

DISPOSABLE BODIES AND LABOR RIGHTS: WORKERS IN CHINA'S AUTOMOTIVE INDUSTRY

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This article focuses on the serious occupational health and safety (OHS) injuries affecting the workers of one of China's most important industries—automotive assembly—and particularly the musculoskeletal disorders (MSDs) that are common in the industry. The data are drawn from a 2011 survey of 1,100 autoworkers conducted at twelve assembly plants in seven Chinese cities. By correlating injury rates with age, speed of the assembly line, length of work hours, mental pressure, availability of floaters to replace absent workers, ease to take sick leave, etc., the data identify the most salient causes of MSD. The study raises the issue that the state and management's ignoring of MSD and the lack of workers' participation and representation in the plants constituted a violation of labor rights. The article offers some remedies that are applicable both in China and internationally.

Having become the world's workshop, China has also acquired a reputation as a country that flouts occupational and safety precautions (Brown and O'Rourke 2007). There are numerous reports in the Chinese and international press of fatal mining accidents and factory fires, toxic poisoning of migrant workers in the labor-intensive export sector, and high incidents of maimed arms, hands, and fingers (Chen and Chan 1999). All of these occupational injuries provide dramatic evidence of the high human cost of China's rapid development. What does not register in public view are chronic injuries that take time to emerge, that are not readily visible to the naked eye, that are not easily detectable, not easily proven as work related, and are difficult to hold management responsible for. These injuries remain unrecognized and unrecorded in occupational health and safety (OHS) statistics. For instance, we have yet to come across research on musculoskeletal disorders (MSDs) in China's OHS studies. After an extensive search, we were only able to locate one three-page Chinese-language article on occupational injuries in the auto industry. But its data are only on visible injuries such as amputations of crushed limbs and fingers, not on MSD. The article reports that about 4 percent of male auto workers, mostly in mechanical work and stamping, have suffered from such accidents (Zheng, Chen, Li and Wang 2000).

This article shows the prevalence of one kind of disorder—chronic MSD—that has been a much studied and researched area in advanced auto-production countries such as Germany and Sweden (Punnett, Fine, Keyserling, Herrin and

Chaffin 2000). Now that China is the biggest automobile manufacturer in the world, it is high time to study how MSD is affecting its autoworkers. For this purpose, we conducted a questionnaire survey on relevant workplace data with 1,100 workers outside twelve Chinese automobile assembly plants. The empirical evidence is drawn mainly from the survey's section on OHS.

The first section of the article introduces why this industry is worthy of attention and briefly provides an international context regarding the main injuries sustained in this particular industry. The next section describes the distribution of injuries in relation to a number of independent variables such as age, years of service, type of work, length of work hours, shift systems, and psychosocial stress factors. The third section describes how management deals with injured workers. The article will conclude with an overview of China's macro-environment, especially the country's legal regulatory system and the absence of workers' representation in the workplace, and workers' own low consciousness, and it will discuss how these factors are conducive to the current high rate of musculoskeletal injuries. The article's findings hold implications in countries throughout the world regarding MSD injuries, workers' long-term physical welfare, and labor relations.

Musculoskeletal Disorders in the Auto Industry

Musculoskeletal injuries are widespread not just in auto plants but also in other industries such as in labor-intensive assembly line work (Punnett and Wegman 2004) and keyboard operators (Hopkins 1990). The automotive industry, as an important capital-intensive high-cost industry, has been the subject of a large amount of research on MSD in Europe and North America by companies, trade unions, and academics who specialize in ergonomics and occupational health.

A musculoskeletal disorder is a condition where a part of the musculoskeletal system is injured over time. It affects muscles, joints, tendons, ligaments, and nerves. MSD is caused by highly repetitive motions, overexertion, heavy lifting, long periods of work, and working in strained and awkward positions. If serious, it can be debilitating, causing permanent damage to the individual (Armstrong & Punnett 1991).

Worldwide, including China, in the late 1980s and 1990s the automotive industry adopted what is popularly known as lean production in workplace organization and management, based on the Toyota Manufacturing System (Kochan, Lansbury, and Paul 1997). The public relations pitch is that this method of work organization gives workers an opportunity to be multiskilled, enhances workers' participation, stimulates mental activities, and reduces boredom from repetitive manual work while reducing production costs and cutting waste. But since the transference of lean production practices to North America and later to Europe, its benefit to workers has remained controversial (Pulignano, Stewart, Danford and Richardson 2008; Tickell and Peck 1995). A longitudinal study of lean production and Canadian auto workers in the early

1990s showed that within a few years after the introduction of lean production, work hours became longer, and irregular shifts and speedups and shorter work cycles have put more psychosocial and physical stress on workers. Outsourcing some of the easier jobs to tiers of suppliers that used to be given to older workers in the assembly plants meant work that was less physically stressful was no longer easily available (Rinehart, Huxley, and Robertson 1997).

The automotive assembly line is highly fragmented. Minute divisions of tasks to increase efficiency require precision in coordinating a large number of work stations and motions. Every movement is measured in units of milliseconds. The time when one or more motions begin to when it is being repeated is known as a cycle. Today, a normal cycle time in a reasonably modern plant is around one minute. Cycles can be as short as, say, 45 seconds or as long as 90 seconds. The shorter the cycle the more repeats of the same movements and the higher the chance that the worker contracts MSD.

According to the International Labor Organization (ILO) Encyclopedia of Occupational Health and Safety, the auto industry (assemblers and parts manufacturers) has one of the highest injury rates, with one in three employees in the sector hurt each year. The assembly plants have the highest levels of OHS injuries due largely to a high rate of MSD, which accounts for more than 60% of all injuries in the sector (Miret 1998). The trimming section where upholstery and internal trim are fitted accounts for the most monotonous and hazardous movements that contribute to MSD.

China's Automotive Industry

In the past one and half decades, China has become a big player in global passenger car manufacturing, from producing under half a million passenger cars in 1998 to 18.1 million in 2013 (the 2013 output in Japan was 8.2 million and in the U.S. 4.3 million) (The International Organization of Motor Vehicle Manufacturers 2014). As yet, China's ability to make world-class cars remains reliant on technology transferred mainly from American, European, and Japanese auto companies. At the insistence of China, all foreign auto companies have to set up joint-venture manufacturing firms (JVs) as minority partners with Chinese state-owned companies (Anderson 2012; Chin 2010; Thun 2006). JV cars dominate the Chinese market today because Chinese consumers trust foreign technology more than Chinese technology. General Motors and Volkswagen cars top the China market running neck-and-neck against each other. For instance, for the first six months of 2013, GM was number one best seller, selling 1.57 million vehicles compared with VW's 1.54 million, taking up almost a third of China's market share.¹

The foreign partners in these JVs, having adopted their version of lean production practices in their home plants, have introduced their latest state-of-the-art production facilities and lean production practices into their Chinese joint venture firms. The hardware, so to speak, is first class. Automation and robotization raises and standardizes quality and reduces defects in vehicles. The

Table 1. Sampled Plants, Location and Ownership, and Sample Size

Acronym	Plant name	Ownership	Number of workers' questionnaires
SH VW	Shanghai Volkswagen	Joint venture	98
SH GM	Shanghai General Motors	JV	110
YT GM	Yantai General Motors	JV	76
GZ HD	Guangzhou Honda	JV	118
GZ TY	Guangzhou Toyota	JV	113
BJ MB	Beijing Mercedes-Benz	JV	71
BJ HY	Beijing Hyundai	JV	116
TJ TY	Tianjin Toyota	JV	86
TJ FAW	Tianjin First Auto Works	State	50
TJ XL	Tianjin Xiali	Private	33
ZZ BAIC	Zhuzhou BAIC	State	88
GZ BYD	Shenzhen BYD	Private	132
			1091

paint shops use the latest technology and have reduced the hazard of toxic fume exposure. In some new Chinese plants, welding, which used to be one of the most dangerous and hazardous manual tasks, is now highly automated, needing only a small number of workers. Automation has also reduced heavy lifting, which has greatly reduced back injuries. But without workers' representation in China, can the modern hardware counterbalance the effect of speedups, short work cycles, and long work hours, which are major causes of MSD?

The Survey

Our survey was conducted in July and August 2011 outside twelve automobile assembly plants located in seven cities (Beijing, Guangzhou, Tianjin, Zhuzhou, Shanghai, Yantai, and Shenzhen). The sizes of the sampled assembly plants range from a workforce of 3,000 to 6,000. The plants are of various types of ownership—joint ventures, state owned, and domestically owned private firms. The joint ventures include major automobile companies with shares held by German, Japanese, Korean, and American partners. There are more joint ventures in our sample than state-owned and domestic private plants. This is because one of the intentions of the project was to compare variations in work conditions in plants managed by major foreign partners using the Chinese ownership types as comparators. (Table 1)

The research team was able to enter five of the plants to conduct interviews with management at various levels. But the team was not able to gain precise information on the size and profile of the workforce for the other seven factories, nor to survey workers inside any of the plants. We therefore resorted to surveying approximately 120 full-time workers outside each of the plants, and ensured that all of the major departments in a plant were covered in rough proportion to their normal size. We collected 1,084 completed valid questionnaires. The respondents replied orally to surveyors who filled in the questionnaires.

A bias in our sample is a higher proportion of young assembly-line workers compared to older, more senior members of the workforce due to differences in accessibility. A minority of senior workers drove to work in their own cars, making it impossible for our surveyors to approach them as they drove out of the factory gate. Younger workers, who comprise the vast majority of the assembly line workforce, either went home in company buses or took public transport, giving the surveyors a chance to approach them at bus stops or inside public buses. Many of the unmarried young workers live in company dormitories or private housing near the plants, offering settings that were more open to our surveyors. Fortunately, we believe this sampling bias constitutes only a minor problem, since very few of the older employees who drive cars engage in strenuous assembly work, and our focus is on the injuries of assembly line workers, almost all of whom are young and too low paid to afford cars.

The workforce is very young compared to the auto workforce of the developed world. This is partly due to the very rapid expansion of China's auto industry in the past decade at greenfield sites. The average age in the sample is 24 years old. Ninety-seven percent of them are male; only 16 percent are married; and 12 percent have children. Eighty percent of them have worked at their respective plants for three years or less. About 60 percent are graduates of vocational or technical schools or tertiary technical colleges, and the remainder either hold high school diplomas or university degrees. For 60 percent, their present job is their first job. That the workforce is young is considered an advantage by managers, in that the workers have little comparative perspective about work conditions and do not need to unlearn a slower and much more relaxed socialist state enterprise work ethos. Many are glad to find a job in a multinational company. Since auto plants are located at the edge of expanding cities, about half of the workers have rural household registration status. Some of these are native residents of these new suburbs, and some are work migrants from distant villages. This is a repeat of the days when Japanese auto companies set up plants in American right-to-work states where young recruits were from small towns and farming communities (Fine 2004; Kamata 1982).

Among the sampled workers, 720 were regular contract workers hired directly by the plant, and 271 were "dispatch" workers hired through labor-for-hire agencies. Most of the regular workers in the sample had signed three or five-year individual contracts with the companies, whereas dispatch workers held one or two-year contracts with the agencies. A minority of the twelve plants, such as Guangzhou Honda, wants a better educated and stable workforce and do not hire dispatch workers. Both types of workers work side by side and had about the same take-home pay, except for a difference in benefits. Several of the companies were in the midst of expanding production and building new facilities. These kept their labor turnover rate low while waiting for the new plants to begin operating. Seventy-three percent of the surveyed workers thought that their contracts would be renewed when they expired. The pressure on job security was not a big problem even among the dispatch workers.

The workers' biggest problem was long work hours. At the time of the survey in 2011, joint-venture German, American, Korean, and Japanese cars were enjoying booming sales under the Chinese government's stimulus plan. On average, the manual workforce worked 9.2 hours a day on weekdays and had one and half days off per week. In a few plants, such as Beijing Hyundai, they consistently worked 11-hour days and had one day off a week. When asked "how many hours a day do you think you should work?" the average preference was 8 hours a day and two days off a week. In other words, the workers found the work hours too long.

Musculoskeletal Disorders in Chinese Auto Plants

Our questionnaire has a section on occupational health and safety, including specific questions regarding musculoskeletal problems. Respondents were presented with a sketch of a human figure labeled with common MSD "hotspots" in different parts of the body (See Figure 1).²

Respondents were asked to check off the spots in the diagram where they have been having pain or problems.³ All hotspots are muscular and skeletal related except for the throat and psychosocial mental stress. Out of 1,091 respondents who checked off problem areas in the figure, 861 workers reported a total of 2,749 problem areas. Only 229 workers reported they have no problems at all. In Figure 1 we have retained the percentage of injuries (note, not the number of injuries) at the various injury spots among workers in the Australian auto industry as a check against the reliability of our survey's percentages. As seen, the two sets of percentages are quite similar, despite two differences in data collection. The Australian figure covered the entire auto industry, whereas ours was only for auto assembly plants. The Australian data were based on compensation insurance claims, which means the injuries had undergone clinical evaluation; ours is based on self-reporting without clinical diagnosis. The former was objective assessment, and ours was subjective reporting. Despite these differences, the surprisingly close percentage distribution indicates that our survey's subjective self-reported injuries are still quite reliable.

Table 2 shows that the number of injuries per worker increases steadily with age. By the age of 35, only 10 percent of the workers responded they have not been afflicted by MSD-related pain.

Even those who are not yet 21 years old have an average of two problem areas, and this increases to five by the time they are over 35 years old. Even among workers who are younger than 25, only about a quarter have no physical

Table 2. Workers Who Reported Current Injuries, by Age

Age groups	<21	21 to 25	26 to 30	31 to 35	>35	Total
No. of workers	137	493	170	41	19	860
Percentages (%)	75.3	76.7	86.3	89.1	90.5	79.0

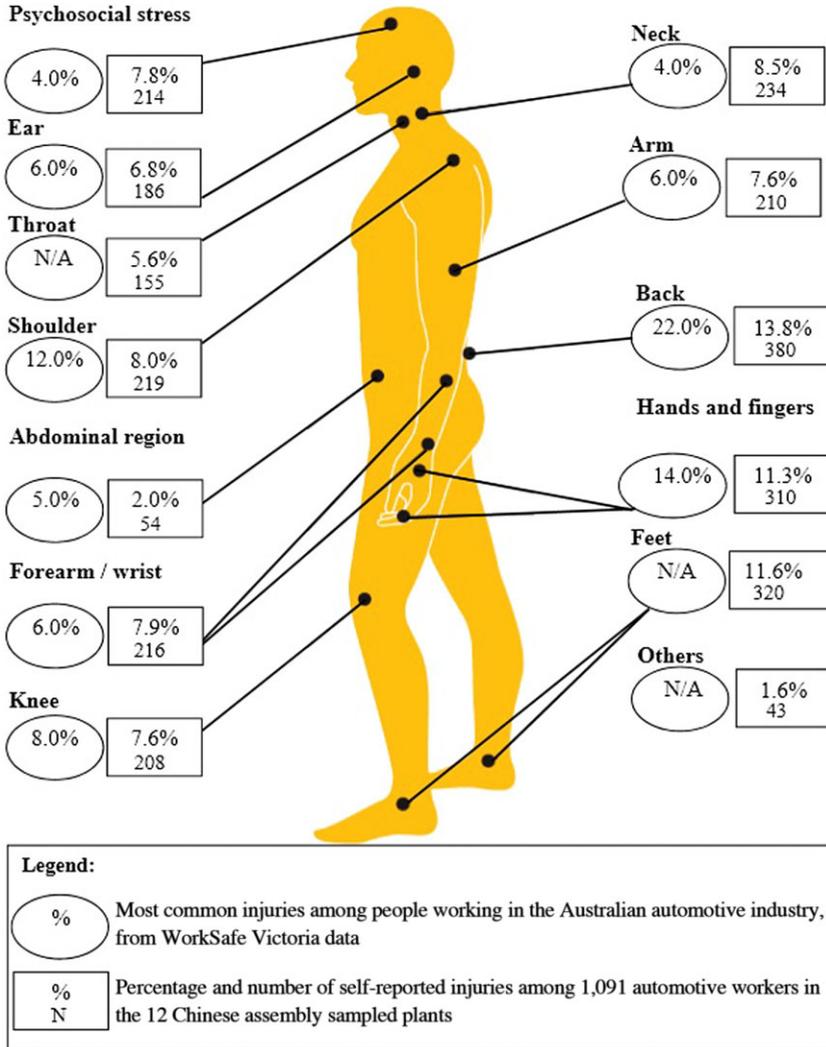


Figure 1. Injury Hotspots in the Automotive Industry in China and Australia.

Note: The percentages of the injury areas in the WorkSafe Victoria chart add up to only 87% because the chart is designed to draw attention to the most common (not all) hazards and injuries.

<http://www.worksafe.vic.gov.au/safety-and-prevention/injury-hotspots-statistics-and-solutions/injury-hotspots-faq#q5>.

problems. What we could not include in the survey are those workers who had injuries and had left the plants and the circumstances under which they left. Some of them might have quit because they could not stand the pain and could not function normally any more. Some of these might have stayed had management allowed them to recuperate by giving them time off, but left because management was not amenable. Had workers with the above situations been able to stay, the injury rates in our sample would have been higher. (Table 3)

Table 3. Average Number of Injuries per Worker According to Age, by Plant

Plant	<21		21 to 25		26 to 30		31 to 35		>35		Total	
	N	Avg	N	Avg	N	Avg	N	Avg	N	Avg	N	Avg
SH VW	4	1.50	60	2.55	29	2.48	5	1.20	0		98	2.42
SH GM	5	3.40	47	4.28	27	4.26	18	5.33	13	6.23	110	4.64
YT GM	6	1.33	53	1.11	12	1.25	5	0.80	0		76	1.13
GZ HD	6	3.33	46	3.22	61	2.97	3	5.67	1	10.00	117	3.21
GZ TY	14	3.43	92	3.68	6	2.50	0		0		112	3.59
BJ MB	13	2.38	51	2.45	3	0.00	3	2.33	1	3.00	71	2.34
BJ HY	7	3.43	77	2.95	25	2.20	4	6.00	3	0.67	116	2.86
TJ TY	17	1.82	53	1.87	16	2.06	0		0		86	1.90
TJ FAW	48	1.50	1	2.00	0		0		1	4.00	50	1.56
TJ XL	10	0.70	23	1.22	0		0		0		33	1.06
ZZ BAIC	9	1.22	66	1.00	10	1.00	3	0.67	0		88	1.01
SZ BYD	43	2.47	74	2.03	8	1.38	5	1.20	2	0.50	132	2.08
Total	182	2.09	643	2.48	197	2.57	46	3.52	21	4.81	1089	2.52

Among workers of the same age, the plants that offer high job security show a higher injury rate than those that have a high labor turnover. This could possibly mean that workers at the high labor turnover plants who showed signs of physical strain and stress had more often been asked to leave the plant or quit of their own accord, resulting in a lower injury rate among the still-employed workforce. In other words, the surveyed plants where workers do not have high injury rates do not necessarily have better OHS records. Notably, the two German joint ventures, Beijing Mercedes-Benz and Shanghai Volkswagen, have better job security and therefore an older workforce, but despite this, their injury rates are not particularly high. This could be a reflection of better OHS conditions in German plants, which generally have a better reputation *vis-à-vis* work conditions.

Are the injury rates in our sample high or low compared to other countries, and do they predominantly occur at similar points of the musculoskeletal frame as in other countries? Data collection for injury statistics varies enormously from country to country, making it very difficult to compare (Wokutch 1992). Based on the expert observations of Cathy Walker, one of the coauthors of the article, who has served as the OHS director of the Canadian auto workers union, who had visited many auto plants in China over the past fifteen years, some more than once, and sometimes had opportunities to talk with management albeit in a formal setting, our survey's injury rate is very high compared to the Canadian data.

The drawing of the figure that we presented to Chinese workers includes "psychosocial (mental) stress" and "throat discomfort," which are not musculoskeletal disorders, and the drawing also includes "foot disorders," which is not listed as an injury hotspot in the Australian survey. It is also not included in the U.S. Occupational Safety and Health Administration's 300-injury illness log (Mirer 2010), even though research on U.S. auto assembly plant workers found that long periods of standing are conducive to foot and ankle disorders. In our Chinese data, foot problems account for 11.6 percent of injuries, which is quite high. We suggest foot problems should be included internationally in schedules of MSD injuries.

Table 4. Relationship between Psychosocial Stress and Musculoskeletal Disorders

Age group	Psychosocial stress	Count	%	Total no. of musculoskeletal injuries	Musculoskeletal injuries per worker
25 and below	Yes	157	19.0	594	3.78
	No	668	81.0	1227	1.84
	Total	825			
Above 25	Yes	57	21.6	231	4.05
	No	207	78.4	482	2.33
	Total	264			
All age groups	Yes	214	19.6	825	3.86
	No	876	80.4	1710	1.95
	Total	1090			

Note: “Yes” means respondents who checked off “psychosocial stress as an injury hotspot.

Though psychosocial mental stress is not an MSD, research on psychosocial conditions at the workplace has found it can aggravate MSDs (Fredriksson et al. 2001; Johansson et al. 1993). Our data show there is indeed a correlation between the two (see Table 4).

Respondents who think that they were under psychosocial stress report approximately two times more MSDs than respondents who say they do not experience this pressure: 3.86 vs. 1.95 (see Table 4). Short of a clinical study, it is difficult to identify the cause and effect relationship between mental stress and physical disorders. It is very likely that they have an adverse effect on each other. Workers who find the work or social relationships at the workplace stressful or are beset with personal or family problems may be more prone to develop physical problems. Conversely, those who have musculoskeletal problems may become psychologically anxious when working in pain and trying to persevere to make a living.

Back injuries are the most common, followed by hands and fingers, and then feet. In the assembly department, where workers have to work in a repetitive cycle of motions, sometimes in awkward positions, 45 percent of the workers reported back disorders, and the stamping department was also especially high, with 37 percent of workers experiencing back problems, while ongoing back injury rates in most other departments range between 25 percent and 35 percent. Hand and finger injuries affect about 35 percent of workers in the stamping, assembly, and automotive interior departments.

There is a distinct difference in the incidence of injuries between online workers at the assembly line compared to off-line workers (see Table 5), such as quality control personnel, material handlers, forklift drivers, machine repairers, etc. Among online workers, a big jump occurs in numbers of injuries by the time workers reach 31 years of age. They report approximately four types of injuries per person, which jumps to 5.5 after the age of 35. While for all age groups, off-line workers have a consistently lower injury rate than online workers, off-line workers who are over 35 experience a doubling of injuries, and beyond the age of 40 the number stays constant. It is possible that, as in auto plants in

Table 5. Average Number of Injuries of On-line and Off-line Workers, by Age

Age group	<21		21 to 25		26 to 30		31 to 35		>35		Total	
	N	Avg	N	Avg	N	Avg	N	Avg	N	Avg	N	Avg
Online workers	128	2.13	478	2.66	138	2.89	38	3.95	13	5.69	795	2.73
Off-line workers	54	2.00	165	1.98	59	1.83	8	1.50	8	3.38	294	1.98

the advanced economies, some Chinese online workers in their mid-30s who can no longer keep up with the speed of the line and are showing symptoms of disorders are given these less stressful non-repetitive off-line jobs or are promoted to supervisory positions.

Such a high injury rate is likely to lead to a short career for most auto workers. Thus, when respondents were asked the question, “With the current work conditions, do you think you can keep working until 40?”⁴ only 34.6 percent of the combined sample of online and off-line workers responded yes, 48.3 percent responded no, and 16.8 percent were undecided.

Factors Contributing to Musculoskeletal Injuries

The three major factors that most affect assembly-line workers are 1) speed of the assembly line, 2) length of work hours and 3) setup of workstations. Jobs that require workers to work in awkward positions are particularly hazardous. Among the twelve sampled plants, the cycle time varies; the shorter the cycle time, the more likely in our survey that workers contract MSD due to an increased number of repetitions.

Shanghai General Motors (SH-GM) exhibits the highest MSD rate. For all the age groups there, the number of injuries per worker increases steadily with age, and for each of the age-groups, the number of injuries per worker is also the highest of the twelve plants, suggesting work conditions in SH-GM are particularly hazardous. More workers here reported feeling pressure due to the speed of the line than workers at other plants. A high number of workers stated there are not enough floaters to replace absentees, which means workers have to speed up when workmates are absent. The work hours were also very long. On average, workers for all plants in the survey worked 9.2 hours on a normal workday and had 1.7 days off at weekends. SH-GM workers worked on average 9.9 hours a day, which was the third longest of the joint ventures in the sample. In addition, SH-GM workers had more difficulty getting sick leave, leading to a higher rate of “presenteeism,” that is, choosing to work when sick at the risk of aggravating their conditions (Dew, Keefe, and Small 2005). Finally, SH-GM had the third highest percentage (25 percent) of workers reporting they felt mentally stressed.

A question was asked how workers felt about various sources of pressures at work—from their superiors, their colleagues, work speed, wages, and the general work environment. For each of these pressures, they had four choices to select from: “never,” “occasionally,” “often,” and “always.” Among the twelve plants, a

comparatively high percentage of SH-GM workers responded they often work under pressure from supervisors and from colleagues, and GM workers also experienced higher-than-average problems with speed, wages, and the work environment. All in all, the findings suggest that SH-GM exerted an enormous pressure both physically and psychologically on its workers.

However, a contradiction has to be addressed. One would have expected that with problems in the work environment and a high rate of injury, more SH-GM workers would want to quit. Surprisingly it is the opposite. When asked whether with current conditions they could work till the age of 40, compared to the other plants a high percentage of SH-GM workers responded yes: 58.7 percent of the ordinary workers, and 78.3 percent of those with supervisory positions. It appears SH-GM workers are willing to trade health problems and pain for comparatively high wages. Their monthly take home pay in 2011 was 4,500 RMB, which was higher than at most auto plants, and in the previous year the workers were awarded a year-end bonus worth five times their basic monthly wage. That year, GM sold the largest number of passenger cars among all Chinese joint ventures. The company was in an upward swing, suggesting the high pay might continue in the coming years.

Disposable Human Bodies

The survey data indicate that a high percentage of workers begin to suffer from MSD not long after they have begun working in the plants. On average, workers checked off two injured areas even before they reach 21. Having a chance to work in an automotive plant, especially in a high-paying joint venture, is regarded as a good job with good prospects. But very quickly they begin to find the work tough and monotonous. In another couple of years, a considerable number have to take off from work now and then to nurse their physical problems. The majority of the respondents think taking sick leave is not a problem; the problem is the wage deduction and loss of bonus for not turning up for work when sick.

At Yantai GM, we conducted two rounds of in-depth interviews with workers in 2011 and in 2013. A worker who was 24 years old in 2011 had worked on the assembly line for six years and had signed two individual contracts with the company. In the month previous to the 2011 interview, he worked 11 hours a day on regular days, and 8.5 hours a day on all four Saturdays and one Sunday, averaging 65.5 hours/per week. His task on the assembly line involved picking up a heavy piece from the floor and then attaching it to another piece. The cycle time was 53 seconds, and after he got used to the movements he could finish the cycle in 40 seconds, which gave him a breathing space of 13 seconds. The production per 8-hour day was 530 pieces, which meant he had to bend down 530 times every 8 hours, or 660 times every 11 hours. He said he was able to keep up with the pace, but he often felt tired and his muscles worn out. Two years later when we interviewed him again, he said a pain in his lower back was getting worse and worse. He could still persist, but the company was putting pressure on

him to quit. Yes, he was allowed to work at other work stations and had become a floater, since he knew how to work at a variety of stations. But this did not help much. He was not able to get lighter jobs as “there are too many workers like me with the same problem.” Many of them had to take extended leave, he said, and after a certain amount of time they would be let go. For each day off, two points were deducted from a 100-point performance bonus. They still obtained a basic wage, but the basic wage was two to three times less than the normal take-home pay. A worker in such a situation could not survive financially and in the end had to resign. “Take me, for instance. Because I have had to take leave on and off, my wage is much lower. My situation now is very bad. My relatives and friends say I am trading off my life for money.”

Another worker has a similar problem. In 2013, he was 33 years old and had worked at the plant for nine years in the car interior department. After six years he began to feel he could not cope, and at age 30, “I began to feel the problem was getting more and more serious.” He is too tall for the task and has to bend over a lot. With time his neck gives way. He began taking off from work and his income declined. He went to a nongovernmental organization (NGO) to see whether he was eligible for worker’s compensation, but discovered that MSD is not included as one of the 115 recognized work-related injuries or occupational diseases eligible for compensation. “How about going to the trade union to seek help?” we asked.

But the trade union represents the company. It does not represent the voice of the workers. . . . Going to the section supervisor is also useless. He’s only concerned with his own situation; he won’t argue on your behalf.

A worker affected by MSD is in a Catch-22 situation. There is no recourse. Workers in this plant are treated as disposable bodies. To attract workers, wages at the GM plant in Yantai are quite high for a city that is not as expensive as big cities, but management policy is to get rid of the infirm without even having to fire them, and lets them resign on their own when they cannot take the pain anymore. Because they are not fired, the company is not liable to severance pay and can get away with paying no compensation or very little.

Absence of Worker Representation

Some studies have indicated that unionization and workers’ representation correlate with a lower rate of industrial injuries (Morantz 2013; Walters 2004; Quinlan 1999). In the advanced industrialized countries, where the trade union movement was once strong, a workplace OHS protection culture persists and is sustained by collective bargaining. Workers’ and public awareness of OHS and ergonomics have pushed unions to accumulate adequate knowledge and experience to lobby and negotiate with governments and employers to uphold OHS standards and institute reforms. For instance, in 2007 the lead author visited the works council at the Opel plant in Bochum, Germany, and was told that some years ago the works council negotiated with management to turn the chassis

sideways to avoid an awkward, injury-prone posture with arms above the head. In a visit to a Porsche assembly plant in Stuttgart, Germany, in 2012, she discovered the works council was able to negotiate that when industrial engineers carry out time studies, average workers and not the most experienced and fastest workers are used. The Canadian Auto Workers Union negotiated in 1966 a collective agreement with the Big Three under which the companies pay for a union time-study representative who is technically as competent as industrial engineers to represent workers on issues regarding OHS and ergonomic improvements. These examples show that strong unions and plant-level worker representation is needed to maintain and improve the safety of the work environment.

How about in China? Up into the 1990s, big state enterprises had an OHS protection system and a Staff and Workers Representative Council, but since then the system has eroded (Chen and Chan 2004, 2010). Today, the focus on profits and efficiency means OHS issues get little priority. The automobile plants contain branches of the official union, and in a joint-venture firm the union chair is usually one of the deputy party secretaries and works closely with the Chinese plant managers and in turn the foreign partner. Whatever the differences between the two joint management sides, the trade union takes on the interests and perspective of the management. Union density is almost always 100 percent among regular workers in these large enterprises. The trade union membership fee is a pittance of a few RMBs a month (about 0.5 percent of a worker's wage per month) and is itemized and checked off from workers' pay slips automatically. China's trade union law also requires the employer to pay 2 percent of the total payroll to the union, which means workplace unions in China are largely funded by management.

In our survey of 720 regular workers, 12 percent were not aware there was a workplace union. Only 57 percent knew they were union members, and of these only 38 percent answered that the union represented their interests. Twenty-five percent responded they knew the meaning of collective bargaining (what the Chinese call collective consultation), and only 12 percent were aware that the union had signed a collective agreement with management (See Table 6). That almost half of the surveyed workers thought they were not union members and that such a small number of workers are aware that there is a collective agreement is surprising, as there is invariably one for such big enterprises, even if it is formalistic.

It is obvious the union does not proactively make its existence known to workers. Though membership is close to 100 percent, a large majority are not aware they pay dues to it. One worker, for instance, thought the unspecified "membership fee" deducted from his monthly pay slip was for Communist Youth League membership. Because the fees are so little, many did not question what the deduction is for. Our research suggests that the trade union prefers workers not to be aware of its presence other than that it hands out small gifts at Chinese New Year and organizes leisure activities, for fear of workers making demands on the union branch. This is true not only in the auto industry but also

Table 6. Workers' Knowledge and Attitudes toward Trade Unions and Collective Consultation

Plant	Trade union in company [†]		Member of trade union [‡]		Trade union represents interests [§]		Knowledge of collective wage consultation [±]		Collective wage consultation in company [¶]		Total
	N	%	N	%	N	%	N	%	N	%	
SH VW	33	97.1	25	73.5	14	41.2	7	20.6	4	11.8	34
SH GM	60	96.8	33	53.2	27	43.5	36	58.1	3	4.8	62
YT GM	29	96.7	26	86.7	18	60.0	4	13.3	1	3.3	30
GZ HD	116	100.0	98	84.5	80	69.0	56	48.3	39	33.6	116
GZ TY	74	100.0	58	78.4	41	55.4	21	28.4	14	18.9	74
BJ MB	69	98.6	37	52.9	25	35.7	7	10.0	6	8.6	70
BJ HY	105	93.8	65	58.0	36	32.1	14	12.5	9	8.0	112
TJ TY	36	90.0	22	55.0	7	17.5	6	15.0	4	10.0	40
TJ FAW											N/A
TJ XL	4	80.0	0	0.0	2	40.0	2	40.0	2	40.0	5
ZZ BAIC	44	100.0	40	90.9	10	22.7	8	18.2	2	4.5	44
SZ BYD	64	48.5	7	5.3	16	12.1	16	12.1	5	3.8	132
Total	635	88.2	412	57.2	276	38.3	178	24.7	89	12.4	720

[†]Does your plant have a trade union?

[‡]Are you a trade union member?

[§]Do you think the plant's trade union represents workers' interests?

[±]Do you know what "collective wage consultation" means?

[¶]Do you know whether your company has "collective wage consultation"?

in other sectors of the economy that contain official union branches (Unger, Beaumont, and Chan 2011).

As a result, there is no pressure on Chinese auto plant union branches to play an active role relating to OHS at the workplace. The coauthors of this article have visited quite a number of auto plants in the past decade and have conducted interviews with management and trade union officials in formal settings. We have yet to come across union officials who mentioned ergonomics and MSD issues. They had scant knowledge of ergonomics and were not aware the issue can be raised in collective consultations. This is also generally the case in other late developing nations. Ergonomics is a young science that in developing countries may be dismissed as a luxury of the wealthy countries. Even in the developed world, the North Americans lag behind the Europeans in research and concern and in recognizing and compensating for MSD injuries (Hopkins 1990).

Conclusion: Occupational Health as a Low-Priority Labor Right

The findings in this study show that with a high workforce attrition rate, assembly-line workers in most of the firms in this high-profile, highly profitable, and relatively well-paying industry in China often suffer the same fate as "unskilled" labor in the less sophisticated labor-intensive sectors—disposable human bodies with a use-by date. The high status of the industry does not guarantee that the OHS problems in the industry draw widespread concern, especially since MSDs are neither traumatic injuries nor fatal. But the research

data show that MSD can be so debilitating that it robs the worker of the ability and therefore the right to work. This right is recognized in Article 25 (1) in the Universal Declaration of Human Rights. "Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family. . . ." Inasmuch as MSD is a very prevalent injury in the auto industry, it should be accorded particular attention.

There are numerous obstacles preventing MSD from being widely recognized in China. The problems can be traced beyond the workplace level to the international level, where OHS ranks low in the hierarchy of labor rights. The ILO has various instruments protecting occupational safety and health, and has collected some grim statistics on work-related injuries and their serious impact on workers and their families. But it is far from being recognized as an important right, less still included as one of the core labor rights.

The low status of OHS is compounded by the fact that labor rights do not enjoy a priority status among human rights in the international discourse on rights. And in the last two decades even the supremacy of human rights has been increasingly challenged by a proliferation of "new rights claims" such as "Rights to Development," "Rights to a Clean Environment," etc. (Chan 1998; Clifford 2005). Rights to a safe work environment and a healthy body at work have not been among them. This can be traced back to the historical discourse on human rights that privileged political and civil rights over economic and social rights. Despite a protracted debate between the developing world and the developed world and among academics and NGO advocacy groups, political and civil rights continue to dominate (Van Ness and Aziz 1999; Nelson and Dorsey 2008). Subsumed under this human rights hierarchy, the ILO has always upheld Convention no. 87, Freedom of Association and Protection of the Right to Organize, and Convention no. 98, Right to Organize and Collective Bargaining, as the two sacrosanct core labor rights. They are regarded as enabling rights essential to the protection of second-order rights such as a minimum legal wage, adequate work conditions, non-excessive work hours, and social security. In this context, OHS at the workplace generally receives little attention in labor rights and human rights discourses.

One source of the problem is an absence of advocacy voices claiming OHS as a labor right. Within the international trade union movement, OHS ranks low after wages, job security, and work hours. The economically advanced countries have recognized MSD as a work-related injury entitling workers to compensation, though Europe led in recognizing MSD ahead of North America. In Australia, it was not until a sudden surge in MSD among keyboard operators with the widespread introduction of computers at workplaces that MSD became a real issue (Hopkins 1990). Notwithstanding this, it has been pointed out in academic fields such as sociology of work, organization studies, and industrial relations that OHS has been understudied (Carter et al. 2013).

As noted, in China MSD has yet to be included in the list of 115 occupational diseases. In 2012, the government took the initiative to revise the list, and in January 2012 even solicited public submissions of suggestions. A year later,

seventeen more occupational diseases and hazards were added to the draft, but MSD-related disorders were not among these new entries (People's Republic of China Ministry of Health 2013). At all levels, from the international to the plant, the environment is not conducive to have MSD recognized. Except for skilled workers, the vast majority of China's assembly-plant workers are disposable. New workers can be easily hired to replace the injured.

China has reasonable labor laws and OHS laws that have set quite high safety standards and an OHS monitoring organizational structure, albeit MSD is not within its purview.⁵ The poor OHS record in China has been due to lax enforcement. The workplace unions and the OHS inspectorate cannot be expected to represent workers' interests, especially in this age of globalization and fierce international competition for foreign investment and global market share. For the last twenty years, poorly staffed and precariously funded tiny labor NGOs in China have attempted to fill the role that should have been performed by the authorities and the trade unions. Their efforts have attained some results, but these are negligible in face of the largest industrial workforce in human history. Partly due to the influence of nearby Hong Kong, Guangdong province is the region in China where OHS awareness is highest and where workers are more active in seeking compensation when injured. Thanks are due to the NGOs' efforts in Guangdong to raise workers' awareness of workplace safety and the legal rights to workplace compensation. Unfortunately, the NGOs' energy is mainly channelled into helping workers to fight for workers' compensation and not on prevention. Admittedly, prevention requires cooperation from management and means extra costs to rectify workplace hazards. This role is beyond the NGOs' power, influence, and expertise. Their work, though commendable, is like putting a tiny bandage onto a large wound. With regard to MSD injuries, there is one thing labor NGOs can do that may lead to positive results—raise awareness among workers, government and union officials, and the society of the importance of ergonomics and lobby the government to recognize MSD is an occupational injury.

The workers themselves have to take up the cudgel. As yet, Chinese workers' consciousness is not high (Chan and Siu 2012). Protests tend to be limited to isolated workplaces and demands are mainly framed as protecting their legal minimum rights and less on raising other demands such as improvement of workplace OHS. Only in rare cases where a sizeable group of workers has contracted serious occupational diseases or fatalities occur in a workplace disaster do workers stage collective protests, and even here, the demands are confined to compensation. Auto workers have not collectively protested over OHS issues. The typical situation is for individual workers when injured to take the exit option. Timid ones suffer in silence, while those more conscious of their rights might seek help from NGOs to try to negotiate individually for the best possible severance package with management. Chinese workers are still a long way behind the injured GM workers in Bogota, where after 200 injured workers were fired some of them formed an injured workers association and have carried out six years of collective protests that have not yet won them compensation but

which have resulted in improved work conditions inside the Bogota plant (Young and Sierra Becerra 2014).

As in Bogota, the responsibility to rectify the troubling MSD situation in China lies with foreign auto companies that have joint ventures in China. These foreign partners should transfer OHS technology and practices as a package when they transfer technology in production. They should take the initiative to study ergonomics among the Chinese workforce as they do in their home country and introduce and popularize the concept and importance of MSD to Chinese managers and workers. They should get their Chinese partners to recognize MSD as an occupational disease. These suggestions may well be wishful thinking since OHS protection is on the decline in the industrialized world. Bogota GM's refusal to compensate the injured workers does not inspire confidence.

The other possible actors who might effect changes are foreign auto unions. Using the Bogota case again as an example, the American Auto Workers Union (UAW) unfortunately prefers to placate GM rather than support the Bogota GM workers (Young and Sierra Becerra 2014). But some European unions are more responsive. Reaching across to the U.S., IG Metall, the giant German union, joined hands with the UAW and was able to convince the Chattanooga Volkswagen plant in Tennessee to let workers hold an election to set up a workers council (Slaughter 2014). Had this project been successful, it would have marked a new stage in American auto industry labor history. The election failed to gain majority vote but the struggle is still ongoing.

Now that China is the biggest producer of German cars, there is a reason for IG Metall to strategize a program in China. The chance of success is not nil. One advantage is the two countries' corporatist tradition of "social partnership" between management and labor (Lüthje 2014). While Germany has works councils, China has staff and workers representative congresses, a Chinese version of works council (Chan and Unger 2009). Presently, German and Chinese auto companies are on good terms. For a start, some lobbying from IG Metall, German labor research institutes such as Friedrich-Ebert-Stiftung, and labor NGOs might be able to convince German auto companies to persuade their Chinese partners to recognize MSD as an industrial injury, run joint training programs, and conduct ergonomic research. At a national level, IG Metall can also seek to interest the All-China Federation of Trade Unions, which has cordial relations with IG Metall, to lobby the Chinese government to revise the OHS injury list. After all, the government did launch a public consultation campaign to invite suggestions when revising the list. An international labor effort might yet affect the Chinese auto industry's OHS culture and practices.

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Notes

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1. Automotive News China, "VW Group sales jump 21% in June, top GM," 16 July 2013, <http://www.autonewschina.com/en/article.asp?id=10500>.
2. The diagram is taken from the website of WorkSafe Victoria, Australia.
3. Constrained by the length of the questionnaire, we were not able to ask questions related to the intensity or frequency of the disorder.
4. In the survey conducted by James Rinehart of Canadian auto workers in the early 1990s, the question was asked whether they could work till 60 years old. But because the Chinese auto workforce is so much younger, we decided to lower the age in the question to 40 years old for fear that young people could not conceive of what they would be doing at the age of 60, and would simply brush off the question and respond "no."
5. Law of the People's Republic of China on Prevention and Control of Occupational Diseases (Order of the President No. 60), http://www.gov.cn/english/laws/2005-10/10/content_75718.htm; Law of the People's Republic of China on Work Safety (Order of the President No. 70), http://www.gov.cn/english/laws/2005-10/08/content_75054.htm.

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