Common Failure and Indivisible Success: How Strong and Weak Forms of Collective Responsibility Shape Team Processes

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Team effectiveness literature recognizes collective responsibility (CR) as an important dimension of team design, but has not specifically defined CR, nor shown how it is designed and enacted by managers and teams. This paper reports a multi-method study of team design in hospital emergency departments and highlights two key findings about CR. The first finding is that teams were designed with a strong form or a weak form of CR. Managers designed a strong form of CR by letting teams collectively experience the outcomes of their joint work. When working under this condition, team members coordinated as a group, helped each other, and interpreted monitoring communication as teamwork, rather than as criticism or control. Managers designed a weak form of CR by assigning work to teams but buffering them from the outcomes of their work. When working under this condition, team members variously avoided work or worked around those who were avoiding work, which undermined the sense that they were a team. Operational data showed that under the strong form of CR, teams worked more efficiently when facing more work, and under the weak form, teams slowed down as work increased. The second finding from the study is that workers enacted the weak form of CR when they had contentious relationships with managers, even when the managers had intended the strong form. Thus CR shapes constructive team processes, but not when enacted weakly or amid contentious manager-worker relationships.

**Keywords:** Team Effectiveness, Team Design, Collective Responsibility

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*If you want the benefits of teamwork, you have to give the team the work.*

– Hackman 2002, page 42

When teams work, the benefits are many. Teams can combine diverse knowledge, generate innovative ideas, flexibly solve problems, and promote satisfaction and accountability, among numerous other benefits (Batt, 2004; Cummings, 2004; Edmondson, 1999; Van De Ven, Delbecq, & Koenig, 1976). Yet the benefits of teams often prove elusive in practice (Gerwin & Barrowman, 2002; Vallas, 2003). Instead, shirking, ambivalence, or conflict within the group can prevent team members from actually combining and coordinating efforts – in short, from acting as a team (Kidwell & Bennett, 1993; Langfred, 2007). Team design – for example,
whether team membership is stable or whether their task is interdependent – is a strong predictor of how effectively teams work (Cohen & Bailey, 1997; Hackman, 1987; Wageman, 1995).

Collective responsibility (CR) is one dimension of team design thought to powerfully shape co-acting groups into coordinating, cooperating, mutually adjusting teams (Hackman, 2002). Many previous studies describe effective teams as having CR (e.g., Hackman, 2002; Valentine & Edmondson, 2013; Wageman, 1995, 2001, 2005). Yet, in prior research on team design, CR has been a background concept and has not been explicitly defined. Additionally, it has not always been clear how CR is actually designed or established, nor is it known how the team members enact the design. The lack of specific definitions and evidence for how CR is designed limits understanding of how CR shapes team processes. Additional research is needed to “specify and fill-in” this promising construct (Golden-Biddle & Locke, 2006, pg. 38).

To address this need, this paper synthesizes disparate definitions of CR. Two main uses of CR are identified in the social science literature. CR refers either to having an obligation (e.g., the group is assigned to tidy the office) or to being causally operative for an event occurring and bearing the consequences of the event (e.g., the group was responsible for earning five percent commission). Thus one use refers to a weak form of CR: groups are responsible because they have an assignment, obligation, or duty. The other use refers to a strong form of CR: groups are responsible because they bear the consequences of their actions. These two uses of CR can be seen across many social science disciplines, but are presently only implicit in team effectiveness research, suggesting that additional research can specify forms of CR in teams.

In pursuit of this aim, this paper reports a multi-method field study of team design in five hospital emergency department (EDs), with a particular focus on how CR was designed and enacted, and highlights two key findings. The first finding is that managers adopted a strong or
weak form of CR in their team designs, with consequences for team processes and performance. Managers designed a strong form of CR by letting teams collectively bear the outcomes of their joint work. When working under this condition, team members coordinated as a group, helped each other, and interpreted monitoring communication as teamwork, rather than as criticism or control. Team members focused on accomplishing their collective work even as they were overwhelmed by the amount of work they were responsible for. Managers designed a weak form of CR by assigning work to teams but buffering them from the outcomes of their work. When working under this condition, team members variously avoided work or worked around those who were avoiding work, which undermined the sense that they were a team. Operational data showed that under the strong form of CR, teams worked more efficiently when facing more work, and under the weak form, teams slowed down as work increased.

The second finding from the study is that workers enacted the weak form of CR when they had contentious relationships with the managers, even though managers intended the strong form. Because of the contentious relationship, workers preferred that responsibility, monitoring, and control remained with the faraway manager rather than with proximate team members. Thus CR shapes constructive team processes, but not when enacted weakly or amid contentious manager-worker relationships.

**COLLECTIVE RESPONSIBILITY: A SYNTHESIS OF THE LITERATURE**

**Definitions of Collective Responsibility in the Social Sciences**

Social science and applied social research deal with the question of CR in two distinct ways. These uses of CR are often in distinct literatures. First, across many scholarly literatures, a weak form of CR can be seen: CR is conceptualized as having a duty or moral obligation. As examples, numerous articles conclude that various groups are collectively responsible to promote
individual health, prevent the spread of HIV, stop global warming, consume responsibly with awareness of social and ecological commons, prevent suicide in prisons, deliver safe and appropriate health care, or report medical errors (Anderson, Huppert, & Rose, 1993; Daniel, 2006; Dorfman, Wallack, & Woodruff, 2005; Espin, Levinson, Regehr, Baker, & Lingard, 2006; Johnston, 2008; Kachalia & Studdert, 2004; Marks, Burris, & Peterman, 1999; Olausson, 2009; Rose & Day, 1990). Even though there are not specific mechanisms referenced whereby the group experiences the consequences of their responsibility, they are said to be collectively responsible – by obligation – for certain issues or problems.

In contrast to the above treatment, many other scholarly literatures use a strong form of CR. In these literatures, groups are collectively responsible when they caused something to happen and bear the consequences of their actions. Legal scholars, for example, are interested in this treatment of CR, as seen in a representative example given in Fletcher (2002, pg. 1557, italics added):

If a single person can be responsible for a child in his care, then a team of babysitters can take responsibility as well. If something happens to the child, they – all together and as individuals – must provide an accounting and stand responsible in the sense of accepting civil liability. They are each responsible for the whole damage.

Here CR means that each person within the group bears the consequences of their joint actions. As another example, a political party system is said to be built around this kind of CR: even when it is difficult to determine which person is culpable for untoward events, voters can hold the entire political party responsible by removing the party from power; the group thus has strong incentive to monitor itself (Fiorina, 1980).

The broad conclusion of research concerned with the strong form of CR is that “collective responsibility is the natural outcome of collective action” (Abraham, 1987, pg. 848), and it gives groups the “incentive to think and act in collective terms” (Fiorina, 1980, pg. 27).
The group is collectively responsible when they were causally operative in an event and bear the consequences together, as elaborated in Feinberg (1968, pg. 677):

The parties share a common lot insofar as their goods and harms are necessarily collective and indivisible... What makes collective liability natural in such cases as business partnerships, joint authorships, and athletic teams, is that parties who are largely of one mind to begin with are led (or forced) by circumstances to act in concert and share the risk of common failure or the fruits of an indivisible success.

This strong form of CR is seen in applied social sciences as well. As an example, some school programs focus on “giving students collective responsibility” for improving their collective ideas and understanding (Zhang, Scardamalia, Reeve, & Messina, 2009, pg. 9; Zhang, Scardamalia, Lamon, Messina, & Reeve, 2007). Notably, “giving students collective responsibility” meant letting the students see how they were collectively operative in creating a shared outcome (in this case a class database). As another example, a community was “collectively responsible” – meaning causally operative – for establishing their first productive water point; and collectively bearing the consequences of this (successful) joint action enabled the community to overcome the “inevitable leadership and organizational problems associated with community-based [water resources]” (Batchelor, 1999, pg. 252).

Collective Responsibility in Team Effectiveness Research

These uses of strong and weak forms of CR appear in different scholarly literatures, meaning there has not been a need to explicitly distinguish them. In organizations literature, however, groups can be responsible through assignment/obligation or can also be responsible by bearing the consequences of their work, so the distinction between these two forms of CR may

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1 Note that in social psychology research, collective responsibility is defined as an individual perception of who is to blame, rather than a state that a group enters into by their joint action. It is defined as a perception that “individuals who were not direct causal agents of negative events but share association with a wrongdoer” are to blame for the events (Denson, Lickel, Curtis, Stenstrom, & Ames, 2006; Lickel, Schmader, & Hamilton, 2003). The focus of this paper is groups, not individual perception, so this specific definition of collective responsibility is not emphasized.
be important. Thus far, team effectiveness research uses CR to refer to both weak and strong forms of CR without distinguishing between the two.

Team effectiveness research has shown that team design is critically important for how and how well teams function (Hackman, 1987, 2002; Wageman, 1995, 2001, 2005). CR is one dimension of team design referenced in these studies, though usually as a minor concept. An example of how CR is used in this research can be seen in Hackman (2002, pg. 42) which argues that “collective responsibility is the difference between a co-acting group and a team.” Hackman (2002, pg. 42) elaborates with an example of telephone operators being called a team but actually functioning as a co-acting group:

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\text{If the team had been assigned collective responsibility for handling all service requests for, say, a specific part of the company’s service area, and if members had been held collectively accountable for how quickly and well those requests were processed, then it would have been a real work team (italics added).}
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Hackman notes that teams can have CR through assignment and teams can also be held collectively accountable (presumably facing collective consequences for their joint work).

These two themes appear throughout team design research, but are not explicitly differentiated.

An example of CR referring to assignment is Wageman’s (1995) important research on interdependence and group effectiveness. The study shows that groups of technicians varied on “the extent to which group members were assigned collective responsibility for responding to repair calls” (Wageman, 1995, pg. 157). As another example, Wageman notes that work was allocated through “a call-queuing process that placed responsibility for all machines on all group members, whereas less interdependent groups had more assignment of individual responsibility for machines in specified territories” (Wageman, 1995, pg. 165). This research uses responsibility to refer to assignments, but still recognizes that people are shaped by whether and how they experience the consequences of their work. One important conclusion of this study is
that groups that earn group rewards benefit from “the collective motivation engendered by group outcomes” (Wageman, 1995). This conclusion was not specifically linked to CR, but the focus on group outcomes relates to the strong form of CR. Thus both weak and strong CR are implicitly referenced in this research.

Other research on team design uses CR to refer specifically to teams bearing the consequences of their actions. For example, the comprehensive and rigorously validated Team Diagnostic Survey looks at whether the teams’ work includes “a potentially assessable outcome for which members bear collective responsibility” (Wageman, 2005, pg. 377). Similarly a study of self-managing teams considered “the degree to which team members take collective responsibility for the outcomes of their work (Wageman, 2005). As an example from research on work design, Bowen and Lawler (1992) argued managers of total quality management programs should place “emphasis on collective responsibility and the horizontal relationships to get individuals to own collective results” (Bowen & Lawler, 1992, pg. 37), the implication being that CR relates to owning collective results.

One study is an outlier in terms of how it conceptualizes CR, but is mentioned here for completeness. Wageman (2001) defined CR as the degree to which people would take initiative on team member’s behalf and not avoid responsibility. CR was thus conceptualized as behavioral evidence that team members felt responsible for the group’s work (Wageman, 2001).

A MODEL OF COLLECTIVE RESPONSIBILITY IN TEAMS

As shown, the team effectiveness literature has identified CR as an important dimension of team design, but references several aspects of CR without explicitly distinguishing definitions. I propose to build on the important foundation developed in the team effectiveness research by specifying a conceptual model of CR. The proposed conceptual model combines the insights
from the synthesized literatures above with two additional literatures. First, the basic shape of the proposed conceptual model mirrors research on individual felt responsibility (e.g., Fuller, Marler, & Hester, 2006; Morrison & Phelps, 1999). Second, the proposed model differentiates weak form and strong form CR and draws on team effectiveness research to develop arguments for how weak and strong form CR will shape team processes. Third, the proposed model shows that CR is designed and enacted between managers and teams, and will therefore be shaped by the relationship between them, and so integrates the research literature on teams in situ (e.g., Mueller, 1994; Vallas, 2003).

**Felt responsibility.** The research literature on felt responsibility can provide the basic theoretical shape for understanding CR in teams. Felt responsibility is defined as a person’s internal state of feeling responsible and it arises from organizational conditions, including being responsible for certain specific tasks (Choi, 2007; Fuller et al., 2006; Morrison & Phelps, 1999; Pearce & Gregersen, 1991). Note the basic shape of the relationships – certain organizational conditions (including actually being responsible) give rise to feeling responsible. Similarly, the proposed conceptual model of CR distinguishes between the ways in which teams are actually made responsible for their work (e.g., by assignment) and whether teams collectively feel responsible. Both are important, and are likely closely related, but may occur in the absence of the other. CR is a dimension of team design, and collectively felt responsibility is an emergent state (Ilgen, Hollenbeck, Johnson, & Jundt, 2005). This basic shape is illustrated in Figure 1

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**Weak form and strong form of collective responsibility and team processes.** The proposed conceptual model also draws on the synthesized literature above to distinguish between
weak form and strong forms of CR, and integrates team effectiveness research to suggest how these different forms of CR will shape team processes. Managers design a weak form of CR by assigning work to teams but buffering them from the outcomes of their work. Managers design a strong form of CR by exposing teams to the consequences of their collective action. This difference in design (likely a continuum rather than a dichotomy) will influence team processes.

Consider, for example, classic economic theory on team production. Alchian and Demsetz (1972) theorize that when a team shares profits (and the group is small), team members will monitor each other’s work, because the benefit each individual gets from improved team productivity is higher than the cost of monitoring. This is an example of strong form CR because by sharing profits, the team collectively bears the outcomes of their joint actions. The article also gives an example of weak form CR, where the teams function as the manager’s agents. In this example, the manager may make the team collectively responsible by assigning them joint work, but in this condition, the team members are incented to shirk and only the manager is incented to increase productivity by monitoring.

The proposed model predicts that team members are likely to act in the best interest of the collective when working under the condition of strong form CR, which will be reflected in constructive team processes like active communication, knowledge sharing, and problem solving (Hoegl & Gemuenden, 2001; Wageman, 2005; Wageman & Fisher, 2013). When working in teams designed with weak form CR, team members may be more focused on their own interests than the interests of the team, and this may lead to less communication, less knowledge sharing, and more conflict (Wagner, 1995; Weldon, Jehn, & Pradhan, 1991a). This argument relates to research on group goals. CR is a design choice that managers make when designing their teams,
and they can leverage many of the mechanisms that link group goals and improved group performance (e.g., effort and planning) (Weldon et al., 1991a; Weldon, Jehn, & Pradhan, 1991b).

**Collective Responsibility in the Space between Managers and Workers.** Finally, the proposed model of CR recognizes that team design is a choice variable made by managers *in situ*. The design and the enactment of the design will be shaped by managers’ and teams’ beliefs and assumptions about teams and control, and the relationship between managers and teams.

The sociological literature that examines how teams are designed and implemented in specific organizational contexts supports this proposition. This research shows that there are paradoxes inherent in team work systems and so unsurprisingly managers and teams feel ambivalence about teams. CR is particularly likely to create tension between managers and workers because it has to do with how work is assigned, controlled, and accounted for.

Vallas (2003) shows how the inherent paradoxes in team design and managers’ ambivalence about teams can undermine their objectives in implementing teams. As an example, the managers he studied implemented teams to increase worker participation, but concurrently tried to centralize and standardize expertise, which undermined team participation. The organization could not have both a centralized, expert “right way” of doing things and also broad worker participation and innovation in teams. In the same study, he also found that the few groups that actually adopted a team work system “used the management’s wish to cut supervisory layers to gain de facto rights of self-management over their production area,” (2003, pg. 231). This study shows that manager’s designs are not simply implemented, but are interpreted, changed, and adapted by the workers to fit their work, culture, and preferences.

As another example, programs that attempted to establish team teaching in schools – with the aim that teachers would take co-responsibility for maximizing learning – were shut down by
school administration (Jang, 2006). There were contradictions in what the administrative leadership wanted: they had a vague sense that teachers should develop CR, but the enhanced roles for teachers also brought perceived threats to power, authority, and control (Wood, 2007).

In another related study, Mueller (1994) showed that firms differed in how they situated their teams in their organizational hierarchy. The Ford Company implemented teams with an appointed team leader who reported to someone above him in the organization’s hierarchy. GM implemented self-managing teams who appointed their own leaders who were not part of the hierarchy. This study showed that two firms in the same industry and in many of the same countries designed teams with different relationships to the hierarchy. The difference was traced back to historical and structural features of each firm.

In summary, the research above can be integrated in a proposed conceptual model for CR in teams: with the basic shape of research on felt responsibility, with a definition that integrates social science research revealing both weak and strong form CR, and with an explicit recognition that CR will necessarily be played out between managers and workers around issues of control, monitoring, and work allocation.

METHODS

Research Design

This research builds on prior studies of team design by focusing on the unspecified dimension of CR. To develop a fuller understanding of CR in team design, this research implements a multi-site study to develop theory through comparative case analysis (Eisenhardt, 1989). The research question is “an open-ended inquiry about a phenomenon of interest” (Edmondson & McManus, 2007, pg. 1160) and thus requires qualitative open-ended data that can be interpreted for pattern identification (Edmondson & McManus, 2007; Eisenhardt, 1989).
The strength of a cross-case comparative approach is the “likelihood of generating novel theory, because creative insight often arises from the juxtaposition of contradictory or paradoxical evidence” (Eisenhardt, 1989, pg. 546).

This paper also complements the qualitative analysis with a quantitative analysis of the key variable identified in qualitative analysis, namely strong or weak form CR. Multi-method research leverages the strengths of both qualitative and quantitative data (Edmondson & McManus, 2007; Jick, 1979). The research question for the quantitative analysis is whether teams engage in more “foot-dragging” (to use Chan’s (2013) term) when they have weak CR for patients (i.e., when they are assigned patients from the department’s pooled queue). As Chan (2013) and Song, Tucker, and Murrell (2013) argue, pooled queues create strong incentives for individual physicians to “drag their feet,” and my qualitative data support this same proposition for teams. I use operational data to provide evidence of “foot-dragging” in teams with weak CR.

**Research Setting**

This research was conducted during a time of change for the U.S. health care delivery system. Problems facing the health care system prompted interest in new care delivery systems, with a particular interest in team-based care (IOM, 2001, 2003). Teams in health care settings were a promising setting for research on team design because managers and leaders were implementing different team designs and needed evidence on whether and how different designs impacted front-line employees and patients.

The particular setting for this research was hospital emergency departments (EDs). EDs were said to be “in crisis” and many changes were implemented that changed the way EDs were organized (Mason, 2007). The ED crisis stemmed mainly from overcrowding and ineffective teamwork (Adams & Biros, 2001; Derlet, Richards, & Kravitz, 2001; Siegal, 2010). The ED setting held particular challenges for team-based work systems because of fluid staffing,
professional conflict between nurses and physicians, and pervasive status differences. Even when ED managers were interested in team-based work flows in the ED, establishing a work system wherein nurses and physicians actually identified as and acted like a team was difficult.

Research Sites

Selection of research sites in these studies is a crucial part of building theory from case studies (Eisenhardt, 1989). To support this selection, I interviewed leaders and staff at seven EDs about their work processes and redesigns (either proposed or realized), and visited five of these EDs in person. I also read supplementary materials, like physician memoirs or operations manuals (Crane & Noon, 2011; Engrav, 2011; Lesslie, 2008). These background materials helped in site selection.

The first site was identified through a contact who knew of my interest in team design. The second and third hospitals were selected and studied after data collection and analysis of the first ED was mostly finished. They were selected to look as much like the first ED as possible to reduce extraneous variation. They helped identify theoretically important variation in design. After data collection and data analysis at the second and third hospitals were mostly finished, I identified two additional EDs that varied on the dimension of theoretical interest (collective responsibility) identified in the first three hospitals. I used these hospitals to confirm theory developed from the first three hospitals. Because the theory was largely confirmed, I concluded the cross-case comparison exercise with these five EDs.

The five EDs were selected to be similar on five organizational characteristics relevant to emerging theory. First, they were all part of academic teaching hospitals. This characteristic was important because the presence of resident physicians influences intergroup and power dynamics between physicians and nurses (Bartunek, 2011), and creates a tension between resident education and patient care, both of which likely influence team design. Second, the five sites
were all urban, safety-net EDs. Urban, safety-net hospitals serve high volumes of indigent patients and therefore provide a considerable amount of unpaid care, the majority of which is initiated in the ED (Clark, Singer, Kane, & Valentine, 2012). This characteristic was important because serving indigent, uninsured patients requires different skills and resources that could plausibly influence how teams are designed and staffed. Third, the five sites were all trauma centers. EDs that are accredited and prepared to treat the most acute trauma cases are laid-out, staffed, and equipped differently (Southard, 1994), and in ways that would influence team design. Fourth, all five sites had an electronic medical record (EMR) system. This characteristic was important in part because I relied on the EMR as a source of data, but more importantly, EMRs significantly influence how physicians and nurses coordinate (Feufel, Robinson, & Shalin, 2011; O'Malley, Grossman, Cohen, Kemper, & Pham, 2010), and therefore are likely to influence team design. Finally, all of the EDs had designed their work around team-based care, with the intention that the teams would serve any ED patient, regardless of acuity, arrival mode, or diagnosis. The different EDs had different labels for their teams, including pods, teams, and zones. In this paper, I refer to the research sites using pseudonyms based on the order in which they were studied: Alpha, Bravo, Charlie, Delta, and Echo.

**Qualitative Data**

At each hospital, qualitative data were collected through interviews, observation, and archival materials. These are detailed in Table 1.

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Formal interviews lasted between 30-90 minutes, were conducted by me or a research assistant in a private room and were all recorded and transcribed. Questions focused on team design, coordination behaviors, and people’s interpretation of the team design. Informal interviews
occurred during meals, before or after meetings, or during observation and were recorded in field notes. At each site, I judged that I had reached theoretical saturation when I was not gaining additional insight from additional interviews (Strauss & Corbin, 1990, pg. 136). All interviews were conducted with people who volunteered to be interviewed, sometimes after encouragement from me or their colleagues. At some sites, getting interviews with people from certain role groups was particularly difficult – this difficulty often revealed fractious relationships between the managers and the frontline workers, especially the nurses, which became important for the findings in the study. Observations were conducted in the main rooms of the ED. Archival materials were collected from ED managers and typically included floor plans and work design and operational information.

Qualitative Analysis

Consistent with best practices for developing theory using case studies (Eisenhardt, 1989; Eisenhardt & Graebner, 2007), I began the cross-case comparison by developing a within-case analysis for the first three field sites. These within-case analyses were purely descriptive, but were “central to the generation of insight” (Eisenhardt, 1989; Gersick, 1988). I next compared each site to the other sites (i.e., Alpha to Bravo, Bravo to Charlie, Charlie to Alpha) to develop understanding of the similarities and differences between each pair. The result of these forced comparisons were “new categories and concepts which [I] did not anticipate” (Eisenhardt, 1989): during the process of the forced comparisons I saw differences in how the teams were made responsible for patients. Although this question of how teams were made responsible for patients was a common topic in the interviews in my first site, it did not emerge as an important theme until the cross-case comparison. I selected Delta and Echo as the final research sites based on this dimension.
I implemented each of these initial strategies to help make sense of the large quantities of interview and observation data I had gathered. They helped me identify overarching themes that came up in interviews across sites. Using these overarching themes as an initial broad framework, I conducted line-by-line analysis of every interview to understand these themes and especially the relationships between them (Miles & Huberman, 1994; Strauss & Corbin, 1990). This was an iterative process, as I developed ideas and discarded or revised themes and relationships as I tested them against additional data. I also iterated emerging ideas with existing literature. I followed this process until I arrived at categories that best fit my data.

**Quantitative Data**

Quantitative data were collected from the electronic medical record (EMR) at each ED. Data were collected for every patient visit for between one and three years (see Table X for a summarize description of the data collected at each ED). The record for each visit reported time stamped events like time of arrival and time of departure, patient characteristics, and de-identified provider numbers for the doctors and nurses who treated the patient. These data represent the digital “footprint” of events that unfolded around each patient visit, so provide an opportunity to triangulate evidence of the dynamics uncovered in the qualitative data (Jick, 1979). Similar uses of data have been referred as a “quantitative ethnography” in the service of deep understanding of relationships in field sites, rather than as a test of generalized and deductive argument (Briscoe & Tsai, 2011; Petersen & Saporta, 2004).

**Measures**

**Time in ED.** The dependent variable for the quantitative analysis is length of time that the index patient spends in the ED, and is calculated by subtracting arrival time from discharge time. Time in the ED is an important measure of the ED performance because it is associated...
with patient outcomes (Casalino et al., 2012; Kennebeck, Timm, Kurowski, Byczkowski, & Reeves, 2011; Singer, Thode, Viccellio, & Pines, 2011) and has been shown to depend on structural or organizational conditions that influence motivation (Chan, 2013; Song et al., 2013). I log-transformed time in ED because its distribution was right-skewed.

**Expected future work.** Chan (2013) developed an empirical model that regressed expected future work (number of patients arriving at the ED triage in the prior to the index patient’s arrival at the pod) to show that physicians who were assigned patients by a nurse manager engaged in “foot-dragging” to avoid getting more patients. Chan (2013, pg. 20) argues, “Other than through the moral hazard of foot-dragging, there is no other reason why [patients’ time in the ED] should increase with expected future work, holding actual work constant.”

Building on this analysis, I calculated the expected future work for the teams in the EDs I studied as the number of patients arriving at the ED triage prior to the index patient arriving at the team. The teams do not control the number of patients who arrive at the ED, but can see their expected future work on the computer system that lists patients who arrived at triage.

**Collective responsibility.** To examine the differential effect of weak or strong CR on “foot-dragging” in teams, a variable indicating whether an ED designed their teams with dedicated queues or pooled department queues was created (0 for weak CR, 1 for strong CR).

**Control Variables.** Control variables for time-category fixed effects (month-year interaction, day of the week, hour of the day) were calculated. Fixed effects for attending, nurse, and resident on each case were also calculated.

**Quantitative Analysis**

Adapting Chan (2013), the quantitative analysis estimated the following model:

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\text{TimeinER}_{ijkt} = \beta_0 + \beta_1 \text{Expwork}_{jt} + \beta_2 \text{CR}_j \times \text{Expwork}_{jt} + \beta_3 \text{CR}_j + \text{MD}_{jk} + \eta_t + \varepsilon_{ijkt}
\]
In this model, TimeinER_{ijkt} represents the log time patient \( i \) spent in ED \( j \). Expwork_{jt} is the number of patients who arrived at triage in the hour before patient \( i \) began treatment. CR_{j} indicates whether the ED had teams with weak or strong collective responsibility (i.e., pooled or dedicated queues) for patients, and CR_{j} \times Expwork_{jt} is the interaction term of CR and Expwork. \( \eta_{t} \) is the sum of time-category fixed effects (month-year interaction, day of the week, hour of the day), and MD_{jk} controls for the provider \( k \) at ED \( j \). The coefficients on \( \beta_{1} \) and \( \beta_{2} \) indicate how teams with weak and strong CR responded to expected future work, respectively.

**QUALITATIVE FINDINGS**

Managers designed their ED teams with a strong or weak form of CR, with significant consequences for team processes and performance.\(^2\) The key difference was how teams were made collectively responsible for their patients. Some EDs, characterized as having strong form CR, assigned each team their own dedicated queue of patients. When these teams worked efficiently, their queues shortened; when they shirked, their queues grew longer and waiting patients built up. Other EDs, characterized as having weak form CR, assigned teams their patients from a queue pooled at the department level. These teams were buffered from the consequences of how they worked. This subtle difference in how teams were made responsible for their work had profound consequences for team processes.

At EDs where the teams had a dedicated queue, they were exposed to the consequences of their actions. When they worked efficiently, they reduced the number of patients in their

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\(^2\) A previous study examined team design in the context of hospital EDs (Valentine & Edmondson, 2013). That study focused on how certain team structures can help groups with hyper-fluid membership (characteristic of the ED) coordinate as a team. That study showed that a team boundary, a role set, and collective responsibility enabled hyper-fluid groups of people to coordinate as a team. That study did not clearly define CR or differentiate weak and strong forms of CR. It is important to note that all five of the EDs studied for the present research designed teams that could be conceptualized as bounded role sets with collective responsibility. Whether they had weak or strong form CR was the difference in their team processes and performance. This point is summarized in Table 2.
queue. If they worked slowly, their queue would grow longer. In theory, they could finish processing all of their patients and then rest, even if other teams were still busy treating patients. (In practice, this did not happen often because the EDs were so crowded). The team’s queue was theirs to manage, meaning they faced the consequences of their collective action.

At EDs where the teams were assigned patients from the department’s pooled queue, they were buffered from the consequences of their work by the nurse manager or flow manager, whose job was to distribute patients from the shared queue to the teams. Teams would not be assigned a new patient until they had discharged an existing patient. The nurse manager could try to monitor progress and encourage efficient efforts, but would not assign a new patient until the team had an opening. Thus the teams were assigned patients, but did not bear the consequences of how efficiently they treated their patients, which is a weak form of CR.

**Alpha and Delta: Strong form of collective responsibility and group coordination**

Alpha and Delta designed teams with dedicated queues. Nurse managers rotated arriving patients to fill each team’s queue. A nurse at Alpha explained, “There is a, “1,2,3,4; 1,2,3,4” for assigning patients to [teams].” An attending at Delta gave a similar description: “The idea here is that there is a triage nurse standing with a deck of cards saying Team 1, Team 2, Team 3, assigning patients to the [teams].” The consequences of this design is that teams “owned their own patients, no ifs, ands, or buts” according to an attending at Alpha.

Managing their own dedicated queue of patients required (and encouraged) the nurses and doctors to think and act in collective terms. Nurses and doctors would help each other and monitor each other’s progress. One attending at Delta explained, “In general here the culture is you want to keep your queue low. It drives me crazy to have a long queue so there is an incentive to see patients in a room fairly quickly… if the residents are taking too long I will just go see the
patients myself.” The senior doctor took on the tasks of the junior doctor for the good of the team’s shared responsibilities. Another Delta attending agreed, “If I know that [my team’s nurses] are too busy I will go and put the IV in myself because the common goal is to take care of this patient. It is whatever it takes to get it done and it is a situation where we are all working towards a common goal.”

In addition to helping each other, teams with strong CR also actively monitored each other’s work and progress. This monitoring was interpreted and described as useful teamwork and communication, rather than as controlling or invasive monitoring. As an example, a nurse at Delta explained, “Sometimes the doctors forget to go and check on somebody who has been four hours here. We remind the doctors, please check on that CAT scan, or check that lab work. Or the lab work came back, their potassium is this. Where are we going with this patient?” A Delta attending agreed, “I have a good sense where the nurses are in their work flow. They have a good sense of where I am and where the residents are so they prioritize things.” One of the residents at Alpha elaborated how monitoring progress of teammates could be helpful:

Sometimes I have to say, after an hour-and-a-half, “Hello? Have you drawn blood on XYZ patient and, if so, what happened?” And they’ll be like, “Oops. She was a hard stick, and I couldn't get a line.” Then it’s, “Why wasn't I notified?” That’s usually not a problem because they’ll usually tell me first. I make it a point to say, “Hey, let me know if there are problems, because I like to keep things moving.” If they can't do it, I’ll do it myself or try to do it myself.

Dedicated patient queues had a downside for teams. Managing their queue was often stressful and overwhelming. People described being “dealt” several sick patients in a row, which would slow the team down and stress their processes for the rest of the day. One resident from Alpha explained, “If you get a bunch of people who can be easily dispositioned [i.e., discharged or admitted to the hospital] and don't need a lot of testing, you can get them in and out the door very quickly. If you get complicated people, or sick, sick people who require procedures or
intubations or central lines, that stuff takes time, which means that we’re not seeing other patients as quickly... that will slow you down and there’s nothing you can do about that.”

Another resident elaborated, “You’ll have rough shifts with a massive influx of patients for some reason. Every system has a breaking point and every once in a while you hit those breaking points, and it’s just painful and you just have to try to get through as best you can.” The dedicated queue came with a trade-off: people were exposed to the consequences of how efficiently they were working, which motivated collective action, but also frequently put the group in an overwhelming situation that was not actually in their individual or collective control. Additional data about strong form CR and group coordination processes are reported in Table 3.

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Insert Table 3 about here
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**Charlie: Weak form of collective responsibility and split individual effort**

At Charlie ED, the teams were designed with a weak form of CR. A nurse manager who was located by the waiting room assigned patients to teams. She only assigned a new patient to a team when the team discharged a patient they had been treating. An attending at Charlie explained, “The [nurse manager] is ultimately responsible for patient flow in the pod. Once the patient is in your pod, of course, you as the attending of the team are responsible for that patient. But the nurse manager decides [which patients] go to which pod when.” Another attending agreed, “Ownership of patients starts when a bed opens up.” People generally agreed that this design served as a disincentive to work quickly. An attending explained:

I think we all still have the tendency to look to make sure we’re not getting dumped on—that if someone is not working as efficiently as they can, if they’re not moving the patients, then all of a sudden *you’re* having a higher volume of work just because you’re being… not quite penalized, but you feel that way—that you’re being penalized for being better.
Team members responded to this moral hazard by splitting: people either avoided work or worked around those avoiding work, which undermined the sense that they were a team. In fact, very few respondents at Charlie ED identified the formally designed teams as a team, and those that did would give an explanation like, “But I’m a social person.” People laughed or shook their heads at the thought that they were working as a team, and instead gave examples of what was really a team in the ED (like the fast-track unit or the night shift).

People who were compensating for those who were avoiding work were not motivated or empowered to directly influence their shirking team mates. Instead, they worked around them. As a representative example, one physician’s assistant explained:

I’m one of the people who will say, “Well, [this patient] is just waiting for urine. Sit them in a chair, and then we can open this bed up for another person.” Sometimes from the nurses I get a response of, “No, because then they’ll just give me another [patient].” There was a day when I actually went to the [nurse manager] and said, “Look at that waiting room. We could take two more patients” because she couldn’t see that.

Many people described going directly to the nurse manager to get more patients when their team mates were working slowly to avoid getting new patients. A nurse described how an attending showed her how to discharge a patient without signaling to the nurse manager that there was an empty bed. She said that when working with that attending, she would approach the nurse manager on the side and ask that more patients be sent to the team.

People were also focused on how their own initiative got things done. People told stories of getting something done for a patient, and would explain, “that’s just me” or “that’s how I am” or “I’m one of the people who…” These explanations emphasized personal effort and initiative, because there was not a sense that the team was collectively accomplishing work for their patients. People were also more focused on their individual assignments. One of the nurses said, “I don't think you’re worried about the team. You’re worried about your own area…. It’s
unusual to be concerned about someone else’s area.” Another nurse explained, “It’s supposed to be a team, but the individual nurse has her own patients. It’s not like two nurses are sharing the same patients, because you have your block and I have my block. It’s not like the two of you have to take care of this patient together… You have yours, and she has hers.”

Thus when the team faced moral hazard from having assigned work but no consequences of how they worked, team members split into different directions with some shirking and others working around them, all of which served to focus people more on getting things done through their individual initiative, and to focus people more on their individual responsibilities. Data illustrating these relationships are reported in Table 4.

Bravo and Echo: Teams with modified collective responsibility

Evidence from the EDs described above would suggest that managers simply implement a strong form of CR if they want to support constructive team processes. Evidence from two additional EDs, however, calls that conclusion into question. Data from these sites suggests that people want to feel like a team in a normative sense before they will accept and enact teams with strong form CR. Bravo and Echo both had years of contentious relationships between the nurses and the doctors, and between managers and the workers. Many nurses at these sites felt disrespected and devalued by status differences and felt disrespected by how conflicts had been handled in the past. They bristled at rhetoric around teamwork, finding it hypocritical or threatening. Both nurses and doctors wanted to feel that they had common interests and mutual respect before they were open to the idea of working as a formally organized team. Managers at these EDs intended that their teams function with the strong form of CR but the strong form
design was modified by the nurses. Evidence for contentious relationships and modified team designs are reported in Table 5.

At Echo, the relationship was less fractured than it was at Bravo, and the teams had been in place for several years. Managers described their team system as having dedicated queues of patients. But the nurses and some of the doctors were aware that the nurse managers modified the system. As a representative example, one of the nurses explained, “[It is] supposed to be that patients go from red team to green team to blue team. Then red will be next up. But normally, the charge nurse is very in tune to see that oh well, our Nurse Janet is being really overwhelmed by her three patients but Nurse Pat, she has six patients that aren't really acute so let me give the next one to Pat. So, we kind of balance it.” Doctors were aware that some “balancing” was happening, but were not always sure why. One attending at Echo said, “The [team] system works best when the workload is evenly distributed and that is not often done here. At [another ED] they tend to rotate the patients more and just go Red, Green, Blue, Red, Green, Blue. Here they will look at other markers – I am not sure what those are – and sometimes triple up on a team.” The nurses modified the system, they said, to help their fellow nurses. The teams had dedicated queues, but the queues were actively balanced by the nurse managers, who felt that they were protecting each other and their patients from managers and doctors who they felt cared too much about “the numbers.”

At Bravo, I began studying the team design as it was being planned and implemented, and followed it over the course of a year. The changes and the change process were heavily contested between the nurses, doctors, and managers. At the same time that they implemented
teams, the managers also implemented a new position of middle management (called flow managers) who were tasked with managing patient flow. Both nurses and doctors saw this new position as unnecessary and redundant to the work the nurse managers were already doing. The nurses in particular, found the new position offensive and threatening. One nurse explained:

A lot of people speculate that management and the MD’s wanted someone who was not a nurse to help with the flow and control things. Before, it was strictly the nurses who controlled the flow of patients. Now there is resentment from the nurses that [the management hired flow managers] because it’s like redundancy to what nurses do. All the flow managers had to be hired from outside facilities and outside our union. No one wants that job here who’s worked here.

It was within this context that the managers wanted the nurses and doctors to begin working as teams with dedicated queues of patients. The nurses simply refused to assign patients directly to teams, and argued that it was a patient safety issue. One nurse explained,

The doctors and management are like, ‘oh we don’t have a waiting room anymore it’s just, people get right in and are assigned to a team.’ [laughs] I love when they say that. Like sometimes when I talk to the managers they’re like, ‘The improvement comes from [direct assignment to a team],’ and the nurses are like ‘Uh, we’re not actually doing that.’

Another nurse agreed, “What is funny is the doctors all think it is happening and the nurses are like, ‘It’s not happening.’ No, we’re not doing that; it’s unsafe.” The nurses continued to triage and assign patients as they had before – when a nurse was ready for a patient, a new one would be assigned, but no queues were formed at the team level.

Thus Bravo and Echo represent two cases where managers intended to implement strong form CR, but did not have the needed relationship with their frontline workers to actually implement that design. The strong form CR design was interpreted as an attempt to undermine the individual needs and preferences of frontline staff (especially nurses), so was modified to match the workers interests. This result mirrors Vallas’ (2003) finding that most of the teams at
his research site did not succeed because the workers simply modified the managers intended
design in a way that better suited their work, culture, and interests.

The modified team design at Bravo was associated with the same split individual effort as
at Charlie, although of course the contentious relationship exacerbated the split. Evidence for
these behaviors are illustrated in table 6.

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Insert Table 6 about here
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QUANTITATIVE RESULTS

The average time that patients spent in the ED ranged from 3.5 hours (Delta) to 6.2 hours (Alpha). For teams with weak form CR, expected future work was associated with increased
time in the ED. The time that the index patient was in the ED increased by about 1% for each
additional patient who arrived at the ED. For teams with strong form CR, expected future work
was associated with decreased time in the ED. The time that the index patient was in the ED
decreased by about 2% for each additional patient who arrived at the ED. This relationship is
visualized in Figure 2, which further shows that when expected future work is high, the
difference between teams with weak CR and strong CR is the largest. Overall, these results
confirm and quantify the consequences of the behaviors demonstrated in the qualitative data.
Teams designed with weak CR engaged in “foot-dragging” and teams with strong CR worked
more efficiently as their expected work increased.

DISCUSSION

Overall, this paper shows the usefulness of differentiating weak and strong forms of CR
for understanding team coordination processes and team performance. Qualitative and
quantitative data supported the distinction between teams being made responsible by assignment alone and teams bearing the consequences of their joint actions. The data show that collectively bearing the consequences of their work shapes groups into teams because it motivates (or sometimes forces) them to think and act in collective terms. The data also show that when teams are buffered from the outcomes of their work, the sense that they are a team is undermined. Some people avoid work, and their team mates are not motivated or empowered to monitor them and work around them instead.

This study contributes to existing research in three main ways. First, it refines team effectiveness research by demonstrating that CR varies on the degree to which work groups collectively bear the consequences of their work. As shown in the literature review, both weak and strong CR are implicit in past research on team design, and this paper demonstrates the value of explicitly specifying how CR is designed, and in particular specifying the degree to which teams bear the consequences of their work. Future research canvaluably distinguish between weak and strong forms of CR.

Second, this study extends team effectiveness research by showing how weak and strong forms of CR shape team processes. Recall Hackman’s (2002) useful example of telephone operators who could function either as a co-acting group or as a team. This study corroborates that prediction and extends it by showing the behaviors that shape co-acting groups and teams. It suggests that if the telephone operators did not collectively bear the consequences of their joint work, then some of them would likely avoid work, and others would likely work around them. Those working around the shirkers would likely focus on using individual initiative, rather than the group’s efforts, to get things done. If the telephone operators did collectively bear the consequences of their work, they would likely help each other, and monitor and update each
other. Note that in the ED teams, monitoring communication was interpreted and described as teamwork, in contrast to Barker’s (1993) respondents who found monitoring in self-managing teams too controlling. The difference may relate to the stability of the teams: ED teams work together for less than a day and thus do not have opportunity to construct controlling group norms. Future research can determine the relationship between team membership stability, CR, and teamwork versus controlling or invasive monitoring.

Third, this study corroborates and extends the sociologically-oriented research that shows the complicated dynamics between managers and workers in enacting teams in real world organizations (as opposed to, for example, teams in lab experiments (see Edmondson, 1999, pg. 39)). For example, this paper corroborates Vallas’ (2003) study by showing another way that managers’ ambivalence about teams sends mixed messages to workers: some ED managers wanted both active teamwork between doctors and nurses and centrally controlled patient flow. Active teamwork and central control seem unlikely to co-exist easily. This paper also corroborates Mueller (1994) by showing that EDs executing the same tasks with the same technology implemented different team designs because of structural and cultural path dependencies. The present study extends this research literature by identifying CR as a likely source of tension between managers and teams. CR relates to work allocation, control, and monitoring, all of which may generate understandable ambivalence in managers and workers.

As with any field research, the findings and ideas developed in this study were closely tied to the empirical setting. There are strengths and limitations to the ED as a research setting. One strength is that the teams in the ED represent a boundary condition in how fluidly team members can change, yet still function as a team (Klein, Ziegert, Knight, & Xiao, 2006; Valentine & Edmondson, 2013). Teams with strong form CR were able to sustain group-level
coordination in the extreme work conditions set up in the ED (e.g., hyper-fluidity, professional group conflict, status differences) suggesting that strong form CR is a powerful social force. One limitation of the ED setting is that work is allocated in a particularly observable way. Recognizing weak and strong forms of CR in pooled and dedicated queues of patients may be more straightforward than recognizing weak and strong forms of CR in, for example, abstract knowledge work. Future research can explore how weak and strong forms of CR are enacted for different types of teams and tasks.

In conclusion, work teams are a key part of how work is accomplished in contemporary organizations. But teams can fail. This research identifies a key dimension of team design that can enhance teams’ ability and motivation to “think and act in collective terms” (Fiorina, 1980, pg. 27). This research also shows that people are more likely to accept and enact this enabling design when they feel part of a team in a normative sense. Strong form CR cannot be imposed on teams, it is something that they accept and enact in partnership with managers.
## TABLES

### Table 1. Data Sources

<table>
<thead>
<tr>
<th>Hospital ED</th>
<th>Qualitative Data</th>
<th>Quantitative Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alpha Hospital ED</td>
<td>Semi-structured interviews with 30 clinicians informants 2 weeks of observation Archival materials</td>
<td>12 months of time-stamped operational data from EMR (~120,000 patient cases)</td>
</tr>
<tr>
<td>Bravo Hospital ED</td>
<td>Semi-structured interviews with 48 key informants Bimonthly observation for six months Archival materials</td>
<td>36 months of time-stamped operational data from EMR (~200,000 patient cases)</td>
</tr>
<tr>
<td>Charlie Hospital ED</td>
<td>Semi-structured interviews with 54 key informants 2 weeks of observation Archival materials</td>
<td>28 months of time-stamped operational data from EMR (~185,000 patient cases)</td>
</tr>
<tr>
<td>Delta Hospital ED</td>
<td>Semi-structured interviews with 40 key informants 2 weeks of observation Archival materials</td>
<td>36 months of time-stamped operational data from EMR (~350,000 patient cases)</td>
</tr>
<tr>
<td>Echo Hospital ED</td>
<td>Semi-structured interviews with 40 key informants 2 weeks of observation Archival materials</td>
<td>36 months of time-stamped operational data from EMR (~250,000 patient cases)</td>
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</tbody>
</table>

### Table 2. Findings from Cross-Case Comparison

<table>
<thead>
<tr>
<th></th>
<th>Alpha</th>
<th>Brave</th>
<th>Charlie</th>
<th>Delta</th>
<th>Echo</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Team Design</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Bounded</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Role Set</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Real-time Performance</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Collective Responsibility</td>
<td>Strong</td>
<td>Weak</td>
<td>Weak</td>
<td>Strong</td>
<td>Mixed</td>
</tr>
<tr>
<td><strong>Group Processes</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Group-level Coordination</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Mixed</td>
</tr>
<tr>
<td>Competition Between Pods</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>
### Table 3. Evidence for Strong Form Collective Responsibility and Group Coordination (Alpha and Delta Hospitals)

<table>
<thead>
<tr>
<th>THEME: Collective Responsibility</th>
<th>THEME: Group Coordination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strong Form: Bear Consequences of Work</td>
<td>In general here the culture is you want to keep your queue low. It drives me crazy to have a long queue so there is an incentive to see patients in a room fairly quickly… if the residents are taking too long I will just so see the patients myself. (Attending, Delta)</td>
</tr>
<tr>
<td>There is a, “1,2,3,4; 1,2,3,4” for assigning patients to pods. (Nurse, Alpha)</td>
<td>Here everybody does what they are supposed to be doing. I have a good sense where the nurses are in their work flow. They have a good sense of where I am and where the residents are so they prioritize things. If I have a patient who is in pain they know that. They will have an IV in and come to me and say this patient needs pain meds or they will do it themselves. If I know that they are too busy I will go and put the IV in myself because I know where they are in their workflow and the common goal is to take care of this patient. It is whatever it takes to get it done and it is a situation where we are all working towards a common goal. (Attending, Delta)</td>
</tr>
<tr>
<td>The idea here is that there is a triage nurse standing with a deck of cards saying T1, T2, T3, assigning patients to the pods (Attending, Delta)</td>
<td>Sometimes the doctors forget to go and check on somebody who has been four hours here. We remind the doctors, please check on that CAT scan, check that lab work. Or the lab work came back, their potassium is this. Where are we going with this patient? Let’s try to figure out, do we send him home? Are we admitting them? Every shift on a team, we try to do this. (Nurse, Delta)</td>
</tr>
<tr>
<td>It takes no more than maybe six minutes for a patient to get assigned to a team. From the triage process, in about six minutes. (Nurse, Delta)</td>
<td>The orders pop up. We say to each other: ‘There’s three of them. You take that one, I’ll take this one, and he’s going to take that one.’ It isn't a lot of, ‘Well, that’s not my patient. That’s on your bed. You need to take care of that.’” (Nurse, Alpha)</td>
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<tr>
<td></td>
<td>There are all kinds of stuff communicated [in the pods]. ‘Hey, I just added on some lines for the patient in 12 that I forgot to order initially. We need to get vitals on that guy. This new one just came in that I’m a little worried about.’ We communicate constantly in the pod. (Resident, Alpha)</td>
</tr>
</tbody>
</table>
Table 4. Evidence for Weak Form Collective Responsibility and Splitting Individual Effort Coordination (Charlie)

<table>
<thead>
<tr>
<th>THEME: Collective Responsibility Weak Form: Assigned Work</th>
<th>THEME: Splitting Individual Effort</th>
</tr>
</thead>
<tbody>
<tr>
<td>The [nurse manager] sort of triages and then, as space becomes available, they get the patients into a [pod]. So a patient who shows up could end up in Blue or Green, depending on where the bed opens up first. (Attending 10, Charlie)</td>
<td>If the patient is stable and they don't need any more meds or labs, a lot of people will just kind of hang onto them because, once that patient goes they’re going to get somebody new. Some people just keep around a bunch of patients who are admitted or are not dispositioned. There’s nothing to motivate them to get the patient out of there, because they’re just opening up a spot to get a new patient. It happens. That's a reality. (Nurse, Charlie)</td>
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<td>It’s the [nurse manager] who divvies up the patients… Depending on which [nurse manager] it is, you get help or you don’t get help. I can go to them and say, “Look. I’m swamped and patients are waiting four hours for me. It’s not for me to go to the Attending or Residents and ask for help. It’s your role as the charge person to acknowledge and see that.” Depending on who is the [nurse manager] that shift, they may or may not help you. (PA, Charlie)</td>
<td>I’m one of the people who will say, “Well, [this patient] is just waiting for urine. Sit them in a chair, and then we can open this bed up for another person.” Sometimes from the nurses I get a response of, “No, because then they’ll just give me another [patient].” There was a day when I actually went to the [nurse manager] and said, “Look at that waiting room. We could take two more patients” because she couldn’t see that.” (PA, Charlie)</td>
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<tr>
<td>I don’t get much backup from the Attending [on the question of patient flow], which is not such a great feeling, but I’ve just learned, “You know what? The ultimate decision is on the [nurse manager] as to where the patient is going to go.” (PA, Charlie)</td>
<td>I’ve heard it from one or two Attendings, I’ll say, “That bed is empty, where is the patient?” And they’ll show me their trick, you can do the whole discharge without putting in a disposition, so then it looks to the [nurse manager] like the patient is still in the bed, even though they have been discharged.” (PA, Charlie)</td>
</tr>
<tr>
<td>If I see the place is really crazy and I feel that my [patients] are stable, sometimes I will take an extra patient or two on the side who doesn’t need a lot of care. But some people are resistant to everything that needs to be done. That makes it difficult. Like a certain [PCA]. Everything I asked her, I had to jump through hoops to get it done. Sometimes they do that so that you don’t ask them, but me, I stay with the program. (Nurse, Charlie)</td>
<td>Everyone that’s just doing the best they can and moving patients. It’s really frustrating when you have several people working hard and someone sitting there drinking coffee and on Facebook. (Nurse, Charlie)</td>
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</tbody>
</table>
Table 5. Evidence for Contentious Relationships and Modified Team Design (Bravo and Echo Hospitals)

<table>
<thead>
<tr>
<th>THEME: Contentious Relationship</th>
<th>THEME: Modified Team Design</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;There is an issue here in the difference in doctor and nursing cultures. There are times over the years where doctors and nurses have not effectively communicated and were probably expressly told not to communicate on certain issues because of union contract negotiations. Because of differences and agendas… sometimes it appears to me that there is an “us” and “them” mentality. (Attending, Bravo)</td>
<td>[The management] is very, “I say something, you do something.” And like I said to [them], “The others are afraid of you and I’m not. If you are going to do something crazy, I’m going to tell you, ‘This is a crazy-ass idea and I’m not doing it.” (Nurse, Bravo)</td>
</tr>
<tr>
<td>[The management] micro-manages us, they call and say “Why are there four people out in the lobby that have waited for five minutes when you’ve got beds inside?” I say, “Mind your own business. Get a life.” I have no problem speaking my mind, especially to [the management]. But the flow managers, they’re not unionized; they could lose their job at any point… but they’re nurses, you know? When it comes right down to it, they’re nurses and they shouldn’t take direction from doctors. It’s totally different. We do things differently than medicine. (Nurse, Bravo)</td>
<td>The doctors and management are like, “oh we don’t have a waiting room anymore it’s just, people get right in and are assigned to a team.” [laughs] I love when they say that. Like sometimes when I talk to the doctors they’re like, “The improvement comes from [direct assignment]”, and the nurses are like “Uh, we’re not actually doing that.” [laughs]. (Nurse, Bravo)</td>
</tr>
<tr>
<td>The difference here at [Echo] is there is not camaraderie amongst nurses and doctors. I would bet $100 that 90% of attendings would say “I would work at [another hospital] any day over [Echo]” for that reason (Attending, Echo)</td>
<td>What is funny is the doctors all think it’s happening and the nurses are like, “It’s not happening.” No, we’re not doing that; it’s unsafe. (Nurse, Bravo)</td>
</tr>
<tr>
<td>The difference here at [Echo] is there is not camaraderie amongst nurses and doctors. I would bet $100 that 90% of attendings would say “I would work at [another hospital] any day over [Echo]” for that reason (Attending, Echo)</td>
<td>Supposed to be that patients go from red team to green team to blue team. Then red will be next up. But normally, the charge nurse is very in tune to see that oh well, our Nurse Janet is being really overwhelmed by her three patients but Nurse Pat, she has six patients that aren't really acute so let me give the next one to Pat. So, we kind of balance it. (Nurse Echo)</td>
</tr>
<tr>
<td>There are interpersonal skills issues here. And I'm not sure that is being addressed here for the nurses. I think part of the issue is unions so it is very difficult to fire people. I am not blaming the leadership. It is a very difficult situation. (Attending, Echo)</td>
<td>If our team is overwhelmed, we just tell the charge nurse listen, can you skip us for the next or give us a lower acuity patient? And that helps us out as well. So even the charge nurse, even though she's over there sitting at her desk she too is part of the team. (Nurse Echo)</td>
</tr>
<tr>
<td>I used to work on a floor for a long time, 16 years, before coming down here [to the ED] and it was a rude awakening to me. I couldn’t believe it. The gossip in this ED… There it was more cohesive. Down here, you don’t know from day to day …depending on a few personalities... I’m adjusting to it (Nurse, Echo).</td>
<td>The [nurse manager] hears us a lot because we complain to her because she's the one who assigns the patients to what team. I'm the sucker who's like all right, I’m just doing it. But you have all the gutsy nurses who are just like “No. I'm not having the next patient.” (Nurse, Echo)</td>
</tr>
</tbody>
</table>
Table 6. Evidence for split individual effort (with modified collective responsibility per Table 5) (Bravo)

<table>
<thead>
<tr>
<th>THEME: Split Individual Effort</th>
</tr>
</thead>
<tbody>
<tr>
<td>“I had the capacity to be able to take in more patients who might be simple and put them in the hallway and to be able to take care of them. I tried to communicate that to the charge nurse in that area of the department, and the nurses that I was working with said that they could take a couple of people in. So the lack of someone looking globally at what could happen in one area of one room, in one pod, seemed to limit what I was able to do further.” (Attending, Bravo)</td>
</tr>
<tr>
<td>“So it gets frustrating when the flow managers are trying to come in and try to push patients onto you, so we’ll say, “Well, we’ve got two ICU patients, two nurses at lunch, there’s no resource nurse on today; we’re not taking anybody.” (Nurse, Bravo)</td>
</tr>
<tr>
<td>“I have gone to the charge nurse, who is on one side in a pod, and said, “I can help move these people in,” and I have been told, “Well, it’s up to the triage nurse and the flow manager what they’re doing.” So I recognize that there is someone who is at the ultimate top who is sort of looking over all of the pods, but sometimes it seems as though the level of communication has become increasingly complex so that there is time wasted when there is open capacity.” (Attending, Bravo)</td>
</tr>
</tbody>
</table>
Table 7. Descriptive statistics of EDs

<table>
<thead>
<tr>
<th>Dedicated patient queue (strong CR)</th>
<th>Mean (sd) Time in ED</th>
<th>Mean (sd) Expected future work</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alpha</td>
<td>6.18 (3.97)</td>
<td>11.5 (4.7)</td>
</tr>
<tr>
<td>Delta</td>
<td>3.54 (3.03)</td>
<td>16.1 (6.5)</td>
</tr>
<tr>
<td>Echo</td>
<td>3.63 (2.98)</td>
<td>16.3 (11.4)</td>
</tr>
</tbody>
</table>

| Pooled patient queue (weak CR)    |                      |                               |
| Bravo                             | 4.32 (2.88)          | 8.3 (4.0)                     |
| Charlie                           | 5.09 (3.22)          | 11.9 (8.7)                    |

Table 8. Regression of expected work and collective responsibility onto time in ED

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3) (excluding Echo)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expected work</td>
<td>0.002** (0.0002)</td>
<td>0.009** (0.0002)</td>
<td>0.009** (0.0002)</td>
</tr>
<tr>
<td>Expected work * collective responsibility</td>
<td>-0.02** (0.0002)</td>
<td>-0.02** (0.0002)</td>
<td></td>
</tr>
<tr>
<td>Collective responsibility</td>
<td>-0.01** (0.003)</td>
<td>0.04** (0.004)</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>1.24</td>
<td>1.32</td>
<td>1.33</td>
</tr>
<tr>
<td>N</td>
<td>885,258</td>
<td>885,258</td>
<td>742,558</td>
</tr>
</tbody>
</table>

** indicates p<0.01. Models control for temporal category fixed effects (month, day of week, time of day) and provider fixed effects.
Figure 1. Proposed conceptual model for collective responsibility in teams

Figure 2. Interaction between expected work and collective responsibility in predicting time in ED

<table>
<thead>
<tr>
<th></th>
<th>Low Expected Work</th>
<th>High Expected Work</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weak CR</td>
<td>-0.015</td>
<td>0.357</td>
</tr>
<tr>
<td>Strong CR</td>
<td>0.087</td>
<td>-0.037</td>
</tr>
</tbody>
</table>
REFERENCES


