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Abstract

Is there a "logic" to industrial capitalism and the market forces of an increasingly global economy which encourage work practices and employee management strategies of individual organizations and across national borders to become more similar? This paper responds to this question by considering the experience of workers in Japanese-Canadian and Japanese-American joint ventures and Japanese transplants in the North American automobile industry. The dissimilarities of the parent Japanese companies' lean production systems are highlighted before consideration is given to the factors which initially encourage adoption by North American subsidiaries of Japanese automobile companies of Japanese employee management techniques and the experiences of workers in these transplants which result in North American workers seeking to reassert more pluralist concepts and approaches to the employee-management relationship. By placing the development and implementation of the various Japanese versions of lean production into their cultural, technological, geographic, historical, and organizational contexts, this paper suggests the variety which flourishes even when conformity is seemingly evident. Consideration of Japanese efforts to import their management techniques into North America suggests both the contexts in which organizations, workforces, labor markets, and political structures are receptive to new management techniques and the strength of cultural, political, and labour relations institutions and practices to modify and recreate. The convergence-divergence debate, as with most dichotomies, demands one winner; reality is, however, more complex and forces not one choice, but rather fosters the creation of more options.

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INTRODUCTION

Is there a "logic" to industrial capitalism and the market forces of an increasingly global economy which encourages work practices and employee management strategies of individual organizations and across national borders to become more similar? Or, do organizational factors and the political, social, cultural and historical experiences at the macro-societal level perpetuate significant differences in what and how work practices and employee management strategies are adopted and accepted at firm and societal levels?

Consideration of the efforts of Japanese automobile manufacturers to transplant lean production systems into their operations in the United States and Canada suggest the limits of industrial capitalism's ability to establish a hegemony of specific labour and production systems. As with most debates which begin with polar opposites, the reality is somewhere in the middle, and this is true as well for the debate about whether industrial capitalism results in a convergence of employment and work practices.

Neither Fordism nor the post-Fordist methods of lean production have, or can, establish a universal approach to work organization and labour processes. Consideration of the efforts to establish lean production systems in the North American automobile manufacturing industry reveal both the pressures to adopt particular management techniques and the contextual limitations to such adoption. Here, the focus is on the human side of lean production (teams, *kaizen,* etc.) and on the commitment of particular Japanese automobile manufacturing companies to these practices and the response of employees to management's efforts to implement these practices.

LEAN PRODUCTION

Lean production systems are characterized by just-in-time production, continuous improvement, team-based work arrangements and total quality management. Such systems purportedly offer employees opportunities for meaningful work and psycho-social benefits absent in mass productions (i.e. Fordism), including multi-skilling, increased consultation and communication, team-based work and participation in and rewards for identifying and implementing quality improvements.

As will be discussed below, there is no one lean production system, but rather each of the Japanese car manufacturers has developed its own variant of a lean production system. Thus, the characteristics which identify a lean production system are differently interpreted and realized by Japanese car manufacturers as well as by their overseas competitors. Further, lean production systems rather than being some form of universal "best practice" are, in fact, responses to a unique set of environmental conditions at a particular time in the industrial and societal history of Japan. In fact, the Japanese automobile manufacturers which pioneered lean production are now under increasing pressure to modify in Japan itself their production processes and staff management systems to respond to significantly different economic and social conditions (Altmann, 1995; Hooper & Nathan 1995; Ogasawara & Ueda 1997; Gronning 1995). As well, a number of researchers and commentators (see, for example, Williams, Haslam, Johal& Williams 1994) suggest that the success of the Japanese car manufacturers may be less attributable to the labour practices associated with lean production than to being well placed to take advantage of economic and

market factors at a critical juncture. In other words, efforts to replicate particular production and labour processes, in this case those associated with lean production, without similar attendant environmental factors are unlikely to produce the significant competitive advantages enjoyed by the originators.

THE ILLOGIC OF LABOUR PROCESS HEGEMONY

Recent discussions of the relationship between work organization and the wider economic and social order has tended to focus on the shift to what has been described as post-Fordism (Hirst& Zeitlin 1991), one stream of which is lean production. Underlying the argument here is the conviction that such overarching syntheses as Fordism and post-Fordism cannot be sustained (Clark 1993).

It is unlikely that an argument for a unitary model of work organization could be sustained at a national, or even an industry, level. For example, the mass production techniques of Fordism were frequently held out as the model of modern manufacturing production and work practice systems for much of twentieth century. The defining features of Fordism are the production of a single product with dedicated equipment using standardized parts machined to invariant tolerances (Jones 1997). The essence of Fordism that can be distilled from these features is the integration of production flows from raw materials to finished products, which occurred on the assembly line at Ford's Highland Park and Rouge River plants in the first decades of the twentieth century.

It is important to distinguish Fordism from Taylorism as the two are often confounded with the result that convergence might be identified when diversity is actually the case. While Fordism is at its heart a production process, Taylorism is a labor process. Taylorism focussed on the detailed control and planning of work methods using industrial engineering techniques and motivating employees by piecework payment systems (Jones 1997). Fordism, as with Taylorism, did result in the deskilling of jobs, but the deskilling of jobs in the Fordist production system arose from the standardization of parts and machinery and the fragmenting of job roles on the assembly line. Fordism also differed from Taylorism in that Fordism utilised measured day rates rather than piecework as the basis for its pay system.

Arguments against the hegemony of Fordism are evident in English manufacturing. While the Fordist model was widely emulated, its adoption was usually accompanied by modifications responsive to local conditions and relationships. Lewchuck (1988), for example, has shown that the response of employees and unions to efforts to introduce Fordist production methods and employee management practices in the UK automobile manufacturing industry resulted in retention of craft aspects of production and less control and definition of job roles than at Ford's American factories. Jones (1997) argues that it was certain aspects of Taylorism, such a piecework payment systems and work measurement, rather than Fordism, which were adopted in the British engineering industry in the immediate postwar period.

It is, therefore, difficult to sustain the argument that Fordism as a unitary concept capable of delivering superior productivity performance ever existed - even in the car industry. While it is true that there are some similarities in the production systems

found in different companies and in different countries over the last sixty years, considerable local variations existed (Lewchuck 1988).

Given that Fordist manufacturing processes were not universally adopted even in the automobile manufacturing industry, arguments by such writers as Womack, Jones, and Roos (1990) and MacDuffie (1995, 1996) that the car industry worldwide is converging towards a new production model - that of lean production based on the Toyota approach - should be treated with scepticism. At the most fundamental level, Williams et al. (1994) have challenged the contention that Toyota's lean production techniques have been instrumental to its superior performance. Instead, they suggest that ease of manufacture, low-wage suppliers, and the removal of employees from production processes in the 1970s were crucial to Toyota's superior performance. They also contend that Toyota's success, like Ford's before it, relied less on superior work processes during its period of rapid growth than on the ability to determine predictable production volumes as a result of market dominance.

In other words, they suggest that Ford's and Toyota's success is less the result of work processes which other producers could emulate than of economic and market factors outside the control of competitors to replicate. As well, Williams et al. (1994) have cast doubt on the key measurement assumptions on which the MIT researchers (Womack, Jones& Roos 1990) based their comparison of the performance of various assembly plants. In short, then, there is reason to query whether lean production is the key factor in delivering success, or whether it delivered success because it was an appropriate response at a particular time and in a particular environmental context.

Equally challenging to the notion of convergence is the fact that the production techniques and employee management practices of various Japanese car companies in Japan itself, while all labelled lean production, vary considerably. If, for example, one looks in broad terms at the development of Nissan and Toyota, one can see that Nissan relied on connections with General Motors (GM) during the 1930s and to Austin during the 1950s for production technology. Toyota, on the other hand, tended to rely on its own resources to make flexible use of manually operated machine tools (Cusamano 1985). Even basic concepts such as continuous improvement have different meanings for the two companies. At Toyota, it has meant a focus on process improvement, whereas at Nissan, it has related to improvement in technology (Tabata 1989). Price (1997) has also sketched out the different trajectory of development at Suzuki and Toyota. These differences are reflected in the Japanese transplants in North America and in joint ventures with American automobile manufacturers.

Similarly, when one looks at the processes of change with regard to production and labour management strategies in Western companies such as Ford, GM, and Volkswagen (VW), it is apparent that they are following quite different trajectories in their development (Jurgens, Malsh& Dohse 1993; MacDuffie 1995). VW pursued a strategy based on attempts to use high levels of automation during the 1980s, whereas Ford did not have the resources to do so and, therefore, opted for breaking down functional barriers in car design and production.

This difference in approach to the development of production systems at the company level can be explained by understanding that management strategies for change to production systems tend to evolve in relation to previous experience and respond to their product and labour market environments (Nelson& Winter 1982). The perceptions of managers, unions, and employees about the nature of the problems faced by the company and about the type of solutions required are critical factors in determining outcomes. For example, Ellegard (1996) discusses the conflicts between different management coalitions at Volvo about the development of the new production system at Uddevalla, paying particular attention to disagreements over the length of job cycle times. Disagreement obviously can also exist between management and unions. For example, the advocacy by unions at VW of Swedish ideas of group work met with strong management resistance during the 1980s, and in the 1990s, support of teams by management influenced by Japanese concepts was opposed by unions (Jurgen 1995). A further example is the opposition to teams by US unions at General Motors after management's attempts to impose team structure in new Southern plants in the 1980s (MacDuffie 1995).

The extent of union power, the nature of industrial relations bargaining regimes and training institutions all affect the development of work organization and provide a context in which it develops. For example, in Germany, attempts to automate parts of assembly production using skilled workers on the line was facilitated by the large numbers of skilled workers available (Streeck 1997). In the US, the relative scarcity of skilled workers as well as the social separation of skilled and production workers hampered such a development (Lewchuck 1988).

Such country differences create the contexts which lead to different strategies with regard to technology and work organization being adopted by individual companies, both within a particular nation and in different nations. Comparative research in the 1980s in the UK and German engineering industry (Sorge 1992) and between German and French industry (Maurice, Sellier& Silvestre 1985), for example, highlight the impact of educational and social context on the development of work organization and job roles.

It is important as well to recognize that even within companies different plants will have different trajectories. Plants within a company often exist in different regions of the country and reflect different experiences. Additionally, each plant is likely to have been created at a time when different production concepts held sway. For example, Berggren (1992) provides a detailed discussion of the trajectory of development of production concepts in Volvo's plants during the 1970s and 1980s. And Hopper and Joseph (1995) indicate that production techniques and employee management strategies at Toyota's Kyushu plant vary the usual practices adopted at Toyota plants, reflecting the different environmental context of the 1990s.

The nature of the local labour market is also an important variable in explaining the development of work organization. For instance, the different stage of development of trade unions in East Germany and higher levels of unemployment enabled experiments in the early 1990s in lean production by Opel at Eisenach and VW at Emden which would not have been readily accepted by unions in West Germany (Bochum and Dorrenbacher 1997). Locke's (1996) analysis of the influence of

different social networks and labour markets on Alfa Romeo in Milan and Fiat in Turin also illustrates the impact of regional context on the development of production systems.

Another factor which is important in the development of production systems and labour management strategies is the level of automation to be found within different stages of the production process and the impact of this on work organization. Within the one site, it is possible to have different levels of technology from high levels of automation in paint and press shops to robot-assisted manual assembly in the final assembly and trim areas. As a result, the nature of work organization is affected by whether largely skilled employees are monitoring and maintaining automated machinery or employees are doing relatively unskilled work in labour intensive assembly operations.

It is within final assembly and trim areas that large numbers of employees are still employed and where lean production concepts have the greatest potential to reduce labour input. Even here, there are differences. In Germany, VW has developed off-line production modules (e.g. doors) which allow for job cycles of up to five minutes before the module is returned to the assembly line (Bochum and Dorrenbacher 1997). Hence, even assembly cannot be viewed as unitary: it is affected by contextual factors such as the company's technology strategy, labor costs, employees' skills, and the power of unions.

In conclusion, it is clear that the hegemony of any particular model of the labour process must be rejected. Any attempts to understand the type of work organization adopted in a particular workplace must take into account the factors outlined above.

DIFFERENT CHARACTERISTICS OF JAPANESE AUTOMOBILE FIRMS

While it may not be surprising that lean production has had a chequered take-up throughout the worldwide automobile manufacturing industry, it may be more of a surprise to learn that there are substantial variations among the Japanese car makers and their development and practice of lean production. Recognition of this point helps explain the different experiences of lean production encountered in the Canadian and American transplants discussed below.

A study of the history of the development of Nissan and Toyota reveals that these two companies had different developmental trajectories. Toyota from the 1930s onwards placed much greater emphasis on the use of flexible machine tools and innovation in production processes. Nissan, on the other hand, was in the 1930s dependent on General Motors for technology and during the 1950s and 1960s placed much greater emphasis on automation (Cusamano 1985). Both companies were exposed to the ideas of quality control circles promoted by the Japanese Association of Scientists and Engineers during the second half of the 1950s (Price 1997). By the late 1980s, however, the approach to worker involvement in quality improvement *(kaizen)* in Toyota focussed on work organization changes which were inexpensive to implement. Meanwhile at Nissan, *kaizen* was concerned with machinery and equipment improvements which were costly (Totsuka 1995). Nissan's urban location

also led to difficulties in introducing Toyota-style **j**ust-in-time (JIT) supply systems in the 1970s (Cusamano 1994).

The fact that the automobile manufacturing industry in Japan did not develop in a particular geographic centre also contributes to the differences in their lean production and labour management systems. Keller (1993, p.54) noted: "On the whole, Japanese car companies [which are dispersed around the country] are more different from each other culturally than the big three in America, which all have their epicentre in Detroit."

The location of Toyota in the country, at Nagoya, was a factor in it developing a style of management, which could be described as paternalistic social control, which encouraged loyalty among the workforce (Totsuka 1995). In Japan, Toyota's provincialism is captured in the derisive phrase "koropolitan" used to describe Toyota employees. "Koromo" is the original name for Toyota City, and "politan" is adapted from the English cosmopolitan (Keller 1993). Toyota also put considerable effort into health and safety measures, promoted job rotation, and welcomed employee feedback (Adler, Goldaftas & Levine 1997; Besser 1996). (The much greater effort by Toyota to integrate employees into the organization through welfare and related measures is of significance in understanding the strong sense of being part of a wider team expressed by employees at the Toyota/GM joint venture, NUMMI, in California and at Toyota's Kentucky plant (Adler 1992; Besser 1997). Nissan, on the other hand, is based in the Ginza district of Tokyo and did not develop the same welfare approach to its employees. Its executives are often graduates of the prestigious Tokyo University, and their style is much more sophisticated than that of Toyota (Keller 1993).

The role of the enterprise union also differed at each company. At Nissan, unions were consulted about staffing levels and job times, for example. At Toyota, however, the unions were merely informed about these matters.

In the case of Suzuki, the company's original plant was located at Hammatsu, a regional centre. The style of management was very autocratic and the union was relatively weak (Price 1997). The impact of this autocratic style can be seen in the problems that the Canadian managers experienced at the Suzuki/GM joint venture. The sister plant in Japan did not have job rotation, had a very lax approach to health and safety (e.g. repairing robots while they were still running), often changes to the work process were imposed on workers instead of using *kaizen*, and management did not tolerate any disagreement about issues (Rinehart, Huxley, and Robertson 1997). Suzuki developed a performance-based wage system which meant that a considerable proportion of wage increases were not able to be directly affected by the enterprise union; this was an important factor in undermining the union's influence (Price 1997).

Suzuki was considerably influenced in some areas by Toyota practices, notably adopting Toyota's low inventory levels and job standardization practices. These influences were primarily transmitted through Toyota suppliers who also sold to Suzuki. Thus, even within Japan and within the Japanese automobile industry, different companies borrowed practices from each other which were compatible with

their general management philosophy and approach, while ignoring other practices, thereby maintaining distinctive approaches to lean production.

Mazda is based in Hiroshima, a medium-sized city which rebuilt itself after being destroyed by the atomic bomb in World War II. Partly because of its small share of the Japanese car market, Mazda has needed to be an effective exporter to survive. Union-management relations are very cooperative with unions giving high priority to productivity. Wokutch (1992) notes that union representatives rejected suggestions from visiting US health and safety officials to modify machines to improve safety because they would adversely affect productivity. During the 1970s when the company ran into financial difficulties, several thousand factory employees were transferred to dealerships instead of being retrenched (Wokutch 1992).

The different approaches of Japanese automobile manufacturers is also highlighted by a range of performance measures in which Toyota emerges as significantly better than its competitors (Williams et al 1994; Roth 1997). On the other hand, Honda is characterized by a strong emphasis on a lean and flexible approach to product development in which it excels compared to its competitors, including Toyota (Cusamano 1994).

Despite differing experiences of lean production as suggested by the discussion above, some general observations can be made about lean production and its context in postwar Japan which suggest that seeming acquiescence of Japanese employees to various lean production approaches was at least as much a response to particular socio-economic environmental factors as to national culture. Research suggests that the generally weak position of unions, the strength of management authority over employees, the existence of job security for core employees, and the use of merit pay (Price 1997) were conducive to a situation in which employees complied with what was demanded of them rather than were committed to their employer (Besser 1993; Morris & Wilkinson 1995; Rinehart et al. 1997). It should also be noted that the formation of quality circles in the 1960s was driven from the top with quality circle agendas and targets for suggestions set by management and enforced through involvement in quality circles being part of performance assessment (Cole 1989; Price 1997). Surveys of workers also indicate that Japanese employees are dissatisfied with the pace of work and feel overworked and exhausted (Wokutch 1992).

THE NORTH AMERICAN TRANSPLANTS

Employees' experiences of lean production in North American transplants of Japanese car manufacturers is the product of the particular approach to lean production of the Japanese parent or joint venture company as well as regional and labour market differences in the North American environment. Five plants - CAMI (a Suzuki/GM joint venture) at Ingersoll in Ontario, Canada; the Mazda plant at Flat Rock, Michigan; NUMMI (a Toyota/GM joint venture) in Fremont, California; a Toyota plant in Georgetown, Kentucky; and a Suburu-Isuzu plant at Lafayette, Indiana - are examined in order to consider to what degree and how the concept of lean production is adopted by companies outside Japan.

Three of the five plants studied (Mazda, NUMMI, and CAMI) are unionized, and the remaining two (Toyota and Suburu-Isuzu) are not. Four of the plants are in labour markets which are close to or part of well-developed industrial communities: CAMI is situated in the corridor between Detroit and Toronto where the Canadian automotive parts industry is concentrated. Mazda's Flat Rock plant is thirty miles south of Detroit and thus in the heartland of the American automotive industry. Suburu-Isuzu's Lafayette plant is located in an industrial region. NUMMI is located in the San Francisco-San Jose corridor dominated by the electronics and computer industries.

The NUMMI plant had been owned by GM, which had closed the plant in 1982 after determining it was financially unviable. The unviability of the plant was largely the result of labour problems. The plant, for example, had the worst strike record of any of GM's US assembly plants (Adler 1992). NUMMI opened its doors in 1986. Its workforce was largely composed of employees from the former GM plant and included those who had been members of the union shop committee.

Many of NUMMI's employees had been unemployed between the closure of the GM Fremont plant and its re-opening two years later as a Toyota/GM joint venture. Turner (1991) suggests that the experience of sustained unemployment affected employee attitudes to work and predisposed them to be more positive and cooperative participants in the NUMMI venture. Age as well may have been a factor in encouraging a more cooperative workforce: the average age of NUMMI employees was 41 (cf. below 30 at its sister plant in Takaoka, Japan) (Adler 1992; Adler et al. 1997), which was older than the average employee age in the other transplants discussed here.

Another important factor in forming employee attitudes was the screening process which sought to employ workers with the "appropriate attitudes." Further, those employees interviewed by Adler (1992) indicated that they had no wish to re-experience the GM system of coercive supervision, bad industrial relations and production of poor quality products, and thus were willing to support new forms of labour management. In other words, NUMMI apparently provided necessary components for effective adoption of a lean production system: a docile workforce and a compliant union.

The Toyota plant in Kentucky is located in a labour market in the mid-South where there was only limited experience of unionism (the mining industry) and no pattern of large-scale industrialization. Well-paid jobs such as those offered by the Toyota plant were not readily available. The workforce had little experience with factory work, and as a result, there was no history of union participation. The screening process ensured that employees were capable of working well in a team environment. Employees were generally well educated with 60% holding post-secondary education qualifications and 13% with university degrees (Besser 1996).

At CAMI, 54% of the workforce had previously belonged to a union. The average age of employees was 31 years, and as in the other plants considered here, emphasis was placed on screening applicants to ensure the hiring of those who could work well in a group problem-solving environment (Rinehart et al. 1997). The choice of plant

location (Ingersoll) was based principally on securing access to supplier firms rather than seeking an area where unemployment was high, wages low, and unionism negligible.

Mazda's Flat Rock plan was unionized, but no constraints were put on Mazda, as it had been at NUMMI, by the United Auto Workers Union as to who was to be hired. The plant became unionized soon after start-up as a result of a union election process in which the company remained neutral (Babson 1995). The plant was in an area which had a history of industrial work, and the union was keen to attract jobs to the area because of growing unemployment.

The Suburu-Isuzu plant is located in the medium-sized town of Lafayette, in an area which has some experience of industrialization while retaining links to its agricultural heritage. Suburu-Isuzu instituted an elaborate screening process to ensure that employees would have the interpersonal skills required for teamwork (Graham 1995). The screening process also sought to exclude pro-union applicants and to select those with reasonably high educational qualifications (Graham 1995). Graham (1995) also suggests that the screening process was designed to establish from the outset employee commitment and loyalty to the company as well as camaraderie among team members.

LEAN PRODUCTION: IDEOLOGY AND PRACTICE IN THE NORTH AMERICAN TRANSPLANTS

In each of the five plants studied here, there was an attempt to install a version of lean production. One crucial feature of the experience for employees was the use of an ideology promoted by management about the nature of the employment relationship. The aim of this ideology was to legitimate the intensification of work and to gain employee acquiescence and commitment to the attendant work practices. Central to the ideology expressed in each plant was a version of the team concept with workers supposedly working together to improve efficiency and rotating between jobs in the team while the team leaders coached and supported team members. An attempt was made in each plant, with varying degrees of success, to articulate the team to the wider organization or, as put by Besser (1996) about Toyota, to a "community of fate." Another key element of the ideology is the presentation to employees, and the perception by them, of the need for a low level of staffing so that when demand slackened job security could be maintained for permanent employees.

In discussing the Japanese companies above, it was suggested that the combination of lean production with Japanese employee relations created a situation where employees complied with, rather than were committed to, their employer. In the North American setting, the factors leading to employee compliance with lean production were not necessarily present. Different employee attitudes to work, the absence of pay systems with a large merit pay element, the role of unions in confronting the shortcomings of the version of lean production which they faced, and the failure of the employer "to walk the talk" about employee involvement and valuing the employee led to modification of aspects of lean production.

CAMI

In all five cases, the nature of the ideology presented to employees at orientation stressed a cooperative approach to employee relations. At CAMI in Canada, employees at orientation were told that the company was a big team and that management cared for individual workers and particularly for their safety (Rinehart et al. 1997). Despite the centrality of teams, no training in team dynamics was given for the first two years of the plant's existence.

In September 1992 (four years after the plant opened), 98.9% of CAMI workers voted to strike; the strike lasted five weeks. The strike was partly about wages, but importantly, it was also about employment conditions. Striking workers voiced their rejection of the company's values of open communication, empowerment, *kaizen,* and team spirit, and they asserted on their picket banners new values of dignity, respect, fairness and solidarity (Rinehart et al. 1997).

The operation of teams certainly did not make employees feel integral to CAMI. In the last round of four surveys of employees (conducted by Rinehart, Huxley and Robertson between 1990 and 1993), 84% considered that teams did not encourage commitment to the company (cf. 34% expressed such a view two years earlier). Low staffing levels were also identified by employees as a key concern. Over 50% of employees in the final survey indicated that they thought work teams were understaffed (Rinehart et al. 1997).

The low staffing levels were exacerbated by the lack of relief workers who could replace absent or injured employees. This situation also severely limited training opportunities to multi-skill employees to permit job rotation, which in turn, offered a means of minimizing injuries. As a result, injuries increased, and the original problem was exacerbated (Rinehart et al. 1997). The continual increase of line speed when workers had adjusted to the pace of work also made the overloading of work groups worse. In the 1992 agreement negotiated after the strike, the company agreed to consult workers before changing workloads. This failed however, to resolve the problem, and in the 1995 agreement, workload standards and a grievance procedure for workers contesting workload levels were set in place (Rinehart et al. 1997).

The *kaizen* concept is central to the ideology that employees are empowered to participate in the lean production system. The results at CAMI were seen as delivering heavier workloads, increased pace of work, loss of team members, and greater risk of injury (Rinehart et al. 1997). For example, when employees were successful in structuring work to free up workers to act in a "floating" position to help a team maintain the pace of work, management unilaterally took this “floater" away from teams, resulting in team members' jobs being further overloaded. In effect, participation in *kaizen* activities became a weapon employees turned on themselves.

Work intensification was not only the result of employee *kaizen* activities. *Kaizen* teams consisting of team leaders, area supervisors and Japanese trainers were formed in 1991 to assess jobs and increase workloads. An industrial engineer was employed to time jobs and set higher workload standards during the launch of a new model in 1992.

Survey responses revealed that management response to *kaizen* suggestions were perceived by employees as resulting in them having to work harder rather than smarter. By the last employee survey, 58% of workers indicated that they would keep ways of making the job easier to themselves and their team rather than reveal them to management (Rinehart et al. 1997).

Continuing problems with repetition strain injuries due to work intensity and long hours were also a problem at CAMI. In 1993, the number of injured workers per 100 was 13.08 compared to an industry average of 10.89. Peer pressure, brought on by high workloads, created situations where injured employees felt pressure to continue to work rather than seek appropriate care. Also, employees on work restriction often assumed heavier workloads than medically advised because of pressure from the work group to continue to contribute at usual levels. Peer pressure was also applied to discourage employees from taking absences, legitimate or otherwise, and from slackening on the job. As time went on and employees became disillusioned with the team ideology and with the outcomes of *kaizen*, they recognized the negative consequences of peer pressure, and only a minority reported being pressured by team members.

Another significant aspect in the maintenance of the team ideology was the role taken by the team leaders and supervisors. The incumbents in these positions played a key role in securing employee involvement and commitment and linking them to the wider organization. At CAMI, team leaders found themselves caught in the traditional dilemma of supervisors: being an agent of management, on the one hand, and on the other, a member of a team. In the labor contract, team leaders had only moral authority, but management expected them to embrace corporate goals and support area supervisors. The union conceived the team leader as a technical advisor, not a personnel manager. In the early 1990s in response to union and employee pressure, team leaders were elected, but subsequently management unilaterally revoked this method of selection (Rinehart et al. 1997).

Unions representing workers in the auto manufacturing industry are often in the invidious position of having to decide whether to support members wishing to take actions to challenge management practices associated with lean production or to cooperate with company management in order to protect jobs. At CAMI, despite growing unemployment in the region, the Canadian Auto Workers Union (CAW) supported employee criticism of working conditions under lean production. In this, it differed from the United Auto Workers Union (UAW) in the US which was more prepared to acquiesce to management requirements in order to secure jobs. As a result, there was not the split in the union local at CAMI between factions opposing the system and incumbent groups which occurred at Mazda's Flat Rock plant and NUMMI.

Toyota Kentucky

Besser (1996) describes Toyota's management philosophy imported to its Georgetown, Kentucky plant as the creation of a "community of fate" in which employees and employer are joined. An essential element in developing this "community" is the socialisation of employees as members of a team. Almost all team members interviewed by Besser (1996, p.60) indicated that there wa a

congruence between Toyota's philosophy and its actual practice. Equal pay for team members and job rotation also helped to cement the team relationship and foster a sense of equality. Toyota was also more successful than, for instance, Mazda at its Flat Rock plant in its efforts to translate team commitment to a wider commitment to the company (Fucini & Fucini 1990; Babson 1993). The continuous improvement of the *kaizen* process also appeared to work well, with employees commenting on being involved in numerous changes (Besser 1996, p.64-65).

The generally favorable response of employees at Toyota's Kentucky plant to lean production techniques was undoubtedly also fostered by being situated in an area of high unemployment. Further, wages and benefits offered by Toyota were considerably better than available from other local employers. And, Toyota's record of providing job security was a crucial factor in forming positive employee attitudes. The absence of a union - in part, the result of Toyota's determination to keep the union out - may contribute to the paucity of employee complaints. (It should be noted, however, that union presence does not necessarily result in poor employee relations. For example, the presence of the UAW at NUMMI has not resulted in a climate of adversarial relations developing between management and employees even though there have been problems. The negative responses to lean production at Mazda and CAMI, it could be argued, are more the result of failure of management to "walk the talk" of their employee management philosophies than of union action) .

The problems of repetition strain injury, which emerged particularly in some areas of the Kentucky plant, is a challenge to Toyota's team ideology. Management must be seen to address the problem or its ideology will be shown as sham. It is interesting to note that employee concerns about this matter did not develop to the extent that the obvious solution of hiring more workers to relieve the pressure was not suggested by even one employee interviewed by Besser (1996). Instead, employees suggested proper job rotation (where it had fallen down), redesigning jobs, and changing equipment.

Mazda Flat Rock

When Mazda's Flat Rock, Michigan plant started production in 1987, employees were told at orientation sessions that safety was a key priority at Mazda. Employees were also assured that the company was concerned for all its employees, that they were all part of the same team, that they would be cross-skilled in robotics, and that they would be involved in consensus decisionmaking (Fucini & Fucini 1990). In 1990, Babson (1993, p.6) surveyed employees (2380 of 2800 responded) and found most employees disenchanted with Mazda managememt's implementation of its promises. For example, almost three-quarters (72%) of the survey respondents believed that their supervisor rarely or only sometimes implemented the company's philosophy of participatory management. Supervisors, who were in charge of four or five teams of five to ten employees each, tended to delegate many supervisory functions (e.g., attendance, offering overtime, balancing workloads, etc.) to team leaders. As a result, the role of team leaders was a major area of contention. Team members tended to see team leaders as junior foremen. Accusations of favoritism were made against some team leaders and supervisors.

The original labor contract did not include specifications about the role and selection of team leaders. In response to employee concerns, when the contract was renegotiated, it was agreed that team leaders were subject to election and recall. Such elections revealed how weak the team system was at Mazda because in some areas it was necessary to define who the team leaders were before the election could take place (Babson 1995).

Instead of involving employees in *kaizening* their jobs to change the standardized work methods, changes were often imposed on employees. The survey results indicated that 74% of workers had their job sheets changed without being consulted, and 67% noted that the changes made their jobs harder (Babson 1993, p. 8). Nearly half of the employees considered that job rotation was minimal in their teams despite Mazda's promises in this area (Babson 1993, p.10). In effect, teams largely existed on paper in the period 1988-91 with real power resting with supervisors or unit controllers (Babson 1995).

The survey results also showed high levels of concern about the intense nature of the workload and the likelihood of injury, and this level of concern was not unwarranted. In 1988, Mazda had levels of injury three times that of GM, Ford, and Chrysler (Babson 1995).

Employee frustration with Mazda's version of lean production during the first three years of operation at the Flat Rock plant resulted in an alternative faction being elected to control the local union branch with a brief to pursue changes to working conditions. The new local union leadership in 1991 negotiated a new agreement which significantly changed aspects of the production system. Among the changes was the establishment of a reserve labour pool from which employee absences resulting from illness, training commitments, etc. could be covered. This labour pool was made up on employees whose jobs had been eliminated as a result of technology or model changes, production cutbacks, *kaizen*, etc. The new union leadership was also successful in compelling management to honor its pledges that all employees would be multi-skilled and trained in the basic maintenance of robots. The union leadership also secured management commitment to the establishment of consultative committees to address issues in the areas of health and safety, training and equal opportunity (Babson 1993).

Suburu-Isuzu

At the Suburu-Isuzu plant in Lafayette, Indiana, management rhetoric and the work reality were also at odds. Graham (1995), a sociologist who gained employment as a line worker in the initial intake of employees offers the insights of a trained observer into the presented ideology and the lived reality of a lean production system. The management philosophy was presented at orientation sessions: safety was a priority. A strong emphasis was placed on identifying with the company and on every employee working as part of a team to produce quality products. Every employee was equal. Management was committed to communicating with and listening to employees, and employees would be involved in *kaizen* activities. Graham (1995) details the considerable efforts made through symbolism and rituals (e.g. same uniform for all employees, a common car park and cafeteria for management and

workers, morning team meetings, public ceremonies, etc.) to create a sense of unity and belonging.

The reality was, however, somewhat different. The reality clashed with the rhetoric. For instance, very little use was made of *kaizening* by team members. Such quality discussions which occurred worked to an agenda set by management. Management also made arbitrary decisions without consulting employees (e.g. changing employees to another shift despite prior commitments to the contrary) (Graham 1995).

Peer pressure and the efforts of individual workers were initially relied upon by management to achieve required results. As workers became increasingly disillusioned and disenchanted, attempts at securing employee cooperation were dropped, and team leaders and supervisors tended to act in an authoritarian manner. The degree of authoritarianism varied from team leader to team leader, enabling some employees who continued to believe in the promises of management and the system, to blame team leaders for the failure of the company to adhere to the principles management had enunciated at orientation.

NUMMI

At NUMMI, the process of socialisation of employees into teams and into the Toyota organization resembled that described above for the Kentucky plant. There were, however, significant differences as many of the employees at NUMMI were former employees of General Motors and thus had significant experience in the auto manufacturing industry and in a unionized workplace. Although there had been careful screening of applicants, UAW insistence ensured that GM's former employees were excluded from selection (Adler 1992).

Starting with a workforce which had negative attitudes arising from their previous experience of working for General Motors posed difficulties for winning employee confidence and commitment. On the other hand, as Turner (1991) points out, many of GM's former employees had experienced unemployment and/or a significant reduction in wages: 40% of the retrenched GM workers had not secured employment during the two years between the closure of the GM plant in 1981 and the opening of the Toyota/GM joint venture in 1983, and those who did find new employment experienced wage reductions of up to 40% (Adler 1992). Such experiences would be more likely to encourage the dissatisfied former GM workers to give their new managers the benefit of the doubt in defining new work practices. Careful selection of managers with a participative style and continuing attempts to maintain open communication with employees and to act on employee suggestions for improvements helped to maintain management credibility with a large number of employees during the 1980s (Adler 1992).

The results of working under the Toyota system at the former GM plant were quite spectacular in terms of productivity improvement and quality. NUMMI consistently rated highest of assembly plants in North America up to the early 1990s. Employee absences went down to 3%, and job satisfaction surveys showed a level of between 80-90% (Adler 1992).

Job satisfaction surveys do not, however, necessarily connote commitment to the organization. As considered above with regard to Japanese workers, it is possible to argue that peer pressure, low staffing levels, and job security acted to ensure compliance. It should be noted that NUMMI lacked both the merit-based pay system and welfare support system found at Toyota's Takoaka plant. Hence, the response of NUMMI employees must be explained, in part, as at Toyota Kentucky, by acceptance of the team ideology. The acceptance of lean levels of staffing was also apparent at NUMMI, as it was at Toyota Kentucky (Adler 1992).

NUMMI opened with considerable support from the union at national and local levels, and the union was willing through the 1980s to accept many of Toyota's production and work practice decisions. In the late 1980s, however, an alternative faction, the "people's caucus," was formed arising from employee concerns about such matters as the effects of peer pressure on employees, problems of job overloading, lack of attention to ergonomic issues which were leading to occupational injuries, and the method of selection of team leaders. The "people's caucus" sought to have employeeconcerns addressed more clearly in the contract.

The concerns over occupational injury came to a head in 1993 with a major increase in repetition strain injuries concurrent with the introduction of a new model. The company was cited by the California State occupational health and safety authority, and a two-hour work stoppage occurred. Management responded by appointing specialist ergonomics consultants and training employee representatives in ergonomics. As a result, there was a dramatic decrease in injuries, and when a new truck model was introduced in 1995, the company was able to avoid a recurrence of increasing occupational injuries (Adler, Goldaftas & Levine 1997).

CONCLUSION

It is apparent from the above discussion that the experience of employees in the plants discussed varied considerably due to factors such as which Japanese auto manufacturer was the parent company, the nature of the labour market where the plant was located, whether the workforce was unionized and the degree to which the union was willing to challenge or cooperate with the company. Additionally, the criticisms offered by researchers regarding the shortcomings of lean production such as the potential to increase occupational injuries and the overloading of jobs are painfully apparent and suggest that the unitary vision of employee-management relations has serious limitations, at least from a worker perspective. The ways in which the human side of lean production (e.g., teams, *kaizening,* role of the team leader, etc.) was implemented by management makes it impossible to argue that a unitary model of lean production was introduced into the transplants - or that there is a unitary model to begin with. Further, the experiences of employees with the production and employee management practices associated with lean production and their willingness to accept or challenge the company's practice also had the potential of creating new versions of lean production. Rather than convergence or divergence, the experience of workers and management with lean production in North American transplants suggests a process of cautious adoption, experimentation, modification and re-creation.

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