Groups, Teams, and the Division of Labor—
Interdisciplinary Perspectives on the Organization of Work

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Introduction

Over the last fifty years, a series of debates have occurred in the workplace and in research journals over the effectiveness of teams as a strategy to organize and compensate work. Small groups and teams have been at the heart of waves of efforts to reform routinized jobs in manufacturing—from the establishment of the human relations school in the 1930s, the growth of the sociotechnical systems movement in the 1950s, and the resurgence of teams at the core of lean production in the 1980s. In contrast to engineering models that seek to maximize individual efficiency, teams have long held the promise of improving worker performance through intrinsic motivation and knowledge sharing.

It is only in the last two decades, however, that we have witnessed a widespread shift in the unit of production from the individual to the group—as firms have adopted lean production, cellular manufacturing, product development teams, and other forms of group work in order to compete more effectively. National surveys show that the prevalence of on-line teams as the unit of production, as well as offline problem-solving groups, has increased in most advanced economies (Cully et al. 1999; OECD 1999; Osterman 2000). At the same time, however, more radical forms of work reorganization, such as autonomous work groups, cover only a minority of workers. In addition, new forms of Taylorized work are emerging in such service activities as retail sales, call centers, IT help desks, and other technology-mediated work.

These trends have spurred a lively and ongoing debate over whether team-based work represents the central organizing principle in 'post-bureaucratic' or 'post-Fordist' organizations. There is disagreement over the extent to which real change has occurred, the source of performance gains, and the outcomes experienced by workers. Management theorists view teams as a source of flexibility and performance gains, labor researchers as a source of liberation from Taylorism, and critics as a scheme to intensify work. Teams are often a point of contention in union-management negotiations because work reorganization fundamentally shapes the quality of jobs and working conditions of employees.

Given the enormous volume of writing on this subject, it is striking that parallel streams of research within and across disciplines have evolved with little integration of the insights from alternative traditions. At a time when firms have embraced team structures to break down bureaucratic organization, academic researchers have continued to operate in disciplinary and theoretical silos.

The purpose of this chapter is to survey and critique this varied landscape of research on groups at work, drawing out common themes and selective weaknesses with the goal of suggesting a more synthetic and informed future agenda. Our discussion is not encyclopedic, but rather focused on three quite different research traditions: those based in psychology, in industrial relations, and in critical sociology. We

outline the intellectual landscape of each case and highlight areas of agreement and disagreement. We argue that this project of cross-disciplinary theory building encounters substantial challenges, but is rich in potential. These traditions differ in their theoretical assumptions, research questions and methods, and outcomes of interest. Nonetheless, we suggest that building a more multi-disciplinary research agenda is worthwhile and conclude with suggestions for further work in this direction.

Psychological Approaches to Small Groups and Teams

Research on small groups in social psychology and organizational behavior developed some of the earliest critiques of the assumptions underlying Taylor's scientific management and helped to legitimize a shift in the unit of production from the individual to the group level. Theoretical and empirical work in these traditions analyzes the internal characteristics of groups that lead to better performance. The subject of this research is stable work groups, where members are interdependent, are perceived by others as a group, and have significant relations with other groups in a larger system (Hackman 1987).

Three traditions provide distinct theoretical explanations for why individuals perform better in groups than in isolation: sociotechnical systems (STS) theory, group effectiveness theory, and information processing theories. STS theory, originating at the Tavistock Institute in the United Kingdom in 1950 and taken up by Scandinavian researchers in the 1960s and 1970s, intersected with the primarily US-based group effectiveness theory that emerged in the 1970s and 1980s. These two traditions have involved considerable cross-fertilization (see Cordery 2003 and Tubbs 1994 for excellent reviews), but have maintained alternative causal explanations, with the former focused on group self-regulation and the latter on group motivation. Both also share a normative concern for humanizing work through team-based redesign. Information processing theory and social cognition, originating more recently, focus on performance gains from information and knowledge sharing in groups and reflect the growing interest in knowledge as a source of competitive advantage.

Sociotechnical Systems and Group Effectiveness Research

STS theory was an early attempt to articulate the processes that link team-based forms of work to organizational and worker outcomes (Trist and Murray 1990). It not only shifted the unit of analysis from the individual to the work group but also conceptualized workers as thinking actors rather than non-thinking extensions of dedicated machinery. Effective organizational design was conceptualized as the joint optimization of technical and social systems, thus challenging the idea that labor is a residual category in a technically engineered production system. According to STS theory, workers at the point of production jointly design work and solve problems through group self-regulation, thereby contributing to both better performance and more intrinsically satisfying work. Group learning and problem solving allow workers to work smarter—not harder or longer. STS researchers emphasized a 'systems' approach in which work groups interact with technology to ease or obstruct information flows and to foster reevaluation and redesign. These sociotechnical systems were viewed as embedded in larger organizational and institutional contexts.

The qualitative and action research methods in the STS tradition facilitated rich descriptions of actual work and organizational change processes and allowed for a comprehension of the workplace as a

complex set of relationships. However, STS research has typically failed to develop testable propositions or to carefully measure constructs and outcomes. It is frequently criticized for its overzealous advocacy of work redesign as a panacea to workplace problems. In addition, while STS theory articulated the links between technology, social organization, and broader institutions, most empirical studies focused on the social organization of work—so that STS research became synonymous with self-managed teams.

While STS theory was most developed in Scandinavia (Berggren 1992), it was also influential in other parts of Europe and Australia (Badham, Couchman, and Selden 1999; Jurgens, Malsch, and Dohse 1993) and in the United States (e.g. Cohen, Ledford, and Spreitzer 1996; Kolodny and Kiggundu 1980). Most of the US literature on group effectiveness, however, drew primary inspiration from input-process-output models (e.g. McGrath 1984) and Hackman and Oldham's (1980) job characteristics model, which emphasized individual task characteristics (autonomy, variety, significance, feedback, and ability to complete a whole task) as the source of intrinsic satisfaction and motivation. Researchers empirically tested this model at the group level (Wall et al. 1986), and Hackman's (1987) more complex model guided many empirical studies in the 1990s (e.g. Campion, Medsker, and Higgs 1993).

The strengths and weaknesses of the US literature are in many ways a mirror image of those of the STS literature. US researchers focused heavily on measuring work group constructs (such as task design, interdependence, cohesion, and norms) and testing quantitative relationships between group characteristics and outcomes. While some scholars began to integrate organizational context into their work (e.g. Ancona and Caldwell 1992; Cohen, Ledford, and Spreitzer 1996; Sundstrom and Altman 1989), most have paid little attention to context and no attention to technology, despite exhortations by intellectual leaders to do so (e.g. Goodman 1986; Hackman 1987). While organizational behavior research has provided insights into group task design and employee behavior, it typically measures a narrow set of employee attitudes, such as satisfaction and intrinsic motivation, as outcomes. Its focus on work group characteristics has led to static models of formal structures and outcomes. While processes such as group cohesion and norms or motivation are theorized to mediate the relationship between task design and performance, these mediated models have rarely been tested.

The empirical research in both the STS and group effectiveness traditions has contributed substantially to our knowledge of how teams work and why, at least in some cases, they improve performance. It has found consistent support for the idea that workers in self-managed teams or more autonomous work groups enjoy higher levels of intrinsic satisfaction and motivation (Cohen and Bailey 1997; Cordery 2003; Guzzo and Dickson 1996; Pearce and Ravlin 1987). Researchers from both traditions also concur that these forms of teamwork are associated with better performance, especially when compared to other types of work reform—such as individual employee participation, or quality circles or other consultative groups that are parallel to the production process (Cohen and Bailey 1997).

The distinct theoretical and methodological approaches across the two traditions, however, has led to a persistent divide between European and US scholarship and has made it difficult to develop meaningful learning and integration of findings. STS theory emphasized the way that workers as a group learn from self-regulation, took a systems approach to integrating the technical and social side of work, and relied primarily on qualitative methods. The US literature, by contrast, focused on task design rather than

worker agency, emphasized motivation as the key causal mechanism for improved performance, paid little attention to technology or context, and was primarily quantitative. Perhaps the most important distinction between the two is the strong orientation toward worker outcomes in the STS tradition compared to the US literature's focus on the value of teamwork for management.

Information Sharing and Social Cognition

In contrast to the STS and group effectiveness literature, studies of information processing and 'social cognition' are in their infancy. Research in this area is primarily concerned with the relationships between individuals' knowledge and the group's knowledge, asking what is the mental life or 'mind' of the group, and how is it similar to, or different from, the mental life of its individual members. Three main theoretical approaches have emerged: team mental models theory (Cannon-Bowers, Salas, and Converse 1993), group information sharing theory (Stasser and Titus 1985), and transactive memory (Wegner 1987).

The first approach views shared knowledge as a collective good, with each team member working from the same set of premises or 'mental model' (e.g. Cannon-Bowers, Salas, and Converse 1993). According to this theory, the shared understanding of work tasks and processes by group members should produce better coordination and efficient group functioning. To date, however, this literature lacks clear definitions and measures of cognitive structures at the group level. Furthermore, almost all of the work in this area is conceptual or based on lab studies.

The information sharing approach, by contrast, is focused on how individuals in groups deal with shared and unshared information (Stasser 1992; Stasser and Titus 1985). The assumption behind much of the literature on teams (as in STS theory, TQM, and group decision making) is that groups with diverse members should be able to pool information and thereby have access to a wider array of ideas and solutions than would otherwise be possible. Stasser and his colleagues, however, have shown that groups tend to focus on the information that is shared, to the neglect of the unshared information held uniquely by some members. This process, referred to as biased sampling, may undermine the creative problem solving assumed to be the source of performance gains from teamwork. Numerous lab studies have replicated these findings, but as field research is yet to be undertaken, we know little about why or under what conditions individuals share information or not in different team settings.

The third approach, transactive memory, refers to a collective memory system, in which individual group members know the domains of expertise of other members and are able to access and/or utilize that information for the group's benefit. The theory grows out of work by Wegner (1987), who observed that married couples develop a division of labor in which each partner knows what the other is good at and relies on the partner to carry out those tasks. At the level of work groups, members learn 'who knows what', so they are able to call on each others' area of expertise. Lab studies, for example, have shown that groups with behavioral indicators of transactive memory perform better at group tasks (Liang, Moreland, and Argote 1995). Recent research has begun to develop ways to measure this construct so that it may be used in field research (Lewis 2003). The concept is useful for understanding how groups

may develop an efficient system of specialization, but it does not explain why group members are motivated to share their expertise or suggest a dynamic process of learning in groups.

These theories of groups put knowledge sharing, information exchange, expertise, and learning in the foreground of research interest, paralleling a growing focus on these more 'intangible' tools in the organizational behavior and business management literature. However, while promising, they are at a very early stage. The literature is primarily conceptual or based on lab studies, and measures of central constructs such as group mental models, knowledge or information sharing, and learning are yet to be developed. Its major contribution is to suggest both the importance and the problematic nature of knowledge sharing and learning within groups. Researchers have not yet tackled such questions as under which conditions teams do better when they have shared understandings or are able to act as interchangeable parts; or when is it important to design teams that bring together diverse areas of expertise to encourage creativity in problem solving and learning. Also yet to be addressed are more fundamental questions, such as what motivates workers to share their expertise (e.g. between experienced and novice workers) or how they learn on the job. Finally, these cognitive approaches lack the normative lens of the prior literatures and show little learning or incorporation of the findings from STS or group effectiveness research.

In sum, psychological research on teams provides a number of useful theoretical lenses on the relationship between group forms of work organization and performance. By focusing on processes and characteristics within work groups, researchers are able to carefully examine the internal variables that distinguish between successful and unsuccessful teams. Taken as a whole, however, these diverse traditions lack a coherent account of the relative importance of or interaction between different motivational and cognitive processes in groups.

More generally, an exclusive focus on social psychological processes as the explanation for work group performance fails to take seriously the economics of production systems and how these vary across industry and institutional contexts. By focusing on the work group as the unit of analysis, researchers in organizational behavior have failed to capture workers in relation to the entire division of labor. In a study of self-managed teams of technicians, for example, Batt (2001a) showed that the teams absorbed the tasks of supervisors in two-thirds less time, reducing indirect labor costs without affecting objective indicators of performance. A focus on teams as the unit of analysis alone would have failed to find these effects, and thus come to faulty conclusions about the mechanisms through which teamwork contributes to outcomes.

Finally, worker outcomes are narrowly conceptualized and tested throughout this literature. There is no attention paid to issues such as wages, work hours, overtime pay, job-related stress, employment security, or conflict at work. Scholars are overly optimistic about the potential for teams to produce mutual gains by solving production problems and simultaneously creating intrinsically interesting jobs. The tension between formal structures and informal group relations, as found in the Hawthorne studies or other early accounts of groups, is largely absent in recent theory and research. Conflicts between goals of different actors at work is thus generally viewed as an obstacle to be overcome on the road to harmonizing outcomes rather than as a constant dynamic within the workplace.

Industrial Relations and Institutional Perspectives

The role of economic institutions and competing interests, lacking in the small group literature, is at the forefront of research on work organization in industrial relations. Research in this tradition integrates theories from economics and sociology to analyze how macro-level institutions shape choices in production systems at the level of the firm and establishment. Industrial relations scholars have paid close attention to the role of technology, product and labor market institutions, and public policy in driving and shaping employer decisions regarding the organization of work. They also view labor and management as social groups with different economic interests, accepting ongoing conflict and cooperation as a natural feature of employment relations. The organization of work is one arena in which labor and management contend for control, and they may or may not be able to negotiate rules for teamwork that are mutually beneficial.

Industrial relations scholars view work organization as only one element in complex production systems, such as mass production manufacturing, in contrast to the psychology-based literature's work group focus. This systems approach seeks to explain why management adopts certain combinations of employment practices within particular employment settings or historical periods. Doeringer and Piore (1971), for example, characterized mass production as including dedicated technology, Taylorized work with low skill and training requirements, seniority-based job ladders, and seniority-based pay. Osterman (1987) further elaborated this theory, identifying four interlocking dimensions of internal labor market rules: skill requirements of jobs, labor organization and deployment, compensation rules, and employment mobility and security rules. These 'rules' may be viewed as the functional equivalent of work organization and human resource practices, and different systems were expected to prevail in different kinds of workplaces, from a white-collar bureaucratic setting to a mass production factory.

This industrial relations systems approach has several methodological implications. First, the arena of research is typically a specific industry or occupation, as shaped by product and labor market institutions. This draws attention to the relationship between business strategy, technology, management practices, and labor relations. Second, industrial relations scholars view work organization or teams as part of a cluster of management practices—rather than viewing work groups as the focal point and organizational context as backdrop. Thus, the unit of analysis is typically the establishment (or entire work system), not the work group. Researchers also pay close attention to the measurement of technology and the economics of the production system—not only the social organization of work and behavioral outcomes. Finally, this focus on systems and context leads industrial relations researchers to use more context-specific measures of work practices and operational outcomes than those used by psychologists, who depend more on psychometric scales designed to be generalizable across contexts.

High Performance Work Systems

An influential stream of research emerging from the industrial relations tradition is found in the literature on high performance work systems (HPWS). These systems are typically defined as the opposite of the mass production model. That is, jobs require relatively high skills; work is organized to promote employee discretion and collaboration or teamwork; and employees are motivated by

incentives and rewards such as investment in training, high relative pay plus some performance-based pay, and employment security (Appelbaum and Batt 1994; Appelbaum et al. 2000). These systems are thought to allow firms to compete more effectively on quality and customization because they allow workers to solve production problems and to use their skills more effectively. Implicit in HPWS research is the notion that these higher productivity jobs also pay off for workers, providing higher pay and more intrinsically satisfying work. Some researchers refer to these systems as 'high involvement', thereby emphasizing the involvement of workers in problem solving (Batt 2002; MacDuffie 1995), while others conceptualize them as 'high commitment', emphasizing their motivational aspects (Wood and Albanese 1995).

Research on high performance work systems in the United States relies on qualitative and quantitative studies of establishments in specific industries and addresses the empirical question of whether high performance systems (compared to mass production systems) lead to substantially better economic performance for firms. Studies set in manufacturing industries found substantial economic benefits from HPWSs in apparel (Appelbaum et al. 2000), auto assembly (MacDuffie 1995; Pil and MacDuffie 1996; Rubenstein 2000), medical electronics (Appelbaum et al. 2000), semi-conductors (Appleyard and Brown 2001; Bailey 1998), computers (Bresnahan, Brynjolfsson, and Hitt 2002), and steel (Appelbaum et al. 2000; Arthur 1994; Ichniowski, Shaw, and Prennushi 1997). Consistent with the systems approach, most of these studies have conceptualized bundles of practices that logically fit together, measuring these through cluster analysis or additive indices.

A second generation of research examined the same set of issues in service workplaces. They found that the systemic differences in production systems identified in manufacturing—for example, between mass and lean production—were less developed or pronounced in service settings. However, where differences in work organization were identified, these studies also found that team-based forms of work contributed to substantially better performance in airlines (Gittell 2002), hospitals (Preuss 2003), call centers (Batt 1999, 2002), and among field technicians (Batt 2001a).

While this research has focused on the question of organizational performance, it differs markedly from the approach found in the strategic human resource management literature (e.g. Huselid 1995; see Legge, in this volume for a discussion). The industrial relations tradition is grounded in real industries, takes technology seriously, draws on extensive qualitative field research, uses context-specific measures of work practices and performance, and often examines the role of labor-management relations.

As a body of work, HPWS research suggests two conclusions concerning the contribution of teamwork to organizational performance. First, at a general level, team-based or collaborative forms of work appear to outperform individually based Taylorized systems. However, second, there is wide variation in what teamwork or collaboration means in different work settings and the extent to which it is able to affect performance. This suggests both a universal and context-contingent interpretation of how alternative forms of work organization are associated with economic outcomes. In steel mills, for example, Appelbaum and her colleagues (2000) found that the critical performance outcome is machine uptime due to heavy investment in capital equipment. The aspect of 'teamwork' that mattered was intergroup communication and coordination across miles of rolling mills and finishing lines—so that the continuous

process would not shut down. In apparel plants, by contrast, the critical performance metric involved reducing throughput time in order to respond quickly to retail demands. By shifting from the progressive bundle system to modular (self-directed) teams, whole garments could be produced by multi-skilled teams in a fraction of the time previously taken (Appelbaum et al. 2000). In call centers, self-directed work groups had better sales than traditionally supervised groups, not because of intergroup communication or job rotation and multi-skilling (as interdependence was low and all workers handle individual customers), but because workers in teams taught each other how to handle tough customers and how to use new software programs more rapidly (Batt 1999). In airlines, it was the use of cross-functional teams that improved on-time departures through tight coordination across departments (ticketing, baggage, mechanics, flight attendants) (Gittell 2002). In semi-conductor fabs, it is multi-occupational teams that provide better output (Bailey 1998). These findings suggest that while teamwork may be associated with better performance in a variety of settings, there are often different reasons for these performance gains due to variation in technical systems.

Despite the contributions of the US HPWS approach, there are several conceptual and methodological weaknesses. First, the 'systems' or bundle approach makes it difficult to evaluate the relative importance of different dimensions of the system—such as teams—to outcomes for firms or workers. Moreover, the focus on internal coherence among human resource practices has led researchers to pay less attention to potentially contradictory practices, such as the simultaneous use of 'commitment enhancing' teams, downsizing, and outsourcing. Critics have also argued that the US literature exaggerates the conceptual contrasts between mass production and lean production (Delbridge 1998).

The high performance literature is also theoretically undeveloped. Empirical studies have found statistical associations between management practices and performance outcomes without measuring underlying causal mechanisms. Much of the research builds on an implicit human capital model in which workers are more productive because they have higher firm-specific skills, opportunity to use those skills, and incentives to do so. This argument does not differentiate between explanations based on individual motivation (working harder), cognition (working smarter), or social behavior (e.g. working together). The HPWS literature also has failed to move beyond single organizational units, despite the fact that supply chain management has emerged as a critical organizational innovation. Finally, critics charge that the US literature has abandoned its traditional concern for worker welfare (Godard and Delaney 2000). While some studies have examined how union strategies can bring about better outcomes for workers (e.g. Frost 2000), most of the US literature is overly optimistic about the use of teams and does not seriously examine conflicts marking formal or informal labor relations in the 'new' workplace.

Like the US literature, European (British and continental) scholarship on teamwork and high performance work organization is primarily based on research in manufacturing plants, especially in the auto sector. Early debates focused on the differences between STS-inspired team-based plants and Japanese-inspired lean production, with a large number of case studies showing substantially higher decision-making discretion and job satisfaction in the former cases (e.g. Berggren 1992; Buchanan and McCalman 1989). These debates are similar to those found in the US literature (Appelbaum and Batt 1994).

Beyond these similarities, however, there are substantial differences between US and European traditions. In general, the European literature on teams has been more influenced by critical perspectives, which are discussed in greater detail below. Researchers have focused primarily on outcomes for workers rather than plant performance (e.g. Procter and Mueller 2000; Whitfield and Poole 1997). More often than not, they have examined the reality of work reorganization in typical plants—rather than structured comparisons of clearly alternative approaches as in the US literature. Danford's (1998) study of seventeen Japanese electronics plants in South Wales is exemplary: he showed that most operated as classic assembly line operations; and those that adopted 'teamwork' provided workers with only minimal involvement in production-level decisions.

The qualitative case study approach used in the United Kingdom, Europe, and Australia has produced more nuanced interpretations of the benefits and trade-offs of team-based systems in different organizational and institutional contexts. While some find that the use of teams is associated with greater employee influence over work operations and greater job satisfaction (Marchington 2000), others report more mixed outcomes. In their study of self-managed teams in a continuous processing aluminum plant, for example, Wright and Edwards (1998) showed that teams experienced work intensification and inconsistent management support as well as greater autonomy, responsibility, knowledge of the production system, and satisfaction. Analyses of the British Workplace Employment Relations Survey (WERS) data also provide mixed accounts, showing that benefits from teams and HPWSs, such as greater influence, discretion, satisfaction, commitment, and job security, are accompanied by higher job strain (Ramsay, Scholarios, and Harley 2000). Delbridge and Whitfield's (2001) analysis showed that workers in establishments with greater use of quality circles and work teams reported having more influence at work than those in more traditional workplaces; however, those with representative (union) participation had greater influence. The central message in this literature is that work restructuring is a complex and contradictory process. The central problem is that concepts are not clearly defined or consistently applied, making comparisons across studies difficult (Marchington 2000). In addition, case studies often attribute outcomes to 'teamwork' when in fact the organization of work is only one element of organizational restructuring.

Critical Sociology

Beyond simply adding complexity to the story of organizational restructuring and performance, critical scholars in sociology provided a healthy antidote to the generally optimistic assessment of teams and teamwork found in the psychological and HPWS literatures. Focused on outcomes for workers and skeptical of the extent to which real change has occurred, they have drawn attention to 'the "dark side" of new production systems' (Smith and Thompson 1999: 210). In this section, we compare current research on teamwork from two influential critical traditions—labor process theory and postmodern approaches. While there are significant areas of disagreement between the two, they share a common concern with dynamics of conflict, coercion, and consent within the workplace. Both typically use intensive field-based studies to explore their theoretical assumptions and approach teamwork as part of management's strategies to control worker effort and output, rather than as potentially emancipatory forms of work organization.

Labor Process Theory

Labor process scholars are centrally concerned with explaining how management effectively controls worker effort and appropriates the surplus value of labor (Braverman 1974; Burawoy 1979; Thompson 1983). An important debate in this tradition is whether new forms of work organization represent continuity or discontinuity from past management practices, and, further, whether they represent any meaningful change for workers—both fundamentally different questions than those posed in the HPWS literature. In Braverman's (1974) classic portrayal of the deskilling of clerical work under Taylorism, management controls the labor process through the 'separation of conception from execution'. The reintegration of tasks and devolution of management functions to workers associated with post-Fordist, team-based production systems represents a challenge to this deskilling thesis. A variety of new interpretations of teamwork have followed, seeking to place it within the context of evolving management strategies to extend control over worker effort and output.

One interpretation holds that new management practices should be understood as a particular moment in a progression of stages or cycles in which distinct strategies of control dominate during different historical eras. In Edwards's influential theory of historical stages of management control (1979), corporations moved from simple or coercive control in the late nineteenth century to technological control in the Fordist assembly line, and then to bureaucratic control in the hierarchical organization of the mid-twentieth century. At each stage, the mechanism of appropriation changed. Under Fordism, management control over the labor process occurred through the separation of conception from execution and the detailed division of labor. In post-Fordist regimes, the use of teams to reintegrate conception and execution of tasks represents an alternative mechanism of control.

Labor process researchers have stressed the continuity of new forms of work with Taylorism, defining new production systems not as 'post-Fordist' but 'neo-Fordist'. They have relied heavily on evidence from lean production team settings, arguing that the use of off-line 'quality circles', multi-skilling, and just-in-time production techniques typically involve little substantive redistribution of responsibility to workers. Instead, the central mechanism of performance improvement is work intensification combined with strategies to mine workers' tacit knowledge in pursuit of continuous improvement. The result is the reproduction of hierarchical control coupled with more effective mechanisms to secure worker consent. Adler's (1995) study of the GM-Toyota NUMMI plant, for example, depicts lean production as 'democratic Taylorism'. Parker and Slaughter (1988) provide a similar, if more negative, analysis of the NUMMI system, describing it as 'a kind of super-Taylorism' where teamwork is little more than 'management by stress'. Moreover, the union's role in defending worker interests is undermined when it cooperates in implementing the system and accepts restrictions on its grievance-processing role. Garrahan and Stewart (1992) critique lean production as constraining union power and bolstering management's control over labor, while Delbridge (1998: 204) argues that Japanese lean production techniques are little more than 'an extension of the principles of Taylor through the systematic standardization and proceduralization of tasks within a context of heightened managerial dominance and control'. Other studies in this vein include Rinehart, Huxley, and Robertson's (1997) study of the CAMI auto plant in Canada, and Babson's (1995) compilation of critical studies of lean production in autos.

These accounts of lean production in the auto industry suggest that its effectiveness as a strategy of work organization stems from its success at securing workers' commitment while intensifying their exploitation. This echoes the themes found in Burawoy's (1979) politics of production in which workers consent to their own exploitation, but adds a focus on production efficiency and conflicts over controlling worker knowledge essential to improving that efficiency. Accounts vary in the extent to which they give space to conflict on the shop floor. Unions are often viewed either as potential collaborators in the exploitation of employees or as marginalized actors in more encompassing systems of control. This helps to explain limited union success in certain Japanese transplants, but does not engage with examples from the institutional literature of union involvement in democratizing teamwork and improving employee outcomes.

Labor process scholars' recognition of workplace conflict and attention to the historical and economic context of shifting management strategies shares much conceptual ground with industrial relations and institutional traditions. However, their use of tools of analysis provided by critical theory combined with in-depth ethnographies of workplaces allows them to explore the interaction between formal and informal shop-floor dynamics often missing from institutional accounts. Perhaps most importantly, by analyzing resistance as a response to relationships of control extending beyond the firm, these theorists challenge scholars to be wary of emancipatory rhetoric accompanying teamwork and flexible production. Instead, they suggest, the disciplines of capital markets and increased global competition have created often contradictory pressures for rationalization and enhanced employee discretionary effort.

Postmodern and Foucauldian Interpretations

In contrast to the focus on lean production in the labor process literature, postmodern theorists have used self-managed teams as a setting for theory building (e.g. Barker 1993; Ezzamel and Willmott 1998; Sewell 1998). In doing so, they have emphasized more discontinuity than continuity with the past. Barker's ethnography of self-managed teams in an electronics plant, for example, begins with Tompkins and Cheney's (1985) theory that new forms of work organization represent a fourth stage of 'concertative' control, building on Edward's schema of progressive changes in management strategy. In place of hierarchical rules imposed by an impersonal bureaucracy, self-managed teams shift the locus of control to workers. These workers then develop a consensus around core values and norms, formalize them as rules of proper behavior designed to maximize quality and productivity, and enforce these rules through peer group pressure and monitoring. They work harder, longer, and are under more stress than before, but paradoxically reject a return to prior forms because they enjoy and take pride in their work. Sewell (1998) shares Barker's concern with the insidious effects of new, normative forms of control in self-managing teams, but argues that teams are often complementary to hierarchical forms of control. He, too, identifies a 'new disciplinary mode' in his ethnography of an electronics firm, which he terms 'chimerical control'. Teams set their own sanctions and rewards (horizontal control), while management information systems identified quality errors, flagging good and bad performers with 'traffic lights' (vertical control).

These two accounts interpret teamwork as a more insidious form of management control than that found under Fordism. Management traps the worker within an 'iron cage' or a web of control limited only by the reach and scope of the surveillance system. In later work (1993), Barker links his theory more fully to postmodern rhetorical theory and Foucault's vision of society as a panopticon, or a prison in which inmates are under constant surveillance from both the guards and one another. These authors share the small group literature's emphasis on employee motivation as the source of performance gains from teams, but they argue that the source of this motivation is coercion rather than the more neutral idea of employee attitudes and goal alignment. Indeed, this focus on the dynamics of worker motivation seems to turn on its head the STS and small group literature's preoccupation with employee satisfaction and organizational commitment.

A notable drawback of these studies is that despite their qualitative methods, they often neglect important aspects of organizational and institutional context. Barker's theory, for example, relies on identity formation in teams, without considering other sources of identity formation such as race, gender, community, religion, or political affiliation. The focus of Foucauldian accounts on encompassing or totalizing control has also drawn criticism from scholars who object to the lack of worker agency or to the neglect of the economic or institutional structures in which workplaces are embedded. One version of this critique holds to a postmodern interpretation of the mechanisms of control in modern teamwork, but argues that worker resistance may be an unintended consequence of power when it conflicts with other forms of worker identity (Knights and McCabe 1998). Ezzamel and Willmott's (1998) case study of work reorganization in an apparel factory traces the shift from a piece-rate system to a team-based pay system, finding that workers refused to assume new self-managing responsibilities due to conflicts with their identities as mates and collaborators. Thus, employees may react differently to the demands of teams as their practical concerns—described here as self-identity or subjectivity—mediate between structure and outcome.

Other critical scholars object to these attempts to bring postmodern traditions to bear on analysis of the labor process, arguing that the distinctive dynamics of control and resistance in capitalism are obscured by a preoccupation with expressions of worker identity and their subjugation to normalizing disciplines (Smith and Thompson 1999). Heated debates have ensued between labor process and Foucauldian theorists. Several case studies have shown that workers do not easily buy into management rhetoric. In their study of several Volvo truck plants, for example, Thompson and Wallace (1996) found little evidence that management used teams as a means of normative regulation. A study of the Scottish Spirits industry showed that workers were positive about the principles of teamwork and relations with coworkers; but they remained critical of management, saw normative training as 'brainwashing', and their attitudes about teamwork were juxtaposed against their overall concerns about job insecurity and instability (Findlay et al. 2000). Similarly, in their study of a Scottish electronics plant, McKinlay and Taylor (1996) showed that workforce resistance combined with competitive pressure led to the unraveling of a comprehensive peer review system. Students of the labor process have also paid somewhat more attention to the implications of work reorganization for unions (Ackers, Smith, and Smith 1996; Bacon and Storey 1995; Garrahan and Stewart 1992).

In summary, the labor process and postmodern traditions contribute important insights into debates over the relationship between modern forms of teamwork and Taylorist production strategies, and present work intensification as a more plausible mechanism through which teams influence performance. Research from both traditions draws attention to continuities in dynamics of power, control, and resistance in teams, casting doubt on optimistic visions of a flexible and empowered post-bureaucratic workplace. Similar to the psychological literature, however, neither tradition has given the kind of attention to the economics of production systems and mechanisms of performance gains that are the hallmark of the HPWS literature.

Conclusions: Complementarities across Traditions

Our review of alternative approaches to team-based work highlights important differences in the kinds of research questions raised, the methods used, and the outcomes of interest across several research traditions. Some of these differences are fundamental—such as theoretical assumptions regarding the level of conflict between labor and management at work. These assumptions also shape alternative research methodologies. The epistemological models underlying each tradition stem from radically different assumptions about the linearity of relationships among phenomena, the role of the researcher, and the validity and generalizability of qualitative versus quantitative methodologies.

Some differences, however, are probably less fundamental. Here, we believe that incremental steps can be made to increase learning across disciplines and theoretical traditions. For example, students of organizational behavior have long argued that their research on groups at work must incorporate a richer understanding of organizational context, but few have done so in a convincing manner. They could learn much from industrial relations scholarship, particularly regarding the relationship between work organization and technology and the importance of understanding the economics of production. This would allow them to articulate a broader array of relevant outcomes and to move away from 'context as backdrop' in order to develop richer insights into how organizational conditions shape implementation. Researchers in organizational behavior would also benefit from the skepticism found in the critical literature on teams. While some have studied interpersonal versus substantive conflict within groups (e.g. Jehn 1995), they have not paid attention to issues such as peer group pressure or conflicts between work teams and management or other occupational groups at work.

Similarly, students of industrial relations, who are strong on context but weak on theory, would benefit from examining alternative theories of information processing and social cognition to better understand how individuals in groups solve problems, share knowledge, and learn from each other in ways that affect their performance. While studies of high performance systems provided explanations of how and why team-based work is associated with better performance, they have not developed careful measures of processes at work nor have they tested mediating mechanisms. Some recently developed measures of knowledge sharing in the organizational behavior literature (e.g. Lewis 2003) could provide a point of integration.

Another arena for complementary work is across US and European traditions. The US research in high performance work organization has focused primarily on performance outcomes, using large-scale

quantitative data across establishments to generate results. European studies have focused more on implications for workers, often relying on qualitative case studies. These differences, however, are beginning to change. Examples include the large-scale study of performance among auto suppliers by Delbridge and colleagues and analyses of the British WERS that test the links between management practices and performance (Ramsay, Scholarios, and Harley 2000). Similarly, recent studies in the United States have focused on the relationship between HPWS and workers' outcomes, including wages, satisfaction, and stress (Appelbaum et al. 2000); wage inequality (Batt 2001b); and wages and layoffs (Osterman 2000). A 2004 special issue of Industrial Relations on outcomes for workers concluded that many programs have no effect on worker pay, but that on average, workers realize a small increase in wages after the introduction of new work systems with higher employee involvement (Handel and Levine 2004).

One area where debate and dialogue have occurred is among critical scholars in the labor process and Foucauldian traditions. As our review indicates, while team-based work may involve greater peer group pressure and surveillance in some instances, a large number of case studies have shown that this is probably not a dominant pattern. Rather there is a wide range of variation in outcomes, which depend importantly on such factors as history, institutional context, and the strategies of employers and unions. This research would benefit, however, from input from psychologists trained in defining and measuring certain of their concepts more precisely—such as the meaning of peer group monitoring, group cohesion, normative control, and surveillance.

Beyond these incremental steps, there are several areas where common ground appears to be growing. First, there is greater recognition of the need to define and measure different dimensions of team-based work more carefully. While this is a long-standing concern of organizational behavior researchers, those in industrial relations and critical studies also have recognized that using different definitions prevents meaningful comparisons across studies. Marchington (2000) provides a useful framework, which captures the degree, scope, level, and form of teamwork. Alternatively, Thompson and Wallace (1996) distinguish between the technical, governance, and normative dimensions of teams.

Second, there is growing awareness of the need to examine a broader array of outcomes from team-based work organization. For workers, these include not only conventional measures of job satisfaction, commitment, and the like, but job security, pay, workloads, job-related stress, and work—family conflict. Similarly, organizational performance measures need to capture not only specific operational measures of quality and efficiency, but labor inputs such as hours of work and labor costs. As research on service activities grows, there is also a need to understand the relationship between management practices, worker experiences, and consumer outcomes.

A third area of growing consensus is the desirability of multi-method studies that focus on particular industries and occupations. Multiple methods include careful field research and observation, interviews at various levels of the organization, surveys to quantify what is observed in fieldwork, and matching of perceptual and archival datasets. One-off case studies of convenience make meaningful comparisons difficult and often yield little beyond descriptive stories.

Fourth, many see the need to move beyond a single unit (the work group, the organization) and examine work organization at multiple levels of analysis. This goes beyond the idea of placing teams in organizational or institutional context. Rather, it is about studying the relations within and across work groups and organizational units. This approach may be particularly useful for studies of supply chain management. New statistical packages such as hierarchical linear modeling also facilitate this type of analysis. More importantly, many have seen the theoretical limits of studying fixed structures and are beginning to conceptualize groups at work in terms of ongoing relationships and processes. This has led scholars to explore the concept of organizational social capital—the relations of trust and knowledge sharing among employees—as a mechanism for performance gains (Leana and Pil 2002). It has also led to experiments with social network analysis, as in Rubenstein's study of the role of the union at the Saturn auto plant (2000).

Fifth, the awareness of globalization has highlighted the need for more sophisticated cross-national research. Other than the rich literature on the international auto sector and the role of national institutions in shaping alternative management practices, few international comparisons of work organization in other industries have occurred. Comparative international studies of work organization in services would be particularly valuable because the historic role of unions and other institutions that have influenced manufacturing may be lacking in many service settings. Studies examining the same corporations operating in distinct national contexts would contribute much to our understanding of the relative importance of institutions and employer strategies in shaping the organization of work and related outcomes.

These directions point to the need for large-scale research projects that bring together psychologists, sociologists, and industrial relations scholars with complementary strengths and expertise. There is also a need for more coordinated international research that compares work restructuring in advanced and industrializing economies. These types of endeavors require major commitments in terms of time and resources, and academics often have limited incentives to undertake such projects. Academic disciplines and journals continue to discourage interdisciplinary work. New systems of management in academia have also pushed scholars to publish large quantities of articles, often recycling their data sets and arguments. It is time, however, to move beyond separate silos and narrow research agendas in order to develop a more theoretically rich and integrated understanding of the organization of work in the next century.

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