

**What Does Transformation Mean to Workers?
The Effects of the “New Industrial Relations”
on Union Employees' Attitudes**

John Paul MacDuffie
Larry W. Hunter
Lorna Doucet

Department of Management
2000 Steinberg - Dietrich Hall
The Wharton School
University of Pennsylvania
Philadelphia, PA 19104
Fax: (215) 898-0401

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MacDuffie
(215) 898-2588
macduffie@
wharton.upenn.edu

Hunter
(215) 898-5739
hunter@
wharton.upenn.edu

Doucet
(215) 898-9113
doucet@
wharton.upenn.edu

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Abstract
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The Chrysler-UAW Modern Operating Agreement (MOA) is a prototype for the “new industrial relations”, establishing (through collective bargaining) reduced job classifications, shop-floor work teams, a pay-for-skills compensation plan, extensive training, and decentralization of various production and quality responsibilities to teams -- all under a joint union-management governance structure. We use a 1993 survey of worker attitudes at six MOA plants (two to five years after MOA was implemented) to predict which workers are likely to express approval of the MOA and the team concept. The survey measured individual, group, and organization-level (i.e. establishment) characteristics in order to capture the full context surrounding the implementation of the MOA, including plant-level variation in worker attitudes. Variables at each of these levels of analysis are statistically significant predictors of favorable attitudes towards MOA and towards the team concept, indicating the value of such a cross-level analysis for understanding worker attitudes towards workplace transformation. We also analyze plant-level differences in attitudinal outcomes and find that some of the variation is explained by factors that are not idiosyncratic to individual plants.

The 1980s and early 1990s saw the introduction of many variations on what has become known as the "new industrial relations" into American unionized firms, particularly manufacturing operations. Among these settings was the automobile industry - the exemplar of the traditional, New Deal approach to labor-management relationships. The New Deal system featured multiple job classifications, wages tied closely to jobs, and an "obey-now-and-grieve-later" approach to shop floor conflict. This system also featured the concentration of business strategy and process improvement decisions in the hands of management.

The auto industry, like other sectors, found that global competition and alternate production strategies placed the New Deal model in the U.S. under increasing strain. Both the Big Three firms and the United Auto Workers experimented with a variety of new approaches to collective bargaining in this dramatically altered environment (Katz and MacDuffie, 1995). Setting the context for our study is one such experiment. The Chrysler Corporation and the United Automobile Workers (UAW) attempted to reform industrial relations through their collective bargaining contract, from the top down. Union and management negotiated what became known as the "Modern Operating Agreement" -- a vehicle to implement features of the new industrial relations such as reduced job classifications, shop-floor work teams, and a pay-for-skills compensation plan.

The Chrysler-UAW attempt at organizational change raises an important set of questions about the direction of the transformation of American industrial relations. Many of the more successful experiments with worker involvement have taken place in "greenfield" sites, but it has proven very difficult to move existing labor-management relationships in "brownfield" sites toward this new model. Here we examine a situation where management and union leaders initiated changes in existing sites with workers initially reluctant to follow this lead, and consider how this joint governance of the change process affected the dynamics of implementation and the impact on worker attitudes. In this regard, it is particularly noteworthy that the MOA is characterized by both a "fostering" strategy emerging from its joint governance structure and a "forcing" strategy, in which company investment decisions were contingent upon adoption of the MOA (Walton,

Cutcher-Gershenfeld, and McKersie, 1994).

Our paper brings a "meso-level" perspective to the study of worker attitudes toward the new system (Cappelli and Sherer, 1991). That is, we explicitly consider the context in which attitudes develop. We look for explanation not only in variation in individual-level characteristics but in the surrounding context, focusing on workers' interpretations of that context¹. This approach allows us to examine comprehensively what happens to workers' attitudes and behaviors when their industrial relations system is changed from the top down, and in particular, from a New Deal model to one featuring aspects of the new industrial relations. Specifically, we ask which workers are likely to embrace the changes -- and which aspects of the changes will they embrace? Which workers are likely to be less persuaded by (and less supportive of) the new approach?

These questions are important because few studies of the transformation of industrial relations have attempted (or been able) to evaluate worker attitudes. Most studies of "the new industrial relations" take place at the organizational level, focusing on changes in collective bargaining processes and corporate strategies to reorganize work and boost quality-of-worklife (e.g. Katz, Kochan, and Weber, 1985). While several studies now link the changed work practices and employment policies of "the new industrial relations" with economic performance (MacDuffie, 1995; Ichniowski and Shaw, 1995; Huselid, 1993; Cooke, 1992; Arthur, 1992), these studies uniformly acknowledge that these changes only lead to improved performance if workers are more motivated and willing to contribute their skill and discretionary effort to performance improvement (Levine and Tyson, 1990; Bailey, 1993). Worker attitudes towards these changes are an important indicator of these preconditions.

Furthermore, the survival of efforts to change the organization of work and the shopfloor practice of industrial relations cannot be taken for granted but depend heavily on the broader labor relations climate and on the commitment of both labor and management (Eaton, 1994). When these favorable conditions exist, research suggests that the new industrial relations may have more staying power and more wide-ranging impact on firm competitiveness than similar efforts in non-union settings (Cutcher-Gershenfeld, 1991; Eaton and Voos, 1992; Kelley and Harrison, 1994).

According to some observers, greater worker involvement with daily operations, through shop-floor teams that engage in problem-solving activities, may also develop a predilection for participation (as well as crucial communication and interpersonal skills) that may boost identification with the union and involvement with internal union governance (Kochan and Osterman, 1994).

In contrast, critics of the new industrial relations and, more generally, of cooperative labor-management efforts and team concept (Babson, 1995; Parker and Slaughter, 1988; Compa and Riesman, 1985) also note that not enough is known about how workers react to these changes. They argue that worker reactions are often more negative than management rhetoric would suggest, based on a realistic appraisal by workers of what is lost through these changes (e.g. seniority rights, work rule protections against arbitrary management action, clear guidelines for regulating work pace, a vigorous grievance process) compared with what is gained (e.g. dubious job security, slow wage growth, limited opportunities to boost skills or career prospects substantially, union reluctance to challenge management). Thus the issue of worker responses to the new industrial relations goes to the heart of debates about the merits, flaws, and sustain-ability of these transformation initiatives. In the words of Kochan, Katz, and McKersie (1986):
Ultimately, the form and effectiveness of the institutions and processes for managing and representing workers must be well matched to the perceived needs and revealed preferences of the individuals and groups they are designed to serve. (P. 206)

The Chrysler-UAW Experiment with MOAs

The institutional context for these changes is a critical part of the story, for it is important to understand just how different the new system at Chrysler is from the old one. The broader study of MOAs (of which this attitude survey is a part) captures several years of experience under the MOA structure -- a period of dramatic ups and downs for the agreement itself, for the company, and for the union. We summarize the most important aspects of the institutional context below. Details beyond what we can include here, about the labor-management context within which MOAs were implemented and about the MOA experiences of different plants, are reported in Lovell et al.

(1991).²

Background. The MOA emerged from discussions between top officials of Chrysler and the Chrysler Department of the UAW, who negotiated the general terms of the agreement in early 1986. MOA contracts were then fine-tuned through local negotiations and ratified plant-by-plant in 1986 and 1987. At this point in time, Chrysler had recovered fully from its brush with near-bankruptcy in the early 1980s and had achieved record-breaking performance during the Big Three resurgence of 1984-85. This gave both Chrysler and UAW officials enough sense of stability that they were able to turn their attention to addressing more fundamental, long-term issues of change at various manufacturing plants. Furthermore, Chrysler was anticipating boosting plant-level investments greatly in the next few years and felt they could require plants to move towards the new industrial relations as a condition for receiving investments.

This made certain plants into logical targets for negotiating and implementing the MOA. By 1987, six plants, representing 25% of Chrysler's manufacturing and assembly operations, had ratified MOA agreements -- including Jefferson Avenue Assembly and Trenton Engine plants in Michigan; New Castle Machining and Indianapolis Foundry in Indiana; Huntsville Electronics in Alabama; and Newark Assembly in Delaware.

The belief among management and union leadership was that if, under MOA, Chrysler could produce more efficiently and with higher quality, the company would also preserve jobs and employee earnings. Union leaders were also motivated by a belief that MOA offered a possibility for achieving aspects of "industrial democracy" through worker involvement that had been neglected in previous years. This latter motivation was perhaps particularly strong among union officials at Chrysler, which had not undertaken initiatives in the late 1970s and early 1980s like those at General Motors (Quality-of-Work-Life - QWL) and Ford (Employee Involvement - EI).

From the start, the MOA effort was designed to function under joint governance by Chrysler and the UAW. Joint union-management steering committees oversaw MOA's implementation at both the plant and national levels. In addition, both Chrysler and the UAW appointed an equal number of facilitators, again at both plant and national levels, and assigned the

jointly-run National Training Center the task of providing ongoing assistance to the program.

Basic Elements. The basic elements of the MOA included the use of teams, start-up and continuous training, a reduction in the number of job classifications, a pay-for-skills compensation plan, the elimination of status barriers in the plants (e.g. no ties for managers, common parking), and a participative style of operating. These changes in the organization of work and the development of skills were intended to boost flexibility with respect to the deployment of labor, worker motivation with respect to discretionary effort, and the bottom-up generation of ideas to improve performance. The MOA was also designed to reduce managerial overhead (particularly the ratio of first-line supervisors to hourly workers), and to encourage workers to take on responsibilities for productivity and quality that were previously carried out by manufacturing staff and engineers.

Perhaps the most dramatic departure from the New Deal model was the implementation of work teams as a fundamental unit in the organization of work. Under MOA, teams are groups of fifteen to twenty employees performing "logical groupings of jobs," taking responsibility for certain economic outcomes, and overseeing the effort, skill acquisition, and performance of team members. Each team chooses a team coordinator, an hourly union employee who takes on some responsibilities of the supervisor under the old system and receives an extra 10 cents per hour in pay. The team has 20 duties under the contract (see Appendix 1), described in terms of daily team behaviors. All employees received training in the team concept and operation of teams, and specifically in the 20 team duties. Industrial engineers in each plant initially established team boundaries, but members chose their own teams, bidding into team positions in order of seniority on a special "Sadie Hawkins Day".

MOA also collapsed a huge number of job classifications into a few broader categories. For example, at one assembly plant 87 categories of semi-skilled jobs were reduced to three technician positions. Accompanying this change was a change in the wage structure. No longer did each job carry its own pay level; rather, most team members received what was termed

Capability Progression Pay (CPP). CPP pays individuals for the ability to perform sets of operations. Workers within each classification add to their base wage by demonstrating the ability to perform multiple jobs on their own team or jobs on other teams. The collapsed number of categories and the pay incentives for cross-training were designed to produce greater flexibility in the allocation of work assignments on a daily or even an hourly basis.

Resistance to MOA. Despite the belief among management and union leadership that the MOA would increase the competitiveness of the company, resistance to the new contract among rank and file workers was strong. In two of the six plants (Newark Assembly and Trenton Engine), the union membership initially voted down the contract. When management linked adoption of the MOA to investments in new technology and to keeping plants open, however, workers at these plants voted again and narrowly approved the MOA. In three of the other plants (Jefferson Assembly, Huntsville Electronics, and Indianapolis Foundry), the initial response was only slightly more favorable. New Castle Machining was the only plant to volunteer for the MOA, with local plant managers and union officials agreeing on the necessity of boosting their long-term competitiveness. Generally, the high seniority, experienced workers at these six plants did not initiate or embrace a transformation in labor relations; rather, it was thrust upon them.

Thus although the MOA was a jointly-governed labor-management initiative (typical of a “fostering” strategy), many workers at these plants experienced MOA as the consequence of a “forcing” strategy, based on corporate management and national union arguments about competitive necessity. In the two plants that first turned down the MOA and only later approved the contract in the face of strong pressure from Chrysler management and national UAW officials, local union leaders who had backed the MOA were often voted out of office in the next round of elections, replaced by MOA opponents (or at least skeptics).

While plant-level issues involving MOA had an impact on local labor-management relations, the reverse was also true. Whenever there was tension and conflict in the broader labor-management relationship, at either the plant level or the national level, MOA efforts would commonly be “held hostage”, with the union (most commonly) refusing to continue with MOA

training or other implementation activities unless management changed its position on some unrelated issue, such as decisions about the outsourcing of parts or the potential sale of plants in Chrysler's parts subsidiary division, Acustar. (Huntsville and New Castle were Acustar plants.)

Summary. The early implementation of MOAs was influenced by a mix of both favorable and unfavorable circumstances. The use of the collective bargaining process to establish the MOA meant that structural changes in the organization of work -- the construction of teams, the reduction of job classes, and the new pay system -- could be carried out systematically, with full backing from the national union and with the help of the joint steering committees and the matched sets of labor and management MOA facilitators. However, while the promises about what MOA could achieve appealed to many workers, a majority were clearly skeptical as implementation began and some greeted the changes with anger and overt resistance.³

Thus the Chrysler-UAW experiment with the MOA allows us to view the new industrial relations holistically, focusing on employees' attitudes and behaviors with respect to this overall approach to change as well as its various specific elements. The MOA experiment shows how various aspects of the new industrial relations might produce or impede commitment by the parties to this approach, and how and why the new approach itself might affect the labor relations climate. Finally, as noted above, it allows for an assessment of worker acceptance of a change effort that is "forced" upon individual plants through a top-down initiative but is also collectively bargained and jointly-governed, providing strong union influence on both strategy and implementation.

Hypotheses

Many studies have demonstrated the positive effects of employee involvement programs on individual employee attitudes (for reviews see Cotton, 1993; Pearce & Ravlin, 1987; Pasmore, Francis, Haldeman, & Shani, 1982; Cummings, Molloy, & Glen, 1977). While such programs vary in their impact on employee attitudes, the most effective efforts often utilize new work structures, such as work teams, that give employees more control over work methods and more influence over managerial decisions that influence their work (Cotton, 1993). The presence of a

union can also boost the effectiveness of work reforms and the receptivity of workers. Eaton and Voos (1992) find that unionized companies make more extensive use of workplace innovations than nonunion companies, and are likely to be more effective in improving economic performance because of the union's role in designing and overseeing the new work structures.

From this literature, we had reason to believe that the attitudes towards MOA reported by Chrysler workers would be positive. Boosting worker control and influence was the primary stated goal for MOA, and teams were the central element of MOA's work reorganization. Also, the fact that MOA was implemented under the joint direction of Chrysler management and the UAW suggested a high likelihood of favorable economic outcomes and hence positive attitudes.

However, while we have some interest in ascertaining the level of support for MOA, our primary goal in this paper is to explain the variation in support for MOA (and its constituent parts) within a sample of workers across the six MOA plants. To this end, we propose a number of hypotheses below that capture potential explanatory factors at individual, group, and organizational levels of analysis. Each hypothesis is stated in terms of how workers are likely to react to the new industrial relations. For this context, this formulation is intended to encompass both worker reactions to "MOA" -- the overall program made up of various changes -- and to the use of teams, a prominent feature of MOA. In the data analyses below, we will compare whether worker attitudes towards MOA overall are similar to or different from attitudes towards teams.

We begin by considering the characteristics of individual employees. Very little work has been done on the relationship between individual demographic and dispositional characteristics and reactions to employee involvement programs (Cotton, 1993). Dreher (1980) found relationships between individual needs (e.g. achievement, affiliation) and reactions to profit-sharing (e.g. the Scanlon Plan). Practical advice is often offered about hiring or selecting "team players" for employee involvement programs (Bowen, Ledford & Nathan, 1991, Cosentino, Allen, & Wellins, 1990, Feuer and Lee, 1988). In terms of demographic variables, Blumberg (1980) found that age influenced job switching in autonomous work groups in a coal mine, with younger workers more likely to switch jobs in order to increase status. The author speculated that the self-concept of older

workers is more strongly tied to their current job and skills, so they are threatened by the possibility of looking foolish in trying something new. From this "resistance to change" perspective, we would also expect more educated employees to be more open to a wider variety of work experiences and feel less threatened by workplace change.

There is little basis in the literature for expecting differences between men and women in attitudes towards the new industrial relations. While women -- with their relatively low plant and/or company tenure -- could be negatively affected aspects of the agreement that granted greater opportunities or privileges to workers with more seniority (i.e. the first chance to take training that could lead to higher pay or to bid for a job in a particular team), this effect should be captured by the individual tenure variable. So we offer no specific hypothesis with respect to gender.

For demographic variables, therefore, we advance the following hypotheses:

H1a: Younger workers will have more favorable attitudes towards the "new industrial relations" than older workers.

H1b: More educated workers will have more favorable attitudes towards the "new industrial relations" than less educated workers.

Although the positive effects of employee involvement programs are well established, few studies have explored the mechanisms for these effects (Cohen and Ledford, 1994). Since this case study consists of a multi-faceted organizational change, it is possible to consider the separate elements of the change and see how each affects the desired outcomes. We first consider issues of job design, examining the elements of skill variety, task identity, autonomy, and feedback that make a job intrinsically motivating, according to job characteristics theory (Hackman and Oldham, 1980). The move to work teams under MOA potentially makes jobs more motivating along many of these dimensions, thus boosting employee satisfaction with teams and the other work reforms. While the extent of feasible job redesign can depend heavily on the technical context for a given job, all the MOA plants contain relatively similar manufacturing jobs, allowing for implementation of similar team designs.⁴

H2: Workers who perceive higher levels of skill variety, task identity, autonomy, and feedback in their job will have more favorable attitudes towards the “new industrial relations” than workers who perceive lower levels of these job characteristics.

Individuals may also experience other rewarding outcomes from the changes associated with the MOA. In particular, the Capability Progression Pay (CPP) compensation plan offers individuals the chance to receive higher pay by mastering multiple jobs within and across teams. As workers acquire new skills, they may also be able to move to a job class that has a higher base pay, better job characteristics, and better advancement opportunities. Thus individuals who experience pay increases and/or movement to a better job class should view the MOA positively.

H3a: Workers whose pay improves due to work reforms will have more favorable attitudes towards the “new industrial relations” than workers whose pay does not improve.

H3b: Workers who move to a better job class due to work reforms will have more favorable attitudes towards the “new industrial relations” than workers who do not.

For both the firm and individual employees to reap the benefits of an involvement program, employees must participate. One would expect an association between positive attitudes towards work reforms, such as work teams, and the frequency and completeness of participation in the assigned tasks for a team. Or the reverse could also be true -- teams that participate actively in performing team tasks may induce team members to hold positive attitudes towards teams, for a variety of reasons. We examine participation at the level of the team and evaluate the effect of overall team activity on individual attitudes towards MOA.⁵

We envision several possible ways in which the overall level of team activity might affect the attitudes of individual workers. Active teams may generate considerable normative social influence among team members to support the team concept (Thomas and Griffin, 1989). Where supporters of team participation are in the majority, team members who are neutral or negative towards the team may be forced into a higher level of team activity than they would prefer.

However, this activity may slowly turn around their attitudes towards the team as they seek to resolve internal dissonance -- i.e. if they are performing team duties, they should support the team -- and avoid social conflict -- i.e. their peers pressure them to support the team, especially if they are “free-riding” non-participants whose their lack of involvement increases the amount of work that must be done by their peers (Deutsch and Gerard, 1955; Homans, 1961; Kiesler and Kiesler, 1969). Over time, a high level of participation in team activities should become more and more closely related to individual attitudes towards teams.⁶

Conversely, when the level of team activity is rather low, it suggests that either those who are neutral or negative towards the team are in the majority or that there is little or no normative pressure applied to those who participate at low levels (or not at all). In this case, the reduced activity for the team should yield increasingly negative attitudes towards teams over time, even among those who were initially positive towards the idea.

With respect to group dynamics and team activities, therefore, we hypothesize that:

H4a: Workers whose teams carry out more team duties will have more favorable attitudes towards the “new industrial relations”

H4b: Workers whose team members rotate jobs more frequently will have more favorable attitudes towards the “new industrial relations”

The job design literature focuses on the individual level, emphasizing how job characteristics can (or can't) satisfy individual needs for meaningfulness, responsibility, and autonomy. But there are also needs for autonomy and influence that are satisfied at a group level rather than an individual level. Indeed, considerable research suggests that employees seek voice at the workplace for their concerns, both about their immediate jobs and about other issues such as technological change and quality that affect the fate of their employer, and hence their employment security (Freeman and Medoff, 1984; Kaufman and Kleiner, 1993). We expect that workers will hold favorable attitudes towards work reforms that they believe have boosted the influence of their work group over managerial decisions affecting them.

Also important in shaping attitudes towards work reforms is whether workers perceive these changes as improving key organizational outcomes such as productivity, quality, and safety. While safety is clearly relevant to workers, productivity and quality have become much more important worker concerns in recent years, amid concerns about U.S. competitiveness and a precipitous decline in employment security (Dertouzos, Solow, and Lester, 1989). This is particularly true in the context of the U.S. auto industry (where employment historically has been highly cyclical, with frequent layoffs during downturns) and Chrysler in particular, given that it nearly went bankrupt in 1979 and had another severe financial crisis around 1990. We investigate two related hypotheses here.

H5a: Workers who perceive that their work group or team has a high influence over their immediate jobs and managerial decisions affecting them will have more favorable attitudes towards the “new industrial relations” than workers who do not perceive such influence.

H5b: Workers who perceive that work reforms have improved important organizational outcomes, such as productivity, quality, and safety, will have more favorable attitudes towards the “new industrial relations” than workers who do not perceive such improvements.

Methods

2000 randomly-selected employees of the six MOA plants were surveyed by telephone between January 17 and February 5, 1993. Larger plants (more than 2000 employees) were surveyed more heavily to yield a sample with a representative distribution of the six plants. 400 employees from the Jefferson and Newark assembly plants, Trenton engine plant, and Huntsville electronics plant were surveyed, while 200 employees from the Newcastle machining plant and Indianapolis foundry were surveyed. Characteristics of the plants are given in Table 1.

Various groups of employees at different organizational levels were surveyed as well. 1420 of the respondents were drawn from the unionized production workers, 307 from the unionized trades workers, 78 from salaried bargaining (unionized technical and clerical

employees), 123 from management and 72 from other categories. The analysis reported in this paper is restricted to the 1420 unionized production workers, the group most affected by the MOA. Comparisons across various employee groups will be made in future analyses.

Of the 1420 unionized production workers surveyed, only those who were members of teams (n=1289) were included for these analyses. Furthermore, only surveys with complete responses were analyzed. This reduced the sample size to 782. No systematic biases were found among the group of respondents with missing data.⁷

The phone survey consisted of eleven pages of questions designed to find out what employees thought of the overall MOA and its many constituent parts. A professional survey research firm carried out the interviews. Names were picked at random from a list of employees at each plant provided by Chrysler and the employees were phoned at their homes. A letter from the researchers, accompanied by cover letters from Chrysler and the UAW, was distributed in each plant a week before calls were made, making it clear to workers that both the company and the union approved of and supported the survey's effort to "learn about the views of employees, both positive and negative, towards MOA." The research team's independence from both the company and the union was also emphasized in the letter. Interviewers repeated the key information from this letter at the beginning of each interview.

Most questions offered respondents two positive (e.g. "agree" and "strongly agree") and two negative (e.g. "disagree" and "strongly disagree") potential responses. Both the question and the responses were read to the respondent by the interviewer. Interviewers did not prompt respondents with responses such as "neither agree nor disagree" or "partially agree, partially disagree". However, if respondents gave such a response, interviewers noted this and these answers were later coded as "3" on a five-point scale.⁸ At the end of the interview, respondents were asked open-ended questions about their reactions to MOA. The telephone interview took 15-20 minutes to complete.

The timing of the survey was advantageous for two reasons. First, as Table 1 reveals, it was administered five to six years after the initial signing of MOA contracts and, even at the plant

that was slowest to implement MOA, over a year after the introduction of teams. Thus we are not picking up the attitudes from a startup period, when a Hawthorne effect or initial resistance to change might be affecting worker views. At the same time, the start of MOA had not been so long ago that workers were unable to remember the pre-MOA situation in their plant.

Second, January 1993 was an intermediate time in the dramatic recovery of Chrysler from its financial crisis of 1990-91 to its recordbreaking sales and profits in 1994. There was neither the dark cloud of another brush with bankruptcy nor the euphoria of a huge year-end bonus to color worker perceptions of MOA. Open-ended comments recorded at the end of each phone survey reveal workers still concerned about employment security but cautiously optimistic that Chrysler was "out of the woods" in terms of its economic performance.

Measures

Demographic variables

Age. The respondent's age was taken from company records.

Gender. The respondent's gender was recorded by the interviewer. Responses were coded as 0=female and 1=male.

Education. Respondents were asked to choose a category which best described their educational background. An 8-point scale was used, where "1" indicated not having completed elementary school and "8" indicated having received a post-graduate or professional degree.

Individual outcome variables

Change in pay class. Respondents were asked if their pay level had changed since the CPP, or Capability Progression Plan started. Affirmative responses were coded as 1 and negative responses were coded as 0.

Change in job class. Respondents were asked if their job class had changed for the better since the CPP, or Capability Progression Plan started. Affirmative responses were coded as 1 and negative responses were coded as 0.

Job characteristics. Respondents were asked to rate their jobs on the following things: *task autonomy* ("the freedom to do pretty much what I want on my job"); *task feedback* ("the feeling that I know whether I am doing my job well or poorly"); *task variety* ("the chance to do a number of different things") and *task identity* ("the change to do a job from beginning to end"). Question wordings were drawn from Hackman and Oldham (1976).⁹ Each item was rated on a scale of 1 to 5 where "1" corresponded to "very low" and "5" corresponded to "very high". Responses of "neither high nor low , or, 50-50" were coded as "3", as noted above.

Team activity variables

Team duties done. Respondents were asked how many of the 20 Team Duties (see Appendix 1) their team always carries out -- 100% of the time. The numerical response was recorded as given.

Job rotation. Respondents were asked whether people on their team rotated jobs. A "yes" response was coded as "1" and "no" was coded as "0".

Team influence. Respondents were asked to rate "how much attention management at your plant pays to what your work team thinks or says" for various issues: *technology* (the use of new technology on your job); *work methods* (the way the work is done -- methods and procedures); *quality* (the quality of the product); *people problems* (handling "people problems"); *job assignment* (who in your team should do what job); *work pace* (how fast the work should be done); and *work effort* (how much work people should do in a day). A 4-point scale was used, with "1" corresponding to "none at all" and "4" corresponding to "great deal".

Organizational Performance Variables

Productivity, quality, safety. Respondents were asked for their perception of whether these organizational performance outcomes had improved or worsened under MOA. A 5-point scale was used, with "1" corresponding to "gone down a lot" and "5" corresponding to "improved a lot". Responses like "stayed the same, etc." were coded as "3", as noted above.

Plant Dummy Variables

Dummy variables were included for 5 of the 6 plants to control for effects of unspecified local plant effects, with New Castle Machining -- the one plant to volunteer for the MOA -- omitted as the comparison plant. While the basic MOA contract was the same for all six plants, differences in the histories of each plant, their production processes, the conditions surrounding ratification votes and early MOA implementation, and other local conditions gave us reason to expect some variation across plants. Plant-level differences are described more fully in Lovell et al. (1991) and some plant-level analyses are included below.

Dependent Variables

Three different questions measuring attitudes about MOA are used as dependent variables. While these attitudes might be expected to be highly correlated, there are plausible reasons for expecting them to differ in some cases, as noted below.

Satisfaction with MOA. Respondents were asked if, overall, they were satisfied with the way things were going in their plant under the MOA. A 5-point scale was used, with "1" corresponding to "very dissatisfied" and "5" corresponding to "very satisfied". Responses such as "partly satisfied, partly dissatisfied" were coded as "3", as noted above.

Preference for MOA. Respondents were asked whether or not they agreed with the following statement: "I prefer working under the MOA to working under the old approach". A 5-point scale was used, with "1" corresponding to "totally disagree" and "5" corresponding to "totally agree". Responses such as "partly agree, partly disagree" were coded as "3", as noted above.

Preference for teams. Respondents were asked whether or not they agreed with the following statement: "Overall, I prefer the team system to working under the old system". A 5-point scale was used, with "1" corresponding to "totally disagree" and "5" corresponding to "totally agree". Responses such as "partly agree, partly disagree" were coded as "3", as noted above.

Comparing and Contrasting the Dependent Variables. "Satisfaction with MOA"

measures the overall reaction of the respondent to the entire package of work reforms in the MOA program. "Preference for MOA" is also an overall measure of MOA, but differs from the previous question by asking respondents to compare this new approach with "the old approach", which was deliberately left undefined. This question therefore taps the relative assessment of MOA relative to the past, rather than the more absolute level of "satisfaction with MOA". "Preference for Teams" focuses on the respondent's reaction to this specific aspect of the MOA, and again is explicitly comparative, requiring a relative assessment of the experience with teams.

There are ample reasons for believing that these dependent variables assess different attitudes. It is quite plausible that someone could not be very satisfied with MOA but still prefer it to the old approach; or that someone could prefer teams but not be very satisfied with MOA; or even that someone could dislike teams but still prefer (or be satisfied with) MOA because of the belief that MOA was important for the plant's economic competitiveness and hence for job security. Table 2 shows a crosstab for these three questions. It reveals that, while most respondents have similar attitudes across these three questions, a minority do hold different views. We will keep this in mind as we interpret the results, below.

Results

Table 3 reports the means, standard deviations and correlations for the individual items relating to job design characteristics, team influence, and perceived performance outcomes. Given the high number of significant correlation coefficients, we carried out factor analyses, with varimax rotation, to create independent variables for the regression analysis. The results of the factor analysis are displayed in Table 4. The expected factors emerged with one addition. "Team influence" loaded on to two separate factors. We interpret the first factor as "team influence on work processes" and the second factor as "team influence on work effort".

Table 5 reports the means, standard deviations and correlations for the variables used in the

regression analysis. The means for all three dependent variables are above 3.0, which marks the neutral midpoint of the scale, and the difference between these means is statistically significant at the 99% confidence level.

Table 6 explores the results for the dependent variables in more detail. Here we present the percentage of respondents, for the whole sample and plant-by-plant, that either “strongly agree” or “agree” with statements reflecting different attitudes towards MOA. Note that while 64% of the overall sample agree they are "satisfied with MOA", a higher percentage (68%) say they “prefer MOA”, and a still higher percentage (76%) say they “prefer teams”. This rank ordering is consistent with the arguments above concerning the potential divergence in views across the dependent variables.¹⁰ Note that the sample average does conceal considerable plant-level variation in attitudes, with Newark Assembly consistently reporting the higher percentage approval of MOA, Huntsville Electronics reporting the consistently lowest percentage of MOA approval, and other plants varying in rank order by question.

The results of regression analyses on the three dependent variables are presented in Table 7. All three equations have statistically significant explanatory power, with adjusted R-squared ranging from 0.38 for "satisfaction with MOA" to 0.34 for "preference for MOA" and 0.29 for "preference for teams." The pattern of significant independent variables is similar for the three equations but not identical, as will be noted as we consider hypotheses 1 through 5 below.

Hypothesis 1, which deals with individual demographic characteristics, is partially supported. Age is a significant predictor in equations 1 and 3, with younger workers preferring MOA and teams more than older workers; age is not a significant discriminating variable for overall satisfaction with MOA. The same pattern holds for gender, with women having more negative attitudes towards MOA and teams than men. This gender effect holds even when controlling for age, which is highly correlated with individual tenure; the pattern holds as well when individual tenure is substituted for age (results not reported here).¹¹ Education is only significant in predicting preference for teams, in the hypothesized direction.

Hypothesis 2 is concerned with the relationship between job design and worker attitudes. Evidence supporting this hypothesis is strong, with the "job characteristics" factor significant at the 99% significance level for the two MOA-oriented attitudes and at the 95% significance level for "preference for teams".

Hypothesis 3 examines individual outcomes of improvements in pay and job class. Surprisingly, pay improvements are not a significant predictor in any of the three equations, while job class improvement **is** significant. The relatively high mean for the pay variable (0.72, where 1 = improved pay) suggests that most workers have been able to improve their pay through CPP, and that they might not necessarily view MOA or teams as the reason they were able to achieve this increase. A move to a better job class, in contrast, is more likely to be seen as facilitated by MOA, which encourages workers to amass new skills and take on new responsibilities.

Hypothesis 4 looks at team activities. "Team duties done" is a significant predictor in all three equations, while job rotation is only a significant predictor for "preference for MOA". While we cannot be sure of causality, it is clear that the members of more active teams consistently express a higher preference for MOA than those on less active teams, even controlling for differences in job characteristics that might also be affected by the level of team activity. It may be that job rotation is not a significant predictor of "preference for teams" because the "task variety" item in the "job characteristics" factor picks up the same effect.

Hypothesis 5 looks at the impact of perceived group influence and perceived organizational performance on attitudes towards MOA and teams. The "team influence on work processes" factor is highly significant (at the 99% significance level) in all three equations, while "team influence on work effort" is significant, albeit at lower significance levels, for the two MOA questions but not for "preference for teams." Furthermore, the "performance" factor, drawn from items concerning perceived improvements in productivity, quality, and safety, is highly significant (at the 99% significance level) in all three equations.¹² These results strongly suggest that worker perceptions about these group and organizational outcomes are as important in predicting attitudes about "the new industrial relations" as their perceptions of individual outcomes.

Finally, we note the presence of statistically significant plant dummy variables in the two "preference" equations (Eq.2 and Eq. 3), although not in the "satisfaction with MOA" equation. Controlling for individual characteristics, perceptions, and experiences, workers at New Castle Machining and Huntsville Electronics report attitudes towards MOA and teams that are significantly more negative than for the other four plants. In light of such strong plant-level variation in attitudes, we turn next to an exploratory analysis of the sources of these differences.

Plant-Level Differences

We identified five possible underlying sources of plant-level variation in worker attitudes towards MOA: 1) starting conditions; 2) plant size; 3) type of production process; 4) degree of competitive pressure; and 5) idiosyncratic experiences with the MOA and team concept. While a thorough exploration of these potential explanations for plant-level variation would require detailed case study analyses of each plant -- particularly for #5, idiosyncratic experiences -- the other factors can be investigated through alternate specifications of the regression model.¹³

The rationale for the first four factors can be quickly summarized; we do not state these as formal hypotheses. First, worker attitudes were very likely to have been influenced by the conditions under which MOA was introduced at each plant. Recall that two of the six plants (Newark Assembly Plant and Trenton Engine Plant) initially voted down the MOA and only approved the agreement reluctantly after pressure from both corporate and national union officials. Of the other four plants, New Castle Machining was the only plant to volunteer to adopt the MOA, while Jefferson Assembly, Indianapolis Foundry, and Huntsville Electronics were asked to approve the MOA as a condition for receiving new product or process technology investment. Here we use New Castle as the omitted plant and create dummy variables for "forced to adopt, approved in first vote" and "forced to adopt, voted down in first vote".

Second, an organizational change of the magnitude of MOA may have been more difficult to implement at larger plants, in terms of plant management and union officials communicating goals and plans for MOA to workers, than at smaller plants. As Table 1 reveals, these plants did

vary greatly in size, with over 3,000 employees at Jefferson (3,375) and Newark (3,859) Assembly Plants, around 2,500 employees at Trenton Engine and Huntsville Electronics, and around 1,000 employees at New Castle Machining and Indianapolis Foundry (figures based on January 1991 employment levels). We divide the plants into these three size categories, and omit the middle-sized group (2,500 employees) when entering dummy variables into the specification.

Third, we consider the type of production process. Certain processes may be more amenable to team-based work organization than others, particularly with respect to the degree of interdependence among sequential process steps. The more highly interdependent the production process, the less teams will be able to separate their activities from the constraint of upstream process steps. From this perspective, teams should have the most latitude for influence where the entire production process for a particular product can be fully completed by a team, and the least latitude when all teams are closely linked in a sequentially interdependent production process.

Among the six MOA plants, the two final assembly plants (Jefferson and Newark) are characterized by the most sequential interdependence -- one interlinked assembly line for the entire plant. Next in degree of interdependence are Trenton Engine and Indianapolis Foundry, where different production lines yield "final" products that are not passed to other downstream processes within the plant (although they may be sent to other plants for further processing). The least interdependence is found at New Castle Machining and Huntsville Electronics, where many different products involving either machining operations or light assembly are completed in different sections of the plant, either in manufacturing cells (New Castle) or on short assembly lines (Huntsville). We divide the plants into these three groups and omit the middle category (Trenton and Indianapolis) in the regression analyses.

For the fourth factor -- the degree of competitive pressure on different plants -- we employ one simple distinction. While four of the plants were fully owned by Chrysler Corporation, two plants (New Castle Machining and Huntsville Electronics) were part of Acustar, a subsidiary of Chrysler that, while also fully owned, was the target of efforts to reduce vertical integration for components. During the period of this study, other Acustar plants that were not involved with

MOA were sold and, while New Castle and Huntsville had been assured that Chrysler had no intention of selling them, there was objectively a greater risk of divestiture for both Acustar plants than for the four Chrysler plants. Here we include a dummy variable for the two Acustar plants in the regression analysis and make the Chrysler plants the omitted category.

In our analysis, we create four new specifications of the regression equations, replacing the plant dummy variables in the model from Table 7 with alternate dummy variables that group the six plants differently, according to each of the above four factors. These new dummy variables are more restricted than the plant-level dummies -- since they capture only one feature differentiating plants rather than the full set of plant-specific features -- and thus would be expected to explain less variance than the plant dummies. If the new dummy variables explain as much variance as the original plant dummies, we will have successfully identified underlying reasons for plant-level variation in attitudinal outcomes that are not idiosyncratic to particular plants. If, however, the new variables explain less variation in the dependent variables than the original plant dummies, we must conclude that there are idiosyncratic sources of attitudinal differences at the individual plants that we have not been able to capture here.

Table 8 shows the results of regressions on the three dependent variables for the “base case” analysis (with the original plant-level dummies and the equation statistics from Table 7) and then for the four new specifications. Each specification adds new dummy variables to the original model in place of the plant-level dummies; the other eleven independent variables from Table 7 are not reported here, to conserve space.¹⁴ While it would be advantageous to understand the effect of each factor controlling for the other three, the equation would be overdetermined if we included more than one set of dummy variables at a time.

For “satisfaction with MOA”, none of the plant dummy variables were statistically significant in the original model. The dummy variables for starting conditions, plant size, type of production process, and degree of competitive pressure are not statistically significant and add no explanatory power. This confirms that for this first dependent variable, there is relatively little plant-level variation to explain.

Next, for the “preference for MOA” dependent variable, the “base case” with the plant dummy variables shows positive and statistically significant coefficients for every plant except Huntsville, in relation to the omitted plant (New Castle). This means that workers at the Jefferson North, Newark, Indianapolis, and Trenton plants expressed a stronger preference for MOA (compared with the “old approach”) than workers at the New Castle plant, controlling for all variables from the original specification, while there was no appreciable difference on this dependent variable between Huntsville and New Castle.

When dummy variables for starting conditions are substituted for the plant dummies, the “voted down” dummy is statistically significant, but with a positive sign, meaning that the two plants that initially voted down MOA (in 1986 and 1987) ended up by 1993 expressing a stronger preference for MOA than the plant that voluntarily adopted the program. The explanatory power for these variables is slightly lower than for the plant dummies, with the adjusted r-squared dropping from 0.34 to 0.33. The dummy variables for plant size are not statistically significant, and the adjusted r-squared drops still further, to 0.32.

The next two sets of dummy variables have equivalent explanatory power to the plant dummies, with the adjusted r-squared holding steady at 0.34. The variables for type of production process are both statistically significant with negative signs, meaning that in relation to the omitted category (plants with an intermediate level of serial interdependence in their production process), the plants at either end of the continuum (i.e. plants whose production process was both more and less closely linked) had a weaker preference for MOA. Similarly, the dummy variable for competitive pressure that identifies the Acustar plants has a negative and statistically significant coefficient, revealing that these plants also had a weaker preference for MOA than the four plants that were more securely integrated into Chrysler’s manufacturing function.

The results for the “preference for teams” dependent variable closely parallel those for “preference for MOA,” although the new dummy variables have less predictive power in the “teams” analysis. The dummy variable for plants that voted down the MOA is strongly significant, but again with a positive sign; the size variables are again not significant; the “production process”

variables once again reveal that the middle group of plants (on the “closely linked” to “loosely linked” continuum) has the strongest positive preference, in this case for teams; and the two Acustar plants do hold more negative views of teams than the four Chrysler plants. The variance explained for these specifications is lower than for the plant dummy equation, with the exception of the “production process” variables, for which the r-squared remains unchanged.

How are we to interpret these plant-level analyses? Some of the factors that are potential sources of plant-level variation in attitudes reduce the explanatory power of the model. However, other factors (e.g. type of production process; competitive pressure) do explain as much variation in attitudinal outcomes as the plant dummies, suggesting that not all of the variation arises from idiosyncratic factors at individual plants.

The Acustar plants (New Castle Machining and Huntsville Electronics), which faced considerably more uncertainty with respect to the long-term future of their operations, consistently reported more negative views towards MOA, controlling for all the variables in our initial model. This is not surprising and is not offset for New Castle by the fact that it was the only plant to volunteer for the MOA. Indeed, the plants that initially voted down the MOA (Newark and Trenton Engine) report more positive attitudes towards MOA than the other plants that were more heavily pressured. Perhaps this is because the plants that voted it down initially had a more thorough discussion about the changes associated with the MOA before the re-vote and hence started with more realistic expectations than other plants.

The finding for type of production process is most puzzling, because it is the two plants with more intermediate levels of process interdependence that report the more positive attitudes towards MOA and teams. It seems possible that teams at Trenton Engine and Indianapolis Foundry allowed for a more fundamental change in job characteristics (and hence a more dramatic change from past work organization) than teams at the two assembly plants (Newark and Jefferson) where the tightly-linked interdependence of the assembly line may limit the prospects for team autonomy. But it would seem that teams should fit the production process best at the two plants with the least process interdependence -- Huntsville and Newcastle Machining. However,

this grouping places the two Acustar plants together, and we already know that these plants hold more negative views about the MOA and teams. Possibly the sense of insecurity at the Acustar plants dominates worker reactions to the MOA and teams more than how well the teams fit with the nature of their production process.

Let us return briefly to the fifth source of plant-level variation -- unique local conditions and events that lead to highly idiosyncratic experiences with MOA and teams. We should not underestimate the potential for a wide range of effectiveness with respect to the implementation of the MOA changes. At Huntsville, for example, which is the plant with the most consistently negative attitudes towards MOA and teams, we know from the fieldwork that the role of team leader was contentious from the time that teams were implemented, mostly because ambiguity in the responsibilities of team leaders vis-a-vis traditional foremen. The first generation of team leaders clearly felt they were supposed to take charge and insure that teams fulfilled their Twenty Team Duties as quickly as possible. While the reported average of team duties accomplished is higher at Huntsville (15.7) than at any other plant, there were tremendous conflicts associated with this achievement. Workers rebelled against having team leaders act like "junior foremen" and insisted on being able to replace team leaders based on a majority vote at any time. Rapidly, the turnover of team leaders reached extremely high levels.

Also, the implementation of MOA at Huntsville was associated with the move into a new plant, which was a very chaotic transition. Teams directed their frustrations with all of these changes towards team leaders (leading to rapid turnover) and eventually towards the union (officials supportive of the MOA were voted out of office). Given the cost of training for team leaders, the rapid turnover in this position frustrated plant management and weakened their commitment to following through with other aspects of MOA implementation. Union officials who won their position by campaigning, in part, on an anti-MOA platform were also less than committed to keeping MOA going. This kind of implementation dynamic can certainly have affected worker attitudes towards MOA and teams.

Discussion

We find that the majority of workers involved with the “new industrial relations” in this context -- the set of new work organization and human resource policies associated with the Modern Operating Agreement (MOA) negotiated between Chrysler and the UAW -- view these changes positively. Roughly two-thirds to three-quarters of the workers interviewed say they “strongly agree” or “agree” that they are “satisfied with MOA” (64%), “prefer MOA to the ‘old approach’” (68%), or “prefer teams to the ‘old approach’” (76%). So workers do have a strong preference for the team system (and to a lesser extent, the MOA overall) over the traditional industrial relations approach found in the past. Yet the general level of satisfaction with the MOA (the only question among the dependent variables that is not explicitly comparative with the past) is considerably lower. This suggests that, while the broad direction of the changes contained in the MOA wins worker support, implementation has not always met expectations.

Furthermore, workers’ opinions regarding the MOA reflect their assessments of both its effects on individual interests -- better job characteristics, e.g. more autonomy and task variety, a chance at a higher pay level or better job class -- **and** on team activity and plant performance. Workers who believe that their teams have influence over key aspects of work process and work effort, as well as workers who believe that economic performance has improved due to MOA, are especially favorable to the program. This confirms the importance of the broader context surrounding the new industrial relations in shaping worker attitudes.

Finally, the organizational context and the broader dynamics of the union-management relationship also appeared to influence these workers’ views. Most of the plant dummy variables were significant. Further exploration of the issue of plant-level differences found that the extent to which plants faced more intense competitive pressure (with respect to the risk of being sold), the nature of the production process, difficulties with aspects of MOA implementation (e.g. the role of team leader), and political dynamics in the local labor-management relationship and within the local union all appeared to affect how workers responded to MOA and the team concept.

The study leaves us cautiously optimistic about the long-term prospects for the “new industrial relations.” The MOA experiment has proved to be durable, having lasted over seven years. Despite the rocky start MOA got at some plants, workers generally prefer it to the old system, and they associate MOA with the improved performance that has raised Chrysler to its current lofty position in the auto industry. The fact that the aspect of MOA that most affects the daily experience of workers -- their activities as team members -- is the one that they view most favorably also suggests that future team experiences may further bolster their support.

Thus American workers in this setting, which has always been a stronghold of a traditional labor-management relationship, do seem to be interested in and committed to pursuing mutual gains and they see the MOA as offering that potential. Yet clearly they will remain supportive only to the degree that such a system actually delivers on its promises.

It is possible that the favorable attitudes expressed here are due to a "halo effect" resulting from the remarkable turnaround in Chrysler's performance over the past few years, from near bankruptcy to the most profitable of the Big Three. However, two things can be said about this. First, attitudes toward MOA, toward the team system, and toward comparisons with the old system are clearly distinguishable, and there is wide variation within and across plants. Second, our models have predictive power -- we consistently identify characteristics of individuals who are favorable to the new approach with each of the three attitude-based outcome variables.

It is striking to find that MOA and the team system are more favorably received by workers who are more heavily involved with key pieces of the program. Even controlling for individual characteristics (including the design of individual jobs), workers on teams that rotate jobs and perform more of the 20 team duties are more likely to feel positively inclined toward the new system. Questions about causality with this association abound. Workers who are more favorable to the new system are certainly more likely to be on teams that engage in these behaviors. However, given the early worker skepticism toward MOA and the fact that teams other changes were implemented without widespread support, this association between behaviors and attitudes is striking. It seems plausible that causality runs in both directions here.

Our evidence here, together with observations from the broader study of the MOA effort (Lovell et al., 1991), suggests some general lessons and conclusions. First, a top-down transformation of industrial relations can be initiated and sustained. The Chrysler-UAW experience supports the conclusion that union involvement in work reforms can be a stabilizing and sustaining force. The joint labor-management governance of MOA and the institutionalizing of MOA's workplace reforms through collective bargaining helped keep the change effort going after a difficult start and through Chrysler's financial difficulties of the late 1980s.

Second, while a "forcing" strategy may have advantages in some situations, the MOA case also reveals the risks of such a strategy. Even years after the MOA changes were initiated, workers are reluctant to embrace the new system completely, even where they clearly favor its individual components. While the "forcing" strategy employed by Chrysler to put leverage on the six MOA plants may have been motivated by competitive necessity -- and legitimized by the union's role in "fostering" and jointly governing the MOA process -- it did limit worker acceptance of MOA's goals and objectives, something that will take a long time to overcome.

Third, individual characteristics clearly affect workers' attitudes toward these changes. Some of these relationships are well supported by theory and previous research (job characteristics, for example) but we need more work to uncover the causes behind other relationships. For example, male workers are no more satisfied with the MOA than female workers, yet they more strongly prefer the new system to the old one. Possibly female workers believe they will have more to lose than men in a system that no longer explicitly recognizes seniority but may still allocate opportunities for training (and thus higher pay) or membership on certain teams (with better work) on the basis on tenure, experience, and interpersonal ties.

Fourth, we have displayed some interesting (though preliminary) evidence linking the new industrial relations, individual behaviors, and perceptions of organizational performance. Both union and management leaders believed that teams, job rotation and execution of the 20 team duties would add critically to the ability of the company to meet performance goals. Workers more involved with these behaviors are more likely to embrace the new industrial relations, as are

workers who believe that the new system is linked to improvements in performance. Further work will look toward untangling these relationships (ideally with longitudinal data).

Fifth, while we did find substantial plant-level variation in worker attitudes, we were also able to explore patterns in this variation through additional analysis, using information about the plants gleaned from our fieldwork. This analytical effort helped lead us to some sources of the plant-level variation that were not idiosyncratic to individual plants -- as well as revealing how much of the variation still was grounded in the history and unique experiences of each plant.

Taken as a whole, we believe this paper powerfully demonstrates the value of taking a “meso”-level perspective on topics formerly treated at the “micro” level of analysis. The combination of quantitative data from individuals with perceptions of group-level and organizational-level outcomes, quantitative analyses based on identifying underlying characteristics of different groupings of plants, and qualitative data from the fieldwork provides important clues to what aspects of the context are relevant for employee attitudes. We hope to continue tracking the progress of MOAs, with particular attention to whether changes in either Chrysler's competitive situation or the union-management relationship will affect the patterns of attitudes across groups of workers or the plant-level dynamics that we see here.

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Endnotes

¹ Our quantitative data for this paper comprise individual-level perceptions of contextual variables (e.g. the level of participation in team activities; the impact of the new industrial relations on productivity, quality and safety outcomes). Because we lack independent confirmation of some of the contextual data (e.g. a supervisor's judgment about the level of participation in team activities), our findings dealing with group- and organizational-level independent variables should be viewed as exploratory. To strengthen our interpretation of trends for these "meso" level variables, we use qualitative data from fieldwork in the six plants together with quantitative analyses of plant-level variation in worker attitudes.

² A team of researchers from George Washington University (GWU) and Massachusetts Institute of Technology (MIT) were invited to study the implementation of MOAs by the top-ranking officials responsible for this initiative at both Chrysler and the UAW. This team (identified in the acknowledgments) received funding from the Department of Labor for this research. Planning meetings for the project began in the summer of 1987, just after all six MOA plants had ratified the agreement. After initial interviews with senior management and union officials involved in the negotiations, researchers began tracking implementation efforts at each of the six plants, primarily through periodic plant visits and interviews but also with an initial attitude survey that did not investigate MOA directly but sought to identify key aspects of worker satisfaction and the nature of the labor-management climate. These periodic visits included until 1991. Lovell et al. (1991) is a report to the Department of Labor that summarizes the findings and recommendations of the full research team to that point. The attitude survey that provides the data for this paper was one of a number of follow-up activities carried out by the research team in 1993 and 1994 at the request of Chrysler and the UAW.

³ These impressions are based on interviews at the MOA plants that began shortly after the ratification votes for the MOA contract (1987-1988) and continued through the period of early implementation (1989-1991) and up to the time of the attitude survey in early 1993. One of the best examples of successful resistance to the initial MOA contract involves skilled trades workers. As of 1995, planned efforts to collapse job classes for maintenance workers and to cross-train them for rotation across a variety of maintenance jobs had not been implemented.

⁴ We assume here that as long as the MOA is broadly associated with improvements in job design characteristics, workers in jobs that score high in "motivating potential" according to the Hackman and Oldham dimensions will view the MOA positively. While we have no way of differentiating among individuals who can directly attribute an improvement in their job characteristics to the MOA from those whose high score on job design characteristics is from a job that predates MOA, we assume that among the production workers we are studying here, most pre-MOA jobs would have had relatively low scores on the Hackman and Oldham dimensions. Thus most of the variation in job characteristics scores seen in these data would reflect the influence of the MOA.

⁵ With limited space for questions, we believed that questioning individuals about their participation in team activities would be highly subject to a social desirability bias. Since we had no way of identifying which individuals were members of which teams (prohibited by our arrangement with the company to keep the identity of individual respondents confidential), the only way we could get a measure of team activity was by asking individual team members.

⁶ This prediction depends on teams being observed beyond the initial formation stage and the stage at which group norms become established. The MOA teams were 2-5 years old at the time of the attitude survey.

⁷ Missing responses were scattered throughout the survey questions. We did find that slightly more responses were missing for certain similar questions on job design, team influence, and performance outcomes that were combined into factors during our analysis. We then found that by using means substitution for only those survey questions used in the factor analysis (see Table 4), we were able to boost the sample size from 782 to 969, with virtually no impact on the means of the dependent variables or the other independent variables. Regression results with this larger sample were also very similar to those reported here.

⁸ This approach is common practice for telephone surveys. In part, not offering a "neither agree or disagree" response shortens the time needed for the interviewer to read all the responses and also reduces the number of different responses that the interviewee needs to hold in his/her head. In addition, this approach minimizes the likelihood that

a respondent will consistently choose the middle or “neutral” response because initial discomfort at expressing an opinion sets the pattern for future responses. However, it does not prevent someone who truly “neither agrees or disagrees” from saying so. When this or any similar comment was made, it was noted by the interviewer and coded. Thus while this approach inherently generates greater variance (i.e. there are fewer “3’s” when the “neither agree not disagree” approach is not explicitly offered), there is no reason to believe that it prevents respondents from stating their opinions clearly or that it distorts or biases the results in any particular direction.

⁹ Due to concerns about the length of the overall survey, we did not include multiple items for each Hackman and Oldham dimension of job design. Also we did not include the Hackman and Oldham question for *task significance*, since, as worded, this question does not have much “face validity” with respect to its applicability to assembly line-based production work; furthermore, we judged that there would be little variation for this question across the manufacturing jobs for production workers at these six plants.

¹⁰ Note also that at both New Castle Machining and Huntsville Electronics, a higher percentage reports satisfaction with MOA than the percentage that claims to “prefer MOA over the old approach.” This suggests that the changes associated with MOA represented a less desirable set of changes (compared with the status quo) for these plants than for the other four plants. We explore the implications of this in the section reporting plant-level analyses, below.

¹¹ Even among workers with identical tenure, it is possible that women might feel more concern about the impact of these changes, either due to past experience or in anticipation of how new work practices and pay systems would be implemented. However, we have no data that allow us to assess this possibility.

¹² There is a strong relationship between independent variable “perceived performance improvements due to MOA” and the various dependent variables (i.e. attitudes towards MOA), with correlations between 0.4 and 0.6 for all the plants. There was also a wide range of responses to both sets of questions. Given a mean score for the overall sample of “0” for the variable on perceived performance improvement (derived from factor analysis), three plants -- Jefferson Assembly (0.2), Newark Assembly (0.2), and New Castle Machining (0.42) -- report a positive score for this factor and the other three plants -- Huntsville Electronics (-.13), Indianapolis Foundry (-.36), and Trenton Engine (-.50) -- report a negative score. In other words, workers at the former three plants agree that MOA has led to performance improvement, on average, and they also show a higher percentage of agreement with satisfaction with MOA, preference for MOA, etc. The latter three plants are lower on agreement with questions on performance improvements and also on their views of MOA.

¹³ Our choice of these factors, the grouping of plants that they imply, and our more qualitative interpretations of the analyses that follow are all based on the fieldwork carried out by various members of the full MOA research team (as listed in the acknowledgements), whose case study summaries of the six MOA plants are found in Lovell et al. (1991).

¹⁴ While the size of the coefficients for these variables change slightly when the new plant-level variables are added, the changes are minor, with the sign of the coefficients remaining unchanged and the significance level either remaining the same or increasing in strength. These analyses are available from the authors upon request.

Table 1 : Key Characteristics of MOA Plants

Plant	Jefferson	Newark	Indianapolis	Trenton	New Castle	Huntsville
Product	Auto assembly	Auto assembly	Engine castings	Engine machining and assembly	Steering and suspension parts	Electronic components
Impetus for MOA Agreements	Building a New Jeep Product and Plant	Receiving the New L Car	Introducing Impact Mold Technology	Receiving the New V-6 Engine	Performance concerns	Building a New Plant
Year Plant Built	1907	1951	1901	1952	1906	1952, 1965 1977, 1988
# of Hourly Employees 1/1/91, including Temp. Layoff	3,375	3,859	990	2,524	1,100	2,663
Average age	48.6	43.2	43.4	43.2	47.7	41.4
Average Seniority (yrs)	24	16.6	15.6	18.8	23.6	10.1
Date of MOA Contract	7/25/86	7/25/87	10/20/86	8/28/86	12/22/86	8/10/86
MOA Kickoff	12/14/87	2/5/88	11/9/87	7/27/88	8/26/87	11/12/87
Teams designated	Winter 1991-92	12/88 - 1/89	Summer 88	3/28/91	Winter 87-88	8/5/88

Table 2 : Cross tabulation of respondents by attitudes towards the new approach

	Satisfied with MOA		Dissatisfied with MOA	
	Prefer MOA	Don't Prefer MOA	Prefer MOA	Don't Prefer MOA
Prefer Teams	423 (54%)	35 (4%)	93 (12%)	55 (7%)
Don't Prefer Teams	22 (3%)	28 (4%)	8 (1%)	118 (15%)

n = 782

Table 3

Variable	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Task autonomy	3.778	1.283													
2. Task feedback	4.431	0.854	0.343***												
3. Task variety	3.899	1.326	0.395***	0.335***											
4. Task identity	4.143	1.150	0.345***	0.439***	0.352***										
5. Advice on technology	3.031	0.837	0.220***	0.159***	0.250***	0.200***									
6. Advice on work methods	3.100	0.845	0.213***	0.210***	0.242***	0.262***	0.631***								
7. Advice on quality	3.495	0.772	0.145***	0.146***	0.210***	0.164***	0.490***	0.544***							
8. Advice on people problems	2.919	0.909	0.194***	0.173***	0.204***	0.189***	0.489***	0.527***	0.387***						
9. Advice on who does what	2.856	0.995	0.100**	0.158***	0.133***	0.160***	0.447***	0.456***	0.262***	0.454***					
10. Advice on how fast work is done	3.177	0.912	0.069	0.058	0.130***	0.088*	0.352***	0.361***	0.370***	0.312***	0.284***				
11. Advice on how much work is done	3.188	0.927	0.056	0.050	0.125***	0.117**	0.356***	0.327***	0.303***	0.329***	0.306***	0.710***			
12. Improvement in productivity	4.095	1.079	0.098**	0.084*	0.103**	0.086*	0.228***	0.308***	0.305***	0.264***	0.145***	0.151***	0.147***		
13. Improvement in quality	4.248	1.116	0.211***	0.150***	0.175***	0.159***	0.254***	0.294***	0.401***	0.212***	0.113**	0.190***	0.168***	0.612***	
14. Improvement in safety	4.047	1.158	0.218***	0.149***	0.149***	0.142***	0.346***	0.333***	0.310***	0.339***	0.215***	0.113**	0.174***	0.445***	0.476***

* p < .05; ** p < .01; *** p < .001 n = 782

Table 4 : Factor Loadings

Variable	Factor 1	Factor 2	Factor 3	Factor 4
	Job characteristics	Influence on work processes	Influence on work effort	Performance outcomes
Task autonomy	0.6993	0.0815	-0.0163	0.1472
Task feedback	0.7264	0.1133	-0.0329	0.0358
Task variety	0.6936	0.1066	0.1201	0.0771
Task identity	0.7294	0.1315	0.0485	0.0263
Advice on technology	0.1587	0.7450	0.1949	0.1861
Advice on work methods	0.1907	0.7471	0.1780	0.2455
Advice on quality	0.1164	0.4801	0.2926	0.4027
Advice on people problems	0.1306	0.7276	0.1295	0.1715
Advice on who does what	0.0605	0.7575	0.1005	-0.0362
Advice on how fast work is done	0.0397	0.2343	0.8896	0.0770
Advice on how much work is done	0.0383	0.2441	0.8684	0.0695
Improvement in productivity	0.0058	0.1211	0.0590	0.8314
Improvement in quality	0.1566	0.0480	0.1321	0.8524
Improvement in safety	0.1193	0.3132	-0.0486	0.6718
Eigenvalue	1.5234	4.5137	1.0483	1.7729

n = 782

Table 3

Variable	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1. Age	45.500	7.731																		
2. Gender	0.813	0.390	0.043																	
3. Education	4.223	0.857	-0.235***	0.002																
4. Improvement in pay class	0.707	0.455	-0.090*	-0.135***	-0.017															
5. Improvement in job class	0.353	0.478	-0.038	0.017	-0.014	0.287***														
6. Job characteristics	0.000	1.000	0.132***	0.025	-0.109**	0.073*	0.069													
7. 20 team duties done	13.784	5.305	0.082*	-0.046	-0.023	0.071*	0.108**	0.124**												
8. Job rotation	0.531	0.499	-0.025	-0.023	-0.010	0.048	0.148***	0.110**	0.162***											
9. Team influence on process	0.000	1.000	0.076*	0.023	-0.081*	0.117**	0.184***	0.000	0.287***	0.154***										
10. Team influence on effort	0.000	1.000	-0.003	-0.098**	-0.031	0.053	0.095**	0.000	0.103**	0.053	0.000									
11. See performance improving	0.000	1.000	-0.041	0.069	0.043	0.048	0.134***	0.000	0.207***	0.115**	0.000	0.000								
12. Plant 1	0.232	0.422	0.238***	0.154***	-0.036	-0.267***	-0.031	-0.012	-0.010	0.030	0.086*	-0.046	0.112**							
13. Plant 2	0.223	0.416	-0.118**	0.154***	0.030	0.081*	0.055	0.042	-0.046	-0.058	0.015	-0.065	0.107**	-0.294***						
14. Plant 3	0.081	0.272	-0.045	0.130***	0.022	-0.161***	-0.071*	-0.084*	-0.049	-0.004	-0.029	-0.041	-0.106**	-0.162***	-0.158***					
15. Plant 4	0.170	0.376	-0.038	-0.028	-0.006	0.112**	0.057	0.054	-0.059	0.017	0.020	0.029	-0.228***	-0.248***	-0.242***	-0.134***				
16. Plant 5	0.109	0.312	0.091*	0.157***	-0.072*	0.044	0.000	0.237***	0.124**	0.040	0.000	0.059	0.149***	-0.192***	-0.187***	-0.103**	-0.158***			
Dependent variables																				
17. Satisfaction with MOA	3.339	1.343	0.008	0.026	-0.066	0.093**	0.216***	0.237***	0.344***	0.138***	0.374***	0.077*	0.413***	0.011	0.105**	-0.068	-0.048	0.074*		
18. Preference for MOA	3.642	1.537	-0.041	0.166***	0.017	0.088*	0.237***	0.156***	0.258***	0.205***	0.277***	0.086*	0.413***	0.059	0.119**	-0.02	0.021	0.012	0.594***	
19. Preference for team system	3.932	1.456	-0.059	0.167***	0.070	0.082*	0.213***	0.115**	0.213***	0.157***	0.225***	0.047	0.357***	0.057	0.086*	-0.009	0.080*	0.008	0.462***	0.695***

* p < .05; ** p < .01; *** p < .001

n = 782

Table 6 : Plant-level attitudes towards the new industrial relations

	All	Jefferson	Newark	Indianapolis	Trenton	New Castle	Huntsville
Satisfied with MOA	64%	65%	75%	59%	57%	72%	56%
Prefer MOA	68%	73%	78%	67%	69%	67%	49%
Prefer Teams	76%	79%	83%	79%	81%	78%	58%
N	782	181	174	63	133	85	146

Table 7 : Regression Analysis of Attitudes Towards the Modern Operating Agreement (MOA) and Teams
(Standard Errors in Parentheses)

Variable	(1) Satisfaction with MOA	(2) Preference for MOA	(3) Preference for teams
Age	-0.007 (.005)	-0.011 (.006)	-0.013* (.006)
Gender	-0.084 (.115)	0.389** (.137)	0.315* (.137)
Education	-0.059 (.046)	0.044 (.054)	0.123* (.054)
Improvement in pay class	-0.080 (.093)	0.062 (.110)	0.102 (.110)
Improvement in job class	0.203* (.085)	0.291** (.101)	0.268** (.101)
Job characteristics	0.291*** (.039)	0.208*** (.046)	0.150** (.046)
"20 team duties" done	0.036*** (.008)	0.029** (.009)	0.026** (.009)
Job rotation	-0.037 (.078)	0.253** (.093)	0.145 (.093)
Team influence on process	0.435*** (.041)	0.320*** (.049)	0.235*** (.049)
Team influence on effort	0.077* (.038)	0.131** (.046)	0.069 (.045)
See performance improving	0.515*** (.041)	0.586*** (.049)	0.487*** (.049)
Jefferson	-0.078 (.142)	0.389* (.169)	0.348* (.169)
Newark	0.182 (.142)	0.519** (.169)	0.344* (.169)
Indy	0.095 (.181)	0.572** (.215)	0.490* (.215)
Trenton	0.131 (.154)	0.692*** (.183)	0.749*** (.183)
Huntsville	-0.086 (.164)	-0.036 (.194)	-0.231 (.194)
constant	3.424*** (.402)	2.609*** (.478)	2.851*** (.477)
F for Equation	32.156***	26.342***	19.103***
R ²	0.402	0.355	0.285
Adjusted R ²	0.390	0.342	0.271
N	782	782	782

* Statistically significant at the .05 level; ** at the .01 level; *** at the .001 level.

TABLE 8 : Regression Analyses of Attitudes Towards MOA: Alternate Specifications of Plant-Level Differences^{a,b}
(Standard Errors in Parentheses)

	PLANT DUMMIES	STARTING CONDITIONS ^c	SIZE ^d	PRODUCTION PROCESS ^e	COMPETITIVE PRESSURE ^f					
SATISFACTION WITH MOA	Jefferson	-.077 (.142)	Forced	-.049 (.131)	Large	.028 (.098)	High linked	-.066 (.098)	Acustar plants	-.133 (.090)
	Newark	.182 (.142)	Voted down	.161 (.133)	Small	.016 (.119)	Low linked	-.174 (.109)		
	Indy	.095 (.181)								
	Trenton	.131 (.154)								
	Huntsville	-.086 (.164)								
	F for Equation	32.2***		39.5***		38.7***		39.0***		42.3***
	Adjusted R ²	0.39		0.39		0.39		0.39		0.39
PREFERENCE FOR MOA	Jefferson	.389 (.169)*	Forced	.291 (.157)	Large	.084 (.118)	High linked	-.197 (.117)	Acustar plants	-.558 (.107)***
	Newark	.519 (.169)**	Voted down	.617 (.159)***	Small	-.133 (.144)	Low linked	-.679 (.129)***		
	Indy	.572 (.215)**								
	Trenton	.691 (.183)***								
	Huntsville	-.036 (.194)								
	F for Equation	26.3***		31.2***		29.3***		32.4***		34.8***
	Adjusted R ²	0.34		0.33		0.32		0.34		0.34
PREFERENCE FOR TEAMS	Jefferson	.348 (.169)*	Forced	.191 (.158)	Large	.017 (.119)	High linked	-.328 (.116)**	Acustar plants	-.603 (.107)***
	Newark	.344 (.169)*	Voted down	.547 (.160)***	Small	-.131 (.144)	Low linked	-.805 (.129)***		
	Indy	.490 (.215)*								
	Trenton	.749 (.183)***								
	Huntsville	-.231 (.194)								
	F for Equation	19.1***		21.0***		19.3***		23.2***		26.4***
	Adjusted R ²	0.27		0.25		0.23		0.27		0.26

^a Each of the five equations also contains the eleven independent variables from Table 7; n = 782 for all.

^b Plants are coded : J=Jefferson, N=Newark, I=Indianapolis, T=Trenton, H=Huntsville, NC=New Castle

^c Forced = J,I,H ; Voted down = N,T; Omitted (Voluntary) = NC

^d Large = J,N; Small = NC,I; Omitted (Medium) = T,H

^e High linkage = J,N; Low linkage = NC,H; Omitted (Medium linkage) = I,T

^f Acustar plants = NC,H

* Statistically significant at the .05 level; **at the .01 level; ***at the .001 level.

Appendix 1

20 TEAM DUTIES

1. Participate in daily audits.
2. Process salvage.
3. Assist in development of work assignment
4. Correct and/or report minor and major tooling and maintenance problems.
5. Provide input into production standards.
6. Assist in methods planning.
7. Monitor and control performance.
8. Adhere to plant safety rules.
9. Monitor and report attendance.
10. Equalize overtime

11. Keep overtime equalization records.
12. Support and help train team members.
13. Maintain a clean work area.
14. Problem solving (quality, productivity, statistical process control, etc.)
15. Schedule vacations.
16. Coordinate with other teams.
17. Be aware of and adhere to EEO Guidelines.
18. Assist in employee counseling.
19. Administer Capability Progression Plan.
20. Seek technical assistance when required.