

## **Transferring the Learning Factory to America? The Japanese Television Assembly Transplants**

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The first great wave of Japanese foreign direct investment (FDI) in U.S. manufacturing was in television assembly in the 1970s and early 1980s. Faced by exceedingly intense global competition in recent years, only four Japanese-owned manufacturing plants in the United States are important survivors in the industry. Except for three fairly small enterprises,<sup>1</sup> seven other Japanese-owned television assemblers in the United States have closed their doors, having relocated operations to Mexico or left the industry altogether. In this chapter, we examine three of the four remaining major television assemblers in the United States and one that closed during the period of our study. In particular, we examine the extent to which Japanese parent companies have "transplanted" their production systems and embedded human resource management and labor relations (HRM/LR) practices in their television assembly subsidiaries in the United States.

As framed in earlier chapters, multinational companies (MNCs) decide whether they will diffuse preferred HRM/LR strategies abroad and/or adopt practices more common to host country industrial relations (IR) systems. Evidence about the diffusion of Japanese practices is mixed. The general conclusion is that the most comprehensive transfer of Japanese HRM/LR methods has taken place within the automobile assembly and auto parts sectors (Kenney and Florida, 1993; Abo, 1994). While some studies have disputed this conclusion (Graham, 1995; Fucini and Fucini, 1990), there can be little doubt that a number of Japanese firms in the automobile and auto parts sectors have implemented core Japanese style HRM/LR practices in their subsidiaries. In contrast, most studies of Japanese-owned consumer electronics factories in the United States (Kenney and Florida, 1993; Sato, 1991; Abo, 1994) and the United Kingdom (Oliver and Wilkinson, 1988; Delbridge, 1998) found a more limited transfer of the Japanese production system. The study of television assembly in

the United States, therefore, provides an important alternative perspective to the studies of Japanese-owned automotive operations, which to date have largely been the basis of our understanding of the diffusion of Japanese production systems in U.S. subsidiaries.

Herein, we first describe the production systems and associated HRM/LR practices in Japanese television factories, which we believe can be characterized as "learning" organizations (Adler, 1993). Second, we examine the extent to which the Japanese transplants in the United States have re-created these systems and address the factors that appear to have influenced differences between Japanese and U.S. practices. In particular, as three of the four transplants studied are unionized operations, we compare the more traditional Fordist practices to those preferred by Japanese companies. Finally, we assess the effects of American labor—management relations and customs on the diffusion of Japanese HRM/LR practices and learning environments.

#### **THE PRODUCTION MANAGEMENT SYSTEM IN JAPANESE TELEVISION FACTORIES**

To assess the extent to which Japanese MNCs have transplanted their production management systems to their U.S. subsidiaries, we first describe the salient HRM/LR practices common to television assembly factories in Japan. As in other large manufacturing companies, the basic form of the Japanese HRM/LR system in the television factories is characterized by a structure of job grades, substantial investments in training and skill development, complicated, individualized pay schemes, extensive upward mobility, the lack of job control or ownership, off-line small group activities, an emphasis on generating performance improvement suggestions, longterm employment, and enterprise union representation (Dore, 1973; Aoki, 1988; Koike, 1988). Such a system is markedly different from the workplace systems commonly found in traditional Fordist manufacturing in the United States. Hence, the diffusion of core Japanese practices to U.S. subsidiaries would generally require a significant transformation of the HRM/LR strategies pursued in more traditional American manufacturing, especially in unionized operations.

In the typical Japanese consumer electronics firm, regular, full-time workers are divided into five basic job grades, yet every individual's wage differs (Nakamura, Demes, and Nagano, 1994). Job grades correspond to the level of skill and experience needed to undertake a category of jobs. In addition, there are no categories such as skilled tradesperson or technician; these tasks are assigned to workers in higher job grades. Workers have no rights to specific jobs and can be reassigned at management's discretion. Seniority plays an important role, not because of years served per se but because workers with longer tenure have greater accumulated knowledge and training. Seniority, however, does not determine job assignment, even though it has a strong influence on pay (Kenney, 1999).

The compensation system for Japanese workers is extremely complicated. In all the consumer electronics firms there are five general categories of operators. In the past, there were also part-time and temporary workers in these factories, who were paid differently and did not have the rights of regular employees. However, by the late 1990s all of these workers had been laid off or retired. The top two categories of regular employees contain what in the U.S. unionized shops are the skilled trades and the lowest level of managerial supervisors. Wages are set according to a formula consisting of seniority (base), performance (merit), and ability components, though their percentage weighting differs by firm. There is also a bonus component that is approximately five months of salary paid in two installments. Salary increases are calculated once per year, and each individual receives a unique raise. For this reason, after a couple of years, it is likely that no two workers receive exactly the same wage.

Distinctions between managers and workers are not as clearly defined in Japan as they are in most Western nations. In most Japanese television factories, all supervisors and many upper-level managers have been promoted from among the workforce (albeit, top-level managers are often dispatched from corporate headquarters). For example, Kenney (1999) reports one case in which the factory manager, who was responsible for over 1,000 employees, began his career as an assembly line worker. Regular workers in Japan, therefore, are not limited in their opportunities for promotion into management positions by artificial glass ceilings (the exception being for women, who in theory face no barriers but in practice have little likelihood of reaching the upper levels of factory management). Higher-grade workers, furthermore, have job tasks encompassing a significant supervisory component (Kenney, 1999; Kenney et al., 1998; Nakamura et al., 1994). The responsibilities of these senior workers include drawing up work instructions (i.e., diagramming the physical motions and steps that workers must undertake to complete jobs), relieving workers, providing technical guidance and assistance to workers on the line, monitoring the status of lines, and even reassigning jobs to workers (Nakamura et al., 1994: 74).

One hallmark of Japanese management has been extensive training of workers (Liker, Fruin, and Adler, 1999; Kenney, 1999; Cole, 1989). Factory workers are hired locally after undergoing a battery of written, oral, and medical tests. Upon employment they normally receive an orientation session lasting between one and five days. Before being assigned to a work section, new employees are quickly rotated through a variety of simple jobs in different sections during the first one to three months of employment. Upon entry into their section, they receive on-the-job training (OJT) from senior workers and supervisors. The typical employee, however, does not remain assigned to a section permanently. About every two years employees are transferred to new sections as a means of promoting a better understanding of the entire production process and to otherwise challenge employees.

Investment in off-the-job or classroom training is also generally substantial. Regular workers receive classroom training from senior employees

on a range of subjects, including quality control, inspection, operation of new machinery, machine maintenance, and special skills such as welding and soldering. These courses are not passive in nature as they include written homework assignments and examinations. As workers progress through job grades, there is a curriculum of classes provided to prepare them for examinations required for promotion to each higher-level grade. Not only do workers take factory-specific classes, but they also take company-wide classes. This broader training imparts to employees the skills to become managers and to improve overall factory operations. After completion of this training, operators can inspect their own equipment and perform routine equipment maintenance and cleaning functions. At higher grade levels, courses prepare employees for working with sophisticated electronics and programming, in addition to developing general management skills.

To fully exploit their investments in human capital, Japanese companies have every worker involved in off-line, "small group activities" (SGAs), such as quality control circles or safety improvement groups. SGAs have the dual purpose of improving operations and creating social solidarity (Cole, 1989). In addition, all factories have programs encouraging workers to individually suggest improvements in order to mobilize all individuals. The quality and number of suggestions received are considered very important and are a component of everyone's job performance evaluation, from the factory manager, to the novice operator. Indeed, the flow of suggestions is tracked closely, as illustrated in one interview, for instance, in which a factory manager reported having received precisely 13.2 suggestions per person in the previous six-month period. To help facilitate the flow of suggestions, supervisors are obligated to teach subordinates how to make useful suggestions.

Television factories in Japan, nevertheless, differ from the more commonly reported model of Japanese factory organization generalized from Toyota and the automobile industry (Cole, 1989; Adler and Cole, 1993). First, work is not organized into multifunctional teams. Instead, workers are grouped under a supervisor and, for the most part, work individually. In one plant, the manager stated candidly that "we do not really work on the team concept" (Kenney, 1999). At his factory, groups are considered administrative units and do not engage in collective problem solving, which is left to SGAs. Second, within groups there are long-term transfers from job to job but little short-term rotation between stations, even within groups. The most significant exception is found in picture adjustment, where eyestrain necessitates job rotation every two hours (this type of work, however, is being automated). Third, the physical process of assembling televisions is highly routinized, with detailed diagrams posted at every assembler's workstation. Workers do not have the responsibility or prerogative to stop the line, even if they notice a pattern of defects. Instead, their responsibility is solely to inform their supervisors, who make the determination as to whether or not the line should be halted.

In such a different work environment, the role of the union in Japan is much different than in the United States. In Japan, television factories are

organized by enterprise unions representing only the firms' regular employees. Since lower-level management staff are members of unions, there is no strict separation between exempt and nonexempt employees. In general, bargaining takes place regarding any overall wage hikes and other benefits. The most important single goal of the unions has been to protect the long-term employment guarantee. Unions have little or no control over the movement of workers in the factories and other actions such as overtime distribution, though it should be stressed that unions have advisory roles, and good labor-management relations are an expressed goal of management. Although, from the perspective of critics, Japanese enterprise unions act as second personnel departments for management, their role is ambiguous. It is clear, nonetheless, that Japanese enterprise unions generally do not consider themselves in direct and constant conflict with management.

Despite the absence of work teams, Japanese television factories have some significant resemblance to Adler's (1993) "learning" bureaucracy, wherein the in-line work process is routinized and engineered in minute detail. Unplanned events and the introduction of new models create, for example, ample opportunities for more creative thinking and problem solving, and it is at these junctures that workers in higher labor grades are especially mobilized. In addition, the learning opportunities are manifested in the suggestion process and in the SGAs. Consequently, despite the routinized process (i.e., the bureaucracy), there is a constant emphasis on improvement, which requires learning.

#### **JAPANESE TELEVISION ASSEMBLY IN THE UNITED STATES**

Japanese success in exporting televisions to the United States in the 1960s and 1970s resulted in significant trade friction, as U.S. assemblers experienced a loss of market share (Porter, 1983). Fearing U.S. protectionism, Japanese television manufacturers opened or acquired assembly plants in the United States during the 1970s and 1980s (14 such plants in total). Initially, the plants were proverbial "screwdriver" factories, receiving both production equipment and critical components from Asia. By 1998, the U.S. market was controlled by two European firms, three Korean firms, and five Japanese firms, each of which also had factories in Mexico.

To examine the extent of diffusion of Japanese production and HRM/LR practices in the remaining Japanese transplants, we gained access to four of the five firms. Our assessment is based on a comprehensive review of secondary source material, plant tours, and personal interviews with selected executives, managers, and supervisors (which were taped and transcribed)? As a precondition for conducting our research, anonymity was granted to the respondents and firms. Hence, we refer to the respective factories as Factories W, X, Y, and Z. It should be noted that the present analysis is part of a larger research project examining the Japanese management system in television assembly factories in Japan, the United States and northern Mexico.<sup>3</sup>

Each factory studied had three to five conveyor belt assembly lines, each dedicated to a few different-sized televisions. Only one factory had a component insertion facility, whereas the other three factories imported their printed circuit boards from Mexico. The televisions arrived at a station and stopped, a single operator performed a set of routines in approximately one minute, and the sets then continued down the line. The group leader, the assistant, or in some cases an automated vehicle delivered the parts. Taken as a whole, the television assembly process was routinized, though not capital-intensive.

The plants in this study were located in three states: Georgia, Tennessee, and Arkansas. One plant was acquired in the 1970s, and the other three were greenfield factories built in the 1980s. Three factories were high throughput, mass production facilities. The other factory was also a mass production factory, but it specialized in large-screen and projection televisions and had shorter production runs. At the time of our investigation (1997), pay and benefits were competitive with those of other electronics plants in their respective regions. A newly hired operator's wage averaged about \$10 per hour. The plants relied on state government employment bureaus for referral of potential operators, for which no company-administered written, oral, or medical examinations were required. Annual turnover has averaged less than 10 percent. No long-term employment guarantees were made to employees, and all plants have experienced both seasonal and long-term layoffs. Employment levels at two of the four plants had fallen from a decade earlier. The female-male ratios at the plants were approximately 60-40. Although we did not collect racial and ethnicity statistics, we observed that employees at two plants were predominantly white, whereas the other two plants employed substantial numbers of African Americans.

#### **Unions and the Labor Environment**

Of the 14 Japanese television assembly factories that have at one time operated in the United States, only 3 were ever unionized. Our sample includes those 3 unionized factories (Factories X, Y, and Z). The nonunionized plant (Factory W), which is now closed, never experienced a union-organizing campaign. When Sanyo purchased the Forrest City, Arkansas, factory, it was already organized by the International Union of Electronic, Electrical, Salaried, Machine, and Furniture Workers (IUE). The Toshiba and Sharp factories were organized in the early 1980s by the International Brotherhood of Electrical Workers (IBEW). All four factories were located in right-to-work states, which gave employees the right not to join the local unions but required the unions, nonetheless, to represent all hourly employees. The unionization rates were 60 percent at Factory Y and 78 percent at Factory Z. At Factory X the proportion of workers belonging to the union had dropped from a high of 90 percent in 1989 to only 44 percent by 1997. All contracts were three-year agreements covering only employees at the respective factories and within identified

bargaining units. This contrasted sharply with sister plants in Japan where union contracts covered workers in all of a company's plants.

The history of labor confrontation at the unionized plants has been mixed. Factory X experienced a short strike in the early 1980s and a one-day strike in 1989. The only walkout at Factory Y was a brief one taken in the early 1980s immediately preceding unionization of the workforce. In contrast, Factory Z, which inherited a polarized situation (Beazley, 1988), has experienced substantial labor unrest. After a brief period of goodwill following the acquisition of the failing factory, the union struck in 1979 for eight weeks over wages and other issues (Harvard Business School, 1981). In 1985, the union struck again in response to management's demands for medical insurance cuts, seniority system changes, and the right to move workers from job to job. The strike was eventually settled, with management's achieving most of its demands. There was, however, a significant lingering level of animosity and distrust on both sides, as the strike was bitter and marked by violence. Management seriously considered closing the factory, but thanks to then-governor William Clinton, who visited Factory Z headquarters in Osaka, the plant remained open. In addition and importantly, Wal-Mart, the Arkansas-based retailer, began distributing Factory Z televisions (Byrne, 1986; Kotha and Dunbar, 1995).

Since the late 1980s, in contract negotiations across all plants, management has focused primarily on its demands for greater flexibility via reallocation of personnel and reductions in the number of job classifications. The primary emphasis of the unions, on the other hand, has been on protecting seniority and job rights. The bargaining environment has proved to be quite challenging for the local unions as a result of the relatively low union penetration rate in the industry and the persistent threat of plant closures and consolidation of operations in Mexico. Although the resulting union contracts can be characterized as fairly traditional ones by U.S. standards and highly rigid ones from the Japanese perspective, they have become increasingly flexible. Of particular note has been the creation of positions that have remained within the bargaining unit but have allowed union members to become team leaders, positions in which union members have assumed some duties previously retained solely by supervision. In effect, the sharp demarcations associated with U.S.-style job control unionism have become slightly blurred.

### **Work Organization, Job Classifications, and Seniority**

Much like their counterparts in Japan, operators in the three unionized plants were divided into groups, which corresponded to a section of the assembly line and encompassed 25-30 operators. Supervisors in the United States, however, were considered members of management and very often had no hands-on assembly experience. In contrast to plants in Japan and the three unionized plants in the United States, a new American management team at Factory W had just begun to reorganize the entire factory into self-directed work teams. Absent from the design, however, were designated team leaders. All

*team* members were to be cross-trained and involved in training. Teams were responsible, furthermore, for checking team members' time cards, assigning members to particular jobs, and participating in line rebalancing.

The three unionized television transplants differed little from other, more traditional U.S. factories, as they adopted fine-grained, complicated U.S. job classification structures and associated job control. An earlier 1986 reporter's interview with the personnel manager at Company Z highlights the sense of employee ownership of jobs and resistance to reassignment: "Here, it's Mary's chair. She's sat there for 15 years, and she'll be damned if she's going to move from that spot" (Byrne, 1986: 51). Only non-union Factory W had attempted to undergo any major revision of its job classification structure. At the time of our study, it was in the process of reducing 30 distinct job classifications down to 5 (production operator, warehouse operator, line support technician, maintenance technician, and quality assurance inspector). The new job titles and descriptions were deliberately left vague in an effort to include a wider number of different work activities within each. Within each job category there were three levels, whereas in the previous structure there were eight pay grades. In addition, the lead operator position, which had been a supervisory position, was eliminated. The motivation for these changes came from the new management team, which wanted to create a learning environment in which there could be rapid improvement in performance and cost reduction. The ideas for this reorganization, however, did not come from Japan but rather from other U.S. firms in the area.

Across all three unionized plants, seniority preference was tantamount and prevalent throughout each of the union contracts. All three had similar, but slightly different, plantwide job bidding and bumping rules based on seniority. These bidding systems awarded jobs to the most senior employees among all qualified applicants, not strictly to the most qualified applicants.

Factory X had seven labor grades and a total of 20 job classifications. Seniority and bumping privileges accrued in departments, of which there were four. With respect to job bidding and layoffs, however, accrued seniority privileges were applied on a plantwide basis. The company retained the right, nonetheless, to temporarily transfer workers between jobs for up to 30 days without regard to seniority or job-posting provisions. In addition, the top-level maintenance employees were not subject to the job bidding process and could be hired solely at management's discretion.

In Factory Y there were eight job grades each for operators and skilled tradespeople. Although employees could bid on jobs throughout the factory, bidding was usually based on identifiable departmental job ladders. In the case of layoffs, more senior workers had rights to bump junior employees at the departmental level. One provision in the contract allowing for some flexibility was management's right to temporarily reassign employees for up to 90 days without regard to the seniority or posting provisions in the agreement. But even in this case, the offer of reassignment was made first to the most senior employee in the affected classification. If that person refused, then management went

down the seniority list until someone accepted or the least senior person was assigned.

At Company Z there were 11 labor grades and five pay groups. For bumping purposes all the jobs were divided into 15 job classification families in which there were seniority ladders. There was a total of 74 specific jobs across the factory covering only 400 bargaining unit employees. Workers accrued seniority in each of the 74 jobs and classification categories. Additionally, workers could not be reassigned except by seniority bumping or if jobs were eliminated.

Nonunion Factory W was in the process of implementing a more flexible job classification structure, though at the time of our study the restructuring had not yet been completed. In combination with a newly created self-directed work team system and cross-training, the evolving job classification and grading structure was viewed as providing management with sufficient flexibility to rotate workers through all tasks performed by teams.

In summary, the combination of job classifications and organization of work in the three unionized plants was far more rigid than that evolving in the nonunion plant. Governed by strict rules of seniority and a climate of job ownership and control, management in the unionized plants had little freedom to reassign or rotate employees through jobs. It is important to emphasize, however, that plant-level management appeared to endorse the U.S. system by accepting the notion that employees had rights to particular jobs. In Japan, on the other hand, management was free to move employees to any positions that management wished, albeit inexperienced, insufficiently skilled employees would not be assigned to positions requiring deep knowledge of a plant and its equipment. Management in Japan, therefore, was constrained by needed skill levels in the reassignment or rotation of employees, not by union resistance to such movement of employees.

### **Division of Labor and Management**

The division between labor and management is often emphasized as an important difference between traditional Fordist and Japanese management. In the transplants there was a clear Fordist distinction between labor and management, but there were indicators that such division was being diminished. For example, at two unionized factories a category of bargaining unit members called "group leader" had been created. These group leaders were being used in lieu of the lowest category of production supervision, a change motivated by cost considerations. Although the appointment of group leaders was entirely at management's discretion, and seniority played no formal bearing on selection, the selection of group leaders was usually made among more senior workers who had significant experience and presumably a desire or willingness to move into the ranks of plant supervision. At the time of our study, the two companies were still phasing in the group leader positions, which included responsibilities for conducting morning meetings to discuss daily schedules and activities, delivering

materials to the production lines, and training new operators. The group leader role, however, was more limited than the traditional supervisory role. In particular, as members of the bargaining unit, group leaders were restricted from issuing verbal instructions to other workers or taking any disciplinary actions.

Here, the unions were able to protect their principles of equality among members and strict separation between certain managerial tasks and bargaining unit work. Despite these restrictions, group leaders generally performed their new roles quite successfully. For example, at Factory Z a supervisor had to be reassigned to a new area, and the group leader assumed most of his responsibilities. According to the production manager, workers "haven't even missed the supervisor there. [Management] came in on Monday and [asked] will you take the job over. [They] then bid it and he has done a super job." Curiously, the managers expressed surprise at what bargaining unit employees were capable of or willing to do when offered opportunities to expand their responsibilities. It would appear, therefore, that management, like their union leader counterparts, had largely embraced and operated within the Fordist paradigm that divides managers and workers.

In addition, contracts specifically forbade managers and supervisors from engaging in bargaining unit work except under special circumstances, namely, during emergencies, for instruction and training, for purposes of checking on workmanship, quality, and equipment functioning, and during experimental and prototype runs. The unions' objective, we surmise, was to prevent any encroachment by supervision and management on bargaining unit work. As a result of this negotiated demarcation, bargaining unit work was largely restricted to more routine production work, leaving nonroutine work to managers and staff. For instance, maintenance work on both automated and test equipment was restricted to engineers. In Japan, such maintenance of equipment would be performed by highly trained high school graduates. In other words, the artificial job distinctions manifested in the U.S. agreements has meant that workers protect their rights to more routine jobs but forfeit many opportunities to engage in nonroutine jobs. Yet, from a Japanese management perspective, having workers engage in nonroutinized as well as more routinized jobs is key to increasing factory productivity, reducing costs, and otherwise enhancing competitive advantage.

In all four factories there also was a separation between technical duties and supervisory duties in the factory hierarchy. Whereas in Japan work instructions were drafted by the supervisor-class workers, all of these activities were assumed by industrial engineering sections in the United States. U.S. supervisors, furthermore, were not expected to be highly competent technically; they needed only to manage effectively. As one manager put it: "The group leader is probably more technical, like working on the line. The group leader is probably more skilled than the supervisors. Because they spend more time on the line. They know the jobs. But they are not there for the management skills standpoint, or motivational [standpoint], planning, or direct control." Hence, there was a separation not only between mental and manual labor but also

between job skills and hierarchical control. Whereas in the transplants these separations were standard, they were not nearly as pronounced in the Japanese factories.

In addition to fairly sharp lines of demarcation based on tasks and responsibilities, it was uncommon for production workers in the unionized U.S. operations to cross the lines of demarcation through promotion. There were a number of instances of promotion from blue-collar to white-collar positions, but unlike in Japanese plants, these were the exception, not the rule, in the U.S. operations. For example, one assembly line worker in Factory Y had during his career at the factory advanced from a production relief operator to production quality assurance department manager. Another had begun at the lowest entry-level category (Assembler II) in 1988, but by 1997, she had been promoted to unit manager. As a unit manager she also had trained two other women, who, likewise, rose through the ranks to become unit managers. In our interview, she explained how she made the transition: "I would go to my supervisor and tell him that I wanted to learn everything that there was on the line. I learned all the positions. I wanted to know how to do things basically talking with them. I had a few Japanese bosses that were just fantastic and they taught me a whole lot of stuff. They helped me and here I am." She also expressed her frustration with lines of demarcation in her new role as a unit manager. For example, one frustration that she experienced as a manager was waiting for maintenance workers to repair machinery:

That was one of the hardest things for me, coming off the line into management. I was used to going up, seeing something wrong, and fixing or whatever to keep everything going. Now I have to walk around with my hands in my pocket, that was a hard habit to break. You know repairing boards or keeping the line flowing smoothly. You have certain people that can do certain things and it matters.

In summary, the lines between production workers and managers in the U.S. transplant operations were far more pronounced than in the Japanese operations. We encountered a number of exceptions, however, with respect to both production workers' taking on some traditional supervisory responsibilities and the promotion of production workers into management positions. Although the blue-collar/white-collar divide in the U.S. factories was permeable, there was almost no such divide in the Japanese factories. The traditional U.S. division between manual and mental labor was, in part, perpetuated and zealously guarded by unions, but the division is also attributable to how the Fordist tradition had become well ingrained in American management philosophy.

### **Training**

Each transplant conducted between one and five days of orientation classroom training for new hires. This training included an introduction to factory rules, safety, general information about the factory and company, and sessions emphasizing the importance of quality control. These courses were

purely informational, and there were neither homework assignments nor examinations. In general, initial orientation in the transplants very much resembled the Japanese orientation sessions. Since entry-level assembly jobs were extremely routinized in the U.S. factories and could be learned in a matter of days, additional training was minimal. Training, moreover, was almost exclusively delivered in the form of OJT provided by supervisors or group leaders. OJT by rotation through different jobs and tasks, however, could not be easily implemented in the unionized factories because of the rigid job classification structure negotiated by labor and management and enshrined in the union contracts. Opportunities for additional OJT occurred, nonetheless, as workers ascended through the seniority-based, job bidding process. Since the job bidding process was generally restricted to within departments, workers became increasingly specialized over time rather than increasingly generalized as in Japan.

With the exception of Factory W, the transplants engaged in far less off-the-job training than their counterparts in Japan. At Factory Y, all employees received only one one-hour class per year, each in handling chemicals and in ISO 9000 and ISO 14000 conformance/environmental awareness. Although other classes were provided, in no case did workers receive more than five hours of regularly scheduled training per year. In Factories X and Z, no classroom training was provided beyond legally required safety training. When there were important equipment or process changes, classroom training was offered only to selected individuals, usually supervisors, technicians, and/or skilled tradespeople.

Nonunion Factory W implemented the most thorough training program, which included substantial off the job training. Indeed, the factory's training investment per employee averaged \$697 in 1997 (not including lost production time), a substantial increase over the mere \$55 average invested a few years earlier. Operators received classroom and OJT training in statistical process control, teamwork, communications, safety, and continuous improvement techniques. As Factory W had just reorganized all production workers into teams and was introducing rotation among jobs, employees also received cross-training. Furthermore, the new team system had an intergroup training dimension, whereby team members were expected to train each other. This training effort was especially impressive in its thoroughness and was unmatched by the unionized factories.

In summary, the difference in training policies between the Japanese and U.S. factories could not be more striking. In Japan, management was clearly devoted to providing training, and all of the senior personnel served as instructors in various classes. In the United States, on the other hand, training investments were minimal, and few managers were involved in formal classroom training activities. In addition, with the exception of the newly reorganized nonunion plant, there was little effort to provide training beyond necessary OJT.

### **Machine Maintenance**

Television assembly generally does not utilize sophisticated machinery, and, consequently, much of the machine maintenance is relatively simple. In the U.S. Fordist tradition, even the simplest maintenance has remained the province of skilled tradespeople, technicians, and engineers, whereas, in Japan, much of the responsibility for routine maintenance is performed by operators. The U.S. transplant record is somewhat mixed in this regard, and some managers expressed the desire to devolve routine maintenance to operators.

At the one nonunion plant, workers inspected the machinery before production began and cleaned their equipment, even though they had no formal maintenance obligations. In Factory Z, workers were responsible for keeping their work areas clean and neat, but inspection and routine maintenance were entirely within the purview of maintenance technicians. At Factory Y, operators were not involved in even the most routine maintenance; all maintenance was performed by a distinct maintenance group. Although operators were allowed to clean their machines, they were instructed that there was to be "no adjustment, no grease, or lubrication." The plant manager indicated, however, that he planned to have the maintenance group begin training operators to make minor adjustments on conveyors and other equipment at the start of their shifts. Similarly, operators in Factory X engaged in no equipment maintenance. As we were told, "They just use the machines and do not even clean them. Cleaning is done by a specialized group. Cleaning of the work place is also done by a specialized group."

The separation of even simple maintenance tasks from operator responsibilities is a legacy of U.S. functional specialization and the division of work between operators and more highly trained personnel. With the exception of management in the nonunion transplant, managers expected little contribution from their operators regarding machine maintenance. Therefore, unlike their Japanese counterparts, the U.S. transplants relied on more highly skilled technicians and engineers to perform necessary routine adjustment work, clearly, a costly underutilization of skill and capabilities.

### **Quality Improvement Involvement**

Both the American transplants and the Japanese plants emphasized the importance of achieving high quality. Toward achieving ever-higher levels of quality, employers have focused on improving design and components, automating difficult or tedious tasks, increasing inspection, heightening worker awareness and responsibility for flagging problems, and involving workers in discovering and resolving quality problems. Although any factory must undertake some combination of these actions to achieve higher quality, it was the Japanese who generalized the use of quality control (QC) circles based on operator involvement (Cole, 1989). The Japanese transplants, however,

repeatedly failed in their efforts to introduce or sustain worker involvement in QC circles and related small group activities; that is, workers monitored quality (a passive function) but for the most part were not engaged in quality improvement activities (an active function).

In the 1970s, when Japanese television assemblers began operations in the United States, they found a workplace environment radically different from their own in Japan. In Factory Z, which had been acquired, the new owners encountered what was, by all accounts, an example of the worst kind of quality consciousness in U.S. manufacturing. For instance, the quality assurance director described his initial impression of the acquired plant in the following way:

Compared with Japan, my first impression was that there was too much specialization. Sectionalism, I felt, was wrong among the departments, lines, and workers. It seemed to me that line workers thought quality control was the responsibility of the inspection or quality departments. I also felt that the concept of cooperation was totally lacking. Japanese workers would think of quality as the concern of the entire company. (Yonekura, 1985: 1)

Exacerbating circumstances, moreover, workers were generally opposed to inspecting the work of coworkers, an opposition common across unionized companies in the United States. As one Japanese manager complained, "They feel that it is wrong to say that a fellow worker has made an error, or even to correct the errors they see. But surely this is essential if the company is to turn out good products. If we make defective products, who will buy them? And where will these people work if nobody buys them?" (Harvard Business School, 1981: 10)

After purchasing the Arkansas plant, the company immediately reorganized production by installing new machinery, using higher-quality Japanese parts, and cleaning and upgrading the facility. To signal the importance of quality, furthermore, the Warwick plant quality control manager was made the plant manager (Kotha and Dunbar, 1995: 7). Although productivity and quality immediately improved, in some measure this might have been due to a "halo" effect as the result of the company's saving Factory Z from certain closure. The different perspectives of Japanese and American quality control managers, nonetheless, made efforts to transform the factory into a high performance operation most difficult. One Japanese QC manager stated, for instance, "Quality improvement can be achieved through cooperation among workers, lines, departments, and managers." In stark contrast, his American assistant argued, "The most important means [to achieve quality] is to introduce more advanced automation, digitalization, and consumer-oriented simple product design" (Yonekura, 1985: 4). As is apparent, one perspective of quality improvement emphasized cooperation among all employees, whereas the other emphasized the use of technical solutions.

The Japanese emphasis on the human element of quality improvement via the use of QCs never took hold in the transplants. In 1982, Factory Z introduced "Quality Improvement Groups" aimed at lowering defects (Yonekura,

1985), but a few years later no QC circles or SGAs were to be found (Abo, 1994). In our 1997 visit, we found QC circles in place, but these comprised strictly nonunion personnel. Similarly, in 1990, as reported by researchers at the University of Tokyo (Institute of Social Sciences, 1990), Factory Y had QC circles in place for the purpose of raising the sense of participation through communication between supervisors and employees. The Japanese manager interviewed stated that the purpose of the circles was to improve both product quality and productivity. The circles were voluntary, though there was a reported participation rate of 70 percent. However, several years later, we found that there was only limited voluntary participation in QC circles among operators, who usually met only one hour per month and after regular work hours. At Factory X, the QC circle program barely functioned. One Japanese manager attributed this to union discouragement of worker involvement, an allegation that we were unable to verify.

In the latter part of the 1980s, Factory W had also introduced QC circlelike activities, only to discontinue them two years later due to a lack of participation. However, as described earlier, management had recently introduced its new team-based structure. That new structure served as a basis for routine QC activity. In addition, Factory W instituted what was called "*kaizen* blitzes," which involved all levels of the factory organized into special teams for the purpose of resolving specific problems in targeted areas. The goal of the blitz was to bring rapid improvement in targeted areas, targets that could be suggested at any level within the organization.

In summary, with the exception of the recently renewed efforts at nonunion Factory W, the transplants diverged markedly from their counterparts in Japan with regard to worker involvement in QC circles and related SGAs. Beyond the simple flagging of quality problems included in their routines, workers contributed little to quality improvement. Hence, the Japanese achieved little success in diffusing QC circles and related employee involvement activities in their U.S. affiliates, an HRM/LR practice basic to the Japanese production systems.

### **Suggestions**

Central to the Japanese production systems in television assembly were employee suggestion programs. In the U.S. transplants, however, there was a remarkable lack of success in implementing such suggestion programs. In Factory X, no suggestion programs had been implemented. Factory Z had a suggestion program, but neither the plant manager nor the other managers whom we interviewed had any idea of the number of suggestions that were being received. Tracking suggestions, we were told, was the responsibility of the quality control department.

At the time of our visit, Factory Y reported having introduced a new suggestion program to replace an earlier one that had fallen into disuse. A document provided by the company indicated that the objective of the new

program, however, was "to build a more energized, productive manufacturing facility through activities geared toward eliminating job dissatisfaction caused by inconsistent or unfair treatment" and to aid the factory "in its objective of providing employees with a work environment that promotes the free exchange of communication with top management." In reality, this program appeared to be more of a mechanism to handle complaints than to solicit suggestions on performance improvements. In Factory Y, furthermore, upper-level management expressed much less interest in shop-floor suggestions than did two lower-level managers whom we interviewed. Unlike the upperlevel managers to whom they reported, these two managers (one was the former operator and union member mentioned earlier) were enthusiastic about worker contributions. Take for example, our discussion with the one supervisor:

Q. Is it hard to motivate feedback?

R. No. They are more than willing to give you an earful. If something doesn't work, they will let you know.

Q. It is one thing to let you know. The other would be to propose a solution.

R. They are good on that. They are really good on that. Like I said we encourage it. They tended to give me feedback in the past. And it has just kind of caught on as the years have gone by. They will, they will do it. Because I will ask, "what do you suggest?" [They] will come up with a countermeasure.

It was apparent from our interview that this supervisor was dedicated to improving performance and eliciting suggestions from operators to enhance performance. Her efforts to involve workers, nonetheless, appeared self-motivated and not part of an organized, plantwide effort.

In summary, what was striking about the transplants was the relative low priority that suggestion programs received. In Japan, all levels of management were extremely conscious of the number of suggestions received and actively sought to increase the number and quality of suggestions. At one Japanese factory, supervisors were trained explicitly in how to work with subordinates to increase the number and quality of suggestions. With the exception of the nonunion transplant, the U.S. transplants either attached only passing importance to generating employee suggestions or otherwise had not found ways to make suggestion programs an integral part of factory operations.

## **CONCLUSION**

In our study of four of the five major Japanese-owned television assembly factories located in the United States, we have attempted to examine the extent to which standard Japanese production systems and embedded HRM/LR practices had been diffused to the United States. We found, on one hand, that much of the technical and physical configuration of Japanese

television assembly operations had been diffused to the American operations. On the other hand, we found little evidence of diffusion of HRM/LR practices, except in the nonunion transplant. In essence, whereas the factories in Japan can be characterized as "learning" bureaucracies (Adler, 1993), the three unionized subsidiaries are best characterized as "static" bureaucracies. That is, in the unionized transplants there were few opportunities made for operators to learn much beyond fairly limited tasks and, in turn, little opportunity for operators to help improve factory-wide performance. These learning opportunities were especially limited by narrowly defined and complex classification schemes, by rigid seniority rules governing assignment and promotion, by sharp lines drawn between blue-collar and white-collar employees that restricted responsibilities and upward mobility, by relatively little investment in training, by restrictions on operator opportunities to maintain their own equipment, by the lack of QC circle or related small group activities, and by the low priority placed on employee suggestion programs.

Overall, we believe that the Fordist tradition of labor-management relationships in the United States had locked both American managers and their union leader counterparts into sustaining static bureaucracies that reinforced and perpetuated Braverman's (1974) dichotomy between managerial conception and worker execution. Such perpetuation is captured, in particular, by the hierarchical job-protection system long ingrained in U.S. union-management relations. That system made it virtually impossible to regularly reassign or rotate employees through different jobs and, hence, increase learning and employee understanding. Given that seniority governed nearly all job assignments, moreover, there was little incentive for management to invest in training beyond that necessary to satisfy the requirements of specific jobs.

Furthermore, in spite of examples wherein workers and supervisors demonstrated the capacity to move toward creating learning environments, the parties were unwilling or unable to capitalize on them. For example, we found a number of instances of promotion from hourly to supervisory ranks, but, curiously, managers viewed such mobility as the rare exception to the rule of hiring from outside. In other words, there was no effort to encourage such mobility, which is commonplace in the Japanese systems. Similarly, even when there were concrete examples of success (such as that of the promoted assembly worker and the group leaders who *were* able to manage production lines in ways that surprised management), upper-level management readily dismissed them as aberrations, not as examples for wider application. Apparently, these examples, which demonstrated that the workforce was capable of substantial change, were not salient enough to trigger a paradigm shift in managerial thinking.

In contrast to the unionized plants, the nonunion plant in our study eventually broke out of the Fordist tradition and began to create a learning environment more in line with that of sister plants in Japan. Consequently, the general nature of the HRM/LR practices embedded in Japanese production systems in television assembly was being replicated in this U.S. operation, and certain practices went beyond even the Japanese practices pursued in Japan. The

plant, however, was closed shortly after our fieldwork. Suffering from a downturn in its fortunes globally, the company transferred production to Mexico.

In closing, the evidence from the unionized transplants confirms and deepens the findings of others regarding the general lack of diffusion of Japanese-style HRM/LR practices to television assembly operations in the United States and the United Kingdom. There were indications of some diffusion of practices in the unionized transplants, of which the development of the new group leader position was the most important. But only in the nonunion plant did we find substantial diffusion of Japanese-style HRM/LR practices. The stark contrast between the unionized transplants and the nonunion transplant strongly suggests that the U.S. union-management environment in which the parties were so rooted made diffusion of the HRM/LR practices impossible or too costly to justify (as illustrated by union willingness to strike over changes pursued by management). In particular, American management in the plants lacked the commitment to create the learning environments conducive to the diffusion of Japanese HRM/LR practices, albeit strongly reinforced by union insistence on maintaining hierarchical job-protection systems. In the end, all parties seem convinced that the socially constructed Fordist tradition was "natural" in these American facilities. We conclude that, unlike their counterparts in auto assembly, the Japanese television MNCs did not insist on the diffusion of their preferred HRM/LR practices, choosing instead to adopt workplace practices embedded in their American host environment.

#### **NOTES**

Martin Kenney gratefully acknowledges Frank Mayadas and Gail Pesyna of the Alfred P. Sloan Foundation for providing the support that made this research possible. The authors also thank Shuichi Hashimoto for his participation in the research.

1. There are three much smaller Japanese-owned factories still in operation: the Pioneer projection television plant in Chino, California, which employed approximately 100 people; the Orion television plant in Princeton, Indiana, which employed approximately 250 people; and the Matusushita television/videocassette recorder plant in Vancouver, Washington, which employed approximately 250 people.

2. We requested interviews with the factory manager, the quality control section manager, the production section manager, the production engineering manager, and a supervisor. All interviewees were chosen by management. Across the four plants, we conducted 22 in-depth interviews. At Factory W, we interviewed the plant manager, one vice president, two production managers, and two supervisors. At Plant X, we interviewed the executive vice president/general manager. At plant Y, we interviewed the president, three vice presidents, two directors, three middle-level managers, and one supervisor. At Plant Z, we interviewed two vice presidents and two directors.

3. Analyses of operations in Japan are reported in Kenney (1999). Analyses of operations in northern Mexico are reported in Kenney and Florida (1993) and Lowe and Kenney (1999).

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