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TEAMS IN PUBLIC ADMINISTRATION: A FIELD STUDY OF TEAM FEEDBACK AND EFFECTIVENESS IN THE ISRAELI PUBLIC HEALTHCARE SYSTEM

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ABSTRACT: *Over recent years, public organizations have increasingly adopted work teams as an organizational tool for improving task coordination, communication, and knowledge transfer. In this research, I discuss action teams in public organizations and the importance of team feedback for the effectiveness of such professionally heterogeneous public teams. I examine two alternative approaches to team feedback, guided team reflexivity and peer assessment, and hypothesize regarding their effects on team processes and performance. Using a field-based, experimental design involving surgical teams in a large public tertiary health care center, I compared the effects of team reflexivity and peer assessment on specific team-related processes and task duration. I found that guided team reflexivity is related to higher levels of team attention to detail, cooperation, and psychological safety than peer assessment, and that team attention to detail mediates the relationship between feedback type and performance.*

INTRODUCTION

In recent years, public organizations have increasingly adopted work teams as an organizational tool for improving task coordination, communication, and knowledge transfer. While some types of public organizations have long organized work around teams (e.g., surgical teams in public hospitals or firefighting teams), team-based structure has today become commonplace throughout the public sector, especially for special projects (e.g., quality implementation teams). In fact, in the U.K.'s National Health Service (NHS), working in teams is being endorsed by policymakers, practitioners, and academics as the means through which integrating care across institutionalized professional and organizational boundaries can be achieved, along with efficient, safe, and patient-centered outcomes (Finn 2008; Department of Health 2000; 2002; General Medical Council 2006a; 2006b; Kennedy 2001).

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The growing use of work teams in the public sector can be traced, at least in part, to doctrines such as New Public Management (NPM), under which modern public administration has been encouraged to improve the effectiveness and efficiency of public services (Martin, Currie, and Finn 2009) by adopting practices from the private sector (e.g., Ferlie et al. 1996; Lynn 1998). As Ferlie et al. (1996, 13) suggest, this model of NPM that emerged from the 1990s onward moves away from hierarchical to more collaborative organizational forms such as teams. In a recent article, Martin, Currie, and Finn (2009) argue that NPM reforms facilitate joint work across professions and statuses and assist the sharing of knowledge such that good practice is translated into rapid service improvement, spread across public services. Teams are often the organizational structure through with such joint work across professions and statuses takes place. Teams are thus seen as a vehicle by which public organizations can imitate the successes of private sector businesses with regard to effectiveness and efficiency (Spreitzer et al. 1999). And in fact, teamwork has been found to be a key factor behind successful capacity building in the public sector, and to be more strongly related to improved performance in public organizations than training in specific skills (Grindle and Hilderbrand 1995).

Many teams in the public sector are ''action teams,'' defined as teams in which members with specialized skills must improvise and coordinate their actions in intense, unpredictable situations (Sundstrom, Meuse, and Futrell 1990). These teams ''conduct complex time-limited engagements with audiences, adversaries, or challenging environments in 'performance events' for which teams maintain specialized, collective skill'' (Sundstrom 1999, 20–21). Prototypical action teams include emergency medical teams, air-force cockpit crews, government regulatory teams, military units, teams for education improvement, firefighting teams, and expedition teams (Edmondson 2003; Ellis et al. 2005). While action teams have specific characteristics, Klein et al. (2006) claim that many of these characteristics are likely to become increasingly common in organizations not typically structured around action teams, as the tempo of work is becoming more dynamic and unpredictable and as organizations are relying more on cross-functional teams brought together to tackle urgent and novel issues. Surgical teams in public hospitals provide a good example of action teams, in that they are highly heterogeneous with respect to profession, status, and rank, and their composition changes frequently. Staff are assigned to teams for a particular challenging, often unpredictable, procedure, and then disperse to form other teams for the next procedure. Such teams therefore have little chance to develop stability, which has been found to be critical for effective performance in stressful situations (Bate and Robert 2002; Olivera and Argote 1999). In addition, the influence of the professional institutions represents a challenge for many action teams such as surgical healthcare teams, emergency unit teams, technology research teams, or disaster response teams (McKinney et al. 2004), whereby while teams might represent a solution to the problems of professional integration, the very existence of those professions makes such integration difficult to achieve (Finn 2008).

Very few studies have been published in the public administration literature regarding teams and teamwork. Yet it has been theorized and observed that teams in public organizations face greater complexity and more potential problems,

including problems with communication and conflict, than teams in private organizations (Rainey 2009). Thus, in an era in which market forces are requiring public health care organizations—like all public service organizations—to be more effective, to provide better service and, at the same time, to cut costs, understanding the mechanisms that may enhance the performance of action teams such as public surgical teams is important. However, this issue may also be generalizable beyond this specific context since, as noted above, according to Klein et al. (2006), action teams are a microcosm of the many demands increasingly faced by organizations today. Thus conclusions regarding mechanisms which may enhance public sector action teams' performance may be generalizable to other organizational settings, perhaps even more so in the future.

One such mechanism enhancing team performance is team feedback. Feedback, or telling employees how well they are performing, has long been recognized as key to organizational effectiveness (Yeager, Rabin, and Vocino 1985). Good feedback has been found to enhance employees' motivation, effort, goal setting, adaptation to circumstances, and goal attainment (Arnold 1976; Ashford and Cummings 1981; Conlon 1980; Ilgen, Mitchel, and Frederickson 1981). Team feedback provided by the team members themselves, as opposed to feedback from supervisors, offers a means by which team members can learn from their peers. Team-level feedback may also be a way to blur organizational professional boundaries (Currie and Suhomlinova 2006) and thus facilitate knowledge sharing in multidisciplinary settings. Two approaches to team feedback have gained popularity in recent years: peer assessment and team reflexivity (described below).

The goals of this study are threefold: (1) to illuminate the centrality of teams for public service in general and highlight the complexity of professionally heterogeneous action teams in public health care organizations in particular, (2) to introduce team-level feedback as a mechanism for enhancing the effectiveness of public-sector teams, and (3) to examine two alternative approaches to team feedback and their effects on the performance of health care teams in a public hospital. Taking a sample from a large public health care center in Israel, I compare along several outcome variables surgical teams implementing structured team reflexivity with those using peer assessment—attention to detail, cooperation, and psychological safety. I then measure the effect of these three variables on team performance, as reflected in the duration of surgeries performed by the teams.

Surgical duration offers a useful measure of performance in the current context for both theoretical and practical reasons. From the theoretical perspective, Edmondson, Dillon, and Roloff (2007) claimed that one definition of team performance is in respect to efficiency-related outcomes (e.g., reduced production cost or time relative to some norm reflecting how well teams leverage knowledge and skills to enhance the efficiency or speed of execution). From a practical perspective, given public hospitals' mandate under NPM to improve services while containing costs, the operating room (OR) is a prime target for efficiency measures, as it is one of the health care industry's highest-expenditure settings. Moving patients more quickly through the OR means that more surgeries can be scheduled within a given time frame, thereby reducing both waiting times for patients and costs to hospitals (Overdyk et al. 1998).

The rest of this article proceeds as follows. In the next section, I describe the role of teams in public administration. I then describe the importance and types of team feedback, followed by the ways in which I hypothesize team feedback to improve team processes and performance. At that point I describe the study and its results. The article concludes with a discussion of the findings' theoretical and practical implications, as well as its limitations, which offer suggestions for future research.

Teams in Public Healthcare

As suggested above, teams are increasingly considered the primary work unit within organizations (Cohen and Bailey 1997; O'Leary, Mortensen, and Woolley 2011). But what exactly constitutes a team? What characterizes teams in public healthcare organizations, and what enables teams to produce performance that is more than the sum of its members' individual contributions?

A team is defined as a small number of interdependent people who share responsibility for outcomes (Ilgen 1999). While other definitions exist, all emphasize the interdependence among team members (Sundstrom, Meuse, and Futrell 1990), and suggest that teams, as opposed to groups, produce through *joint* contributions of their members, and require individual and *mutual* accountability. Working as a team requires that team members not only share a common purpose, but also that this purpose is translated into specific performance goals, and that team members agree on and commit to a common approach toward the task for which they are responsible.

Over the years, several taxonomies of teams have emerged (e.g., Cohen and Bailey 1997; Hackman 1990; Sundstrom 1999). These taxonomies distinguish among types of teams based on three main issues: (a) the lifetime of the team (i.e., short-term mission teams versus long-term continuous teams; Finn and Waring 2006; Vashdi et al. 2007), (b) whether the team's composition is professionally homogeneous or heterogeneous (Finn 2008), and (c) the complexity and stability of the environment in which the team acts (Pepinsky, Pepinsky, and Pavlik 1960; Finn, Currie, and Martin 2010). Based on these features, all taxonomies identify some form of action teams—"highly specialist teams cooperating in brief (but often urgent) performance events that require improvisation in unpredicted circumstances" (Sundstrom, Meuse, and Futrell 1990, 12). Action teams are short-term mission teams with transient memberships and are an increasingly prevalent part of the organizational landscape, ranging from information technology response teams to firefighting teams to software development teams (Ancona, Bresman, and Kaeufer 2002; Ellis et al. 2005). These teams often face intense, difficult situations that require them to quickly and dynamically respond to multiple task inputs in a highly coordinated manner (Klein et al. 2006).

Teams in hospitals fit all the characteristics of action teams (Edmondson 2003). They tend to be short-term, with team members changing frequently due to, among other things, the structuring of work around shifts. These teams are professionally heterogeneous, including doctors, nurses, and other support staff. Finally, such teams work in a complex environment characterized by time pressure and life-threatening situations. In a public hospital, this complexity is heightened by the fact

that public hospital administrations—like those of all public organizations—must take account of public opinion, and may have to work within constraints imposed as part of larger political processes.

There is a common notion that teams in healthcare are characterized by consensus, cooperation, and interdependency, as complementary professional roles come together to work as a team (Blau 1972). However, healthcare teams face challenges encompassing the fundamental conflict between the need for integration, on the one hand, and specialization of professional groups, on the other (Donnellon 1996). Healthcare is characterized by a professional division of labor that is increasingly fragmented and specialized (Finn 2008). Each profession has a distinct role and socialized membership, with deeply entrenched, historical, professional boundaries and hierarchies (Freidson 1988; Nancarrow and Borthwick 2005; Sanders and Harrison 2008). This provides for fundamentally different professional interests which contradict the need for integration at the team level (Allen 2000; Dingwall 1980; Dingwall and MacIntosh 1978; Webb and Hobdell 1980). In fact, professional heterogeneity in healthcare teams has been treated as a fault line (Hall 2005; Varpio et al. 2008) and is a well-documented source of team conflict due to the different perspectives of each profession, role stereotyping and turf battles, different socialization processes, and perceptions regarding physician dominance (Leipzig et al. 2002); similar problems may arise in information technology response teams where engineers from different backgrounds (e.g., information systems, industrial, and mechanics) sit together in an attempt to solve problems.

On top of the general potential communication problems professional heterogeneity may bring to any action team, it has been found that teams within the public sector are characterized by more intensive and difficult communication, more conflict, as well as a smaller likelihood of sharing information than those in private organizations (Rainey 2009). Among the reasons for these enhanced problems is the fact that in public hospitals management is restricted in its control of several activities, and there are conflicting professional and organizational hierarchies (Brunsson and Sahlin-Andersson 2000), as well as a wider array of interests and parties (Rainey 2009). In addition, it has been found that public organizations may be characterized by higher levels of internal organizational politics, over and above the level of internal politics in private ones (e.g., Vigoda-Gadot and Kapun 2005) and that this spills over to higher levels of internal politics within public sector teams (Vigoda and Vashdi 2012). In fact, Devine et al. (1999, 681) claim that ''teams cannot be understood independent of their context, and knowledge pertaining to teams in one setting does not necessarily generalize to teams in other settings.'' Thus, understanding the factors enhancing a team's ability to perform in action teams within public organizations is critical for public administration theory and practice.

Team Feedback

Teams need feedback if they are to improve their behaviors towards successful performance outcomes. As mentioned in the introduction, researchers have found relationships between feedback and a number of positive behavioral and attitudinal

outcomes, including motivation, effort, goal setting, and improved performance (Arnold 1976; Ashford and Cummings 1981; Conlon 1980; Ilgen, Mitchel, and Frederickson 1981).

Social cognitive theory (Bandura 1997; 2001; Wood and Bandura 1989) explains feedback as an integral component of human psychology. The theory posits that people are proactive, aspiring organisms who continuously set goals, devise plans of action to achieve these goals, monitor and evaluate their own behavior (among other things) relative to these goals, and revise their goals and action plans in accordance with their evaluations. While such a feedback loop is innate at the individual level, at the team level formal feedback is rarely provided by the team members themselves. Rather, this is usually part of the supervisor's job (Kemp et al. 1983) or is provided by the public (through satisfaction surveys, complaints, and so on). However, although team feedback may not be a natural process, as it is for the individual, or enshrined in tradition, like feedback from external sources, there are arguments in favor of encouraging team members to engage in internal feedback processes. First, a normative process structured for different occupational and professional groups may facilitate the needed integration among the different professional groups participating in the team (Currie and Suhomlinova 2006), especially for teams in public organizations characterized by more conflict and communication problems. Second, team members are the most well placed to know exactly who is doing what within the team. By giving each other feedback, team members can thus better understand each other's tasks, learn to better coordinate their performance, and clarify expectations about the task and the team (Rasker, Post, and Schraagen 2000). Third, team feedback offers a means by which team members can learn from their peers. Teams where such learning takes place are likely to see improved performance at both the individual level (as team members put into practice newly learned techniques and procedures) and at the team level, thus improving the outcomes offered by the team. In addition, it is likely that team members who learn to acknowledge and internalize feedback from peers will also be more willing and able to accept feedback from citizens.

To be effective, team feedback must take place in a responsive climate characterized by transparency and mutual trust, and an understanding that feedback is a means to improve work conditions and performance, and not an opportunity to point fingers and cast blame. Drawing from theories on team effectiveness, I compare two different methods by which team feedback may be undertaken, namely team reflexivity and peer assessment. For both methods, team feedback is understood to be offered strictly by the team members themselves.

Team Reflexivity

Swift and West (1998, 4) describe reflexivity as "a turning back on the self," encompassing both self-awareness and agency. According to their model, team reflexivity incorporates three main activities: reflection, planning, and adaptation. In the first stage, reflection, team members identify discrepancies between actual and desired performance. In the planning stage, they identify ways to minimize these

discrepancies and specify patterns of action for doing so, taking time constraints and other potential obstacles into account. In the final stage, adaptation, they implement this plan-directed behavior.

Teams engaging in such activities are involved in a continuous cycle of self-appraisal and behavioral change (West 1996). Members of these teams continuously appraise their own and their teammates' performance along criteria related to the team's strategic objectives and processes with professional boundaries set aside. Based on the results of this self-appraisal, they seek to effect change in their individual and collective logics and repertoires of action (Bacharach, Bamberger, and McKinney 2000). Thus, while non-reflexive teams may be unable to identify patterns of action that consistently generate less-than-satisfactory performance, reflexive teams work to identify problems and resolve them in order to improve performance. Reflexive teams differ from their non-reflexive counterparts in three main ways: They are more likely to structure their members' behaviors so that they are transparent and open to appraisal by the individual and his/her teammates. They are more likely to reflect on the relationship between their team and other organizational groups, or the organization as a whole. Finally, drawing from the notion of double-loop learning (Argyris and Schon 1978), reflexive teams typically are prepared to challenge the appropriateness of team and organizational objectives and the assumptions that underlie them.

In practice, team reflexivity needs to be structured and regulated, rather than being left to happen spontaneously. This is especially true for short-term or project teams, where members typically disperse once the project is complete (Vashdi et al. 2007). Teams whose tasks are by nature quite urgent, such as primary healthcare teams, also tend not to engage in reflexivity because of the demands on their time and resources (West and Poulton 1997). Such teams may benefit from adopting a guided form of team reflexivity. In guided team reflexivity, members are encouraged to systematically explore behavior-outcome linkages and member interactions in an open and safe context (Gurtner et al. 2007). Guided reflexivity sessions involve an open and candid team discussion at the end of the performance episode, at which participants weigh whether goals set prior to the episode were achieved, what went wrong and why, and what can be done better in the future. Participants analyze the process, point out mistakes and successes (their own or others'), suggest possible contributing factors, and draw conclusions as to what should be done in the future. Such guided sessions facilitate the sequence of reflection, planning, and action and may result in enhanced performance in action teams by facilitating the creation of shared interpretive schemes and meanings (Weick 1993), thus allowing for more coordinated, team-level attempts at correcting commonly accepted performance gaps.

Peer Assessment

Peer assessment is a feedback method by which individuals review and evaluate the performance of their peers (Fox, Ben-Nahum, and Yinon 1989). Researchers have shown that peer assessment is reliable and demonstrates higher validity than is generally obtained with commonly accepted alternatives such as supervisor ratings

(Church and Bracken 1997). Several factors have contributed to the high validity and general acceptance of peer assessment: (a) peer assessments use as reference points individuals who are similar to the evaluated individual—such reference points are thought to provide the most valuable information for evaluation (Fox, Ben-Nahum, and Yinon 1989); (b) peer assessments can be used simultaneously for administrative, feedback, or research purposes (Viswesvaran, Schmidt, and One 2002); (c) peer assessments typically mean that employees are assessed by a number of people, allowing for the aggregation of ratings, which improves reliability (Scullen, Goff, and Mount 2000); and (d) peers typically have access to a wide variety of performance information, making it difficult for poorly performing employees to hide or disguise their actual performance level from co-workers. In short, peer assessment is argued to promote a culture of performance improvement, and to enrich the tools available to organizations for performance measurement. In addition, supporters of peer assessment as a team feedback technique argue that peer assessment allows team members to communicate standards and norms to one another, so that the expectations of all team members are in alignment.

One problem that limits the usefulness of peer assessment is resistance from employees (Cederblom and Lounsbury 1980; Fedor and Bettenhausen 1989; Waldman, Atwater, and Antonioni 1998). Scholars in the field suggest that organizations can reduce employees' concerns about peer assessment in two main ways. First, findings suggest that, at least initially, the purpose of any peer assessment program should be strictly developmental (Waldman, Atwater, and Antonioni 1998). In other words, employees are more likely to accept the peer assessment model if such assessments are not used to make decisions about salaries, promotions, and the like. Second, employees who are asked to assess others are more likely to be honest in their feedback if they know their ratings will be anonymous. Waldman, Atwater, and Antonioni (1998) found that ratings become less genuine if raters believe they can be identified. Similarly, Tornow and Tornow (2001) argue that anonymity is essential in order to ensure that raters give open and candid feedback. Thus, to keep resistance minimal, peer assessment should be restricted to developmental purposes, and should ensure anonymity for raters.

Team Reflexivity Versus Peer Assessment

As the foregoing descriptions suggest, there are a number of important differences between peer assessment and team reflexivity. The first is the focus of the feedback method. The main goals of peer assessment are to (a) help appraisees better understand how their performance is viewed by other people and (b) suggest areas for skill development and performance improvement (London and Smither 1995). These objectives indicate that the focus of peer assessment is the individual. The question to be asked is: How can this employee or team member improve his or her skills and competence? Indeed, as peer assessments are kept personal and confidential, they can produce little learning at the team or organizational level. For team reflexivity, in contrast, the focus is on both individual and team learning. Moreover, team reflexivity promotes learning not only through what is said at reflexivity sessions,

but through the reflective experience itself. The question is not what I, as an individual, can learn from the experience, but rather how I, as part of a larger team or organization, can learn from it so that the whole process will be better next time. As performance of action teams is often examined at the team level (e.g., safety of the flight, length of the surgery, creativity of the project) and not as the performance of the individual members taking part in the team, it is likely that the team focus of team reflexivity will be related to team performance and outcomes more than a process focused on the individual.

Besides the focus of the two feedback methods, there are a number of additional differences between them. First, peer assessment is conducted only occasionally (typically once every few months), while team reflexivity sessions take place after every project or event. Finally, while peer assessment offers a general evaluation of overall performance, behavior, and ability, team reflexivity is an event-specific evaluation aimed at the performance, behavior, and ability of team members with regard to a specific project.

According to Hackman (1983), team effectiveness is a multidimensional concept comprised of three factors: (1) the degree to which the products or services meet standards of those receiving, reviewing, or using them; (2) the degree to which the team's work processes enhance the capability of the team members to work together in the future; and (3) the degree to which the team's experience contributes to the growth and well-being of the individual members (Hackman and Walton 1986).

It seems that while team reflexivity is aimed at providing team members with feedback associated with all three elements of team effectiveness (i.e., reflecting on the distance between goals and actual outcomes, on team processes and interactions, as well as providing personal feedback regarding the actions in the recent performance episode), peer assessment is aimed only at the third element.

As teams in public organizations are characterized by more conflict and communication problems, it seems a mechanism that has the potential specifically to highlight communication and conflict throughout the performed activity is likely to be especially effective in this context. However, this has not yet been put to empirical test. Therefore, the question remains as to which mechanism is more effective for action teams in the public sector. The current study takes a step toward answering this question by looking at how the two methods affect team performance. Below, I propose that team reflexivity is more likely than peer assessment to improve three team-level processes or properties: attention to detail, cooperation, and psychological safety. I then consider the effect of these three variables on team performance, conceptualized by the length of time needed to complete the team's set task (a particular surgical procedure). According to Holzer and Halachmi (1996), time reduction reflects cost savings, additional services, and reduction of waiting times and is a critical measure of public organization's performance.

Team Feedback, Team Processes, and Psychological Safety

The literature on teams describes team effectiveness as arising from a complex interaction among multiple inputs, processes, and properties of a team (sometimes

called ''emergent states''). Marks, Mathieu, and Zaccaro (2001, 357) defined team processes as ''the means by which members work interdependently to utilize various resources, such as expertise, equipment, and money, to yield meaningful outcomes (e.g., product development, rate of work, team commitment, satisfaction).'' In an attempt to show not only that team reflexivity is more likely to enhance performance such as surgery duration than peer assessment but to also explain why this is the case, I sought to examine whether these feedback mechanisms are related to such team processes or properties. West (2002) describes a high reflexive team as one that is characterized by greater attention to detail and that encourages critical debate regarding current or potential problems and goals. In addition, in an attempt to explain the consequences of team reflexivity, Dayan and Basarir (2010) noted a number of cooperative behaviors such as collecting and disseminating information together. Thus, while reflexivity may affect additional team processes and properties, this study concentrates on attention to detail, psychological safety, and team cooperation. Psychological safety is defined as a shared belief that the team is a safe environment in which to engage in interpersonal risk taking (Edmondson 1999) such as critically debating current and potential problems and goals. Each will now be discussed in turn.

Team-Level Attention to Detail

Public organizations in general, and public hospitals in particular, face the challenge of ensuring not only the welfare of their patrons, but their own survival as well, due to the growing competition with similar private organizations. Under the NPM philosophy, public hospitals are required to operate in line with the public interest, ensuring fair processes and equitable provision of service, while supplying the best possible health care to their patients and, at the same time, keeping their work cost-effective. One way to approach this almost impossible objective is to develop work processes that enhance quality performance.

According to the quality improvement literature (Garvin 1988), attention to detail is a key component of an organizational culture of quality. Attention to detail means that work tasks are completed with precision and accuracy (O'Reilly, Chatman, and Caldwell 1991), and with consistency as well as adherence to rules and standards (Garvin 1988). Consistency is important here, as without a record of consistent attention to detail, the organization's customers or clients cannot be certain that the service they receive will be to the standard they expect.

I maintain that team reflexivity is likely to improve team members' attention to detail more than peer assessment. There are several reasons for this. First, team members are more likely to internalize the importance of precision and consistency when they acknowledge that their actions influence the performance of the entire team. Similarly, team members are likely to pay more attention to detail when they feel sure that their teammates will be doing so as well, ensuring that nobody's efforts will be wasted. Both these outcomes can be expected to arise from team reflexivity sessions, which focus on each person's contributions to the work of the team, more

than from peer assessment, which puts the focus on the individual. Finally, the greater frequency of team reflexivity sessions means that team members who take part in these sessions have more opportunities to share ideas about how to improve precision and consistency, and to incorporate lessons learned from previous episodes into their performance.

H1: Teams in public organizations that engage in structured reflexivity will pay more attention to detail compared with other such teams that operate under similar conditions but engage in peer assessment.

Team-Level Cooperation

Team cooperation refers to the quality of interaction among members of the team (Erez, LePine, and Elms 2002). Tjosvold (1984) examined over 100 studies and found that cooperation was a key determinant of team-level productivity, with cooperation shown to promote the interaction necessary to complete complex and interdependent tasks requiring coordinated work.

I propose that members of teams that engage in team reflexivity will cooperate more readily and to greater effect than members of teams implementing peer assessment. While both forms of feedback concentrate on the team member's behaviors, communication style, and interpersonal as well as professional contributions to the team, in team reflexivity sessions team members can openly discuss how to improve these interpersonal behaviors at the team level as well as be presented with concrete examples of these behaviors and alternative ways of action. Moreover, the mere awareness that a team reflexivity session will occur at the end of the specific procedure may encourage team members to cooperate more, so as to avoid making themselves a target for discussion.

H2: Teams in public organizations that engage in structured reflexivity will cooperate more compared with other such teams that operate under similar conditions but engage in peer assessment.

Team-Level Psychological Safety

As mentioned above, Edmondson (1999) defined "team psychological safety" as a shared perception that the team is a safe environment in which to engage in interpersonal risk taking. That is, psychological safety is characterized by a climate of interpersonal trust and mutual respect, so that people feel free to express their opinions or try something new without fear of criticism or censure (Edmondson 1999; Schein and Bennis 1965).

I argue that perceptions of psychological safety will be higher in teams implementing team reflexivity sessions than in teams undergoing peer assessment. Reflexivity sessions

promote open and candid discussions regarding what went right and what went wrong, when, and why, with a focus on improving performance in the future rather than casting blame. Indeed, one aim of structured reflexivity is to encourage self-reflection, with each team member able to discuss how his or her own actions affected the team's performance. Thus, reflexivity sessions are likely to promote a feeling of psychological safety, enabling team members to speak up and to contribute to planning and adaptation. Peer assessment, in contrast, does not promote the emergence of psychological safety, and may even inhibit it. With peer assessment, team members may worry that raising concerns about others' performance may be "repaid" by those individuals in a future assessment, and that admitting errors of their own may be used against them.

H3: Teams in public organizations that engage in structured reflexivity will have greater perceptions of psychological safety compared with other such teams that operate under similar conditions but engage in peer assessment.

The Mediating Role of Team Processes and Psychological Safety on Performance

Previous research has shown the existence of a relationship between each of the team processes and properties examined here and efficient performance. The main notion is that teams that are cooperative, attentive to detail, and psychologically safe spend less time synthesizing team member perspectives and agree upon the proper way to approach a task, making them more efficient (Bettenhauser and Murnighan 1985; Chatman and Flynn 2001). In fact, Zheng et al. (2008) found that cooperation within the team was related specifically to reduced surgical duration. In addition, psychologically safe teams have been shown to be more efficient as team members immediately feel free to exploit the knowledge and skill they have (Kostopoulos and Bozionelos 2011). Finally, high attention to detail at the team level means the teams are highly focused on the task at hand and not distracted or engaged in other peripheral activities, thus becoming more efficient (Primus, Healey, and Undre 2007; Pape et al. 2005).

I posit that the effect of feedback condition on the processes and properties discussed here will in turn enhance performance outcomes such as team efficiency. Based on the classic input–process–outcome model (McGrath 1964), I claim that the team feedback method used by the team will affect the extent to which team processes such as team-level attention to detail or team cooperation are apparent in the team, which in turn will enhance team outcomes such as team efficiency. Thus,

H4: Team-level attention to detail, cooperation, and psychological safety will mediate the relationship between feedback condition and performance, as reflected in the relative duration of a given procedure.

METHOD

Surgical teams in a large, tertiary public healthcare center in Israel were studied. Randomly selected surgical teams nested within nine surgical wards participated in the study over a six-month period. Each team had three to eight members, and included at least one surgeon, one nurse, and one anaesthesiologist. Due to the large pool of surgical and nursing staff and their schedule variations, fewer than 5% of the teams shared the exact same composition.

The study was designed to compare surgical teams implementing structured team reflexivity with surgical teams undergoing peer assessment. The research team involved in this study asked the hospital's management to identify sets of three wards that were similar in terms of their particular medical/surgical specialty and scope of surgical activity, resulting in three sets of three matched wards. To reduce the risk of confounding effects, we randomly selected one ward from each matched set for the reflexivity intervention, and one ward from each matched set for the peer assessment condition. Thus, three wards were assigned to the guided reflexivity condition and three to the peer assessment condition. The three remaining wards served as a control group.

Design

The study was designed as a longitudinal field experiment with three phases.

Baseline Phase

To ensure that no systematic differences existed with regard to the performance outcomes among the different wards, pre-intervention performance-related data were collected from 112 teams performing surgeries from all nine wards. Forty teams were observed from wards selected to undergo team reflexivity, 40 teams from the peer assessment condition, and 32 from the control group.

Training Phase

Once the baseline data were collected, surgical team members (surgeons, nurses, anaesthesiologists, and relevant technicians) in the three wards assigned to the team reflexivity condition underwent training in guided reflexivity on the basis of a briefing–debriefing model drawn from the Israeli Air Force (IAF) (Ellis and Davidi 2005; Ron, Lipshitz, and Popper 2006; Vashdi, Bamberger, and Erez 2007).

The IAF (based on a process adopted by the British and American armed forces several decades ago) has, for the past 20 years, created and implemented a guided system of preflight briefings and postflight debriefings aimed at promoting reflexivity among its primary action teams, namely its flight teams (comprised of varying members having diverse functional specializations). While acknowledging the differences between the two contexts (hospital surgical teams and military air force flight crews), it was apparent that such guided reflexivity sessions might be ideally suited to surgical

teams for several reasons: both flight crews and surgical teams are action teams; both operate under high-risk, high-stakes conditions; and both can suffer from status-based barriers to intra-team communication. This approach is consistent with the observations of Helmreich (2000), who notes that many of aviation's strategies for enhancing teamwork and safety may be applied to medicine. The task of creating the actual briefing–debriefing protocol to be used by the surgical teams participating in the study was assigned to a joint hospital–IAF task force. The task force was charged with ensuring that all briefing–debriefing sessions would be used to constructively identify critical incidents requiring further analysis, and that all participants would be encouraged to openly express their opinions and concerns. The product of this task force was specific guidelines for the briefing–debriefing process and forms to be filled out by the surgical teams. All surgeons, surgical nurses, anesthesiologists and other support staff (such as heart-lung machine technicians, who are part of surgical teams in heart surgery) in the team-reflexivity condition were trained in when and how to use the briefing–debriefing forms. In addition, the heads of the wards in the guided-reflexivity condition were encouraged to gather the conclusions from the team debriefings and discuss them in ward meetings in order to spread the lessons learned to all members of the ward.

Two guided reflexivity protocols—one each for the briefing and debriefing—were approved by the hospital administration and a pilot study was run in one surgical ward to make sure the tool was adapted adequately. The briefing protocol covered (a) the indications leading to the operation, (b) the procedure to be performed, (c) the kind of anesthetic to be used, (d) special equipment needed, (e) possible complications, and (f) protocols to be followed in the event that such complications arose. The debriefing protocol included a review and analysis of (a) what happened during the surgery, (b) any problems or complications that arose, (c) the degree to which surgical goals were met, (d) what prevented the achievement of specific goals, and (e) what might be done in the future to avoid such complications and to better assure the meeting of objectives. Staff members from the three team reflexivity wards were trained in how to follow these two protocols, with one of the surgeons (either the head surgeon or an assisting surgeon) leading the process.

Prior to the training stage, the peer assessment tool was developed based on peer-evaluation instruments used in major American tertiary centers. The tool included 40 items representing six factors: (a) performance of work routines, (b) professional knowledge (i.e., diagnosis and implementation of treatment protocols), (c) ability to function under stressful conditions, (d) relations with patient and his/her family, (e) relations with the work team, and (f) involvement in ward activities.

To confirm that this instrument is effective in improving work outcomes, the research team ran an extended pilot study in six of the hospital's internal medicine wards, where three wards implemented peer evaluation and three others served as controls. After we saw the positive effect the peer assessment had on the perceptions of the ward members in regard to the team processes in the internal wards, we introduced this method into the three surgical wards, which were randomly chosen as explained above. Participants in these three wards completed the peer-evaluation instrument during a routine professional ward meeting. About a month later, we gave every participant

in the peer assessment wards a confidential summary of the evaluations prepared by their co-workers. The data were presented to the ratees anonymously, and all participants were offered the opportunity to discuss their evaluations with the researchers.

Performance Phase

Immediately upon conclusion of the training, staff in the three reflexivity wards began to implement guided reflexivity practices. The heads of the three wards encouraged their staff to perform the full briefing–debriefing for every surgery.

Over the four-month performance-phase period, the research team randomly selected 226 surgeries for observation, as described below. The observation data were collected by senior medical students, all of whom received a full day of training in observing surgeries and in using the protocol. The observers were present throughout each surgery, and recorded their duration, as described below. For each randomly selected surgery, the observers also recorded whether or not the team conducted a full briefing–debriefing process (i.e., a briefing at the beginning and a debriefing at the end of the surgery).

The observed surgeries included 111 in the three team reflexivity wards, 70 in the three peer assessment wards, and 45 in the three control wards. Of the 111 in the first group, only in 59 surgeries was the full briefing–debriefing process conducted. The other 52 teams cited various reasons for failing to complete the full process, the two most common being time pressure and difficulty in rounding up the team's members either right before or right after the surgery. As the main research goal was to compare teams conducting a full guided team reflexivity process to teams undergoing peer assessment, in the analysis I included only the 59 teams in the team reflexivity condition that conducted the full briefing–debriefing. There was no difference found in the mean level of complexity between the surgeries performed by those that conducted briefing–debriefings and those that did not (Mean $\text{complexity}_{\text{briefing–debriefing}} = 1.833$, Mean $\text{complexity}_{\text{no briefing–debriefing}} = 2$, $t_{120} = 1.05$, *ns*).

Measures

Independent Variable

Team feedback condition was operationalized by two dummy variables. The first was coded as 1 for teams from the peer assessment condition and 0 for teams from the guided reflexivity condition that conducted a full briefing–debriefing. The second dummy variable was coded as 1 for teams from the control condition and 0 for teams from the guided reflexivity condition that conducted a full briefing–debriefing.

Dependent Variable

Relative duration. The observers recorded the time the patient entered the operating room and the time the operation was declared over. Because surgeries vary widely in length across sub-disciplines (ranging from 10 minutes to 10.5 hours), I normalized this variable by calculating the ratio between the duration of the particular surgery

observed and the mean duration of the same type of surgeries performed by teams in the same ward during the baseline period.

Mediating Variables

Team processes and psychological safety were assessed based on a questionnaire given to all team members at the end of each surgery. All items were measured along a seven-point Likert scale from 1 *strongly disagree* to 7 *strongly agree*.

Attention to detail. Based on the scale developed by Miron, Erez, and Naveh (2004), participants were asked to rate two statements describing team behaviors relevant to attention to detail. The items were "The team paid attention to the little details needed to perform the task"; "The team performed the task accurately throughout the procedure" ($\alpha = 0.87$). The responses were aggregated to the team level by taking the mean score of the members' responses. The mean coefficient of agreement (r_{wg}) for all teams was 0.87, with scores ranging from 0.5 to 1; intraclass correlation coefficient (ICC) (1) = 0.32; ICC(2) = 0.38.

Cooperation. Based on the scale developed by Erez, LePine, and Elms (2002), participants rated their team on three statements describing team behaviors relevant to cooperation. The items were "The members of my team were cooperative with each other"; "Everyone on the team seemed to work well together"; and "Team members are willing to share information with each other" ($\alpha = 0.93$). The responses were aggregated to the team level by taking the mean score of the members' responses. The mean coefficient of agreement (r_{wg}) for all teams was 0.94, with scores ranging from 0.8 to 1; ICC(1) = 0.60; ICC(2) = 0.67.

Psychological safety. Based on a scale developed by Edmondson (1999), participants rated their team on three statements relevant to psychological safety. The items were "It is safe to take a risk on this team"; "No one on this team would deliberately act in a way that would undermine my efforts"; and a reversed item, "If you make a mistake the team is likely to hold it against you" ($\alpha = 0.76$). The responses were aggregated to the team level by taking the mean score of the members' responses. The mean coefficient of agreement (r_{wg}) for all teams was 0.86, with scores ranging from 0.3 to 1; ICC(1) = 0.28; ICC(2) = 0.34.

I conducted a confirmatory factor analysis to verify the distinctiveness of these three variables (especially due to the high correlation found between them) using all eight items. I used the Proc Calis procedure in SAS and found that absolute fit indexes for the proposed three-factor model ranged from good to excellent ($\chi^2 = 26.8$, $df = 18$, $p = 0.08$, goodness of fit index = .97, comparative fit index = .99, normed fit index = .97, root mean square error of approximation = .05). These results indicate that the three scales represent concepts that are not only theoretically, but also empirically, distinguishable.

Control Variables

In order to rule out possible confounding effects, I controlled for a number of patient and team characteristics. First, to account for possible effects of patients'

general health on the dependent variables, I controlled for patients' ASA scores—a metric of pre-operative physical status developed by the American Society of Anesthetists. ASA categories range from 1 (normal, healthy patient) to 5 (moribund patient who is not expected to survive another 24 hours with or without surgery). ASA levels in the current study ranged from 1 through 4. Second, I controlled for team size (i.e., the number of team members taking part in a given surgery). Additionally, to show that the performance effects I ascribe to the feedback condition are independent of members' experience working together, I controlled for the number of prior surgeries observed within this study that included at least two members of a given team. Given that this number might be affected by the size of the ward in question (smaller wards are likely to have a smaller pool of staff to draw from), I centered this variable by subtracting a value equivalent to the mean number of surgeries in which at least two team members jointly participated. Thus, this variable represents the degree to which shared experience by at least two team members deviates from the mean for that ward. Finally, variance in surgical team performance may also stem from differences in experience, surgical style, or leadership behaviors exhibited by the head surgeon. To control for such effects, I incorporated into the models a parameter accounting for the possibility of such random variance (described below).

Data Analysis

As the data were collected from teams in nine different wards, I first analyzed the data on the basis of hierarchical linear modeling (HLM) (Bryk and Raudenbush 1992, 84–86), using the SAS mixed model procedure. This approach allows for testing the nested effect of surgeries within wards, as well as the nesting of head surgeons in multiple surgeries. The advantage of HLM is that by modelling both individual and group-level residuals, the procedure acknowledges that individuals within one group may be more similar to one another than to individuals in other groups (Bryk and Raudenbush 1992). In this case, the "individual level" (i.e., lower level) is the specific surgery, and there are two levels of groups: the head surgeon (i.e., surgeries performed by the same head surgeon may be more similar to one another than to surgeries conducted by different head surgeons) and the ward (i.e., surgeries performed by teams in the same ward may be more similar to one another than to surgeries performed by teams in different wards). I found that, in most cases, the random variance of ward and head surgeon was insignificant, signifying that there was no need for HLM modelling. I therefore reanalyzed the data using multiple regression and added the *R*-squared of these models as an indicator of the models' effect size.

As my hypotheses included mediation relationships among the variables, I used Baron and Kenny's (1986) mediation procedure.

RESULTS

Descriptive statistics (displayed in Table 1) indicate a high correlation between team-level attention to detail and team-level cooperation ($r = 0.83^{***}$). However,

TABLE 1
Descriptive Statistics

Variable	N	M	SD	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*
1. ASA	167	2.19	0.87								
2. Team size	166	5.19	1.33	−0.04							
3. Centered number of surgeries at least two members participated in	172	−0.26	5.93	−0.14	0.29***						
4. Team psychological safety	81	5.79	0.89	−0.19	−0.05	−0.22*					
5. Team attention to detail	76	5.85	0.99	−0.22*	−0.10	−0.18	0.75***				
6. Team cooperation	76	5.95	0.89	−0.23*	−0.08	−0.17	0.77***	0.83***			
7. Relative duration	171	1.05	0.67	0.03	0.13	0.05	−0.20	−0.35**	−0.23*		
8. Feedback condition: Peer Assessment vs. Team Reflexivity	174	0.40	0.49	−0.29***	0.03	0.04	−0.08	−0.03	0.03	0.08	
9. Feedback condition: Control vs. Team Reflexivity	174	0.34	0.47	0.38***	−0.009	−0.06	0.28*	0.32**	0.22*	−0.19*	−0.58***

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

multicollinearity is not an issue in the direct effect models, as these variables constitute dependent variables. As for the mediation model, I explain below.

Examination of the correlations among the variables suggests there is no statistically significant bivariate correlation between feedback condition and the dependent variables, at least for the comparison between peer assessment and team reflexivity. However, as shown below, when the control variables are included, feedback condition has a significant relationship with these dependent variables. This is likely due to the fact that team processes are negatively correlated with ASA scores, indicating that when the patient's condition is critical team members are likely to be stressed and thus focus less on the team processes and more on the task itself, even at the expense of being uncooperative, for example. It is also apparent from the correlation between feedback condition and ASA that while surgeries were randomly selected in each ward, those selected in the team reflexivity condition had patients with higher ASA scores. Thus, no bivariate correlation was found between ASA and team processes. This emphasizes the importance of the ASA as a control variable. Only after controlling for the patient's medical condition (as reflected in the ASA score) can one see the direct and indirect effects of the feedback conditions.

Analysis of the baseline (i.e., pre-intervention) data indicates no significant difference among the teams assigned to the different conditions in any of the team process or property variables.

To test the hypotheses, I first examined a model that included only the control variables for each dependent variable (see models 1, 3, and 5 in Table 2 and model 1 in Table 3). Examining the models with only the control variables is important in HLM analysis, so that when I examine the impact of the independent variables and the mediator on each dependent variable, I can show that the effect is above and beyond the effect of the control variables. Models 2, 4, and 6 of Table 2 examine the main effects of feedback condition (H1, H2, and H3) by including the two dummy variables comparing the three feedback conditions. As can be seen in model 2 of Table 2, reflexivity had a beneficial effect over both the control and peer assessment conditions (Estimate $= -1.11$, $p < 0.01$; Estimate $= -0.76$, $p < 0.05$, respectively) when team attention to detail was the dependent variable. When I reanalyzed the model, changing the reference of the two dummy variables (results are available from the author), there was no significant difference between the control and peer assessment conditions (Estimate $= 0.34$, *ns*). As can be seen in model 4 of Table 2, reflexivity had a beneficial effect over both the control and peer assessment conditions (Estimate $= -0.73$, $p < 0.01$; Estimate $= -0.66$, $p < 0.01$, respectively) when psychological safety was the dependent variable. A reanalysis changing the reference of the dummy variables revealed no significant difference between the control and peer assessment conditions (Estimate $= 0.07$, *ns*; results are available from the author). Finally, as can be seen in model 6 of Table 2, reflexivity had a beneficial effect over both the control and peer assessment conditions (Estimate $= -0.77$, $p < 0.01$; Estimate $= -0.52$, $p < 0.05$, respectively) when team cooperation was the dependent variable. Again, a reanalysis changing the reference of the dummy variables revealed no significant difference between the control and peer assessment conditions (Estimate $= 0.24$, *ns*; results are available from the author).

TABLE 2
Main Effect of Feedback Condition on Team Processes

	Model 1		*Model 2*		*Model 3*		*Model 4*		*Model 5*		*Model 6*	
	Attention to detail (n = 69)		*Attention to detail (n = 69)*		*Psychological safety (n = 74)*		*Psychological safety (n = 74)*		*Cooperation (n = 69)*		*Cooperation (n = 69)*	
	Effect		*Effect*		*Effect*		*Effect*		*Effect*		*Effect*	
Dependent variable	*Estimate*	SE	*Estimate*	SE	*Estimate*	SE	*Estimate*	SE	*Estimate*	SE	*Estimate*	SE
Intercept	6.89***	0.59	7.60***	0.59	6.14***	0.53	6.93***	0.52	6.33***	0.54	7.29***	0.52
ASA	−0.26*	0.13	−0.35**	0.12	−0.18	0.12	−0.31**	0.11	−0.13	0.12	−0.31**	0.11
Team size	−0.10	0.08	−0.09	0.08	−0.005	0.08	−0.02	0.07	−0.03	0.08	−0.07	0.08
Centered number of surgeries at least two members participated in	−0.02	0.02	−0.01	0.02	−0.03*	0.02	−0.03	0.02	−0.02	0.02	−0.02	0.02
Control vs. Reflexivity			−1.11**	0.35			−0.73**	0.26			−0.77**	0.28
Peer Assessment vs. Reflexivity			−0.76*	0.30			−0.66**	0.23			−0.52*	0.23
Random variance ward	0.28	0.21	0.00		0.11	0.10	0.00		0.12	0.11	0.00	
Random variance head surgeon	0.27	0.18	0.30	0.19	0.071	0.171	0.00		0.04	0.27	0.00	
−2 loglikelihood	171.3		165.6		182.7		176.1		165.3		160.7	
Δ − 2 loglikelihood			5.7†				6.6*				4.6†	
R^2 for same model without HLM	0.08		0.26		0.09		0.21		0.09		0.21	
ΔR^2			0.18***				0.12**				0.12**	

†$p < 0.10$; *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

TABLE 3
Main Effect and Mediation with Relative Duration as the Dependent Variable

	Model 1 (n = 150)		*Model 2 (n = 150)*		*Model 3 (n = 66)*	
	Effect		*Effect*		*Effect*	
	Estimate	SE	*Estimate*	SE	*Estimate*	SE
Intercept	0.56*	0.26	0.13	0.27	1.38	0.79
ASA	0.12*	0.06	0.16**	0.06	0.07	0.09
Team size	0.04	0.04	0.05	0.04	0.13*	0.05
Centered number of surgeries at least two members participated in	0.009	0.009	0.006	0.008	−0.005	0.01
Control vs. Reflexivity			0.44**	0.13	0.26	0.25
Peer Assessment vs. Reflexivity			0.39**	0.12	0.30	0.20
Team attention to detail					−0.32*	0.14
Team psychological safety					−0.08	0.13
Team cooperation					0.17	0.16
Random variance ward	0.00		0.00		0.01	0.03
Random variance head surgeon	0.06*	0.04	0.001	0.03	0.00	
−2 loglikelihood	267.9		259.1		106.4	
Δ − 2 loglikelihood			8.8*[a]		4.3	
R^2 for same model without HLM			0.09		0.24	
ΔR^2					0.11*[b]	

[a,b]Where missing data resulted in fewer observations for the expanded model, the difference between the two 2 loglikelihood and the two R^2 were based on a re-estimate of the reduced model excluding the missing observations (that is, omitting all the observations in model 2 where the variables attention to detail, psychological safety, and cooperation were missing).

*$p < 0.05$; **$p < 0.01$.

Models 2 and 6 differed only marginally significantly from the model that included only the control variables ($\Delta - 2\text{loglikelihood} = 5.7$, $p < 0.10$ for attention to detail; $\Delta - 2\text{loglikelihood} = 4.6$, $p < 0.10$ for cooperation), suggesting that feedback type has only a marginal effect above and beyond the control variables in explaining the variance in team-level attention to detail and cooperation. Model 4 differed significantly from the model with only the control variables ($\Delta - 2\text{loglikelihood} = 6.6$, $p < 0.05$) when psychological safety was the dependent variable.

It is important to note that in all models the random variance for both head surgeon and ward was non-significant, indicating that surgeries conducted by the same head surgeon or in the same ward are no more similar to one another than surgeries conducted by different head surgeons or in different wards. I therefore re-analyzed the data using linear regression. The results were similar to those obtained above, with feedback condition having a significant effect on all three dependent variables (attention to detail, psychological safety, and cooperation). *R*-squared for these models was 0.26 for attention to detail, 0.21 for psychological

safety, and 0.21 for cooperation (full results may be obtained from the author). All these models explained significantly more variance of the dependent variable above a model with only the control variables. Thus, H1, H2, and H3 were supported.

Hypothesis 4 proposed that team-level attention to detail, cooperation, and psychological safety would mediate the relationship between feedback condition and performance as measured by relative duration of the procedure. As can be seen in model 2 of Table 3, there is a significant main effect for both feedback condition dummy variables, indicating that reflexivity was associated with significantly shorter surgeries than both the control and peer assessment conditions (Estimate = 0.44, $p < 0.01$; Estimate = 0.36, $p < 0.05$, respectively). Note that the sample size for Model 2 of Table 3 is substantially smaller than for models 1 and 2, as some team members did not fully fill out the postsurgery questionnaires, while duration of the surgeries was recorded by the observers. As can be seen in model 3 of Table 3, when attention to detail, cooperation, and psychological safety are included in the model, team attention to detail is significant (Estimate = -0.32, $p < 0.05$) while feedback condition is no longer significant, indicating that attention to detail is a mediator of the feedback condition–performance relationship.

In both models 2 and 3, the random variance of head surgeon and ward was again not significant. I therefore reanalyzed these models using multiple regression. R squared for the full model (paralleling model 3 of Table 3) was 0.24, showing that this model explains significantly more variance than the model with the controls and feedback condition only ($\Delta R^2 = 0.11$, $p < 0.05$). To ensure that this result was not affected by the high correlation between the three proposed mediating variables, I ran three models in which I examined only one of these variables as a mediator each time. Only where attention to detail was the mediator did I find a significant mediation effect, indicating that the findings are not a result of multicollinearity. In addition, in the linear regression model I calculated the VIFs for all included variables. All VIFs were below 4, indicating that multicollinearity is not apparent in this data (O'Brien 2007). Thus, while teams undergoing guided reflexivity have higher average levels of attention to detail, psychological safety, and cooperation than teams undergoing peer assessment, it is through team-level attention to detail that performance efficiency is enhanced.

DISCUSSION

Structuring work around teams in public organizations has the potential to produce substantial improvements in the effectiveness and efficiency of the organization's performance (Guzzo and Dickson 1996). However, public organizations need to learn how to manage teams in order to ensure that the potential for better performance is fulfilled and as a way to deal with conflict and problematic communication characterizing teams in public organizations. Studies conducted in the British NHS, similar to those conducted in the Israeli public healthcare system, have shown the complexity of working in professional heterogeneous teams with turf battles and power games characterizing teamwork (Finn, Currie, and Martin 2010). This study

builds on knowledge from the business sector to learn more about the unique role of teams in the public sector. As studies show (e.g., Rainey 2009), beyond considerable similarities, the two sectors substantially differ in managerial tools and therefore also in the meaning of teamwork. I suggest that team feedback, and particularly guided team reflexivity, may be an important tool by which to improve the performance of action teams in public organizations, as it is one way in which professional boundaries can be blurred.

I found that members of public sector teams that engaged in guided team reflexivity paid more attention to detail, felt psychologically safer, were more cooperative, and completed their tasks more quickly than members of teams which either engaged in peer assessment or received no form of formal feedback. In addition, team-level attention to detail played an important role in explaining why teams engaging in guided team reflexivity completed their surgeries more efficiently (as measured by duration of the surgeries) than those that underwent peer assessment. That is, participation in reflexivity sessions promoted greater attention to detail among team members, which in turn reduced task duration.

This finding is important for two main reasons. First, it might have been expected that teams that paid more attention to detail would take longer to complete their surgeries, and thus would provide quality at the expense of efficiency. In fact, at least at the team level, attention to detail seems to reduce performance time, probably because the team avoids distractions and is focused on the task at hand. Second, a finding of shorter surgeries by the reflexivity teams without the mediation variable would have left open the possibility that team members in the reflexivity wards simply speeded up their work to make time for the briefings and debriefings. The findings indicate that, to the contrary, team reflexivity reduces the duration of surgeries through its impact on team processes, and specifically attention to detail.

Public hospitals are professional bureaucracies in which "professionals will tend to orient toward their own silos rather than reach out to foster collaborative relationships" (Martin, Currie, and Finn 2009, 774). Physicians in these hospitals tend to be individualistic and aristocratic and, in some healthcare systems such as the NHS, have power of veto over NHS administrators in regard to any organizational reconfigurations that they do not welcome (Martin, Currie, and Finn 2009; Bate 2000; Ferlie and Pettigrew 1996). Working in a team with physicians may be especially hard for those team members with other professional backgrounds. By enhancing cooperation and psychological safety, team reflexivity may be used not only as a mechanism for team level learning but as a tool for overcoming these professional barriers. Conducting an open review of objectives prior to the surgery and of the team performance after the surgery, as well as discussing alternative causes of action, enables all team members to speak up during the surgery and perceive the team as a cooperative entity. This finding contributes to public administration theory in that it introduces a specific feedback mechanism as a possible way to overcome professional power conflicts and may encourage researchers to seek additional organizational mechanisms that may enhance professional integration.

It is important to note that while team reflexivity was found to be more strongly related to team attention to detail, cooperation, and psychological safety than peer

assessment, only attention to detail was found as a mediator of the relationship between feedback type and task duration. It may be that cooperation and psychological safety are mediators of a relationship between feedback type and other performance indicators. For example, psychological safety may mediate a possible relationship between feedback type and enhanced team safety, adherence to quality standards, and minimization of team mistakes. Team cooperation may mediate a relationship between feedback type and team satisfaction or cohesion. Similarly, there may be additional variables that may mediate the relationship between feedback type and task duration beyond team attention to detail, such as team monitoring and backup behaviors or team coordination. Team reflexivity sessions in which clear goals are set and team members discuss upfront what may go wrong and what may be needed to be done in such cases are likely to enhance helping and coordination between team members, which in turn is likely to enhance efficiency, especially if such deviations happen. Future research should examine both the additional mediators and additional performance indicators to understand the broad impact of such team feedback mechanisms.

These findings have a number of implications for organizations in general, but primarily for public sector organizations, where knowledge about team activity and team effectiveness is still scarce. The specific complexities facing public sector organizations, which must be responsive to both public opinion and government constraints, can make such organizations less flexible and less responsive to pragmatic managerial processes than private firms. I show that public organizations can benefit in measurable ways from interventions that enhance both team functioning and team performance, and I present one such intervention—guided team reflexivity—as a specific tool that can be implemented in public bodies. Moreover, I show that team-based feedback can serve as a mechanism to enhance team performance in public organizations without requiring managers to cede administrative control. Moreover, team reflexivity may be a valuable means of saving time—and therefore cutting costs—in task performance in general, and in public surgical wards in particular.

From a theoretical point of view, the findings add to the literature by introducing a partial explanation for the relationship between a specific feedback process (team reflexivity) and a performance outcome (shorter task duration). This explanation is in the form of a team-level process, specifically team attention to detail. Team reflexivity enhances team efficiency by focusing the team on the details of the task. More broadly, the study helps bridge the conceptual gap between the discourse in the generic management literature on the one hand, and the public administration and public personnel literature on the other, by exploring how feedback processes such as team reflexivity are especially relevant to public-sector action teams, such as those used in public health care organizations. Moreover, this research provides an attempt to answer Kelman's (2007, 251) call for research that mixes "questions from mainstream organization theory creatively with the special political context of government," in this case the context of multiprofessional action teams in public hospitals.

This study has a number of theoretical and methodological limitations. The first concerns the generalizability of the findings. The findings reflect the effect of guided team reflexivity and peer assessment in surgical teams, which are interdisciplinary

action teams. Therefore, the findings may not be applicable to more stable teams, or to action teams comprising individuals of the same discipline and status. However, the observation of O'Leary, Mortensen, and Woolley (2011) that today's employees often belong to multiple teams suggests that teams in many different settings are increasingly taking on at least some features of interdisciplinary action teams. Thus, even if those teams are more stable or homogeneous than the teams studied here, team-based reflective processes, which enhance learning via team-level feedback, are likely to take on increased salience as employees find themselves bringing new knowledge and understanding from one team to another.

A second limitation has to do with implementation of the guided reflexivity intervention. The research team had a difficult time gaining the trust and cooperation of the surgical teams selected to learn and implement the briefing–debriefing process. I postulate that competition among sectors in the hospital for resources and status may have created a sense of frustration and a lack of trust in the hospital administration, leading to suspicion of any intervention. This point illuminates the fact that while new processes and technologies may be useful and enhance organizational effectiveness, they are not necessarily easy to introduce or administer. However, the fact that more than half of the teams examined in the reflexivity condition actually implemented the briefing–debriefing process is actually quite encouraging. In a recent study examining the applicability of only a briefing intervention, 64% of the participants reported concerns regarding staff availability to complete such a procedure (Henrickson et al. 2009). In addition, in a study examining the compliance rate with a pre-operative checklist, compliance ranged from as low as 18.5% to 80.0% regarding the entire team orally confirming different issues regarding the patient (Spence et al. 2011). Future research may want to examine the underlying complexity of introducing such new processes, and explore ways to overcome any resistance.

Third, I would be remiss were I to leave untested the alternative explanation that it is not team reflexivity that affects team performance, but rather some factor relating to the team leader (i.e., the head surgeon) in teams that conduct guided team reflexivity. In order to test this possibility, I calculated the percentage of surgeries led by a head surgeon in which a reflexivity session was conducted. I then examined the correlation between this variable and relative duration for those teams belonging to the three wards whose members received reflexivity training. I found no significant correlation between the head surgeon's propensity to lead a reflexivity session and the relative duration of that surgery ($r = -0.14$, *ns*). Thus, I can conclude that the head surgeon's propensity to lead a reflexivity session in itself is not related to a reduction in duration. Similarly, one may suspect that there are other team characteristics that cause team members to be more prone to actually conducting guided team reflexivity sessions, which in turn affect performance. However, as team composition changes so frequently, with only 5% of the teams participating in this study sharing the exact same composition, it is unlikely that team members would be initially aware of such a team characteristic and thus feel more comfortable to conduct a guided team reflexivity session. Future research may want to further examine this possibility.

Fourth, this study examined whether different types of feedback influence team processes and performance, but did not examine the quality or extent of the team

feedback processes. While the findings show that team reflexivity in general enhances team performance more than peer assessment or no feedback at all, this is only a "first-step" (Light and Pillemer 1984, 18), and there is doubtless much to learn about what makes both team reflexivity and peer assessment more or less effective. Future research may want to examine whether variables relating to the quality of these team feedback procedures further explain the variance in team processes or performance.

Finally, given the practical difficulties of running and maintaining a field experiment over an extended time frame, the findings and conclusions are relevant to the influence of guided reflexivity in the short run (six months). Team reflexivity might have a different impact over a longer period, one that allows time for changes to take root in the organizational culture or, alternatively, its effects might wear off and be reversed. This too should be explored in future research.

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