consulting teams. The individual-level domain-specific experience measure was used as the basis for the measure of recognition of specific expertise (below); team members' scores were averaged to create a team-level measure of domain-specific experience.

*Recognition of general expertise.* I adapted Austin's (2003) measure of expertise recognition for field-based project teams. On Survey 1, using a five-point scale (very little expertise to great expertise), team members were asked to rate themselves and each other on five dimensions of expertise long recognized in the accounting literature as the core skills necessary for incoming auditors (e.g., Johnson, 1975): technical skills, identifying improvement opportunities, oral and written communications, project management, and client relations.[3] AuditCo's head of human resources confirmed that these five dimensions are considered critical for effective client service; AuditCo uses them for individual evaluations at the end of each project and they are the building blocks of the firm's foundational training program. Wording on the surveys reflected descriptions used in AuditCo's training materials and the heads of both the audit and consulting divisions approved the items. Measures of inter-member agreement — rwg(j), using a uniform expected variance distribution— indicate that team members shared beliefs about each member's level of expertise (James, Demaree, and Wolf, 1984): Mean rwg(j) was .92, median rwg(j) was .93. Moreover, intraclass correlations (ICCs) provided evidence for sufficient inter-member reliability: ICC(1)=.29, ICC(2)=.62; $F(90,262)=2.62$, $p<.001$. ICC(1)

[3] Asking respondents to rate themselves was intended to increase their engagement in the rating task, thereby enhancing the accuracy of their rating of co-workers (Saavedra and Kwun, 1993), but self-scores were not used to measure team-level expertise recognition.

indicates the percentage of variance in ratings due to team membership, whereas ICC(2) indicates the reliability of differences between team means (Bliese, 2000).

Expertise recognition implies that people should rate their team members' expertise in line with their actual levels of expertise—giving the highest general expertise ratings to those with the highest general expertise and so on—as measured by the two items described above. To calculate the accuracy of teams' expertise recognition, I first regressed each individual's objective general expertise score on the mean expertise rating provided by his or her team. The residuals from this model are the individual-level deviation between a person's actual general expertise and his or her teammates' perceptions of that expertise, while avoiding the problems of calculated difference scores (Edwards, 1995). For each team, the average of the squared residuals across all team members thus represents the team's overall deviation in assessing one another's general expertise. These scores were multiplied by negative one so that higher scores (closer to zero) indicate teams' more accurate recognition (i.e., less deviation from reality).

As a robustness check, I also calculated this measure as the team-level correlation between members' actual expertise (their general expertise score, above) and the mean rating of each member by teammates (excluding self-ratings). Such a method has been used in prior research on team-level alignment between expertise recognition and use (Bunderson, 2003). Correlations between the two measures (i.e., residuals-based and correlation-based) were high and significant ($r>.40$, $p<.01$); tests of all hypotheses using both methods produced similar results.

*Recognition of domain-specific expertise.* Parallel to the measure of recognition of general expertise, this variable was calculated by first regressing each team member's actual expertise (his or her objective domain-specific expertise score, above) on his or her mean rating from team members. The team measure is the average squared residual across all team members, reversed so that higher scores indicate more accurate recognition. Again, robustness checks using a team-level correlation measure (Bunderson, 2003) confirmed a significant correlation between the two approaches and the expected relationship of this measure with other Study 1 variables.

*Use of general and domain-specific expertise.* **U**sing team members' expertise effectively means giving each individual influence over the team's end product in proportion to his or her level of expertise (Bunderson, 2003). I captured expertise use on Survey 2 (administered during the final week of the project). Respondents were asked, "How would you rate yourself and each of your team members in terms of the amount of influence you each had over the team's final deliverable to the client. In other words, how much did each team member shape, direct and contribute to the team's product?" Responses were captured on a seven-point scale (from very minimal to very extensive). Measures of intermember agreement—the average rwg(j), using a uniform expected variance distribution, was .84 and the median was .88—indicate that members shared perceptions about how much each member's expertise had been used (James, Demaree, and Wolf, 1984). Intraclass correlations (ICCs) suggest sufficient intermember reliability: $ICC(1)=.54$, $ICC(2)=.83$; $F(102,322)=5.87$, $p<.001$.

This measure of expertise use, like the measures of expertise recognition, constitutes the team-level average deviation (squared regression residual) between each member's general or domain-specific expertise score and the influence score given to her or him by teammates.

*Control: Firm-client prior relationship.* A professional firm's prior relationship with a client could enhance client ratings; AuditCo's total number of years' service with each client was therefore used as a control variable in testing hypotheses 1 and 4. These data were provided by

AuditCo's business development function; audit records for all public companies were cross-checked on the FAME database of company reports (Bureau van Dijk Electronic Publishing).

*Control: Project complexity.* Consistent with prior research on team knowledge processes (e.g., Lewis, 2003), I included project complexity as a control in testing all hypotheses. Partners used a five-point agreement scale to compare the focal project to the "average" AuditCo project or audit they had experienced: "This audit [project] team has a more complex or technically challenging issue to address," "This audit [project] requires more professional judgment (i.e., forming opinions, not just gathering facts)," and "This audit [project] demands that the ideas of all team members be shared in order to succeed." Partners' scores were significantly correlated with team members' perceptions of complexity ($r=.65$, $p<.01$; rated during Survey 2); to minimize same-source bias, I used partners' ratings for this measure. ($\alpha=.70$)

*Control: Team size.* Because team size is likely to affect members' ability to recognize others' expertise (Littlepage and Silbiger, 1992) and may influence a client's perception of the team's work, this variable was included as a control in all analyses.

*Control: Project duration.* Longer projects may also affect teams' expertise use or give them more time to apportion influence or establish stronger relationships with clients, whereas shorter projects might place teams under greater time pressure. Project duration (number of months) was included as a control in all analyses.

**Results**

Table 1 shows descriptive statistics and pair-wise correlations for all variables.

--------------------- INSERT TABLE 1 ABOUT HERE ---------------------

I used hierarchical OLS regression to test my hypotheses. Hypothesis 1a, which predicted a direct effect of performance pressure on team performance, was supported ($\beta=.55$, $p<.001$), as shown in Table 2 (Model 2). Hypothesis 1b predicted that these effects are partially mediated by team effort-directing actions. Given the results of H1a, assessing the support for partial mediation requires two further steps (Baron and Kenny, 1986), both of which were supported by my results: (1) The effect of performance pressure (independent variable) on effort-directing actions (mediator) was found to be significant, ($\beta=.32$, $p<.05$) and (2) the effect of performance pressure on performance (dependent variable) lessened when effort-directing actions were included in the model. Further analysis of hypothesized indirect effects using the Preacher and Hayes (2008) bootstrapping procedure were significant at the ten-percent level, indicating that partial mediation has occurred (Baron and Kenny, 1986; Kenny, Kashy, and Bolger, 1998).

--------------------- INSERT TABLE 2 ABOUT HERE ---------------------

Table 3 shows the results for the effects of performance pressure on team expertise use. Confirming findings from prior research, I found that recognition of general professional and domain-specific expertise led to their more effective use (Table 3, Models 1 and 4, respectively).

I predicted that performance pressure would moderate this relationship between expertise recognition and use, with the direction of its effects dependent on the expertise type. Specifically, I tested Hypothesis 2—that the higher the performance pressure, the greater the extent to which teams would rely on recognized general professional expertise—by regressing teams' use of general professional expertise on an interaction term between performance pressure and recognition of general professional expertise. This hypothesis was supported, as shown in Table 3 (Model 3): Performance pressure increases the relationship between recognition and use of general professional expertise ($\beta=.29$, $p<.05$).

Hypothesis 3 predicted that the higher the performance pressure, the lesser the extent to which teams would rely on recognized domain-specific expertise; that is, performance pressure would weaken the link between teams' recognition and use of domain-specific expertise. This hypothesis is also supported, with Table 3 (Model 6) showing the moderation effects of performance pressure on the use of domain-specific expertise: Performance pressure decreases the relationship between recognition and use of domain-specific expertise ($\beta$=-.27, $p<.05$). Using Aiken and West's (1991) method for graphing interactions, Figure 1 shows the contrasting effects of performance pressure on the use of recognized general professional expertise and recognized domain-specific expertise.

-----------------INSERT TABLE 3 ABOUT HERE ------------

-----------------INSERT FIGURE 1 ABOUT HERE -------------

I also predicted that teams' effective use of their members' general professional expertise (H4a) and domain-specific expertise (H4b) would be associated with higher performance. As shown in Table 4 (Model 2), effective use of general expertise was not significantly associated with performance; Hypothesis 4a was not supported. However, as predicted by H4b, the use of domain-specific expertise was positively linked to performance (Table 4, Model 3: $\beta$=.24, $p<.05$). Hypothesis 4c predicted that the performance-enhancing effects of domain-specific expertise would be stronger than those of general expertise. As shown in Table 4 (Model 4), the effects of domain-specific expertise use are positive and significant ($\beta$=.45, $p<.01$), whereas those for general expertise use are non-significant. Controlling for the direct effects of performance pressure, my variables together explain 32 percent of the variance in teams' performance. To test hypothesis 4c I used the "seemingly unrelated estimation procedure" (SUEST command in Stata12). This procedure is an extension of the linear regression model which allows estimation of different equations for the different expertise types but takes into account the correlation of errors between equations. Results show that there is a significant difference between the two equations ($X2= 3.75$; $p < .05$), supporting H4c.

--------------------- INSERT TABLE 4 ABOUT HERE ---------------------

**Study 1 Discussion**

Tests of my predictions on a field sample of 72 audit and consulting teams from a Big Four accounting firm demonstrate that performance pressure enhances team performance, possibly by motivating team members to achieve superior performance, but that it also interferes with teams' effective use of different kinds of expertise. Specifically, teams under performance pressure rely more on general expertise at the expense of using domain-specific expertise that could allow them to customize their work and better satisfy their clients. Surprisingly, my results indicate that use of general professional expertise does not enhance team performance. To explore why, I conducted a number of follow-on interviews with AuditCo clients and returned to the transcripts of post-project interviews. Clients reported that when they hire a Big Four accounting firm, they expect project teams to have sufficient general professional expertise to deliver a satisfactory outcome. But for a client to be very highly satisfied—enough, say, to recommend AuditCo to peers—the team must tailor its work so that the client can readily understand and apply it. Clients told me that the more critical the project, the more they expect a "bespoke" rather than "cookie cutter" solution. Such customization depends on the team applying domain-specific expertise. In sum, my findings show that when teams need domain-specific knowledge the most, they tend to use it the least, despite evidence suggesting they are highly motivated to do well on their task.

**STUDY 2: EXPLORING BEHAVIORAL MECHANISMS UNDERPINNING KNOWLEDGE-SUPPRESSION EFFECTS**

In Study 2, I aimed to uncover *how* performance pressure affects team processes such that members focus on one kind of expertise at the expense of another—even to the extent of discounting expertise previously recognized as valuable. I sought to uncover specific group processes that underpin teams' differential use of different types of expertise and to identify the roles team members play in affecting expertise use. Following Edmondson (1999), I designed my follow-up study as a combination of team observations and interviews to explore the behavioral mechanisms that underpin knowledge-suppression effects in teams, rather than to confirm or disconfirm hypotheses.

**Sample and Data Collection**

I conducted six in-depth case studies of project teams. I refer to each team by its client sector: the four from ConsultCo are called Pharma, Retail, Biotech, and Banking, and the two from AuditCo are Energy and Medical. The two firms' staffing directors selected these teams based on (1) their start date and expected duration, (2) their size, and (3) content variation. I followed each team through its entire project (three to ten weeks), observing at least one team meeting per week, each lasting one hour to three hours. In total, I observed 45 meetings totaling over 81 hours (see Table 5 for details).

I recorded all meetings and took extensive notes to capture both verbal and nonverbal indications of the team process (e.g., team members taking notes, turning their backs on others, raising their voices, checking a BlackBerry while someone was speaking, nodding in agreement, making deliberate eye contact with others). I also observed and noted pre- and post-meeting discussions (e.g., comments a team member made while escorting me to the day's conference room) and any relevant comments in emails sent to me by project team members. After each project ended, I also interviewed the team leader, the partner responsible for the project, and at least one other team member about their experiences.

All meetings were transcribed. I assembled the transcripts and other materials into comprehensive chronological case histories for each of the six project teams. These documents provided the source material for the analyses described below.

-------------------- INSERT TABLE 5 ABOUT HERE ----------------------

**Analysis of Qualitative Data**

Because performance pressure may vary at different phases of a team's project, I used my case studies to capture more fine-grained data than my two surveys allowed. My highest unit of analysis was the team meeting, where interpersonal behaviors are most easily observed both by the researcher and by members themselves. Actions that are evident to group members are likely to influence their own subsequent actions (or inaction).

**Data coding and reliability checks.** Because my objective was to uncover how performance pressure affects team processes such that members focus on one kind of expertise at the expense of another, I content-analyzed the source material and coded for three types of information: (1) level of performance pressure per meeting, (2) team behaviors and processes involving expertise usage, and (3) reference to expertise types.

First, to determine the amount of performance pressure associated with each meeting, I analyzed transcripts and other notes associated with the meeting to understand how critical it seemed at that particular point in the project for the team to perform exceptionally well. For example, some meetings were attended by a very senior partner or involved a phone call to a client steering committee member; some meetings involved direct references to performance pressure (e.g., "Now we're in the hot seat, guys" or "All eyes are on us today"). I extracted relevant passages and assessed the level of performance pressure per meeting on a seven-point scale. Then two research assistants, blind to the study's purpose, independently coded those passages for a subsample of 12 meetings to assess the reliability of my coding procedure. Because inter-rater reliability was high (Krippendorff's $\alpha$ >80) I used my own ratings for the remaining 33 meetings.

Second, to understand team behaviors and processes, I content-analyzed the source material using a three-stage coding procedure, progressing from "descriptive" to "interpretive" to "pattern" coding (Miles and Huberman, 1994). Initially I generated a start list of codes from prior research that focused on small-group decision-making or problem-solving interactions, focusing on actions indicating an individual's own participation (e.g., content contribution; Futoran, Kelly, and McGrath, 1989), his or her pursuit of additional knowledge related to team performance (e.g., information seeking; Durham et al., 2000), or his or her use of another's contributions (e.g., adoption; Baumann and Bonner, 2004; Littlepage and Mueller, 1997). Table 6 provides a sample of my starting codes. I treated these as "descriptive codes," which are meant to categorize segments of text according to a certain class of phenomena (Miles and Huberman, 1994). As I initially coded my data, I focused on identifying individual actions, including both verbal and behavioral expressions, which represented expertise contribution, use, support, or their opposites. While conducting interpretive coding in my next step (see below), I modified my list of descriptive codes to capture additional actions embedded in the sequences. For example, additional codes for verbal expressions included apologizing for a mistake, interrupting, and acknowledging another's contribution; additional codes for nonverbal expressions included turning one's back on the speaker, checking one's Blackberry, and taking notes. I added these codes selectively, based on my judgment of whether they added meaning to the expertise-related behaviors; for example, I interpreted turning one's back on the speaker to be a signal of disinterest in or disagreement with that person's contribution, but I did not code instances of people eating because those actions seemed irrelevant to expertise use.

-------------------- INSERT TABLE 6 ABOUT HERE ----------------------

Next, I assigned "interpretive codes" to data units (individual expressions or small sequences of them) to which I had already assigned descriptive codes. Interpretive codes are meant to reflect a deeper understanding of the situation dynamics and to offer an additional layer of insight into the coded material (Miles and Huberman, 1994). I sought to understand how units fit into the context of the broader interaction, with reference to the actors' positions on the team where appropriate. Thus, when one team member opposed another's input, it was coded as a *contribution challenge*; a series of disagreements about a specific idea was grouped together as *task conflict*; turning one's back on a speaker and checking one's Blackberry were combined as *showing disinterest*. I iterated between my data and existing research to understand how to interpret the data; wherever possible, I adopted terminology consistent with prior literature.

I then analyzed the coded data to uncover behavioral patterns across larger passages. Generally, pattern codes depict how initial descriptive and interpretive codes fit together (Miles and Huberman, 1994). I sought meaning in the patterns as it related to my research question: How does performance pressure affect team processes such that members focus on one kind of expertise at the expense of another? Again, I iterated between my data and existing small groups research to understand how data units fit together into meaningful processes; some prior studies (e.g., Edmondson, 1999) include specific examples of representative text against which I could compare my component statements. I ended up with eight pattern codes: discouraging debate, dominating, encouraging debate, participative problem solving, reflecting, reinforcing, seeking novel inputs, and undermining.

I tested the reliability of my coding procedure by asking two coders, unrelated to the study, to classify a representative set of 160 interpretive segments (about 20 percent of the total) using the eight pattern codes I provided. The overall agreement with the coding scheme was acceptable (Krippendorff's $\alpha$ =.76).

Finally, I coded the source material to indicate two sorts of expertise-related information. First, I examined the relative level of general expertise and domain-specific expertise for every person included in my observations, based on details about each team member's prior client and professional experience provided to me by the firms at the end of my observation period. I categorized the team member(s) with the highest level of each type of expertise as that type of expert, allowing for multiple designations in case team members' levels were very similar.[4] Others were categorized as "other team member." Second, I coded source material to indicate clear references to domain-specific expertise or general professional expertise. For example, I coded as referring to domain-specific expertise statements that involved or suggested knowledge about individuals at a client firm, that involved or suggested idiosyncratic procedures at the client firm (e.g., the phrase "proprietary system"), or that explicitly referred to something as being unique to a particular setting or requiring a departure from standard practice. I coded as general professional expertise those passages that referred directly to industry-wide frameworks, AuditCo or ConsultCo methodologies, and so on. Ambiguous passages were left uncoded. My

[4] In principle, expertise categories were not mutually exclusive because the same person could have the highest level of both domain-specific expertise and general professional expertise. In practice, we found only one person in our sample who tied for the highest level of general expertise and who also had the most domain-specific expertise. We assigned both expert-type codes to him.

two research assistants coded 50 (nearly 10 percent) of these statements to check reliability; average agreement with my codes was acceptable (Krippendorff's $\alpha$ =.79).

Data analysis. Addressing my research question– how performance pressure affects team processes such that members focus on one kind of expertise at the expense of another – involved three sets of analyses following coding: (1) mapping the knowledge-use behaviors of team members under varying levels of performance pressure, (2) overlaying role assignments onto team members (i.e., general professional expert, domain-specific expert, other team members) and evaluating how coded behaviors affect expertise contribution and use, and (3) investigating how the knowledge-use processes vary under different levels of performance pressure.

*Analysis1.* To analyze the effects of performance pressure on team members' behaviors, I created within-case person-by-meeting data matrices for individual behaviors (Miles and Huberman, 1994). Specifically, for each case (project team), each row represented a meeting and each column represented a person on the team. I extracted complete passages and their related descriptive and interpretive codes, then clustered them by code and summarized them, creating a matrix of each person's behaviors by frequency per meeting. At this stage, I added each meeting's performance-pressure values (created in step 1 of the coding, described above) to the matrix. These matrices thus provided a summary of the types of behavior that occurred within each team, arranged by level of performance pressure. As another analytic tool, I generated process maps for a number of sequences for each team, selecting processes that occurred across ranges of performance pressure for each team. I examined both the matrices and the process maps in order to understand the association between performance pressure and knowledge-use behaviors, making note of specific segments of interest for my next analysis.

*Analysis 2.* To focus on the behaviors supporting or undermining teams' use of different kinds of expertise, I began by analyzing individuals' behaviors with respect to the expert roles assigned to them in the third stage of coding ("general expert," "domain expert," or "other team member"). I returned to the process maps created in the first phase of analysis and matched each team member with his or her corresponding expertise level. (See Figures 2a and 2b for example process maps of AuditCo's Medical team in high- and low-performance-pressure meetings, respectively.) Next, I overlaid the expertise codes for the discussion content—that is, the codes from the third step of coding that indicate references to different kinds of expertise. So, for example, if a process map indicated that Person A (general expert) contradicted an idea, I noted whether that contested idea involved general professional expertise or domain-specific expertise. I then analyzed these maps to understand the sequence of actions by role and added to the diagrams my interpretation of the meaning conveyed at various stages in terms of its impact on expertise use. (See Figures 3a and 3b for examples of how I modified the process maps to include my interpretations.) I found that four processes were particularly strongly associated with favoring general professional expertise and suppressing domain-specific expertise, as I detail in the results section below.

-------------------- INSERT FIGURES 2A AND 2B ABOUT HERE -----------------------

-------------------- INSERT FIGURES 3A AND 3B ABOUT HERE -----------------------

*Analysis 3.* To evaluate the relationship between the variations in performance pressure and the team knowledge-use processes emerging from my prior analysis, I created a between-case process-by-pressure-level matrix with my four knowledge-use processes (uncovered in analysis 2) in order to understand the pattern and frequency of these processes relative to performance pressure. In other words, rows represented the varying levels of pressure, each column represented a team, and cells were populated with the team processes that occurred at each meeting characterized by that particular level of performance pressure. I studied this matrix to identify the processes that, across teams, were prevalent at high versus low levels of performance pressure.

**Results**

This section first summarizes the findings from each of my three analyses, then elaborates each of the four knowledge-use processes that I uncovered. I explain how these group processes underpin teams' differential use of different types of expertise and show the roles team members play in affecting expertise use.

My first set of analyses identified the team knowledge-use behaviors that were prevalent at high versus low levels of performance pressure. For example, under low performance pressure, team members were more likely to exhibit such knowledge-use behaviors as asking for clarification, taking notes, and acknowledging each other's contributions. Conversely, in high-performance-pressure meetings, team members were more likely to display behaviors that undermined the group's optimal use of members' expertise, such as interrupting, checking emails while another is speaking, and telling others to stop contributing domain-specific expertise. Table 7 summarizes illustrative behaviors, classified into those typically occurring under high versus low performance pressure. For example, in ConsultCo's Pharma team (see Table 7, Row 1), when performance pressure was high, the domain-specific expert's peers pushed him to stop dissenting from the general expert's standardized recommendations. In ConsultCo's Retail team (Table 7, Row 3), a domain-specific expert who actively contributed in low-performance-pressure meetings changed her behavior during high-performance-pressure meetings, not contributing until asked to do so. In ConsultCo's Banking team (Table 7, Row 5), the general professional expert, who was also the team leader, invited dissent and "what if" scenario work in low-performance-pressure situations, but directly dismissed unique domain-specific contributions under high performance pressure.

-------------------- INSERT TABLE 7 ABOUT HERE --------------------

Through analysis 2, which involved generating and interpreting process maps, I refined my understanding of team behaviors in order to pinpoint their effects on knowledge use and to identify members' roles in that process. Four team processes seemed especially strongly associated with team knowledge-use behaviors: (1) a heightened drive for consensus, (2) an increased propensity to focus on common knowledge, (3) a switch in priorities from learning toward project completion, and (4) an emphasized conformity to each member's position in the team's hierarchy. As a result of each process, teams inadvertently end up paying more attention to general expertise than to domain-specific expertise. Indeed, some of these processes resemble those discussed in prior small groups research, such as the increased pressure for uniformity (Schachter et al., 1951) or common-knowledge effects (Stasser, 1999), although existing research had not examined performance pressure as an antecedent or team use of differing kinds of knowledge as an outcome.

As an example of these four processes, low-performance-pressure and high-performance-pressure instances of the consensus drive occurred in AuditCo's Medical team and are contrasted in Figures 3a and 3b. During a low-pressure meeting, the leader, who had the greatest general professional expertise but not the greatest domain-specific expertise, used open-ended questions to elicit the team's ideas; members participated fairly equally. The domain-specific expert contributed her knowledge of the client's particular record-keeping system. Her colleagues expressed their support, both verbally and nonverbally, and her idea was ultimately accepted as the team approach. But during a high-pressure meeting, the general professional expert asked fewer but more directed questions and nearly all discussion was a two-way exchange between him and one other team member at a time. The domain-specific expert made one attempt to challenge the general professional expertise, but she was rebuffed by both the general expert (verbally) and her team members (nonverbally) and ultimately retracted her suggestion.

Next, I sought to understand how individuals' roles on the team (i.e., general professional expert, domain-specific expert, or other team member) affected their expertise use. Through my examination of within-case matrices and the process maps, I found that team members of all role types initiated, accepted, and reinforced the full range of knowledge-use behaviors; there was no clear pattern suggesting that the general professional expert, the domain-specific expert, or other team members were more or less responsible for the way the team used knowledge.

Analysis 3 identified the prevalence of the four processes across teams under varying levels of performance pressure: Eighty-two percent of the instances occurred in meetings with above-average levels of performance pressure. This distribution strongly suggests a link between these four processes and performance pressure. Analysis 3 thus replicates the pattern, found in Study 1, of teams relying more on general professional experts than on domain-specific experts under higher performance pressure and helps us understand how this process unfolds.

**Consensus Drive.** The first knowledge-use process that I found to be associated with high performance pressure was a strong collective drive toward consensus on the part of general professional experts, domain-specific experts, and other team members. Specifically, I observed that team members transitioned from intentionally stirring up dissent in low-pressure meetings (e.g., asking the domain-specific expert to play "devil's advocate") to focusing more on ideas that were supportive of the group's emerging consensus (e.g., asking more questions, probing for more detail, providing encouraging nods, writing ideas on flip charts) while discounting dissenting ideas both nonverbally (e.g., rolling eyes, turning one's back) and verbally (e.g., "Keep up the debate and we'll be here all night") during higher-pressure meetings. Also, when under higher performance pressure, teams tended to solicit general experts' views about typicality more frequently (e.g., "How does this usually play out?"), whether there was a single general expert (as in the Biotech team) or a pair (as in the Energy team). In addition to these changes to collective actions—often peer-to-peer—leaders began silencing debate more as the pressure increased. In particular, I found that when dissent stemmed from domain-specific expertise that contradicted general practice, general experts directly countered the objection by using numerous concrete examples to demonstrate their general professional expertise. Finally, I noted several examples of domain-specific experts apparently self-censoring under high pressure; for example, by starting to object to a point, then rapidly backing down ("OK, never mind") after being rebuffed by others.

The Banking team provides an illustration of the shift to consensus drive as performance pressure increases (summarized in Table 8).

-------------------- INSERT TABLE 8 ABOUT HERE --------------------

**Common Knowledge Focus.** I observed a second process that produced a greater focus on general expertise rather than on domain-specific expertise: Higher performance pressure exacerbated groups' well-known propensity to attend to information that is more commonly held across members (Wittenbaum and Stasser, 1996; Stasser, 1999). In the Biotech team, for example, both the (high-ranking) partner and one (low-ranking) analyst were Ph.D. chemists and "garage tinkerers" who created and tested homemade biofuels; both had previously served this same client on several other projects. In lower-pressure meetings, they often paired their specialized chemistry knowledge with their domain-specific expertise to help the team think through implications for the client's issue. Team members welcomed their contributions by asking questions, making supporting gestures or responses (e.g., nodding or saying, "Aah, I get it"), and sometimes explicitly changing written drafts of client reports to reflect the experts' ideas ("That settles it. This chart needs to be edited to take on board what [the expert] just said.") Similarly, in lower-pressure meetings this team took account of their client's internal politics ("How would this proposal affect [one VP]'s group versus [another]'s?"), of which only the two domain-specific experts were aware.

Under higher pressure, however, the chemists offered their specialist knowledge far less frequently and the team tended to discount it. For example, in one high-pressure meeting, the domain-specific expert started elaborating his specialized knowledge but the manager said "Let's table that for now" and ignored the suggestion. I saw a parallel pattern in the Banking team: Under lower pressure, the team carefully considered information about their client's specific history and strategy that most of the group had not known until the domain-specific expert contributed it, but under higher pressure, the team focused on widely known industry trends and analytic frameworks as the basis for its recommendations. Again, my evidence suggests that these processes are not top-down directives, but rather are collective processes equally likely to emanate from the general expert, the domain-specific expert, and the other teammates.

**Completion Orientation.** The third process that I distilled through my qualitative data across cases was an apparent shift away from a learning orientation in low-pressure situations toward a strict focus on "delivery" or completing the objectives in higher-pressure situations. For example, when ConsultCo's Retail team held meetings with lower performance pressure, they tended to use a process of "going around the table," soliciting ideas from all team members to jointly develop a client document. During this process, members often elaborated on their suggestions with examples, metaphors, or a narrative and teammates responded with questions, challenges, or comments before the next person took his or her turn. In the highest-pressure meetings, however, the general expert asked specific questions, one or two members responded—justifying their responses with evidence (usually quantitative), and then the discussion moved on. I observed a similar pattern of participation in the Banking and Biotech teams: Domain-specific experts could surface their expertise as part of the normal low-pressure team discussions, but lost this platform when high performance pressure limited such exploratory conversations.

The Medical audit team provides an illustration of the shift to completion orientation as performance pressure increases (summarized in Table 9).

-------------------- INSERT TABLE 9 ABOUT HERE --------------------

**Conformity to the Team Hierarchy.** The fourth process that I observed involved teams shifting their behaviors such that the higher the performance pressure, the more closely each person's actions reflected his or her position in the team's hierarchy; collective actions (verbal and nonverbal) reinforced the tendency. Across the teams in my field sample, I found that when performance pressure was higher, lower-ranked members typically exhibited a greater number of deference behaviors and far fewer dominance behaviors than they did under low pressure, while senior members displayed primarily dominance behaviors and few deference behaviors when pressure was high. In addition, I documented various ways that team members influenced each other to behave in ways that were congruent with their formal roles on the team.

These contrasts were most clearly evident in the Pharma team, especially for the domain-specific expert ("Daniel"), who was relatively junior, and the general expert ("Simon"), who was the project manager. (Figure 4 summarizes these data.)  During the first third of their project, when performance pressure was fairly low (with an average rating of 3.5 on a 7-point scale), Daniel displayed more role-inconsistent than role-consistent behaviors. Despite his junior formal position, he tended to exhibit confident behaviors such as taking the lead in answering a client's question, contradicting others' viewpoints, and standing up during a team meeting to illustrate his argument with a diagram on the whiteboard. During this same early phase, Simon often exhibited deferential (role-inconsistent) behaviors such as acknowledging others' superior knowledge ("Don't look at me—Dan is the real expert on the team"), making self-deprecating jokes, and inviting others to present ideas to very senior partners in the firm. After the performance pressure increased dramatically, however, Daniel began behaving more and more in line with his junior rank for example by downplaying his contributions ("It might not be worth mentioning, but …"), speaking less frequently, and verbally deferring to more senior colleagues. In contrast, Simon's speech and actions became more and more dominant, such as interrupting others, giving orders, and arriving late to a meeting without explanation or apology. Under high pressure, the other team members were just as active in reinforcing Dan's low status. Although in low-pressure meetings they had deferred to him explicitly (e.g., asking him to help interpret analyses) and implicitly (e.g., turning to him before answering a question), during high-pressure meetings they physically turned their backs on him in order to face Simon. More senior team members repeatedly interrupted him and even one of his peers encouraged him to stop talking ("C'mon, that's enough already").

--------------------- INSERT FIGURE 4 ABOUT HERE -----------------------

**Study 2 Discussion**

I set out to understand how performance pressure affects team processes such that members focus on one kind of expertise at the expense of another and sought to uncover specific group processes and team member inputs that underpin this effect. My longitudinal case studies revealed four knowledge-use processes—consensus drive, common-knowledge focus, completion orientation, and conformity to hierarchy—that were especially prevalent when teams experienced high performance pressure. As a result of these processes, teams increasingly attended to general professional expertise and consequently minimized or ignored domain-specific expertise. Combining these results with my survey findings allows me to develop a more comprehensive conceptual model of performance pressure's effects on team process and outcomes, as depicted in Figure 5. I return to this conceptual model in the general discussion section below.

-------------------- INSERT FIGURE 5 ABOUT HERE ----------------------

Given any person's finite ability to focus on a set of knowledge (March and Simon, 1958), I suggest that the privileging of general professional expertise over domain-specific expertise that I saw in my case studies was a process of "crowding out" rather than a deliberate choice. Supporting this idea, my data further suggest that these effects are not the fault or consequence of any single individual, but rather result from a series of collective actions that emanate from the general expert, the domain-specific expert, and the rest of the teammates.

Post-project interviews further indicated that even members of the same team had varying awareness of how their team problem-solving approach had changed over the course of the project. There appeared to be no consistent differences in awareness between AuditCo and ConsultCo teams or between hierarchical levels. On the one hand, some team members readily acknowledged the increased reliance on general professional expertise when the pressure was higher, but said that they considered it “normal,” as a senior team member put it. A junior member of a different team said that this was “the way it just happens.” One mid-level team member laughingly called it the “sled dog mentality.” He explained, “When the blizzard hits, we just follow the dog in front. We might not get to our exact destination, but at least we’ll all arrive somewhere together.” His comments reflect the particular distribution of expertise on his team, because the “lead dog” was also the clear general professional expert, but reactions were similar even where seniority and expertise were less tightly correlated. One experienced partner with significant domain-specific expertise reflected that he had not intentionally withheld information about the particular client implications, but that he had deferred to the team’s generally accepted approach “because it wasn’t clearly wrong, even if it wasn’t ideal. It seemed like an expedient trade-off at that time [when we came under pressure], but we regretted it later [when the client called their report ‘ho-hum’ and ‘generic’].”

On the other hand, some interviewees seemed surprised when asked to reflect on their pattern of participation. When asked to describe his team’s functioning, the project manager of the Pharma team (“Simon,” whose dominance under pressure was shown in Figure 4) initially suggested that they had “become more efficient over time” and that he was pleased with everyone’s level of contribution. He paused for some time when asked about whether he had deliberately shouldered more and more of the workload as time progressed, then answered, “I just did it, sort of without thinking, really. Whatever seemed most natural. And I guess it worked because nobody said otherwise.”

It would appear, then, that the privileging of general professional expertise over domain-specific expertise results from otherwise normal processes that, under high performance pressure, are exacerbated to the point of dysfunction. For example, I saw that performance pressure increases the normal propensity to focus group discussions on commonly-held information (Stasser, 1999), such as the general expertise that all professionals learned during their training, at the expense of using uniquely held, domain-specific expertise learned through encounters with a particular firm. Thus, although it was apparently not their intention to suppress domain-specific expertise, each team member's actions contributed to this effect.

## GENERAL DISCUSSION

I set out to address a core puzzle in small groups research: Why do some teams fail to use their members' expertise effectively, even after having recognized it as valuable for the collective task? Teams need to draw on members' complementary knowledge and expertise in order to deliver high-quality performance on complex tasks (Hackman, 2002; Bunderson and Sutcliffe, 2002), but they often fail to do so, leading to suboptimal team performance and poor decision quality (Baumann and Bonner, 2004; Bunderson, 2003). Small groups research has identified many predictors of teams' ability to optimally use members' knowledge but has largely overlooked the effects of holding teams accountable for delivering high-quality results, despite the prevalence, significance, and relevance of this factor for real-world work groups (DeZoort, Harrison, and Taylor, 2003; Hackman, 2011; Lerner and Tetlock, 1999; Semin and Manstead, 1983; Tetlock, 1985). By integrating findings from research on individual accountability with small groups research, I developed a conceptual model that helps explain how performance pressure affects teams' use of different kinds of knowledge and how the ensuing patterns of knowledge use can result in suboptimal outcomes. Combining my proposed model with findings from a multi-method study allowed me to develop a more complete understanding of teams' knowledge-use patterns, as we can now explain how performance pressure produces both positive and negative effects on team interactions.

In Study 1, I tested my initial hypotheses on a field sample of 72 audit and consulting teams from a Big Four accounting firm. Study 1 confirmed my predictions that performance pressure has competing effects on teams: Although it improves performance through effort-directing actions, it limits teams' ability to draw effectively on the full range of members' knowledge. In particular, performance pressure leads teams to rely more on general expertise and less on the domain-specific expertise that could allow the team to customize its work and better satisfy the client.

In Study 2, I conducted a set of six longitudinal team case studies in order to uncover how performance pressure affects team processes such that members focus on one kind of expertise over another, even to the extent of discounting expertise previously recognized as valuable for their project. My findings highlight an irony of team life: When teams are under pressure to perform at their best—and even when they are motivated to do so—they engage in behaviors that actually constrain their performance.

My research contributes to the team effectiveness literature in three ways. First, this paper unpacks the construct of "team knowledge" to explain teams' differential use of different kinds of knowledge and link those expertise-usage processes to differences in team performance. Second, I uncover behavioral mechanisms that underlie these knowledge-usage and performance effects, showing how behaviors emanating from all members of the team contribute to biased information processing that is neither fully deliberate nor the fault of any single team member. Third, this paper introduces and conceptualizes performance pressure as a factor that makes it both more important for a team to use the full range of its members' knowledge and less likely that the team will do so. Cumulatively, these insights allow the development of a more comprehensive conceptual model to guide future research on performance pressure's effects on teams' knowledge use and effectiveness.  I elaborate each of the contributions below.

**Differential Use and Outcomes of Different Expertise Types**

This paper enhances theory of small group effectiveness by unpacking the concept of knowledge in groups, delineating the processes by which teams use different kinds of knowledge and linking those processes to team performance. Until now, research examining the use of knowledge or expertise in small groups has largely overlooked the multi-dimensional nature of task-relevant knowledge.  Lab-based studies typically operationalize group members' expertise by capturing the distribution of specific task-related facts (Hollenbeck et al., 1995; Stasser, Stewart, and Wittenbaum, 1995) or by measuring individuals' prior performance on a similar task (e.g., Littlepage, Robison, and Reddington, 1997).  Some field studies assess team members' overall work-related knowledge without specifying its dimensions (Bunderson, 2003); others assess members' backgrounds as proxies for distinct functional expertise but stop short of examining how teams actually use that expertise (Bunderson and Sutcliffe, 2002).

Much of the existing research thus masks the fundamentally different ways that teams use different kinds of knowledge, but an emerging set of studies suggests the importance of a more nuanced examination (Ethiraj et al., 2005; Haas and Hansen, 2005, 2007).  Haas and Hansen (2005) contrast the effects of management consulting teams' use of codified documents from a firm's database (akin to general professional expertise) with their use of personal advice from colleagues (customized knowledge helpful for tailoring projects to a specific client's need). They found that the higher the stakes of a consulting team's project, the more general knowledge hurt the team and customized knowledge helped the team. Yet, teams in higher-stakes situations were much more likely to rely on codified than on customized knowledge.  Haas and Hansen ask, “Why did these teams choose such seemingly mistaken strategies for utilizing knowledge?” (2005: 19), but can only speculate about factors associated with high-stakes projects.

I drew on findings from research on individual accountability to develop predictions about how teams use general versus domain-specific expertise differently. I propose that characteristics associated with general expertise (e.g., its commonality amongst professionals, its proven usefulness in solving varied problems across settings, its legitimacy based on links to the professional curriculum) make it more salient and safe. In contrast, I argue that using domain-specific expertise is riskier because (a) it is idiosyncratic to a single client setting and thus held only by individuals who have spent enough time with a particular client to acquire this expertise and (b) using such expertise requires other team members to deviate from the standard shared practices and scripts of their profession. Because outcome-accountable people typically opt for approaches that are legitimate and can be easily defended (see Lerner and Tetlock, 1999 for a review), I reason that such teams are more likely to use one another’s general expertise.

My research thus offers a novel explanation for Haas and Hanson’s (2005) findings and advances broader theory linking team knowledge use and effectiveness. Specifically, I unpack the concept of team knowledge, introduce fine-grained context-specific measures of both client-specific and general expertise, and explain how overreliance on general expertise is less useful for enhancing team performance. By delineating the contrasts between how teams use domain-specific and general expertise, I show the importance of specifying the types of expertise teams are using and theorizing more precisely about the effects each type may have on performance.

**Behavioral Mechanisms That Underlie Team Knowledge Use and Performance**

This paper enhances our understanding of small groups by uncovering behavioral mechanisms that link performance pressure with knowledge use and performance, thereby shedding light on how knowledge-suppression effects arise and unfold in groups. My longitudinal case studies suggest that performance pressure affects four group processes—consensus drive, common-knowledge focus, completion orientation, and conformity to hierarchy—that lead teams to privilege general expertise over domain-specific expertise. Overlooking expertise that is essential for excellent team results may appear irrational, but these knowledge-suppression effects appear to be neither fully deliberate nor the fault of any single team member. Instead, the underlying processes emerge from a series of collective actions that research has identified as typical group interactions, such as the reliance on shared versus unshared knowledge (Stasser, 1999). Further, these processes encompass the interrelated actions of a team's general expert, domain-specific expert, and other members, suggesting that no single person or role is responsible for the effects. This paper thus offers novel insights into how performance pressure exacerbates "normal" group processes that can lea d to the suppression of potentially performance-enhancing knowledge.

At the same time, this paper also establishes the link between performance pressure and teams' effort-directing actions, suggesting that performance pressure can motivate teams to achieve higher performance. The resulting conceptual framework accounts for both the motivational benefits and the knowledge-related process losses associated with performance pressure. By theoretically and empirically parsing the positive from the negative effects, we can begin to explain the various complex ways that performance pressure influences team effectiveness. I uncover simultaneous process gains and process losses in teams experiencing performance pressure, a finding that can account for some of the conflicting results in prior literature regarding pressure's effects on teams.

**Introduction and Conceptualization of Performance Pressure**

Finally, my study conceptualizes performance pressure as a distinct set of factors associated with demands for superior team performance, distinguishes performance pressure from other sorts of pressure that have been studied in small groups research, and points to its value in understanding teams' use of members' knowledge and related team outcomes. I define team performance pressure as an externally imposed set of three interrelated factors that increase the importance of a team delivering superior collective outcomes: shared outcome accountability, heightened scrutiny and evaluation of its work, and significant consequences associated with its performance. This construct is conceptually distinct from other sorts of pressure previously studied in small groups research in that it stems from the need for high-quality performance (as opposed to the need for survival or task completion) and can be anticipated and planned for. These distinctions inform my proposed theoretical arguments about performance pressure's effects on knowledge-related team processes and lay the foundation for further research.

**Boundary Conditions, Limitations, and Future Research**

Some of the limitations of this study point to opportunities for future research, which I incorporated as proposed moderators in my conceptual model, shown in Figure 5. First, the survey sample from within a single firm raises questions of generalizability. The relatively large number of teams and the inclusion of both audit and consulting projects may ameliorate the problem to some degree. Further, patterns in qualitative data drawn from a considerably different professional service firm closely mirror both the qualitative and quantitative data from the initial firm. Yet questions concerning generalizability outside the realm of professional organizations remain valid. In particular, team members in this setting seemed to have responded to performance pressure by becoming motivated and engaging in effort-directing actions that then led to higher performance. Future research testing my theoretical model in settings where teams are less willing and able to respond positively to performance pressure may find that its positive effects are significantly weaker, perhaps leading to a net negative effect on team performance.

Second, my findings that domain-specific expertise provides better performance than general professional expertise may not generalize beyond "opaque environments," in which it is difficult for a client to accurately or immediately assess the quality of a team's output, even after it has been delivered. In such situations, clients are likely to use customization—uniquely a product of domain-specific rather than general expertise—as a signal of quality. Settings classified as "opaque" range from advertising agencies (Broschak, 2004) and Central Intelligence Agency analysts (Hackman, 2010) to hospitals, biotechnology companies, and architecture firms (Von Nordenflycht, 2010), indicating that my findings on the suppression of domain-specific expertise warrant further attention. Further, regardless of the weight clients place on domain-specific expertise to evaluate performance, a team's systematic discounting of one sort of knowledge is likely to hamper its effectiveness in all situations where performance hinges on the effective use of members' full range of expertise. Future research could elaborate and test the specific task characteristics and settings that affect differential performance benefits of different kinds of team expertise.

Finally, there was no practical way to determine which team members were in fact the true experts. While experimental settings allow for the manipulation of expertise, field research typically relies on data that can best approximate actual expertise. In this paper, the strength of the expertise measures (such as hours charged to the client for prior work) lies in part in their objectivity, but I may err by assuming that, on average, these measures translate into higher levels of expertise. Again, the choice of setting helps to lessen these concerns, because it is commonly agreed that learning in professional service firms occurs primarily through professional practice (Lowendahl, Revang, and Fosstenlokken, 2001) and that the merit-based "up or out" promotion system makes it more likely that greater experience or tenure reflects greater expertise (Hitt et al., 2001). Future researchers might fruitfully consider seeking field-based research sites where each individual's pre-project expertise can be more accurately measured.

**Implications for Practice**

My research suggests that leaders can improve team performance by altering the conditions for teams facing high performance pressure. Research shows that when people are held accountable for the way they make a decision, not merely for the decision itself, they use relevant expertise more extensively (Paolini, Crisp, and McIntyre, 2009; Scholten et al., 2007). Team leaders should therefore consider ways to hold their teams accountable for their ongoing knowledge-use processes. In particular, leaders can conduct periodic reviews to ensure that members reflect on how effectively they are contributing their own expertise and integrating others' expertise. If the team is not relying on the contributions of members who were initially recognized as possessing important expertise, it needs to understand whether this shift is functional (e.g., the task has changed) or dysfunctional (e.g., pressure-induced discounting of important expertise).

**Conclusion**

Contemporary organizations use teams to address the complicated high-stakes projects characteristic of an increasingly competitive global marketplace. As the importance and complexity of projects increase, it becomes ever more vital that teams draw on the particular expertise of each of their members. Yet, as this paper documents, it is exactly at these moments when teams default to processes that lead them to ignore certain types of expertise, ultimately limiting their performance. My paper sheds light on the dual effects of performance pressure, showing how it enhances team motivation while undermining the use of team knowledge, thus opening a new door for future empirical and theoretical investigations of team effectiveness.

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**Table 1**
**Means, Standard Deviations, and Correlations**

| | Mean | s.d. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Prior relationship | 4.85 | 5.04 | | | | | | | | | | | |
| 2. Project complexity | 3.92 | 0.74 | .04 | | | | | | | | | | |
| 3. Team size | 7.36 | 3.40 | .06 | .18 | | | | | | | | | |
| 4. Project duration | 2.26 | 0.95 | .03 | .06 | .11 | | | | | | | | |
| 5. Average team-level general expertise [a] | .00 | 0.58 | .04 | .08 | -.27 | .09 | | | | | | | |
| 6. Average team-level domain-specific expertise [a] | -.04 | 0.37 | -.10 | .32 | .12 | .11 | .14 | | | | | | |
| 7. Performance pressure | 3.85 | 0.87 | .02 | .56 | .09 | .12 | .05 | .51 | | | | | |
| 8. Team recognition of general expertise | .53 | 0.37 | -.22 | .09 | .07 | -.06 | .01 | .16 | .08 | | | | |
| 9. Team recognition of domain-specific expertise | -.68 | 0.47 | -.02 | -.03 | .21 | -.06 | -.14 | .24 | -.03 | .33 | | | |
| 10. Effective use of general expertise | 1.85 | 1.78 | -.07 | .00 | .13 | -.15 | .00 | .02 | .05 | .23 | .28 | | |
| 11. Effective use of domain-specific expertise | -2.12 | 1.75 | -.05 | .07 | .17 | -.18 | -.11 | .10 | .13 | .14 | .29 | .71 | |
| 12. Team performance | 3.96 | 0.62 | -.17 | .24 | -.04 | -.03 | .01 | .29 | .55 | .07 | -.06 | .05 | .31 |

a = standardized scores
Correlations >=|.20| are significant at .05 (two-tailed) and >=|.25| at .01 (two-tailed).

**Table 2**
**Results of OLS Regression Analyses Predicting Main Effects of Performance Pressure on Team Performance (H1a, H1b)[a]**

| Variable | Model 1 | Model 2 (H1a) | Model 3 (H1b) |
|---|---|---|---|
| Prior relationship | -.13 | -.06 | -.01 |
| Project complexity | .221 | .01 | -.05 |
| Team size | -.08 | -.04 | -.06 |
| Project duration | -.01 | -.05 | -.07 |
| Average team-level general expertise | -.14 | -.08 | -.05 |
| Average team-level domain-specific expertise | .27 | .04 | .11 |
| Performance pressure | | .55*** | .53*** |
| Team effort-directing actions | | | .26* |
| Adjusted $R^2$ | .09 | .26 | .31 |
| $\Delta R^2$ (versus Model 1) | | .17 | .06 |
| F | 1.96 | 4.09** | 4.49*** |

N=63 * p<.05; ** p<.01 ***p<.001
[a] Standardized coefficients are shown.

**Table 3**
**Results of OLS Regression Analyses Predicting Expertise Use (H2, H3)[a]**

| | Use of general professional expertise | | | Use of domain-specific expertise | | |
|---|---|---|---|---|---|---|
| Variable | Model 1 | Model 2 | Model 3 (H2) | Model 4 | Model 5 | Model 6 (H3) |
| General professional expertise | .13 | .13 | .17 | -.02 | -.01 | .02 |
| Domain-specific expertise | -.07 | -.07 | -.13 | .03 | -.03 | .03 |
| Project complexity | -.04 | -.04 | -.05 | .12 | .06 | .11 |
| Team size | .06 | .06 | .04 | -.13 | -.13 | -.11 |
| Project duration | -.05 | -.05 | -.06 | .12 | .13 | .10 |
| Expertise recognition | .27* | .27* | .30** | .22* | .24* | .24* |
| Performance pressure | | -.01 | .09 | | .15 | .11 |
| Interaction: Expertise recognition x pressure | | | .29* | | | -.27* |
| | | | | | | |
| Adjusted $R^2$ | .02 | .01 | .08 | .05 | .05 | .11 |
| $\Delta R^2$ | | .00 | .08 | | .01 | .06 |
| F | 1.27 | 1.08 | 1.85* | 1.70 | 1.60 | 2.21* |

N=72. * p<.05; ** p<.01
[a] Standardized coefficients are shown.

**Table 4**
**Results of OLS Regression Analyses Predicting Team Performance (H4a, H4b, H4c)[a]**

| Variable | Model 1 | Model 2 (H4a) | Model 3 (H4b) | Model 4 (H4c) |
|---|---|---|---|---|
| Prior relationship | -.06 | -.06 | -.04 | -.05 |
| Project complexity | .03 | .03 | .00 | -.03 |
| Team size | -.05 | -.05 | -.09 | -.08 |
| Project duration | -.07 | -.06 | -.04 | -.06 |
| Average team-level general expertise | -.12 | -.12 | -.10 | -.09 |
| Average team-level domain-specific expertise | .07 | .07 | .06 | .04 |
| Performance pressure | .51** | .51** | .50** | .50** |
| Team use of general expertise | | .05 | | -.28 |
| Team use of domain-specific expertise | | | .24* | .45** |
| | | | | |
| Adjusted $R^2$ | .25 | .24 | .30 | .32 |
| $\Delta R^2$ (versus Model 1) | -- | .00 | .05 | .08 |
| F | 3.96** | 3.44* | 4.22** | 4.19*** |

N=72 * p<.05; ** p<.01 ***p<.001
[a] Standardized coefficients are shown.

**Table 5**
**Overview of Study 2 Case Studies**

| Firm | Team (named for client sector) | Project duration (weeks) | Number of observations | Total hours observed | Related interviews |
|---|---|---|---|---|---|
| ConsultCo | Pharma | 8 | 12 | 22 | 3 |
| | Retail | 4 | 5 | 8 | 2 |
| | Biotech | 10 | 10 | 19 | 3 |
| | Banking | 3 | 5 | 6 | 3 |
| AuditCo | Energy | 5 | 6 | 8 | 2 |
| | Medical | 4 | 7 | 18 | 3 |
| Total | 6 cases | | 45 | 81 | 16 |

**Table 6**

**Samples Start Codes, Definitions and Sources, and Examples of Observed Comments and Interactions**

| **Behavioral Code** | **Definition & source in the literature** | **Examples of observed behaviors (GPE = General professional expert; DSE = Domain-specific expert)** |
|---|---|---|
| Content contribution: Proposal | Content contributions are directly related to achieving the group outcome or product. Proposals directly contribute to the task product or support the group in enacting its performance strategy (Futoran, Kelly, and McGrath, 1989). | 1. "This particular client has a habit of making things and then leaving them on the shelf, so their WIP [work-in-progress] is much higher than you'd expect. It's like going back a couple of centuries in that place and you can't trust their WIP database." (AuditCo's Medical team)<br>2. "These guys [client] have always been more concerned about their regional brokerage strategies; that's their scope, so let's forget the national level for now." (ConsultCo's Banking team)<br>3. "The West Texas group is too idiosyncratic from a management standpoint. We want a more general example that we can apply elsewhere in the client, so I think we should go to a different outfit." (AuditCo's Energy team) |
| Content contribution: Evaluation | Content contributions are directly related to achieving the group outcome or product. Evaluations are contributions that respond either in support or in opposition to ideas that propose modifications to task content contributions (Futoran, Kelly, and McGrath, 1989). | 1. "I struggle with seeing this [supply management recommendation] as a big deal for [the client]. Who would be making this happen?" (AuditCo's Energy team)<br>2. *GPE directs at the team:* "We need to systematically interview them." *DSE counters:* "Oh, no no. With them it's much better to just touch base on a phone call or quick email." ( ConsultCo's Banking team)<br>3. "I'm not trying to choke off other ideas, but I want to make sure that we are considering these ideas as well. [These other ideas] will create stability in the organization." (ConsultCo's Pharma team) |
| Information seeking | Pursuing additional knowledge in hopes of improving performance (Durham and Locke, 2000). | 1. *GPE to DSE* : "Do you, [DSE], see any reason that we shouldn't recommend that the client moves forward at this stage?" (ConsultCo's Biotech team)<br>2. "I would encourage everyone to contribute. Everyone should say what their top three priorities are and there will be good things that come of it. We can use this as an aid and go back to [the AuditCo partner] to tell him what we're seeing across the group." (AuditCo's Energy team)<br>3. "Have they got any plans to move production overseas?" (AuditCo's Medical team) |
| Adoption of expertise | Group adopts content contribution presented by a team member, possibly over other members' contributions (Baumann and Bonner, 2004). | 1. "Didn't you say there was a new sales director and controller at the [client's] business? That now they are buying a lot of instruments in the U.S.? That should weigh in to our tax projections." (AuditCo's Medical team)<br>2. *GPE questions DSE and edits client presentation on his computer:* "What do we need to add to the conceptual model? Read me the edits you came up with." (AuditCo's Energy team)<br>3. *GPE, after a team discussion about various approaches to a project document deliverable:* "Let me morph that into one new chart. I'll take each of your main points and turn it into a template at the end of each section." (ConsultCo's Pharma team) |

**Table 7**
**Performance Pressure and Associated Expert-role Team Behaviors**

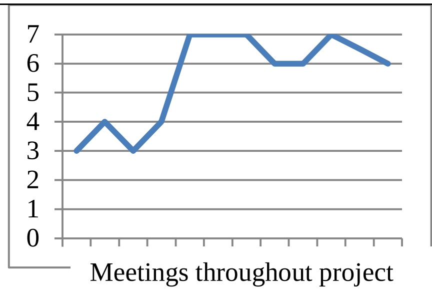
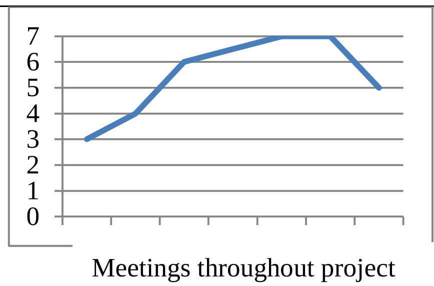
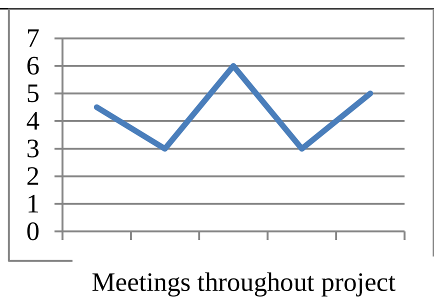
| | | Illustrative behaviors during high- versus low-performance-pressure (PP) meetings | | |
|---|---|---|---|---|
| Team, firm, project | Performance pressure by meeting | General expert(s) | Client-specific expert(s) | Other team members |
| Pharma, ConsultCo, consulting |  | • Low PP: Role-inconsistent, deference behaviors and remarks; shared credit and airtime with juniors<br>• High PP: Dominance behaviors (interrupting others, arriving late without an explanation, giving orders); insistence on "checking" work before clients saw it | • Low PP: Role-inconsistent, leadership behaviors and remarks such as taking lead with clients<br>• High PP: Downplayed own contributions, decreased participation frequency, apologized for mistakes | • Low PP: Deferred to client-specific expert, both explicitly (asking him for help with analysis) and implicitly (turning to him before answering a question)<br>• High PP: Pushed client-specific expert to stop dissenting |
| Medical, AuditCo, audit |  | • Low PP: Explicit focus on learning and capability development<br>• High PP: Increasingly took more airtime during meetings; became nearly sole contributor in front of clients or senior partners | • Low PP: Suggested new tracking system based on client needs; took lead in assigning roles to team<br>• High PP: Advised the team to withdraw his previously recommended system and revert to standard spreadsheets | • Low PP: Willingness to take risks to develop new capabilities<br>• High PP: Increasingly reverted to their "comfort zone" to do tasks using their proven abilities |
| Retail, ConsultCo, consulting |  | • Low PP: Solicited input from all members by "going around the table"<br>• High PP: Targeted questioning, directed at members who "owned" that piece of the problem | • Low PP: Proactively offered and elaborated own suggestions<br>• High PP: Waited until asked to contribute | • Low PP: Encouraged discussion; significant back-and-forth discussions<br>• High PP: Data-based answers to specific questions |

**Table 7 (continued)**

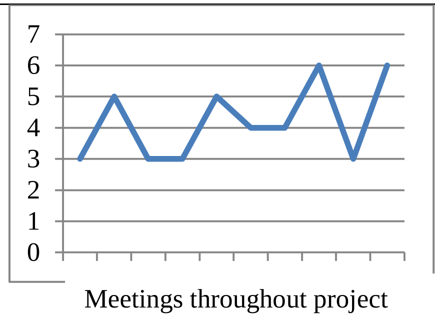
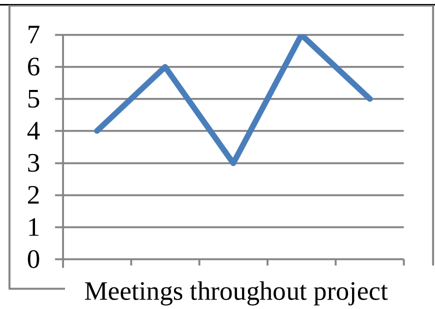
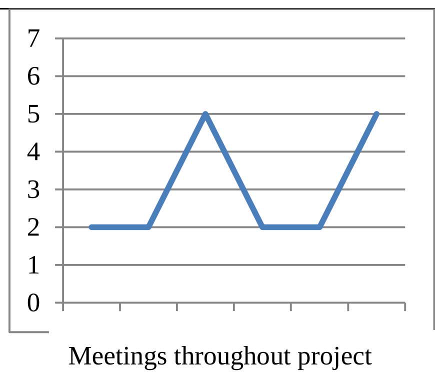
| Team, firm, project | Performance pressure by Meeting | Illustrative behaviors during high- versus low-performance-pressure (PP) meetings | | |
|---|---|---|---|---|
| | | General expert(s) | Client-specific expert(s) | Other team members |
| Biotech, ConsultCo, consulting |  | • Low PP: Openly used specialists' inputs (e.g., changed reports to reflect domain-specific expertise)<br>• High PP: Shut down discussions that weren't obviously direct inputs for the team's problem | • Low PP: Frequently offered unique expertise (product knowledge and client politics)<br>• High PP: Reduced participation and eventually withdrew from discussions | • Low PP: Asked questions and behaved supportively toward domain-specific experts<br>• High PP: Discounted domain-specific expertise; solicited general professional expert's views of "typical" situation |
| Banking, ConsultCo, consulting |  | • Low PP: Invited dissent (devil's advocate and "what if" scenarios)<br>• High PP: Dismissed client-specific objections by invoking numerous varied examples | • Low PP: Offered detailed insights about the client's idiosyncratic organization to counter a suggestion made by others<br>• High PP: Initially offered client-specific ideas but stopped after several failed attempts | • Low PP: Listened to and influenced by domain-specific expertise (e.g., client's history and strategy)<br>• High PP: Silenced dissent overall; focused on general industry trends as basis for decision |
| Energy, AuditCo, consulting |  | • Low PP: One expert asked occasional clarifying question, often appeared to be working on other documents; other mainly focused on the process but let others take lead on substantive inputs<br>• High PP: Both experts engaged in debate solely with each other; over-talked others when they did try to join | • Low PP: Repeatedly offered opinions based on "insider knowledge" (personal relationships) about client preferences, politics, views of AuditCo's competitors<br>• High PP: Retreated to general, data-based inputs (process updates, survey results) | • Low PP: Reinforced domain-specific expertise both verbally and with actions (nodding, taking notes)<br>• High PP: Solicited general professional experts' views of "typical" situation; ignored domain-specific examples |

**Table 8**
**Team Behaviors Illustrating the "Consensus Drive" Process Emerging in High-Pressure Meetings for ConsultCo's Banking Team**

| **Team member behaviors** | **Low-pressure meetings** | **High-pressure meetings** |
|---|---|---|
| Offering / accepting expertise | Domain-specific expert frequently brought up detailed insights about the client's idiosyncratic organization to counter others' suggestions; these arguments were routinely entertained and often influenced the group's decision. | General expert frequently dismissed objections concerning the client's particular decision-making structure by invoking his superior industry knowledge of the process (based on his experience at other clients and insights from industry conferences). |
| Knowledge seeking / accepting | Members probed the domain-specific expert for "what if" scenarios or counterfactuals based on his knowledge of their client's idiosyncrasies. | Team members seek knowledge and examples from general expert and their behaviors suggest that they are impressed by his inputs (e.g., taking notes, probing implications).<br><br>Team members do not appear to accept the domain-specific expert's inputs (e.g., interrupt him, fail to look at him as he speaks, move abruptly to next topic without acknowledging that he spoke). |

**Table 9**
**Team Behaviors Illustrating the "Completion Orientation" Process Emerging in High-Pressure Meetings for AuditCo's Medical Team**

| **Team member behaviors** | **Low-pressure meetings** | **High-pressure meetings** |
| --- | --- | --- |
| Setting team objectives | The project manager emphasized that the team should focus on building their own skills: "The main thing from my point of view is that it's a great client to audit because you can really get your arms around it. The fees aren't big, but it's a good developmental opportunity." | Soon after the project started, the manager announced that the client's finance director was "on our tails" – scrutinizing the audit team very carefully in order to defend his own tenuous position. Manager announces that team outputs have to be "bullet proof." |
| Allocating team tasks | The kick-off meeting involved an explicit discussion of each member's learning goals and a plan to divvy up the work to allow people exposure to new areas. | Team members increasingly reverted to their "comfort zone"; for example, two junior members traded their work assignments so that they could handle parts of the audit that they were most familiar with. |
| Experimenting | The team agreed to use a novel raw materials cost-tracking system suggested by the domain-specific expert based on his knowledge of how the client handled work-in-progress inventory. | The domain-specific expert, after consulting with the project manager, advised the team to withdraw his proposed new system and revert to the standard spreadsheets because "this isn't the time or place for experimenting." |

**Figure 1**
**Moderation Effects of Performance Pressure on Teams' Use of Two Types of Expertise**

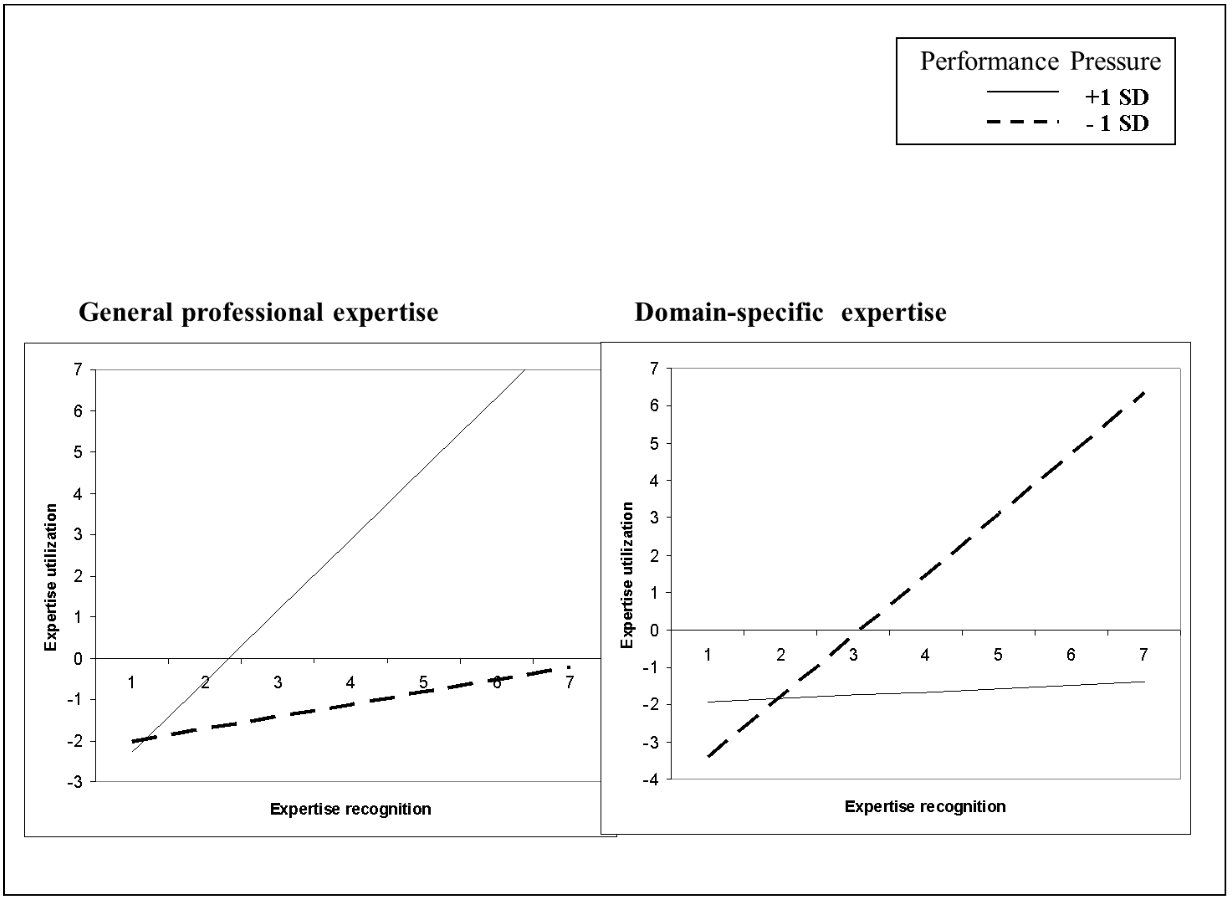
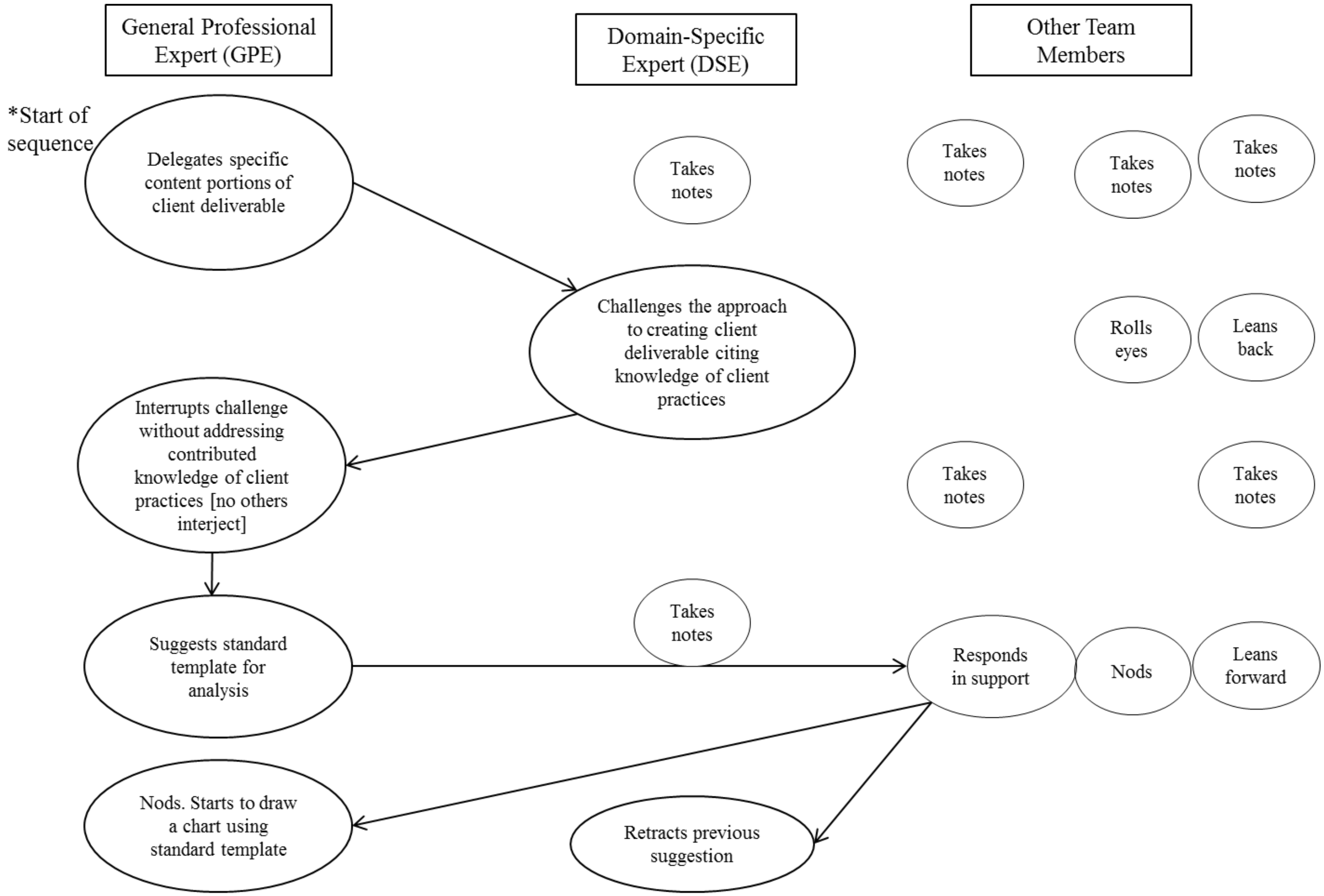
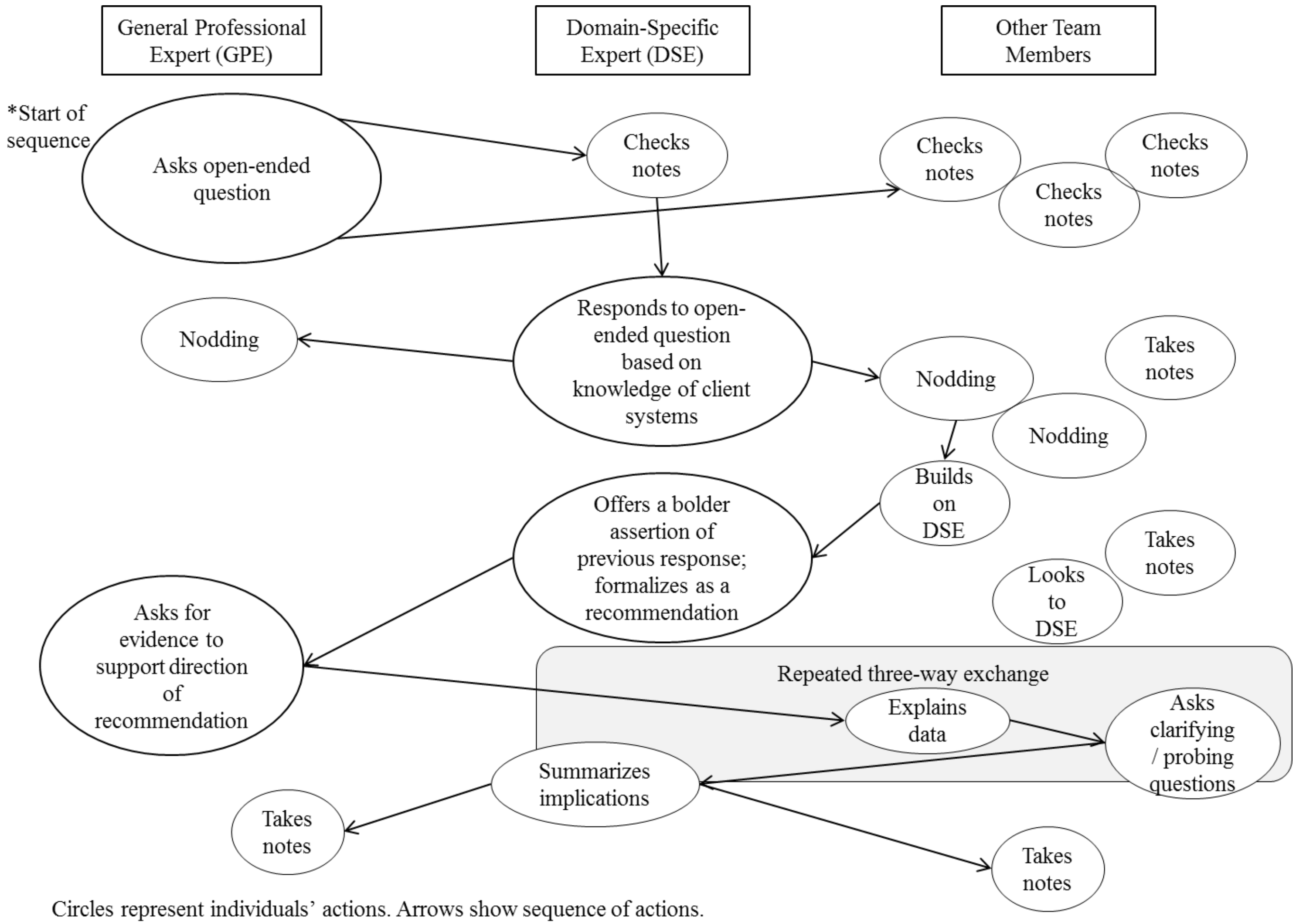


**Figure 2a**
**AuditCo's Medical Team Process under High Performance Pressure**



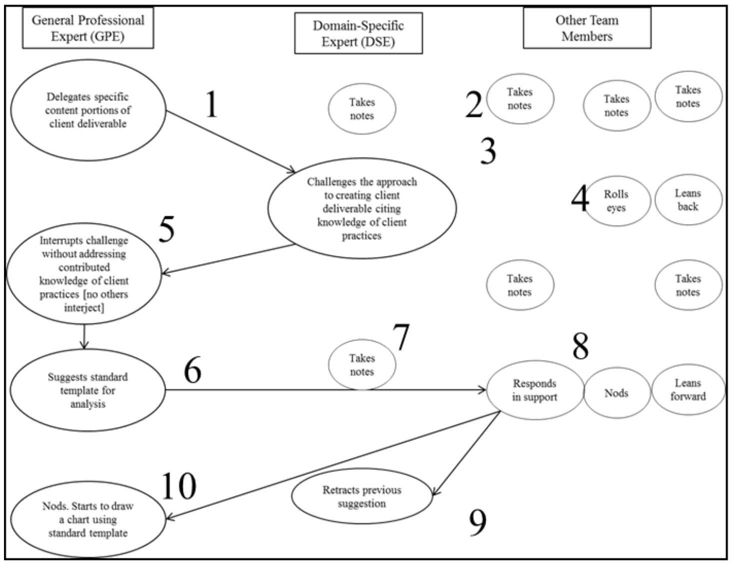

Circles represent individuals' actions. Arrows show sequence of actions.

**Figure 2b**
**AuditCo's Medical Team Process under Low Performance Pressure**




Circles represent individuals' actions. Arrows show sequence of actions.

**Figure 3a**
**AuditCo's Medical Team Process under <u>High</u> Performance Pressure with Interpretation of Impact on Expertise Use**




**Summary:** In this high-performance-pressure meeting (score d 7 on a scale of 1 [low performance pressure] to 7 [high performance pressure]), the domain-specific expert attempted to challenge a recommendation made by the general professional expert by drawing on specific experiences with the client's practices. The general professional expert effectively dismissed this contribution by interrupting and continuing without adjustment to content; other team members did the same through non verbal (rolling eyes at DSE, leaning back in chair, and ceasing to take notes) and verbal (expressing explicit support for the general professional expert's contribution) behaviors. DSE retracts contribution and general expertise trumps the exchange.

1. Directive meeting style; GPE is not inviting dialogue from other team members.

2. Attention directed toward the contributions of the GPE; note-taking facilitates contribution-retrieval.

3. DSE attempts to insert expertise based on unique knowledge of client; this expertise is in conflict with the GPE's contribution.

4. Nonverbal displays from other team members (stop note-taking) signal lack of intent to integrate knowledge contribution by DSE and delegitimize (eye roll, lean back) the knowledge contribution.

5. Interruption discourages dissent and begins to set norm for knowledge-use interactions.

6. Suggestion implicitly closes the door on exploratory dialogue about the approach to problem solving on client issues.

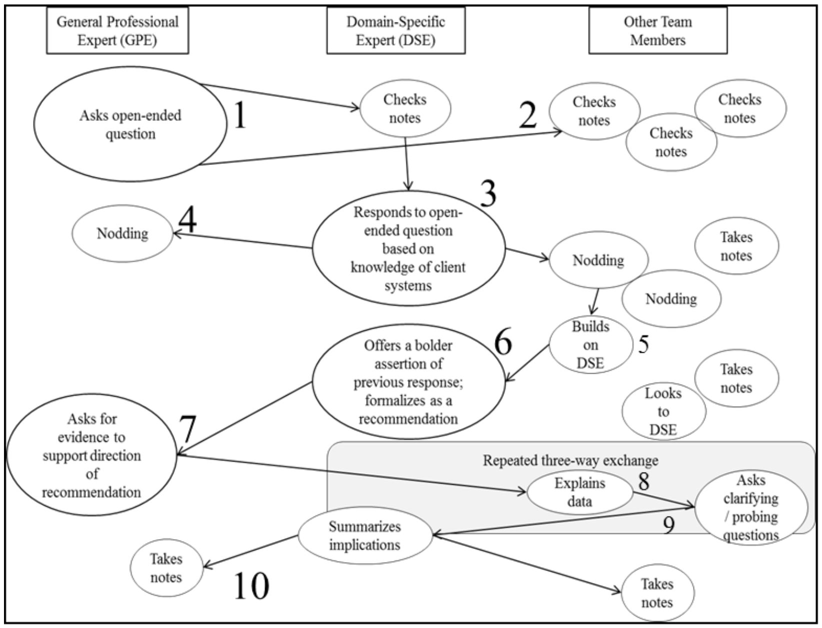
7. By not restating previously interrupted client-related knowledge, the DSE effectively backs down and opts for conformity to the process as directed by the GPE.

8. Other team members offer verbal and nonverbal feedback that reinforces the validity of the GPE's contributions and undermines the DSE's client-based knowledge.

9. Domain expert conforms to prevailing use of general professional expertise over domain-specific expertise.

10. General expertise "wins," making it up to the whiteboard, where its use is further reinforced as the deliverable is crafted.

**Figure 3b**
**AuditCo's Medical Team Process under <u>Low</u> Performance Pressure with Interpretation of Impact on Expertise Use**




1. GPE invites contributions by asking an open-ended, non-directive question.

2. DSE and other team members engage in content-retrieval processes in order to potentially contribute to problem solving.

3. DSE contributes domain-specific expertise by answering GPE's question based on knowledge of client systems.

4. GPE (and others) offer nonverbal affirmation of DSE's contribution, validating the action.

5. DSE contribution and subsequent validation creates an environment that supports content contribution; other team members respond to this by building on the content with their own contributions.

6. Others' contributions increases DSE's confidence and willingness to contribute client-specific knowledge.

7. GPE presents an exploratory challenge for supporting evidence; display of information seeking; these behaviors facilitate expertise contribution (through seeking information) and use (through repetition and follow-up).

8. Other team member presents data: widens participation and supports DSE's recommendation by building on it.

9. Repeated exchange of information seeking (probing questions) and contribution (offered data) suggests attempt to draw out the best mix of expertise.

10. GPE taking notes signals intent to use others' novel knowledge contributions.

**Summary:** In this low-performance-pressure meeting (scored 3 on a scale of 1 [low performance pressure] to 7 [high performance pressure]), the general professional expert engages in several instances of information seeking and support for novel domain-specific contributions. Both the domain-specific expert's and the other team member's actions support an exchange of information most relevant to the problem at hand through affirmation, probing for detail, and knowledge capture for future use.

**Figure 4**
**Performance Pressure and Role-consistent Behaviors: Comparison of Junior versus Senior Members of One Team**

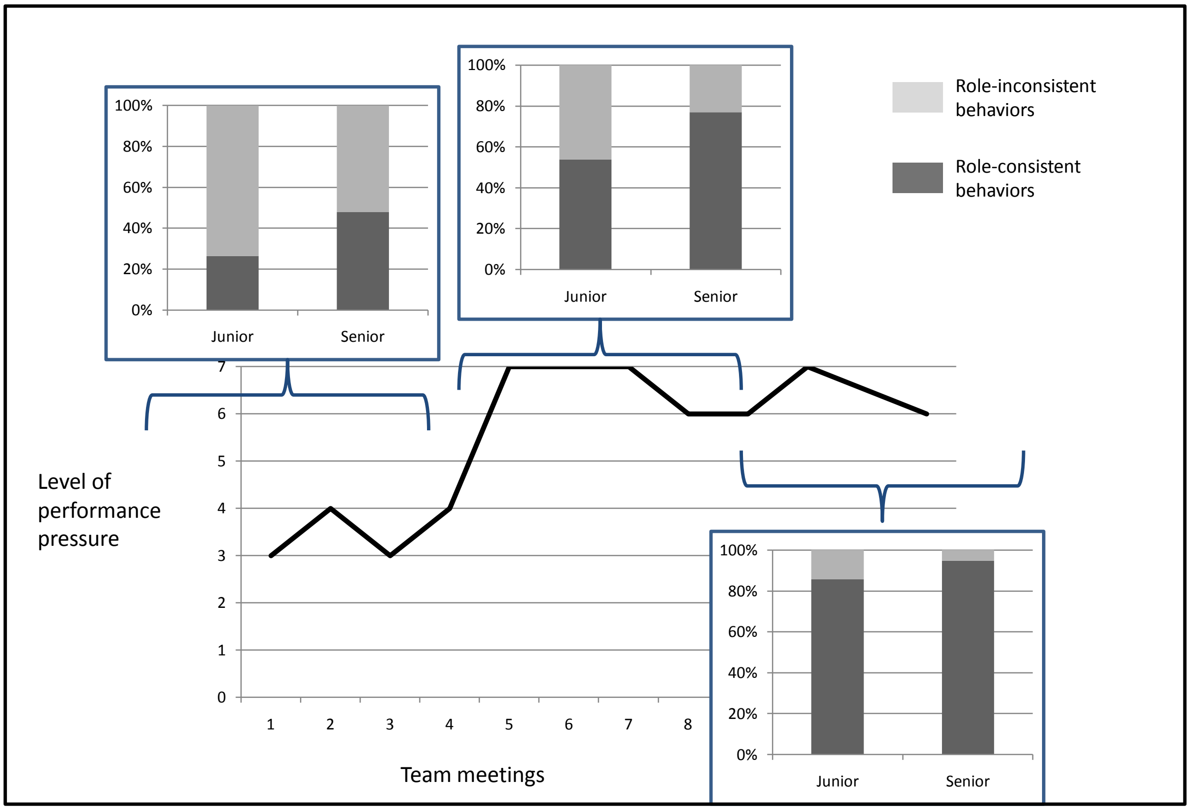


**Figure 5**
**Conceptual Model of Performance Pressure's Effects on Team Process and Performance**