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台灣受僱者的集體力量與其健康之相關

Collective power of employees, and its association with
health outcomes in Taiwan

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國立臺灣大學碩士學位論文
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台灣勞工的集體力量與勞工健康
之相關性分析

Collective power of labors: distribution, correlates
and workers' health outcomes in Taiwan

本論文係張恆豪君 (R02848003) 在國立臺灣大學健康政策與
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謝辭



回顧兩年的碩士班生涯，是一段預料之外的旅程，但也因此對於未來的方向有了更清楚的輪廓。健康除了受到個人行為以及衛生體系的影響，往往忽略有許多其他社會決定因素，也與健康息息相關，其中工作佔了生活時間的一大半，勞動與健康的關係，在經濟發展被奉為圭臬的台灣社會中，應當要有更多的討論與分析。從關心醫療工作者的勞動權益與健康出發，有幸在雅文老師的指導下，接觸更多職業安全衛生領域的議題，涵蓋職業災害保險單獨立法的倡議，也觸及職災個案訪談的生命經驗分析；同時也因為擔任老師多堂課程的助理工作，有機會參與課程的設計規劃，更能體認到作為一個公立大學的學術工作者，在研究、教學、以及社會參與三者之間的投入，老師所樹立的典範對我有深切的影響。

謝謝雅文老師研究室的諸位同學們，特別是怡欣、佩樺、立中、婉汝等幾位學長姊在研究上給予我的幫忙與指教，讓我對研究方法與統計操作有更明確的方向；而介然、育慧、彥莉、翊華、明叡諸位的相伴與討論，也讓研究所的日子有更多有趣的火花。也再次感謝健管所的師長們給予我的鼓勵、指導與包容。

揮別在校園的第十年時光，勿忘無懼的勇氣以及對於事物獨立思考以及批判心。期許自己無論未來在什麼位子，都能成為成為讓社會更好的「解方的一部分」。

中文摘要



背景 勞工參與之意義，在使受僱者得以對影響本身工作條件之各項決策有參與的權利，並增進職場安全衛生職場安全衛生管理的效能。實務上個體受僱者很難介入工作場所職業安全衛生的管理，因此經常是透過如組織工會，形成集體的力量來做參與。然而，台灣受僱者透過集體的力量，參與職業安全與健康的成效如何，缺少相關的研究提供實證資料。

研究方法 研究資料來源為台灣全國具代表性的受僱者問卷調查，本研究探討台灣受僱者的集體力量在不同社經地位、僱傭狀態、心理社會工作特性的受僱者中分佈的狀況，並檢視在受僱者的集體力量與其自評健康、心理健康、以及職災的相關性。此外，為了解受僱者的集體力量如何透過現行的機制影響受僱者的健康，額外進行了補充性的質性訪談。

研究結果 總計有 9180 位男性及 7269 位女性介於 25 至 65 歲之間的受僱者被納入本研究。研究結果發現，受僱者的集體力量在男性與女性受僱者之間並無並無顯著差異。教育程度較低、工時低於 40 小時、定期契約、按件或按時記酬的受僱者有較低的集體力量。在公司規模方面，受僱者的集體力量隨著公司員工人數增加而增加。社會心理工作特性上，高工作負荷、低工作控制、低就業保障、低職場正義的受僱者有較低的集體力量。多變項迴歸分析的的結果顯示，在控制性別與年齡之後，集體力量較低的受僱者的健康風險皆顯著高於集體力量較高的受僱者，自評健康狀況較差、發生職災以及心理健康較差的勝算比分別為 1.89, 1.58, 1.72。受僱者的集體力量對與其健康的相關性，可能是受到僱傭安定性以及職場正義的影響。

結論 本研究結果呼籲應當更為重視受僱者的集體力量對於職業安全衛生管理的重要性，以及對於受僱者健康的正面影響。



關鍵詞：受僱者的集體力量; 工會; 職業安全職業安全與健康

Abstract



BACKGROUND Worker participation allows employees to exercise control over their work conditions and enhances the efficiency of occupational safety and health management in the workplace. It is common for individual employees to participate through collective power, such as by organizing a labor union. However, the associations between the levels of workers' collective power and occupational safety and health (OSH) outcomes have not been empirically examined.

METHODS By utilizing data from a nationally representative sample of paid employees in Taiwan, this study examined the distribution of employees' collective power across socio-demographic categories and work characteristics. The associations of collective power with self-rated health, self-reported occupational injuries, and mental health were examined. A complementary qualitative interview was conducted to explore the possible mechanisms behind the associations of employees' collective power with OHS outcomes.

RESULTS A total of 9180 men and 7269 women aged 25–65 years were studied. The results indicated that employees with lower educational status, lower working hours than 40 per week, fix-termed contract, and piece-rated or time-based payment reported



lower collective power. The collective power increased along the size of the enterprise.

Those who had lower job control, higher job demands, higher employment insecurity

and lower workplace justice were found to possess lower collective power. The results

of multivariate regression analyses showed that lower collective power were associated

with higher risks for poorer self-rated health, higher occupational injuries, poorer

mental health, after adjusting sex and age. The odds ratios were 1.89, 1.58, and 1.72

respectively. The associations were found to be attributed to the correlation of higher

job insecurity and poor workplace justice with lower levels of collective power.

CONCLUSION Findings from this study call for more attention on the importance of collective power of employees in the occupational safety and health management and its influence on workers' health.

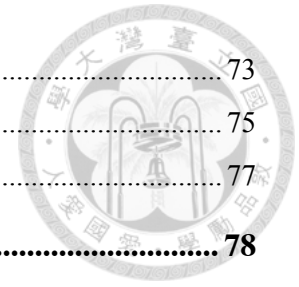
Key words: collective power of employees, union, occupational safety and health

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Chapter 1. Introduction



1.1 Background and importance of this research

Worker participation is an important element of managing occupational safety and health. Workers often know more about the hazards associated with their workplace than anyone else. It can be expected that worker participation may help develop some realistic and effective ways of occupational safety and health management. Workplaces in which employees actively contribute to safety and health management often have a lower occupational risk level and accident rates (Walters, Wadsworth, Marsh, Davies, & Lloyd Williams, 2012). Full worker participation not only includes having the employees be informed, trained and consulted on safety and health, but also involving them in making decisions.

Worker participation is required by the International Labor Organization (ILO)'s Occupational Safety and Health Convention 1981 (C155, C164), and many national governments have ratified the safety and health conventions and update the laws accordingly. In Taiwan, the Occupational Safety and Health Act and other labor regulations enable union or employees' representative to participate in the occupational safety and health management through collective agreement, labor-management



meeting, safety and health work rules, and safety and health committees(孫友聯 & 蔡雅如, 2013). Worker participation also plays a role on intervening in labor policy and securing legislated labor protections, which may also have an impact on occupational safety and health. However, little was known about whether these mechanisms are effective or not, and whether worker participation, particularly via collective power of employees such as labor union, contributes to improve the occupational safety and health outcomes.

Unions have generally been weak in Taiwan and the coverage of collective bargaining agreement is very low. The labor-management relation highly depended on the regulations established by the government. Under this weak nature of Taiwan's unions, though the government has promoted the importance of worker participation in occupational safety and health management, to further understand the effectiveness and barriers is critical to better strengthen the capacity of worker participation.

This study aims to use data from a nationwide survey of paid employees conducted by the Ministry of Labor to explore empirically the association between worker participation, exercising with collective power, and the health outcomes of the employees. I hope this research can provide some policy recommendations for the

governments and occupational safety and health advocates to put more emphasis on the potential function of worker participation through employees' collective power.



1.2 Research objectives

1. To investigate the distribution of collective power of employees in Taiwan across different social economic status, employment status, and psychosocial work characteristics
2. To examine whether the employees with lower collective power may report poorer self-rated health, poorer mental health, and higher occupational injury rate
3. To explore the challenges and barriers behind the potential mechanisms of collective power of employees on occupational safety and health management

Chapter 2. Literature Review

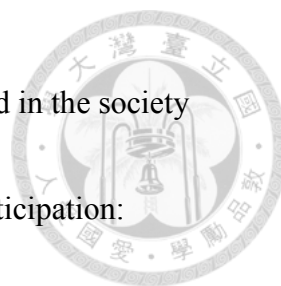


In this chapter, I first discussed the definition of worker participation, and its relation with collective power of employees, such as labor union, particularly in the occupational safety and health management. I then reviewed the previous studies on measurement of union effectiveness, and gave an overview about the development and status quo of labor unions in Taiwan. Legislation mandate of worker participation in occupational safety and health management in different countries was then introduced. I followed by reviewing the empirical studies about the link between worker participation, labor union and occupational safety and health outcomes.

2.1 Worker participation, collective power of employees and occupational safety and health management

2.1.1 Concept of worker participation in occupational safety and health

Worker participation is an important part of managing occupational safety and health, and influences its effectiveness. Strauss said that participation is a process that allows employees to exercise some control over their work and the conditions under which they work (Strauss, 2006). Gonzales put worker participation as a variety of processes and structures which enable and encourage employees to directly and



indirectly contribute to and influence decision-making in the firm and in the society

(González Menéndez, 2009). There were three aspects of worker participation:

provision or exchange of information, consultation and consideration of views of the employees, and full engagement and involvement in management (Health and Safety Commission, 2006). A good model of worker participation may motivate employees to participate in the process of making decisions, which have a direct impact on work environment. In terms of occupational safety and health, employees may have direct interest, and often know more about the hazards associated with their workplace than anyone else, because they regularly work with them. Where process standards require hazards at work to be identified and evaluated, employees' experience and knowledge is crucially important in successfully completing both of these tasks (Gunningham, 2008).

Worker participation can be either direct, which means employees or a group of employees get involved immediately, or indirectly through representative, which can be trade union, work councils or etc (Ozaki & Trebilcock, 2011). In practice, it is very difficult for individual employees to intervene in the management of a workplace; therefore, it is common for individual employees to participate in the occupational safety and health management of a workplace by organizing a labor union (Yi, Cho, &

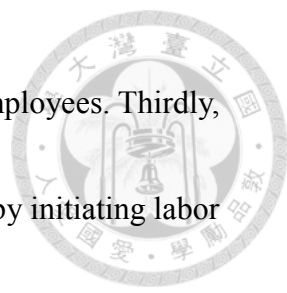
Kim, 2011).



2.1.2 Collective power of employees, labor union, and its importance on occupational safety and health

Collective power is a fundamental concept of a labor union. A single employee achieves very little, but employees may organize themselves in organization like unions or other organizations in order to maximize their collective power. Individuals may benefit from the collective strength of unions, which is linked to the occurrence of regular workplace meetings and for the impact of these meetings on organizational decisions. Additionally, employees seem to benefit individually from unions' collective power in terms of appropriate pay and job security (Furåker & Bengtsson, 2013).


There are several reasons to consider the importance of union's value for occupational safety and health management. Firstly, unions may consider workplace safety a high priority while bargaining collective agreement contract. Many contracts allow union members to refuse to work when the working conditions are regarded to be unsafe and unhealthy. Secondly, unions may provide knowledge and raise awareness about occupational safety and health issues through training program, newsletter, and events. Union safety trainings may be more effective, as they tend to be more



fundamentally worker-centered, and have more credibility among employees. Thirdly, unions may ensure the existing policy and regulations are followed, by initiating labor inspection or strike to increase management awareness about occupational safety and health. Lastly, unions can facilitate and provide guidance for active and effective worker participation at the workplace, such as through requesting and joining occupational safety and health committees (Gray, Myers, & Myers, 1998; Hilyer, Leviton, Overman, & Mukherjee, 2000; Sinclair, Martin, & Sears, 2010).

2.1.3 Measurement of labor union effectiveness

There has been limited research about the measurement of labor union effectiveness. Some researchers used wage level, union density, or coverage of collective bargaining agreement as indicator to analyze union effectiveness. However, union effectiveness also referred to its political and industrial power, and bias may occur when merely the previous mentioned indicators were used. Burchielli constructed a framework for union effectiveness in three dimensions: representation, administration, and ideology. Representative effectiveness encompasses measures for recruiting new members and retaining existing members by achieving outcomes which respond to their needs. Administrative effectiveness may involve structure, leadership and internal




democracy (Burchielli, 2004). Gall and Fiorito proposed a ‘Goal-System’ framework of union effectiveness, focusing more on a few identifiable ultimate indicators such as benefit premium and membership growth (Gall & Fiorito, 2014). Bryson considered the meaning of union effectiveness is correlated with employee perceptions of union effectiveness in delivering improved working conditions. He found strong links between unions’ organizational effectiveness and employee perceptions of internal function of the union and union's effectiveness to deliver better working conditions for its member, such as achieving fair pay, promoting equal opportunities, and protecting workers (Bryson, 2003).

2.1.4 Labor union and collective power of employees in Taiwan

For many decades the Nationalist government (the Kuomintang, KMT) dominated industrial relations in Taiwan as an authoritarian government, manipulating labor unions as supplementary means of authority and even intervening in industrial conflicts.

Unions used to play a weak role until the 1980s, lacking its voice and autonomy. They were employed as supplemental organization to support political and economic strategies of the government instead of representing the collective power of employees.

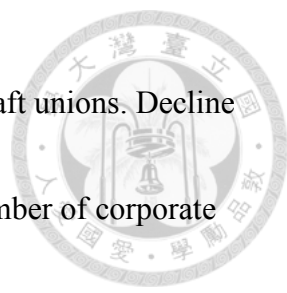
The enactment of the Labor Standards Act in 1984 and the lifting of martial law in 1987 were two landmarks of industrial relations in Taiwan by the 1980s. The state



began loosening its manipulation of industrial relations as well as setting up the Council of Labor Affairs in 1983. The Labor Standards Act, announced in 1984 and modified in 2002, ensures minimum standards for working conditions, and protects employees' rights and interests. Then the three labor laws: Collective Bargaining Agreement Act, Settlement of Labor Disputes Law and Labor Union Law, as the pillars of collective rights, have been substantially modified and implemented since 2011(Chang & Chang, 2010; Chu, 1996).

After the new Labor Union Act took effect in 2011, labor unions in Taiwan can be classified into corporate unions, industrial unions, and craft unions. A corporate union is organized by more than 30 employees within the same factory or workplace of the same business entity, e.g., the Chunghwa Telecom Workers' Union and the Taiwan Railway Labor Union. Industrial union refers to a labor union organized by employees in the industry, e.g., the Taiwanese Nurse Union; while craft union is a labor union organized by employees with the same professional skills, e.g., Taipei Documentary Filmmakers' Union.

According to the governmental statistics, the aggregate union density at the end of 2014 was 33.7 percent. There were 905 corporate unions, 142 industrial unions, and



4088 craft unions, while the majority of union members are in the craft unions. Decline of corporate unions is visible in the past decade, as the aggregate number of corporate union members has been decreasing; while the number of craft unions has doubled since 1990s (Ministry of Labor, 2015). The main purpose to join a craft union is to be covered by the national labor and health insurances. To be entitled to the benefits of labor and health insurance, one person has to be registered as an employee in company or a member of craft union. Craft unions attract members who do not have regular employers or who are unemployed. Therefore craft unions act as "labor insurance unions", and their main function may not be representing members to bargain with associations of employers.


Collective bargaining is regulated by the Collective Agreement Law, which was enacted in 1930 and then modified in 2008. Accordingly, labor union is the only legitimate body to negotiate about a written contract of employment with an employer. However, the coverage rate of collective bargaining is very limited, only 98 collective agreements have been signed by the end of 2013. In another word, collective bargaining in Taiwan is rare and underdeveloped (Tai, 2012).

2.2 Legislation mandate of worker participation in occupational safety and health management in different countries as well as in Taiwan



Development of workers participation in occupational safety and health

management is supported by legal regulation or guidelines worldwide. The International Labor Organization Convention 155 concerning Occupational Safety and Health and the Working Environment in 1981 declared that the national government should consult the employee representative organization to formulate, implement and review the national policy on occupational safety and health. At the workplace, employees should be given the right to have adequate information about safety as well as the right to enquire about any related matters to enable them to participate effectively in this area. The convention also stated that employees or their representatives to be consulted by the employer on all aspects of occupational safety and health associated with their work (ILO, 1981a). Occupational Safety and Health Recommendation No. 164 concerning Occupational Safety and Health and the Working Environment provides further guidance of employees regarding measures to be taken to facilitate the participation of workers and their representatives at the workplace in occupational safety and health related activities as well as cooperation with employers (ILO, 1981b).



European legislations on occupational safety and health recognize the importance of worker participation. The EU Framework Directive 89/391/EEC on managing occupational safety and health sets minimum requirements on workers consultation. Employers are required to consult employees or their representatives and allow them to take part in discussions on all questions relating to safety and health at work (EU-OSHA, 2012). The United Kingdom's Health and Safety at Work etc. Act 1974 and Safety Representative and Safety Committee Regulations 1977 requires the employers to consult the union appointed safety representative on safety and health issues. The Health and Safety (Consultation with Employees) Regulations 1996 has further ensured the consultation for those employees with no union or no safety representatives. In Germany, most of the provisions of the Framework Directive were stated in the act on occupational safety and health ('Arbeitsschutzgesetz', ArbSchG). Trade unions represent their members in the National OSH Conference ('Nationale Arbeitsschutzkonferenz', NAK) as well as the Commission for OSH and Standardisation ('Kommission Arbeitsschutz und Normung', KAN). At the workplace with more than 20 employees, a health and safety committee (Arbeitschutzausschuss)

should be set up, which includes two members of the works council, and individual employees with particular safety and health tasks (Fulton, 2013).



In Australia, the Work Health and Safety Act mandates worker involvement and gives elected employee representatives rights to intervene (Blewett & Dorrian, 2012). It is reported that the introduction of the participation system in the area of safety and health has changed the attitudes of both labor and management regarding safety and health (Warren-Langford, Biggins, & Phillips, 1993). The Occupational Safety and Health Act of Korea also requires employers to establish an occupational safety and health committee composed of an equal number of works and employers (Yi et al., 2011).

In Taiwan, the Occupational Safety and Health Act, formerly known as the Labor Safety and Health Act, came into effect in July of 2014 and expanded the coverage of the act to all employees. Currently, the mechanism regarding worker participation in occupational safety and health, specified in the Occupational Safety and Health Act and other related labor regulations, includes collective agreement, labor-management meeting, safety and health work rules, and safety and health committees (尤素芬 & 陳

美霞, 2007; 孫友聯 & 蔡雅如, 2013; 陳奕翰, 2014). The details of those in the




Occupational Safety and Health Act were as follows:

(1) Employers shall prepare, in consultation with labor representatives, appropriate safety and health work rules which suit their needs. These rules shall be posted and implemented after a copy has been submitted to a labor inspection agency for reference. (Article 34, Occupational Safety and Health Act)

(2) The central competent authority may invite laborers, employers, and government representatives, academic experts, and occupational accident labor organizations to convene occupational safety and health consultative committees to examine and discuss national occupational safety and health policies and provide recommendations; neither genders of members shall comprise less than one third of such a committee. (Article 35, Occupational Safety and Health Act)

(3) In the event that an occupational accident occurs at the workplace of business entities, the employers shall immediately take necessary measures such as first aid and emergency rescue, and conduct an investigation, analysis of the accident, and make record of such in consultation with labor representatives. (Article 37, Occupational Safety and Health Act)



(4) Employers shall formulate a safety and health management plan based on the scale and characteristics of their business entities, and shall also establish safety and health organizations and personnel to implement safety and health management and self-inspections. Safety and health organizations includes a safety and health committee which provides recommendation to the safety and health policies drafted by the employers, and review, coordinate and recommend relevant safety and health matters. Labor representative shall comprise more than one third of such a committee. For the business entity with labor union, the representative may be chosen by the labor union.

(Article 23, Occupational Safety and Health Act)

Even so, the occupational safety and health activities were still mostly dependent on the role of the enterprise owners. All these mechanisms were a matter of formality and did not function well. The discussion about safety and health work rules and the convention of safety and health committees were often predominated by the employers and the employee representatives have little capacity and power to provide opinions and make decision. Besides, due to the low unionization rate and weak collective power, occupational safety and health management was often not the priority of the labor

unions. Occupational safety and health management was also seldom covered in the collective bargaining agreement (尤素芬 & 陳美霞, 2007).



2.3 The link between worker participation, labor union and occupational safety and health outcomes: review of empirical study

Participation of the workers enhances the efficiency of occupational safety and health management in the workplace. Effective worker participation involves risk assessment and measures planning as well as implementation and evaluation of occupational safety and health policies (EU-OSHA, 2012). Rivilis et al conducted a systemic review on the effectiveness of participatory ergonomics, showing a positive impact on musculoskeletal symptoms, reducing injuries, workers' compensation claims, and sickness absence (Rivilis et al., 2008). Several studies have shown that interventions to reduce the risks of work-related musculoskeletal disorders were more effective if worker participation was involved (Oakman & Chan, 2015; Podniece, Heuvel, & Blatter, 2008). Lower accident absenteeism and sickness absence were recorded by Widerszal-Bazyl et al in companies with worker participation compared with those lacking (Widerszal-Bazyl & Warszewska-Makuch, 2008). One study also showed that workers' participation may affect an employee's job satisfaction,

productivity, and commitment, and all of these qualities may create comparative advantage for the organization (Bhatti & Qureshi, 2007). Employers also recognized worker participation as a key success factor for occupational safety and health management and particularly for psychosocial risk management (González, Cockburn, Irastorza, Houtman, & Bakhuys Roozeboom, 2010).

Many of these previous researches involved worker representatives or labor union for the process of worker participation. Support from labor union is an important determinant for an effective worker participation program, and union may also utilizes the collective power to improve in legislation, compensation and prevention. WHO Commission on Social Determinants of Health's report on Employment Conditions and Health Inequalities proposed a model that labor unions may exert its power on both the labor market and social protection policies, modifying employment relations and welfare system so as to result in social and health inequalities (Benach, Muntaner, Santana, & Chairs, 2007). Power resources used by labor unions may act on labor market through employment or unemployment, level of salaries, and welfare state such as pensions and social and healthcare services (Navarro et al., 2006). Brugiavini et al found that union density or collective bargaining coverage correlates approximately

with the welfare state regime types in wealthy countries (Benach et al., 2007; Brugiavini et al., 2001).



The empirical evidence on the effect of unions on occupational safety and health is ambiguous, as previous literatures have not provided conclusive and consistent results (Donado, 2015; Economou & Theodossiou, 2015). Some studies reported a negative relationship between unionization and work-related injuries (Litwin, 2000; Morantz, 2013), whereas other studies find a positive relationship (Fenn & Ashby, 2004). A more recent study using sample of 10 European countries indicated that unionization may reduce fatal and non-fatal injuries at the workplace after controlling the effects of endogeneity (Economou & Theodossiou, 2015). The literature suggested that this ambiguity may be an outcome of bias. The report rate of work-related injuries was higher in workplace with strong unionization. Unions are also more likely to organize in workplaces with more hazards and risks.

There were few studies related to labor union and employees' general health condition and mental health. Dollard et al proposed that unionization was significantly positively related to workers' health, but such relation became non-significant when the factor of psychosocial safety climate was added. Thus it implied that unionization is

related to worker health via psychosocial safety climate (Dollard & Naser, 2013).

Most of these empirical studies were cross-national and measured unionization with union density or membership rates. Merely using these indicators were criticized by some scholars as "density bias", undertaking other sources of power in labor movement (Sullivan, 2010). The measurements of health outcomes, such as injury rate, were mainly aggregated data at the industry or national level, and suffered from using different data sets of the union variables. The material I used for my research, however, allows me to calculate the health outcome variables based on each individual's experience.

Moreover, previous studies mostly focused on the psychosocial hazards associated with poor health outcomes, namely poor job security, low job control, high job demands, low workplace justice (D'Souza, Strazdins, Lim, Broom, & Rodgers, 2003; Kivimäki et al., 2004). But whether there is any upstream factor, which may moderates these psychosocial hazards, was rarely discussed.

Chapter 3. Methods and Materials



3.1 Quantitative questionnaire survey

3.1.1 Study subjects and design

The Council of Labor Affairs of Taiwan has conducted a nationwide survey of paid employees “Survey of Perceptions of Safety and Health in the Work Environment” every 3–5 years since 1988. The questionnaire survey was conducted along with the “Human Recourses Survey” of Department of Statistics, Executive Yuan. Subjects for this study were the participants of the survey conducted in 2013, while it was the first time question items regarding employees’ collective power were added. The survey was distributed between March 17th to March 22nd in 2013.

Participants were selected through a two-stage random sampling process. In the first stage, all districts and villages throughout Taiwan were grouped into strata according to their levels of urbanization. A random sample of districts and villages was chosen from each stratum. In the second stage, a random sample of households was selected within each district or village, and residents of the sampled households who were currently working as paid employees at the time of survey were identified and invited to participate in the survey. Self-administered questionnaires were delivered to

the selected households by trained interviewers. After 1 week, completed questionnaires were collected and onsite checking was performed by the same interviewer. The questionnaire was issued to 28,677 employees, and 25,480 valid questionnaires were recovered with return rate of 88.9%.



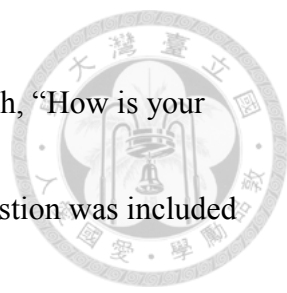
My study subjects were participants aged between 25 to 65 years old, and those who did not answer the question items regarding employees' collective power were excluded. The total number of study subjects was 16,449.

3.1.2 Operational definition of study variables

3.1.2.1 Independent variables

Collective power: measured by asking the study participants two questions about their perception of collective power in their working environment, “(1) in my work place, there is a labor union or a labor organization to defend the interest of the employees”; “(2) in my work place, there is a labor union or a labor organization which is able to influence the policy decision of the enterprise.” (Please refer to appendix questionnaire section 2, question 9, No.22 and No.23.)

3.1.2.2 Dependent variables



Self-rated health: A single item assessing general self-rated health, “How is your health at present”, was raised to the study participants. The same question was included in the universally recognized Short-Form 36 Health Survey. Previous research has shown that a simple, single item general self-rated health question is a strong predictor of mortality and use of physician services.

Occupational injuries: A single item self-reported question was used to measure occupational injuries, “in the past year, did you ever have any injuries or diseases because of your work?”

Mental health: the Brief Symptom Rating Scale (BSRS-5) was used to measure the mental health status, including five symptom items of anxiety, depression, hostility, interpersonal sensitivity/inferiority, and insomnia. BSRS-5 is derived from the 50-item Brief Symptom Rating Scale and has demonstrated good reliability and validity. A cut-off score of 6+ for BSRS-5 was determined for psychiatric disorder, with accurate classification rate of 76.3%.

3.1.2.3 Control variables

The demographic variables included sex, age, and education. The work characteristics variable consisted of average work hours per week, employment contract,

pay system, industry, type and size of enterprise, employment grades, union membership and psychosocial work characteristics such as job demands (psychological and physical), job control, job security, and workplace justice.



Job demands and job control were measured with the Chinese version of Job Content Questionnaire (C-JCQ). Nine items for the job control scale are about learning new things, non-repetitive work, creative work, allowing own decision, high level of skills, freedom to make decision, various tasks, influential opinions and develop one's abilities. Job demands includes seven psychological items related to fast work, hard work, excessive work, insufficient time, concentration on job for long time, hectic work, and insufficient manpower, as well as one physical item related to physically demanding work. The JCQ was based on Karasek's Demand-Control model, which claimed that high job demands and low job control are one of the main factor for job stress.

The 9-item workplace justice scale consists of three items for distributive justice (work duties and responsibilities arranged fairly, rewards and benefits arranged fairly and performance evaluated fairly), two items for procedural justice (employees' opinions influential and employees well informed in decision making process), two items for informational justice (information not hidden, information reliable) and two

items for interpersonal justice (supervisors trust employees and supervisors treat employees with respect).



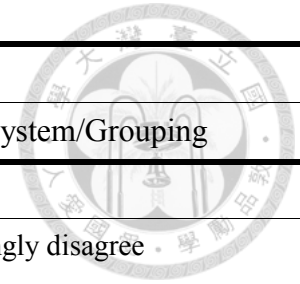


Table 3-1. Operational definition of study variables

Variable	Operational definition	Point system/Grouping
Independent variables		
Collective power	(1) in my workplace, there is a labor union or a labor organization to defend the interest of the employees;	1=strongly disagree 2=disagree
	(2) in my workplace, there is a labor union or a labor organization which is able to influence the policy decision of the enterprise	3=agree 4=strongly agree Collective power score=Q1+Q2
Demographic variables		
Sex	male; female	
Age	what is your age?	25-35; 35-55;55-65
Education	(1)illiteracy; (2)self-study; (3)elementary school; (4)middle school; (5)high school; (6)vocational high school; (7)junior college; (8)university; (9)master; (10)doctor	Junior school or below =1, 2, 3, 4
		High school=5, 6
		College and graduate =7, 8, 9, 10
Work characteristics variable		
Working hours per week	How many hours did you work last week?	<40; 40-48; >48
Employment contract	(1)long-term employment for continuous work; (2)contract for temporary, short-term, seasonal or specific work; (3)part-time, substitution; without specific employment period	fixed term=2, 3
		non-fixed term=1
Pay system	(1)fixed salary; (2)performance-based with basic pay; (3)piece-rated without basic pay; (4)time-based without basic pay	1;2; (3and 4)

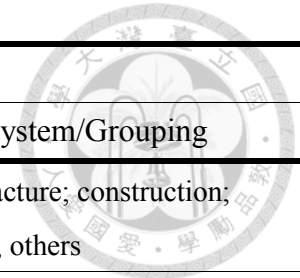


Table 3-1. Operational definition of study variables (con.)

Variable	Operational definition	Point system/Grouping
Industry	What is your workplace and what is the main business?	Manufacture; construction; service, others
Type and size of enterprises	How many people are employed at your workplace? 1; 2-9; 10-29; 30-49; 50-99; 100-199; 200-499; >500; government agency	1-99; 100-499; >500; government agency
Employment grades	What are your work department, position title, and response tasks?	Managers; professionals; non-manual skilled; non-manual low-skilled; manual skilled; manual low-skilled
Union membership	Do you join the union? If yes, which type of union is it: (1) craft union (2) industrial union (3) corporate union?	1=no union membership 2=craft union 3=industrial union 4=corporate union
Psychological job demands	(1) my job requires working very fast; (2) my job requires working very hard; (3) I am not asked to do an excessive amount of work; (4) I have enough time to get the job done; (5) my job requires long periods of intense concentration on the tasks; (6) my job is hectic; (7) there is no enough workforce at my workplace	1=strongly disagree 2=disagree 3=agree 4=strongly agree Score=Q1+Q2+(5-Q3) +(5-Q4)+Q5+Q6+Q7

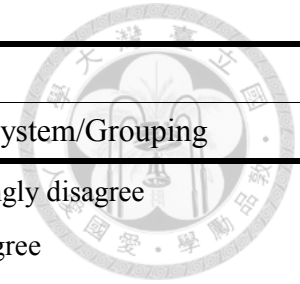


Table 3-1. Operational definition of study variables (con.)

Variable	Operational definition	Point system/Grouping
Physical job demands	My job requires lots of physical effort	1=strongly disagree 2=disagree 3=agree 4=strongly agree no=1, 2; yes=3, 4
Job control	(1) my job requires that I learn new things; (2) my job involves a lot of repetitive work; (3) my job requires me to be creative; (4) my job allows me to make a lot of decisions on my own; (5) my job requires a high level of skill; (6) on my job, I have very little freedom to decide how I do my work; (7) I get to do a variety of different things on my job; (8) I have a lot of say about what happens on my job; (9) I have an opportunity to develop my own special abilities	1=strongly disagree 2=disagree 3=agree 4=strongly agree score=[Q1+Q3+Q5+Q7 +Q9+(5-Q2)]*2 + [Q4+Q8+(5-Q6)]*4
Job security	My job security is good	1=strongly disagree 2=disagree 3=agree 4=strongly agree no=1, 2; yes=3, 4

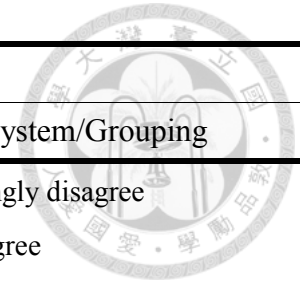


Table 3-1. Operational definition of study variables (con.)

Variable	Operational definition	Point system/Grouping
Workplace justice	(1) my supervisor and management trust employees; (2) information released by my supervisor and management is reliable; (3) my supervisor and management hide important information from employees; (4) in my company, employees' opinions are influential in the company's decision making; (5) in my company, employees' work duties and responsibilities are arranged fairly; (6) in my company, employees' monetary rewards, benefits and welfare are arranged fairly; (7) in my company, employees' performance is evaluated fairly; (8) during the process of making important decisions, my supervisor and management inform employees and provide sufficient information; (9) my supervisor and management treat employees with respect	1=strongly disagree 2=disagree 3=agree 4=strongly agree $score=Q1+Q2+(5-Q3)+Q4+Q5+Q6+Q7+Q8+Q9$
Health status		
Self-rated health	How is your health at present?	1=excellent 2=very good 3=good 4=fair 5=poor good=1, 2, 3, 4 poor=5

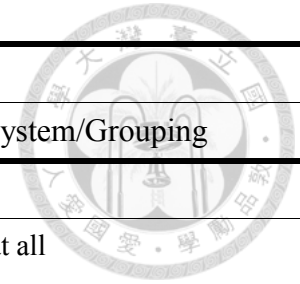
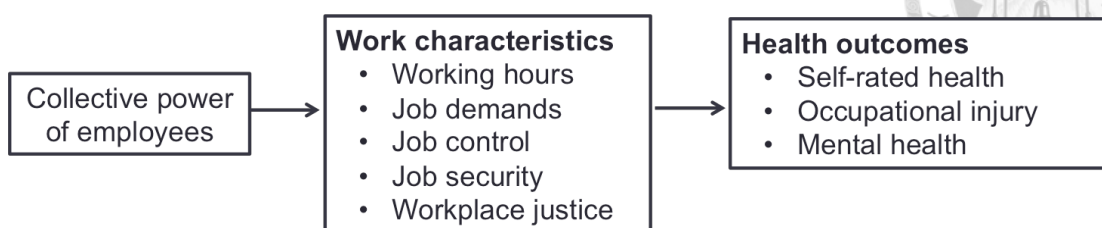


Table 3-1. Operational definition of study variables (con.)

Variable	Operational definition	Point system/Grouping
Occupational injuries	In the past year, did you ever have any injuries or disease because of your work?	yes; no
Mental health	(1) I have troubles falling asleep; (2) I am feeling tense; (3) I am feeling easily annoyed or irritated; (4) I am feeling blue; (5) I am feeling inferior to others	0=not at all 1=a little bit 2=moderately 3=quite a bit 4=extremely score=Q1+Q2+Q3+ Q4+Q5



3.1.3 Research framework



3.1.4 Research hypothesis

Employees with weaker collective power may report poorer health outcomes:


poorer self-rated health, higher occupational injury rate, and poorer mental health.

Collective power may influence health outcomes through its association with work characteristics: working hours, job demands, job control, job security and workplace justice.

3.1.5 Data analysis

Descriptive analyses of collective power by demographic, work characteristic and health status were performed. Chi-square test was used to examine whether there is significant difference of collective power among categories of nominal variables; while t-test was used for continuous variables.

The associations of employees' collective power with poor self-rated health, occupational injuries and poor mental health were examined by logistic regression models. Mediation analyses methods, proposed by Baron and Kenny, are employed to



explore the underlying mechanism by which collective power influences these health outcomes through some intermediate process (Baron & Kenny, 1986). The associations of collective power and working hours, job demands, job control, job security and workplace justice were tested with either linear regression model or logistic regression model. Then collective power and working hours, job demands, job control, job security and workplace justice were used simultaneously to predict the health outcomes. I evaluated if the significant associations between collective power and health outcomes were greatly reduced or became non-significant, when these work characteristics variables were added into the regression model. Lastly, occupational injuries high-risk subgroup: male construction employees was selected to compare the association with the total study population.

SAS 9.4 edition (SAS Institute, Cary, North Carolina, US) was used for all of the analyses.

3.2 Qualitative interview

The purpose of the interview served as a complementary study to explore possible mechanisms behind the influence of collective power on health outcomes of employees.

Besides, the occupational safety and health regulations in Taiwan provided some

specific approach for the employees to intervene in the occupational safety and health management at the workplace, but little was known whether these channels were effective or not, and whether certain challenge or barriers exist.



Unions' executive or other labor organization representatives were the targeted population for in-depth interviews. Study participants were recruited by convenient sampling and snow-ball sampling, which started from my personal networks. 4 participants were selected for the interview, including one from the union of a state-owned enterprise, two from the union of a private owned company (one from the industrial sector, and the other one from the service sector), and another one from a national non-governmental organization related to labor rights. The detailed background of these 4 study participants was shown in table 4-2.

Confidential, semi-structured, and in-depth one-hour face-to-face interviews with each participant were conducted at the participants' worksite in May 2015. The interviews were tape-recorded to facilitate further analysis. To probe the topic of the role of collective power of employees on occupational safety and health management, the following questions were asked: How does the union participate in the occupational safety and health management? What is the current participation in the consultation of



safety and health work rules as well as the occupational safety and health committee?

What does union do for an occupational accident and labor inspection? Does the union

have any strategy to help manage the psychosocial hazards related to overwork? I

followed up with clarifying questions when necessary. After responding to the

semi-structured questions, participants were encouraged to share additional thoughts.

The interview was summarized, and if the part of the content was directly related to our

topics, it would be transcribed and cited.

Table 3-2. Background of study participants

Number	Sex	Age	Job position	Type of enterprise	Time and duration of the interview
No.1	Male	50-60	Director of occupational safety and health of labor union	State-owned enterprise (industrial sector)	2015/5/20; 53min
No.2	Male	50-60	Former president of labor union	Private owned company (industrial sector)	2015/5/26; 127min
No.3	Male	50-60	President of labor union	Private owned company (service sector)	2015/5/27; 158min
No.4	Male	40-50	Secretary General	NGO	2015/5/19; 25min


Chapter 4. Results



4.1 The demographic characteristics, work characteristics, and health status of the study participants

As shown in table 4-1, a total of 16,449 participants were included in this study, 9180 of them were male and 7269 of them were female. In regard to the demographic variables, the average age of male participants was 41.56 (y/o) and 40.28 (y/o) for female. The majority of the participants aged between 35-55 years old. As for education level, most of them had college or graduate degree.

In regard to work characteristics as well as employment status, the average work hours per week for male participants were 43.50 (hr) and 42.53 (hr) for female. The majority of the participants worked between 40 to 48 hours per week, accounting for 78.29% for male and 81.35% for female. Most of the participants had non-fix-termed contract, 80.76% for male, and 81.40% for female. Fixed salary is the major payment system for the participants regardless of gender. Regarding the industry in which the participants worked, the service sector occupied the first place, while manufacture came second. It is worthwhile mentioning that 14.85% of male participants worked in construction industry, but only 2.21% of females in the meanwhile. Participants who



worked in smaller enterprises with employees fewer than 100 sat the primary position, 64.51% for male and 65.48% for female. With respect to employment grades, the majority of male participants were manual low-skilled (24.64%) and manual skilled employees (23.14%), while the majority of female participants were non-manual low-skilled (37.38%).

Male participants showed significantly higher psychological and physical job demands and job control than female ones. In terms of job security and workplace justice, no significant gender difference was found.

Lastly, referring to the health status, around 95% of both male and female participants had good self-rated health. It was more likely for male participants to have occupational injuries (14.3%). More female participants reported to have poorer mental health (17.42%).

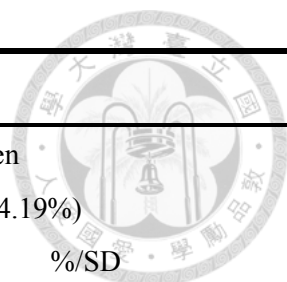


Table 4-1. Background variables of study participants (n=16,449)

	Men (n=9180; 55.81%)		Women (n=7269; 44.19%)		<i>p</i>
	n/mean	%/SD	n/mean	%/SD	
Demographic variables					
Average age*	41.56	10.21	40.28	9.90	<0.0001
Age (years)					<0.0001
25-35	2804	30.54	2531	34.82	
35-55	5222	56.88	4014	55.22	
55-65	1154	12.57	724	9.96	
Education					<0.0001
Junior school or below	1834	19.88	1278	17.58	
High school	3049	33.21	2339	32.18	
College and graduate	4297	46.81	3652	50.24	
Work characteristics					
Average work hours per week (h)*	43.50	8.22	42.53	7.79	<0.0001
Working hours per week (h)					<0.0001
<40	642	6.99	530	7.29	
40-48	7187	78.29	5913	81.35	
>48	1351	14.72	826	11.36	
Employment contract					0.2490
Non-fix-termed contract	7414	80.76	5917	81.40	
Fix-termed contract	1751	19.07	1334	18.35	
Missing value	15		18		
Pay system					<0.0001
Fixed salary	6439	70.14	5543	76.26	
Performance-based with basic pay	1137	12.39	778	10.70	
Piece-rated/ time-based pay	1594	17.36	934	12.85	
Missing value	10		14		
Industry					<0.0001
Others	377	4.11	152	2.09	
Manufacture	3370	36.71	2115	29.10	
Construction	1363	14.85	161	2.21	
Service	4070	44.34	4841	66.60	

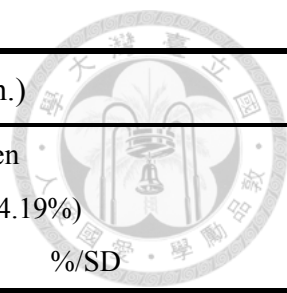


Table 4-1. Background variables of study participants (n=16,449) (con.)

	Men (n=9180; 55.81%)		Women (n=7269; 44.19%)		<i>p</i>
	n/mean	%/SD	n/mean	%/SD	
Type and size of enterprises					<0.0001
1-99	5922	64.51	4760	65.48	
100-499	1203	13.10	869	11.95	
500-	850	9.26	499	6.86	
Government agency	1205	13.13	1141	15.70	
Employment grades					<0.0001
G1: Managers	367	4.00	83	1.14	
G2: Professionals	1188	12.94	1092	15.02	
G3: Non-manual skilled	1784	19.43	1460	20.09	
G4: Non-manual low-skilled	1022	11.13	2717	37.38	
G5: Manual skilled	2124	23.14	330	4.54	
G6: Manual low-skilled	2262	24.64	1546	21.27	
Missing value	433		41		
Psychological job demands	18.04	2.73	17.88	2.87	0.0005
Low	2782	30.31	2438	33.54	<0.0001
Medium	3988	43.44	3045	41.89	
High	2410	26.25	1785	24.56	
Missing value			1		
Physical job demands					<0.0001
No	4292	46.75	4289	59.00	
Yes	4881	53.17	2975	40.93	
Missing value	7		5		
Job control	50.94	13.76	48.36	13.74	<0.0001
Low	2819	30.71	2710	37.28	<0.0001
Medium	2991	32.58	2446	33.65	
High	3370	36.71	2113	29.07	
Job security					0.3154
No	4727	51.49	3798	52.25	
Yes	4447	48.44	3462	47.63	
Missing value	6		9		

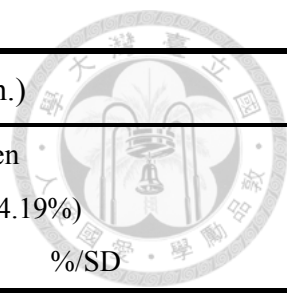
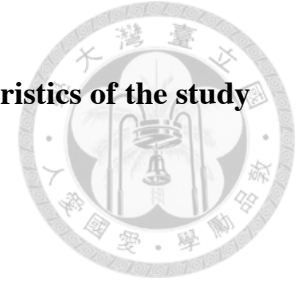


Table 4-1. Background variables of study participants (n=16,449) (con.)

	Men (n=9180; 55.81%)		Women (n=7269; 44.19%)		<i>p</i>
	n/mean	%/SD	n/mean	%/SD	
Workplace justice	59.60	15.31	59.86	15.42	0.2869
Low	3232	35.21	2515	34.60	0.0554
Medium	609	6.63	552	7.59	
High	5299	57.72	4174	57.42	
Missing value	40		28		
Health status					
Self-rated health					0.7406
Good	8848	96.38	7014	96.49	
Poor	327	3.56	252	3.47	
Missing value	5		3		
Occupational injuries					<0.0001
No	7867	85.70	6460	88.87	
Yes	1313	14.30	809	11.13	
Mental health	2.80	3.24	3.13	3.38	<0.0001
Good (BSRS-5 score <6)	7813	85.11	6003	82.58	<0.0001
Poor (BSRS-5 score ≥6)	1367	14.89	1266	17.42	

* referred to t-test, while others were chi-square test



4.2 Collective power by demographic and work-related characteristics of the study

participants

Table 4-2 summarizes the mean scores and standard deviations of collective power of employees by age, education, size of enterprises, industry, employment grades, employment contract, payment system, and psychosocial work factors. No significant gender difference was found on scores of collective power of study participants.

It was noticed that study participants with lower educational status, working hours lower than 40 per week, fix-termed contract, and piece-rated or time-based payment reported lower collective power, regardless of gender. Among the industry, male construction employees were shown to have the lowest collective power. A clear gradient of collective power of study participants was observed along the size of enterprise and employment grade. Participants who worked in larger enterprises with employees more than 500 had higher collective power scores. With respect to employment grades, the collective power reported by the managers was the highest, while by the manual skilled and low-skilled employees were the lowest. In regards to union membership of the employees and the reported collective power, it was shown

that those with no membership had the lowest collective power, while those with industrial or corporate union membership had the highest collective power.



In regard to psychosocial job characteristics, study participants with lower collective power were those who had lower job control, higher job demands, higher employment insecurity and lower workplace justice, regardless of gender. A clear gradient of collective power of study participants was observed along the job control and workplace justice.

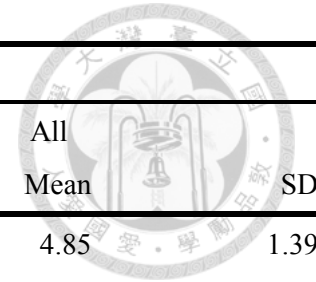


Table 4-2. Collective power by demographic and work characteristic variables of study participants (n=16,449)

	Men			Women			All n	All Mean	All SD
	n	Mean	SD	n	Mean	SD			
Total	9180	4.86	1.39	7269	4.83	1.39	16449	4.85	1.39
Demographic variables									
Age (years)			<i>p</i> =0.002			<i>p</i> =0.1279			<i>p</i> =0.0006
25-35	2804	4.87	1.38	2531	4.87	1.38	5335	4.87	1.38
35-55	5222	4.83	1.40	4014	4.80	1.40	9236	4.82	1.40
55-65	1154	4.99	1.38	724	4.88	1.36	1878	4.94	1.38
Education			<i>p</i> =0.0009			<i>p</i> =0.018			<i>p</i> <0.0001
Junior school or below	1834	4.77	1.38	1278	4.73	1.34	3112	4.75	1.36
High school	3049	4.85	1.36	2339	4.87	1.39	5388	4.86	1.37
College and graduate	4297	4.91	1.42	3652	4.84	1.41	7949	4.88	1.42
Work characteristics									
Working hours per week (h)			<i>p</i> <0.0001			<i>p</i> =0.0068			<i>p</i> <0.0001
<40	642	4.63	1.42	530	4.65	1.37	1172	4.64	1.40
40-48	7187	4.88	1.38	5913	4.85	1.39	13100	4.87	1.38
>48	1351	4.86	1.46	826	4.81	1.42	2177	4.84	1.44
Employment contract			<i>p</i> <0.0001			<i>p</i> =0.0004			<i>p</i> <0.0001
Non-fix-termed contract	7414	4.91	1.40	5917	4.86	1.40	13331	4.89	1.40
Fix-termed contract	1751	4.67	1.35	1334	4.71	1.36	3085	4.69	1.36
Missing value	15			18			33		

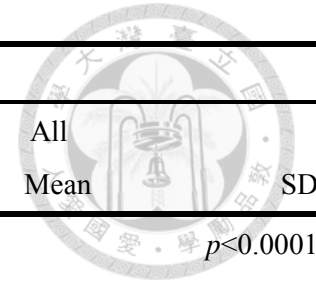


Table 4-2. Collective power by demographic and work characteristic variables of study participants (n=16,449) (con.)

	Men			Women			All		
	n	Mean	SD	n	Mean	SD	n	Mean	SD
Pay system			<i>p</i> <0.0001			<i>p</i> <0.0001			<i>p</i> <0.0001
Fixed salary	6439	4.90	1.39	5543	4.85	1.40	11982	4.88	1.39
Performance-based with basic pay	1137	4.95	1.40	778	4.91	1.33	1915	4.93	1.37
Piece-rated/ time-based pay	1594	4.64	1.38	934	4.63	1.39	2528	4.64	1.39
Missing value	10			14			24		
Industry			<i>p</i> =0.0017			<i>p</i> =0.0677			<i>p</i> =0.0056
Others	377	5.00	1.39	152	4.93	1.43	529	4.98	1.40
Manufacture	3370	4.87	1.38	2115	4.77	1.41	5485	4.83	1.40
Construction	1363	4.74	1.33	161	4.96	1.32	1524	4.76	1.33
Service	4070	4.88	1.42	4841	4.85	1.38	8911	4.86	1.40
Type and size of enterprises			<i>p</i> <0.0001			<i>p</i> <0.0001			<i>p</i> <0.0001
1-99	5922	4.78	1.39	4760	4.79	1.39	10682	4.78	1.39
100-499	1203	4.85	1.38	869	4.75	1.41	2072	4.81	1.40
500-	850	5.07	1.37	499	4.99	1.34	1349	5.04	1.36
Government agency	1205	5.12	1.40	1141	5.00	1.38	2346	5.06	1.39

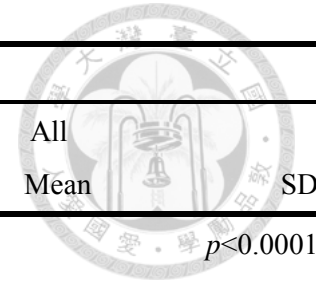


Table 4-2. Collective power by demographic and work characteristic variables of study participants (n=16,449) (con.)

	Men			Women			All		
	n	Mean	SD	n	Mean	SD	n	Mean	SD
Employment grades			<i>p</i> <0.0001			<i>p</i> =0.0002			<i>p</i> <0.0001
G1: Managers	367	5.05	1.43	83	5.00	1.42	450	5.04	1.43
G2: Professionals	1188	4.99	1.40	1092	4.97	1.36	2280	4.98	1.38
G3: Non-manual skilled	1784	4.95	1.42	1460	4.87	1.43	3244	4.91	1.43
G4: Non-manual low-skilled	1022	4.85	1.39	2717	4.83	1.39	3739	4.83	1.39
G5: Manual skilled	2124	4.81	1.34	330	4.70	1.40	2454	4.80	1.35
G6: Manual low-skilled	2262	4.77	1.38	1546	4.73	1.36	3808	4.76	1.37
Missing value	433			41			474		
Union Membership			<i>p</i> <0.0001			<i>p</i> <0.0001			<i>p</i> <0.0001
No union membership	6692	4.74	1.43	5664	4.75	1.42	12356	4.75	1.42
Craft union	1825	5.08	1.26	1270	5.04	1.25	3095	5.07	1.25
Industrial union	362	5.48	1.08	153	5.30	1.33	515	5.43	1.16
Corporate union	269	5.41	1.18	149	5.52	1.03	418	5.44	1.13
Missing value	32			33			65		
Psychological job demands			<i>p</i> <0.0001			<i>p</i> <0.0001			<i>p</i> <0.0001
Low	2782	4.92	1.39	2438	4.91	1.36	5220	4.92	1.37
Medium	3988	4.96	1.30	3045	4.91	1.34	7033	4.94	1.32
High	2410	4.63	1.50	1785	4.59	1.49	4195	4.61	1.50
Missing value				1					

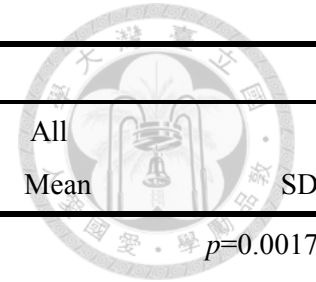



Table 4-2. Collective power by demographic and work characteristic variables of study participants (n=16,449) (con.)

	Men			Women			All		
	n	Mean	SD	n	Mean	SD	n	Mean	SD
Physical job demands			<i>p</i> =0.0002			<i>p</i> =0.3900			<i>p</i> =0.0017
No	4292	4.92	1.38	4289	4.84	1.40	8581	4.88	1.39
Yes	4881	4.81	1.40	2975	4.81	1.38	7856	4.81	1.39
Missing value	7			5			12		
Job control			<i>p</i> <0.0001			<i>p</i> <0.0001			<i>p</i> <0.0001
Low	2819	4.52	1.41	2710	4.52	1.42	5529	4.52	1.41
Medium	2991	4.82	1.32	2446	4.85	1.31	5437	4.84	1.31
High	3370	5.18	1.37	2113	5.21	1.35	5483	5.19	1.37
Job security			<i>p</i> <0.0001			<i>p</i> <0.0001			<i>p</i> <0.0001
No	4727	4.52	1.37	3798	4.52	1.39	8525	4.52	1.38
Yes	4447	5.23	1.32	3462	5.17	1.32	7909	5.20	1.32
Missing value	6			9			15		
Workplace justice			<i>p</i> <0.0001			<i>p</i> <0.0001			<i>p</i> <0.0001
Low	3232	4.08	1.25	2515	4.07	1.24	5747	4.07	1.24
Medium	609	4.68	1.22	552	4.57	1.25	1161	4.62	1.23
High	5299	5.36	1.26	4174	5.33	1.27	9473	5.35	1.26
Missing value	40			28			68		

4.3 Association of collective power and psychosocial work characteristic variables



Tables 4-3 presents the results of regression models of psychosocial work characteristic variables on the collective power of study participants. After controlling sex, age, and other psychosocial work characteristic variables, low employees' collective power, compared to high collective power as reference group, may be associated with lower job control, lower workplace justice, and higher job insecurity. Employees with collective power in the lowest tertile, as compared to those in the highest tertile, had decreased score in job control and workplace justice (2.21 and 11.39 points respectively). The odds ratio for job insecurity was 1.78 for employees with low collective power compared to high collective power.

Table 4-3. Association between collective power and psychosocial work characteristic variables from multivariate linear or logistic regression models

	Working hours per week (n=16389)	Psychological job demands (n=16389)	Job control (n=16389)	Workplace justice (n=16323)	Physical job demands (n=16389)	Job insecurity (n=16389)
Collective power						
Low	$\beta=-0.08$ (-0.37, 0.21)	$\beta=-0.40$ (-0.82, -0.03)	$\beta=-2.21$ (-2.66, -1.76)***	$\beta=-11.39$ (-11.84, -10.94)***	OR=0.88 (0.81, 0.96)**	OR=1.78 (1.64, 1.93)***
Medium	$\beta=-0.14$ (-0.58, 0.31)	$\beta=0.28$ (-0.40, 0.93)	$\beta=-0.32$ (-1.01, 0.36)	$\beta=-6.33$ (-7.06, -5.60)***	OR=0.79 (0.70, 0.90)***	OR=1.15 (1.01, 1.29)*
High	$\beta=0$	$\beta=0$	$\beta=0$	$\beta=0$	OR=1	OR=1
Sex						
Male	$\beta=0.98$ (0.74, 1.23)***	$\beta=-0.94$ (-1.31, -0.58)***	$\beta=2.82$ (2.44, 3.21)***	$\beta=-0.60$ (-1.02, -0.18)**	OR=1.77 (1.65, 1.90)***	OR=1.10 (1.02, 1.18)**
Female	$\beta=0$	$\beta=0$	$\beta=0$	$\beta=0$	OR=1	OR=1
Age						
25-35	$\beta=0.69$ (0.42, 0.96)***	$\beta=1.13$ (0.74, 1.52)***	$\beta=-0.40$ (-0.82, 0.02)	$\beta=0.26$ (-0.19, 0.72)	OR=0.93 (0.86, 1.00)	OR=1.16 (1.07, 1.25)***
35-55	$\beta=0$	$\beta=0$	$\beta=0$	$\beta=0$	OR=1	OR=1
55-65	$\beta=-1.14$ (-1.54, -0.74)***	$\beta=-2.15$ (-2.73, -1.57)***	$\beta=-2.03$ (-2.65, -1.40)***	$\beta=0.77$ (0.09, 1.44)*	OR=1.12 (0.99, 1.25)	OR=0.92 (0.82, 1.03)
Working hours per week (hr)						
<40		$\beta=-3.95$ (-4.65, -3.25)***	$\beta=0.34$ (-0.42, 1.09)	$\beta=0.31$ (-0.50, 1.13)	OR=2.29 (1.98, 2.64)***	OR=2.53 (2.18, 2.93)***
40-48		$\beta=0$	$\beta=0$	$\beta=0$	OR=1	OR=1
>48		$\beta=2.28$ (1.75, 2.80)***	$\beta=0.77$ (0.21, 1.34)**	$\beta=0.46$ (-0.15, 1.08)	OR=1.26 (1.14, 1.40)***	OR=1.15 (1.04, 1.28)**
Psychological job demands						
High	$\beta=2.07$ (1.71, 2.44)***		$\beta=5.46$ (4.89, 6.03)***	$\beta=-6.81$ (-7.41, -6.20)***	OR=13.70 (12.33, 15.22)***	OR=1.09 (0.98, 1.21)
Medium	$\beta=0.75$ (0.44, 1.06)***		$\beta=3.16$ (2.69, 3.64)***	$\beta=-2.52$ (-3.04, -2.01)***	OR=7.07 (6.46, 7.73)***	OR=0.96 (0.88, 1.05)
Low	$\beta=0$		$\beta=0$	$\beta=0$	OR=1	OR=1

Table 4-3. Association between collective power and psychosocial work characteristic variables from multivariate linear or logistic regression models (con.)

	Working hours per week (n=16389)	Psychological job demands (n=16389)	Job control (n=16389)	Workplace justice (n=16323)	Physical job demands (n=16389)	Job insecurity (n=16389)
Physical job demands						
Yes	$\beta=0.14$ (-0.13, 0.42)	$\beta=11.17$ (10.81, 11.53)***	$\beta=-3.68$ (-4.10, -3.25)***	$\beta=0.17$ (-0.29, 0.63)		OR=1.31 (1.21, 1.42)***
No	$\beta=0$	$\beta=0$	$\beta=0$	$\beta=0$		OR=1
Job control						
Low	$\beta=0.37$ (0.04, 0.71)*	$\beta=-4.30$ (-4.78, -3.82)***		$\beta=-4.03$ (-4.60, -3.47)***	OR=1.87 (1.70, 2.06)***	OR=7.33 (6.69, 8.03)***
Medium	$\beta=0.30$ (-0.01, 0.61)	$\beta=-2.57$ (-3.02, -2.12)***		$\beta=-2.30$ (-2.82, -1.78)***	OR=1.26 (1.16, 1.38)***	OR=2.88 (2.64, 3.13)***
High	$\beta=0$	$\beta=0$		$\beta=0$	OR=1	OR=1
Job security						
No	$\beta=-0.64$ (-0.91, -0.36)***	$\beta=0.32$ (-0.08, 0.73)	$\beta=-8.94$ (-9.34, -8.53)***	$\beta=-4.24$ (-4.70, -3.77)***	OR=1.31 (1.21, 1.42)***	
Yes	$\beta=0$	$\beta=0$	$\beta=0$	$\beta=0$	OR=1	
Workplace justice						
Low	$\beta=-0.17$ (-0.47, 0.14)	$\beta=6.06$ (5.63, 6.49)***	$\beta=-3.35$ (-3.82, -2.88)***		OR=0.88 (0.80, 0.96)**	OR=2.16 (1.98, 2.35)***
Medium	$\beta=0.33$ (-0.17, 0.83)	$\beta=2.55$ (1.83, 3.26)***	$\beta=-1.84$ (-2.61, -1.07)***		OR=0.93 (0.81, 1.07)	OR=1.43 (1.24, 1.64)***
High	$\beta=0$	$\beta=0$	$\beta=0$		OR=1	OR=1

* $p<0.05$ ** $p<0.01$ *** $p<0.001$



4.4 Odds ratios of health outcomes of study participants

4.4.1 Health outcomes by collective power of the study participants

Tables 4-4 shows that in the group of employees with low collective power, the percentage of poor self-rated health, presence of occupational injuries, and poor mental health is greater, regardless of gender.

4.4.2 Odds ratios of self-rated health

Tables 4-5 presents the results of logistic regression models of poor self-rated health on the examined social-demographic and work characteristics of all study participants. Male and female study participants were not divided, as previous study finding indicated that no significant gender difference was shown on the collective power of study participants.

When all the examined social-demographic variables, including sex and age, were controlled simultaneously in the regression models, it is found that the presence of low collective power may be associated with poorer self-rated health, with odds ratio 1.89 (1.57, 2.26) compared to high collective power as reference group. The statistical significance was dismissed after the psychosocial work characteristics variables, including work hours per week, psychological job demands, physical job demands, job



control, job security, and workplace justice, were added into the model. The results suggested that job security and workplace justice may respectively affect the association of collective power and poor self-rated health when other variables were controlled.

4.4.3 Odds ratios of occupational injuries

The same pattern was found for occupational injuries as shown in 4.4.1. Tables 4-6 shows the results of logistic regression models of occupational injuries on the examined social-demographic and work characteristics of all study participants. Male and female study participants were not separated, as previous study finding indicated that there is no significant difference of the collective power between male and female study participants.

When all the examined social-demographic variables, including sex and age, were controlled simultaneously in the regression models, it is shown that the presence of low collective power may predict higher occupational injuries, with odds ratio 1.58 (1.43, 1.74) compared to high collective power as reference group. The odds ratio of occupational injuries for medium collective power group was also significantly higher: 1.35 (1.14, 1.59). Both the statistical significance was dismissed after the psychosocial work characteristics variables, including work hours per week, psychological job


demands, physical job demands, job control, job security, and workplace justice, were added into the model. The results showed that job security and workplace justice may respectively affect the association of collective power and occupational injuries when other variables were controlled.



4.4.4 Odds ratios of poor mental health

The same pattern was found for poor mental health as shown in 4.4.1. Tables 4-7 presents the results of logistic regression models of poor mental health on the examined social-demographic and work characteristics of all study participants. Male and female study participants were not divided, as previous study finding indicated that no significant gender difference was shown on the collective power of study participants.

When all the examined social-demographic variables, including sex and age, were controlled simultaneously in the regression models, it is found that the presence of low collective power may predict poorer mental health, with odds ratio 1.72 (1.57, 1.89) compared to high collective power as reference group. The odds ratio of poor mental health for medium collective power group was also significantly higher: 1.79 (1.55, 2.06). After the psychosocial work characteristics variables, including work hours per week, psychological job demands, physical job demands, job control, job security, and



workplace justice, were added into the model, the statistical significance for the low collective power group was dismissed. The significance of odds ratio of poor mental health for medium collective power group was greatly reduced to 1.17 (1.00, 1.37). Job control, job security and workplace justice seem to respectively affect the association of collective power and poor mental health when other variables were controlled.

4.4.5 Odds ratios of occupational injuries among male construction employees

Among the study participants, there were 1363 male construction employees and 22.89% of them reported to have occupational injuries, while 12.00% of the rest of the study participants reported likewise.

Tables 4-8 shows the results of logistic regression models of occupational injuries on the examined social-demographic and work characteristics of male construction employees. When the examined social-demographic variables, age, were controlled simultaneously in the regression models, it is found that the presence of low collective power may be associated with higher occupational injuries, with odds ratio 1.75 (1.32, 2.31) compared to high collective power as reference group. The odds ratio of occupational injuries for medium collective power group was also significantly higher: 1.89 (1.19, 3.02). Both the statistical significance was dismissed after the psychosocial

work characteristics variables, including work hours per week, psychological job demands, physical job demands, job control, job security, and workplace justice, were added into the model. The odds ratios of occupational injuries for both low and medium collective power group among male construction employees were both higher referencing the total study population shown in 4.4.3.



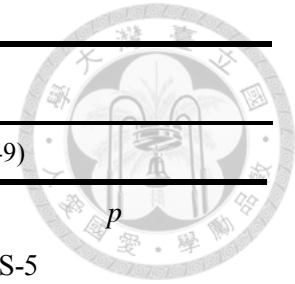


Table 4-4. Health outcomes by collective power of study participants

	Self-rated health (n=16441)			Occupational injuries (n=16449)			Mental health (n=16449)		
	Good	Poor	<i>p</i>	No	Yes	<i>p</i>	Good (BSRS-5 score <6)	Poor (BSRS-5 score ≥6)	<i>p</i>
	n (%)	n (%)		n (%)	n (%)		n (%)	n (%)	
Male			<0.0001			<0.0001			<0.0001
Collective power									
Low	3943 (95.38)	191 (4.62)		3437 (83.10)	699 (16.90)		3397 (82.13)	739 (17.87)	
Medium	847 (96.47)	31 (3.53)		751 (85.44)	128 (14.56)		699 (79.52)	180 (20.48)	
High	4058 (97.48)	105 (2.52)		3679 (88.33)	486 (11.67)		3717 (89.24)	448 (10.76)	
Female			<0.0001			<0.0001			<0.0001
Collective power									
Low	3188 (95.33)	156 (4.67)		2900 (86.67)	446 (13.33)		2652 (79.26)	694 (20.97)	
Medium	694 (97.88)	15 (2.12)		624 (88.01)	85 (11.99)		577 (81.38)	132 (18.62)	
High	3132 (97.48)	81 (2.52)		2936 (91.35)	278 (8.65)		2774 (86.31)	440 (13.69)	
All			<0.0001			<0.0001			<0.0001
Collective power									
Low	7131 (95.36)	347 (4.64)		6337 (84.70)	1145 (15.30)		6049 (80.85)	1433 (19.15)	
Medium	1541 (97.10)	46 (2.90)		1375 (85.59)	213 (13.41)		1276 (80.35)	312 (19.65)	
High	7190 (97.48)	186 (2.52)		6615 (89.65)	764 (10.35)		6491 (87.97)	888 (12.03)	

Table 4-5. Odds ratios of poor self-rated health from the multivariate logistic regression models

	Overall (n= 16407)	Overall (n= 16381)
Collective power		
Low	1.89 (1.57, 2.26)***	1.13 (0.92, 1.39)
Medium	1.14 (0.82, 1.59)	0.81 (0.57, 1.13)
High	1	1
Sex		
Male	1.01 (0.85, 1.20)	0.94 (0.79, 1.11)
Female	1	1
Age		
25-35	0.53 (0.43, 0.66)***	0.52 (0.42, 0.65)***
35-55	1	1
55-65	1.44 (1.15, 1.81)**	1.52 (1.20, 1.92)***
Working hours per week (hr)		
<40		2.11 (1.64, 2.72)***
40-48		1
>48		1.41 (1.12, 1.77)**
Psychological job demands		
High		2.20 (1.71, 2.83)***
Medium		0.96 (0.75, 1.23)
Low		1
Physical job demands		
Yes		1.58 (1.30, 1.94)***
No		1
Job control		
Low		1.25 (0.98, 1.58)
Medium		1.16 (0.92, 1.46)
High		1
Job security		
No		1.39 (1.14, 1.70)**
Yes		1
Workplace justice		
Low		1.85 (1.50, 2.28)***
Medium		1.67 (1.20, 2.32)**
High		1

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

Table 4-6. Odds ratios of occupational injuries from the multivariate logistic regression models

	Total (n=16415)	Total (n=16389)
Collective power		
Low	1.58 (1.43, 1.74) ***	1.09 (0.97, 1.22)
Medium	1.35 (1.14, 1.59) ***	1.05 (0.89, 1.25)
High	1	1
Sex		
Male	1.32 (1.20, 1.45) ***	1.18 (1.07, 1.30)**
Female	1	1
Age		
25-35	0.69 (0.62, 0.77) ***	0.68 (0.61, 0.76)***
35-55	1	1
55-65	1.14 (0.99, 1.31)	1.22 (1.06, 1.41)**
Working hours per week (hr)		
<40		1.56 (1.33, 1.84)***
40-48		1
>48		1.22 (1.07, 1.39)**
Psychological job demands		
High		1.57 (1.36, 1.81)***
Medium		1.00 (0.87, 1.14)
Low		1
Physical job demands		
Yes		2.29 (2.05, 2.59)***
No		1
Job control		
Low		0.89 (0.78, 1.02)
Medium		1.00 (0.88, 1.13)
High		1
Job security		
No		1.18 (1.06, 1.31)**
Yes		1
Workplace justice		
Low		1.91 (1.70, 2.15)***
Medium		1.22 (1.00, 1.49)*
High		1

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

Table 4-7. Odds ratios of poor mental health from the multivariate logistic regression models

	Total (n=16415)	Total (n=16389)
Collective power		
Low	1.72 (1.57, 1.89)***	0.99 (0.88, 1.10)
Medium	1.79 (1.55, 2.06)***	1.17 (1.00, 1.37)*
High	1	1
Sex		
Male	0.84 (0.77, 0.91)***	0.75 (0.69, 0.82)***
Female	1	1
Age		
25-35	0.96 (0.87, 1.05)	0.91 (0.83, 1.00)
35-55	1	1
55-65	0.73 (0.63, 0.85)***	0.83 (0.71, 0.96)*
Working hours per week (hr)		
<40		1.29 (1.09, 1.53)**
40-48		1
>48		1.15 (1.01, 1.30)*
Psychological job demands		
High		3.32 (2.90, 3.79)***
Medium		1.44 (1.27, 1.64)***
Low		1
Physical job demands		
Yes		1.22 (1.10, 1.34)***
No		1
Job control		
Low		0.74 (0.65, 0.83)***
Medium		0.83 (0.74, 0.93)**
High		1
Job security		
No		1.12 (1.02, 1.24)*
Yes		1
Workplace justice		
Low		2.99 (2.68, 3.33)***
Medium		1.70 (1.42, 2.03)***
High		1

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

Table 4-8. Odds ratios of occupational injuries of male construction employees from the multivariate logistic regression models

	Total (n=1359)	Total (n=1359)
Collective power		
Low	1.75 (1.32, 2.31)***	1.32 (0.96, 1.82)
Medium	1.89 (1.19, 3.02)**	1.57 (0.96, 2.58)
High	1	1
Age		
25-35	0.85 (0.61, 1.18)	0.84 (0.60, 1.18)
35-55	1	1
55-65	1.09 (0.76, 1.56)	1.08 (0.75, 1.55)
Working hours per week (hr)		
<40		1.28 (0.98, 1.82)
40-48		1
>48		1.36 (0.86, 2.12)
Psychological job demands		
High		1.73 (1.14, 2.64)*
Medium		1.25 (0.85, 1.84)
Low		1
Physical job demands		
Yes		1.31 (0.88, 1.95)
No		1
Job control		
Low		0.85 (0.59, 1.23)
Medium		0.97 (0.69, 1.37)
High		1
Job security		
No		1.42 (1.01, 1.98)*
Yes		1
Workplace justice		
Low		1.47 (1.08, 2.00)*
Medium		0.94 (0.52, 1.71)
High		1

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$



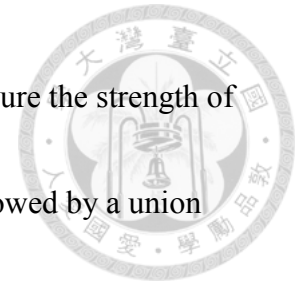
4.5 Unions' participation in the occupational safety and health management

4.5.1 Unions' role in overseeing related regulations

As previously noted, the current legally regulated mechanism of worker participation in the occupational safety and health management includes collective agreement, labor-management meeting, safety and health work rules, and safety and health committees. The basic role of union is to ensure that the enterprise abides by the regulations related to occupational safety and health. None of the interviewee of the union representatives noted that they have signed collective agreement with the employers. But they all had safety and health committee to establish safety and health work rules and discuss about any safety and health related matters. Labor- management meetings were also regularly held, but mainly for negotiating employment conditions such as salary, work hours and etc.

Labor inspection is fundamental to ensure that the previous stated legal regulations are followed and union plays an important role in assisting the labor inspection. When an employee appeal to the labor union, labor union may seek whether it is a generalized violation at different workplaces of the enterprise, and inform the authority concerned for labor inspection. Union's accompany during the labor

inspection also helps to prevent threat from the management and secure the strength of union. The quality of the inspection improves if the inspector is followed by a union member being knowledgeable about the circumstances at the workplace.



"Our accompany during the labor inspection may make the laborers feel supported and feel that labor union is able to play the responsible role expected. We also told the labor inspectors to watch for whether overtime pay is listed on the payslip..... After the inspection, the manager has recruited more employees and given the laborers enough time-off they deserved." (case No.2)

4.5.2 Unions' bargaining power

The occupational safety and health committee at the workplace is regarded as the most important and regular approach that unions are involved with occupational safety and health. The depth of the participation and how occupational safety and health is emphasized may vary between unions. All my interviewees reported that the regulations are rarely violated and the protection for the employees is sufficient, but the role of unions, especially those of the state-owned enterprises with more bargaining power, is to establish standards surpassing the regulations, for example to include more health check-up items for the employees. Once any occupational injury accident occurs, the



unions may also propose measures to improve the safety protection and review the necessary training courses during the committee meeting. The union of the state-owned enterprise often holds preparation meeting prior to the committee meeting. The interviewees further pointed out that the perception of managers about occupational safety and health also influences the negotiation during the committee meeting.

"Our (state-owned) enterprise considers occupational safety and health to be important, therefore normally the union and the employer have similar mindset for the protection of employees. Compared to other private enterprises, state-owned enterprises have less concern about cost so that it is easier for union to achieve better negotiation results." (case No.1)

"Due to the time constraints of the (private enterprise) employers, it is very often that we combined several meetings together in one day. As the union had many items about working conditions to negotiate, normally we spent very little time discussing about occupational safety and health issues." (case No.2)

However, the proper and effective participation in the occupational safety and health committee may be restricted to mainly the unions of state-owned enterprise, or unions with more collective power, needless to say that worker participation in

occupational safety and health management within an enterprise with no union is merely a matter of formality.



"When the management side is too strong and the union is too weak to formulate a solid position, the union may act very passively to support their members to report the occupational injury accidents.....The system of the union of state-owned enterprise may be more robust, but also more rigid. And we shouldn't forget many enterprises don't have corporate unions, and industrial unions don't have strong power to request for more participation." (case No. 4)

The union representative reported that even though the employees in the state-owned enterprises rarely have occupational injuries, it is observed that the accidents may occur in their outsourcing projects. The employees of these outsourcing projects were not union members, and union's high standard of occupational safety and health may not be able to apply to them.

"Due to privatization of the state-owned enterprise, there is an increase of using outsourced or dispatched workers. It is very difficult to supervise their occupational safety and health management. For example, though we require certain certification of the workers, we cannot guarantee they are from the exactly same workers at the

workplace." (case No.1)



One of my interviewees showed particular concern about the burnout and mental health problems of the employees at their workplace. They have intervened with the verbal violence cases, as well as analyzed relevant causes of high frequency of overtime work and high turnover rate so as to pressure for change at the labor-management meeting.


"Burnout and psychological stress are very serious problems for workers in the financial service sector. This may be due to required sales achievement and pressure from the executives. In our enterprise, there is the culture that if you have great competence, you will work to death. We have found that many workers got sick in recent years and the turnover rate has remained very high. We emphasized in the labor-management meeting that the fundamental way to solve the overwork problem is to improve the human resources allocation." (case No.3)

Chapter 5. Discussion



The results from this study indicated that employees with fix-termed contract, and piece-rated or time-based payment reported lower collective power. Employees working in smaller size of enterprise, in construction industry, those who were manual skilled and low-skilled employees, and those with no union membership also had lower collective power. In regards to psychosocial job characteristics, study participants with lower collective power were those who had lower job control, higher employment insecurity and lower workplace justice. No significant gender difference was found. The results of logistic regression models showed that low collective power may be associated with poor self-rated health, presence of occupational injuries, and poor mental health. The associations were found to be attributed to the correlation of higher job insecurity and poor workplace justice with lower levels of collective power. The effect of collective power on occupational injuries is greater for male construction employees compared to general study participants.

In many other countries, union is the most fundamental and legally important form of employees' collective power. But in Taiwan the organization rate of corporate union and industrial union is very low, and many unions were not able to represent their



members to bargain with the employers. I used the concept of employees' collective power instead of labor union to analyze, aiming at avoiding the possible misinterpretation of labor union, and including other forms of worker participation such as labor-management meeting, self-help organizations, or any other type of group of employees that may defend the interest of the employees and influence the policy decision of the enterprise. The results of employees' collective power by union membership reflected the general understanding how different types of union functions in Taiwan. In addition, how the questionnaire evaluated employees' collective power was very much linked to the concept of procedural justice (denoting the fairness in the decision-making procedures), and the results from the correlation analyses indicated that employees' collective power was highly correlated with procedural justice. These findings further substantiated the validity of question items for employees' collective power. Nevertheless almost all previous literature used labor union as the research subject, and my present findings showed consistency with that of available studies. It is needed to cautiously remember the employees' collective power in my study includes but not limited to labor union.



5.1 Distribution of collective power of employees by demographic and work

characteristics

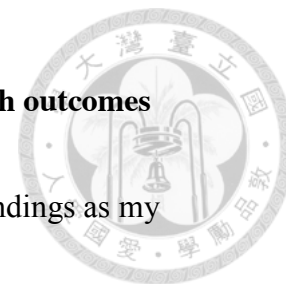
In many countries, employees with standard employment relationship are often union members, or covered by collective bargaining contracts. The increase of informal or precarious employment in recent years has weakened unionization (Bonner & Spooner, 2011; Vosko, 2006). Evidence shows that members of union earn significantly more than their non-union counterparts (Long, 2013). Multiple previous researches have shown that union may reduce wage inequality and union density as well as bargaining coverage correlates negatively with wage inequality (Aidt & Tzannatos, 2002; Dell'Aringa & Pagani, 2007). Furthermore, workers paid for performance, by using variable pay such as bonuses, commission, or piece-rated, are relative unlikely to be union members, as such system individualize the employment relationship and exclude the union involvement (Lemieux, MacLeod, & Parent, 2007; Metcalf, Hansen, & Charlwood, 2001; Rute Cardoso et al., 2008). In Taiwan, the number of temporary and dispatched workers has increased in the past decades (陳宇治, 2012), placing challenge for the labor union especially that the dispatched workers are not allowed to join the union of users enterprises. My interview with the union of state-owned enterprise

further linked this precarious employment tendency with privatization and union has lost control over occupational safety and health management.




Collective power, taking union density as an indicator, is quite divergent by industry among different countries. In almost all countries, the public sector is more unionized than the private sectors (Waddington, 2005). In 2013, collective agreement coverage for construction workers was 15.8% in UK, and 27.3% in Canada (BIS, 2014). However, the increased temporary contracts and subcontracting in the construction industry has destabilized collective agreement and eroded the union power (Wells, 2001). Most of previous studies have found that the level of union membership and collective bargaining coverage to be lower in small- and medium-sized enterprises (SMEs) than in larger firms. The difficulty of unionization in SMEs may be particularly due to close interpersonal relationship and organizational loyalty (Holten & Crouch, 2014; Industrial Relations in Europe 2006, 2006; Kirton & Read, 2007). In Taiwan, the Labor Union Act regulates that unions must be established with at least 30 employees. Although the amendments in 2010 introduced industrial union for worker in the same industry across different workplaces and regions, challenge remained because of low membership rate and limited rights.

5.2 Collective power of employees and its correlations with health outcomes



Some previous studies have also provided similar empirical findings as my research. Yi et al used various database in Korea including occupational accident compensation data and found that in the manufacture industry with five or more employees, workplaces with labor unions had a lower rate of occupational injury and illness than one without a labor union in 2007. (Yi et al., 2011). Boal analyzed the effect of unionism on accident fatalities in USA coal mining industry with state-level and mine-level data between 1897 to 1929. Unionism appeared to reduce the frequency of fatal accident in coal mining after controlling number of days and hours worked, coal mining by machine, workers' compensation and state safety regulations. It was possible as previously assumed that the union workers tend to support one another, refusing to work in unsafe places (Boal, 2009). Unionization may reduce fatal and non-fatal injuries at the workplace after the effects of endogeneity were considered. (Economou & Theodossiou, 2015)

My findings went beyond linking collective power of employees with their risk of occupational injuries, and reflect the associations with general health condition and mental health in particular. Overwork, work pressure and burnout is a very critical




problem in Taiwan's labor market, and the work-related karoshi, stroke, or mental disorders were reported frequently in the past decades. The fundamental approach to combat these adverse health outcomes is to eliminate the psychosocial hazards, and one of the interviewees showed that employees' collective power may play an important role for raising awareness and negotiating with the employers for better working conditions.

5.3 Exploring the mechanisms of collective power of employees on health outcomes

5.3.1 Intervening psychosocial hazards

The quantitative study indicated that job security and workplace justice may affect the association of collective power and health outcomes of employees. Even though in practice, unions or other employees' organization may not have the competence in occupational safety and health management and set a high priority, their intervention in the employment relations, such as assisting the laid off employees for their rights and benefits or protecting the employees from workplace violence, is expected to bring a positive effect on the health outcomes of employees.

Some previous studies have shown that union members feel more security over their current jobs. Survey in New Zealand and USA suggested that union membership is related to employee's perceptions of job security and job satisfaction (Brochu & Morin,



2012; Shulruf et al., 2010). It was more likely for employees to get job security guarantee when union at the workplace have a higher membership (White & Bryson, 2013). Union were also the main driven force for the expansion of job security regulations (Emmenegger, 2014). In addition, ensuring fair treatment and reducing arbiter rules of employers are perhaps one of the most important functions of unionization. Both the procedural and distributive justice afforded by grievance system was strong predictor of satisfaction with a union (Bennett & Kaufman, 2011; Fryxell & Gordon, 1989).

The role of employees' collective power was traditionally restricted in workplace safety, but employees' collective endeavor on improving working conditions may also have an ultimate positive effect on their health outcomes. As the amendments to the Taiwan Occupational Safety and Health Act came into effect in 2014, the employers are required to take precautionary measures to prevent adverse physical and mental health effects resulting from abnormal working schedule and workplace violence. In additions to that employees are able to participate in workplace planning to reduce chemical or ergonomic hazards and unsafe procedures, they may also collectively require the precautionary measures for psychosocial hazards be implemented.

5.3.2 (Psychosocial) safety climate



One way to understand the influence of collective power on employees' health outcomes may be through changing workplace safety climate. Workplace safety climate referred to the value, attitude or belief employees possess for their safety at the workplace. How the employers concerned about and committed to the safety and health at the workplace would also influence the workplace safety climate. Gillen et al. found that unionized construction workers reported a stronger safety climate than non-unionized construction workers, perhaps owing to the role union play for occupational safety policy enforcement (Gillen, Baltz, Gassel, Kirsch, & Vaccaro, 2002). Union safety values, the relative priority union place on safety issues, were also found to influence employee safety outcomes through its association with higher safety motivation, particularly on engagement of safety participation and to comply with basic safety requirements. Safety motivation was related to employees' concern of their own health, and was strengthened when union supported their desire to be safe (Sinclair et al., 2010). Organizational justice was shown to be closely associated with workplace safety perception and employees' safety behaviors (Gyekye & Haybatollahi, 2014). Psychosocial safety climate, policies practices, and procedures for the protection of




worker psychological health and safety, was previously found to moderate the effects of job demands on mental health, and involvement of workers such as union representative, is a principal component in psychosocial safety climate (Hall, Dollard, Winefield, Dormann, & Bakker, 2013; Idris, Dollard, Coward, & Dormann, 2012).

5.3.3 Participation in the occupational safety and health committee and labor inspection

Currently, the most common approach for unions to be involved in the occupational safety and health management in Taiwan is through participation in the safety and health committee at the workplace. Previous studies in other countries showed that lower work injuries rate were observed in enterprise where an union participated in the occupational safety and health committee (Nichols, Walters, & Tasiran, 2007). The input and performance of unions may have an impact on the quality of the design and function of the occupational safety and health system at the workplace (Chen & Chan, 2004).


Based on the scale and characteristics of the enterprise, not all enterprises in Taiwan were required to establish the safety and health committee. Enterprise with fewer employees may not have much resource to recruit safety and health professionals,



therefore worker participation would be even more important. Still, in enterprises with safety and health committees, very few of them were able to be involved in the decision making, such as occupational safety and health standards, finance, and work injuries investigation report (李燕清, 2001; 徐嘉珮, 1997).

Due to the lack of importance of the committee, union representative may lose the interest to be involved. Also, many unions in Taiwan reported that occupational safety and health was not their priority, as they already had difficulties to survive and occupational safety and health is too professional for them to handle. Even employees would consider occupational safety and health to be less important and bothersome to comply with. But still some unions, especially those in the state-owned enterprise, was able to coordinate different resources to provide training for their members, respond to the need and complaints of the members, oversee the health check-up, and even request for policy changes (曾鈺琄, 2001).

Besides, currently there is a lack of labor inspectors in Taiwan: in 2012 one labor inspector was responsible for 27,634 employees, which is below the ILO standard one per 10,000 employees for industrial market economies (行政院勞工委員會, 2013; ILO, 2006). It is crucial to have worker participation to supplement and strengthen labor




inspection. Weil found that unions may increase the enforcement of occupational safety and health inspection. Employees were much more likely to accompany an labor inspector to point out potential violations, inspections lasted longer, and penalties for violating safety and health standards were greater (Weil, 1991). Even though according to the law in Taiwan, the labor inspector shall notify the union upon entering an enterprise for inspection, it is often limited to cooperate unions but not industrial union.

5.4 Limitation

Firstly, due to the nature of cross-sectional study design, the observed associations of employees' collective power with self-rated health, occupational injuries, and mental health might reflect reverse causation. For example, working in an enterprise with higher work injuries rate may motivate employees to organize union to protect themselves. However, previous study taken into account the endogeneity effect was consistent with my findings. In addition, there might be the problem of common method. Using the same measurement method to access the variables, the correlations among the variables can be inflated or deflated.

Secondly, my research used the subjective perception of employees to represent the effectiveness of collective power at the workplace. The health outcomes variables



were also self-reported based. Therefore it is still likely to be influenced by the personality factors, and result in confounding effect. However, I have found out that using perception of employees to measure collective power did provide consistent results and distribution as previous research for employment contract, salary, union membership, and job security in particular. Future studies to develop a more objective measure for the assessment of employees' collective power, especially in occupational safety and health may be needed. The validity and reliability of using single-item measure for self-rated health and BSRS-5 for mental health were supported in previous studies. Moreover, there might be inconsistency between the self-reported message from the interview and the real situation due to social desirability bias. Using the opinions of the employees may be helpful to validate the interview results.

Thirdly, it is unclear how the interviewees interpreted the "other labor organization" in the question item, especially when there is no labor union in their enterprise. This may limit the inference of policy recommendation of my study.

Fourthly, though sex age, education, and work characteristic variables were taken into account in the statistical analysis model, there may still be other work-related

variables or employees' personality factors that influence the correlation between collective power of employees and their health outcomes.




Lastly, due to the limitation of the secondary data, I was not able to compare the difference between state-owned enterprises and the others. I tried to investigate in the comparison with the qualitative interview, but the results should be taken carefully because of limited number of interviewees. Besides, my qualitative study interviewees were unions that have existed for decades, therefore their situation may not apply to other unions.

5.5 Policy implication

Firstly, though it is believed that the collective power of employees in Taiwan is very weak, my research still showed that it may have a positive influence on their health outcomes. Employees should be empowered to build up their collective power. The government needs to strengthen the knowledge and power of the employees with appropriate training and educational program as well as sufficient resources, particularly about unionization and occupational safety and health management.

As labor union is still the most basic form of collective power of employees, it is important to strengthen the capacity of labor unions. Besides, the restriction to form a



corporate union of an enterprise with fewer than 30 employees should be released and industrial unions should be provided with the opportunity to participate in occupational safety and health management. The labor inspection authority should also strive to forbid any discrimination on union members, and ensure that the laws related to worker participation are followed.

Secondly, the authority concerned should emphasize more on the role of employees' collective power on occupational safety and health management. Employees should be aware of the consequence and risk of an unsafe working environment and form common values about occupational safety and health management. Employees may join together to request unions, other workers' organizations, or in the labor-management meeting for education and training, which is critical to achieve effective arrangements for worker participation in occupational safety and health. Employees may also unite to put pressure on the employers to commit to their social responsibility on occupational safety and health, including negotiating better safety and health standards in the collective agreements. The occupational safety and health professionals should also cooperate with the employees for strengthening their planning and implementation.

Thirdly, the threat caused by the increase in the use of temporary and dispatched workers on occupational safety and health management should be seriously considered.

It is very difficult for these workers to unionize, and many of their employers were passive abiding by the labor and safety standards.

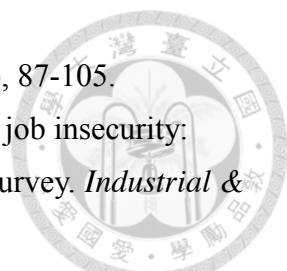
5.6 Conclusion

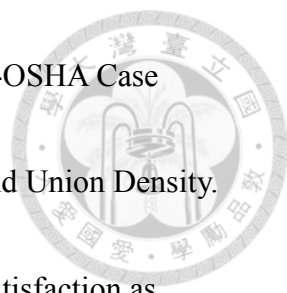
Worker participation allows employees to exercise some control over their work conditions and enhances the efficiency of occupational safety and health management in the workplace. Despite of the weak nature of labor unions in Taiwan, my research found that the collective power of laborers still possesses a positive effect on the health outcomes of employees. Low employees' collective power may indicate poorer self-rated health, higher occupational injuries, and poorer mental health, as compared to high collective power. This significant effect was found to be influenced particularly by job insecurity, and workplace justice. I hope to call for more attention on the importance of collective power of employees on supporting occupational safety and health management. All in all, employees are the core element of the workplace, and they should have the rights to speak out and protect for themselves.

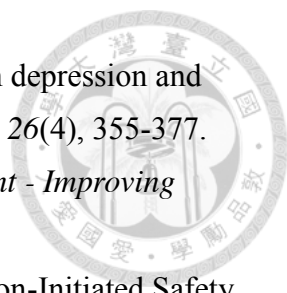
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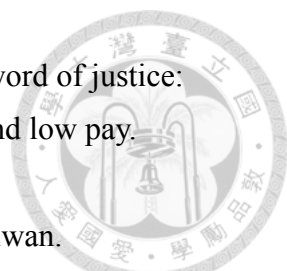


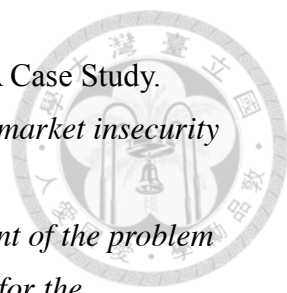
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 核定文號：主普管字第 1020400174 號
 有效日期：民國 102 年 11 月 30 日



中華民國 102 年

工作環境安全衛生狀況認知調查表

(資料標準週 3 月 10 日~16 日)

親愛的朋友：

您是國家經濟發展的主力，工作環境的安全衛生關係著您的工作安全與身體健康；為建立更好的工作環境，我們需要瞭解您現在工作場所狀況及身心健康狀況，特於本次人力資源調查附帶辦理「工作環境安全衛生狀況認知調查」，請您依實際情形填寫本調查表，交給調查員彙送本所。各位給我們正確的寶貴資料，將有助於我國勞工工作環境安全衛生的改善，調查表中所填事項僅供綜合統計分析之用，絕不會帶給各位不利影響，敬請安心據實填寫，謝謝您的合作。

敬祝

工作安全
 身心健康

行政院勞工委員會
 勞工安全衛生研究所

請調查員先行填寫

樣本編號	地區	層別	村里編號			樣本戶號		
			縣市代號	鄉鎮市區代號	村里代號			

填表人戶內
 人口編號:

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第壹部分：個人狀況（請您在適當位置勾選或填寫）

一. 您從事目前**主要**工作已有____年____月（以3月10日~16日資料標準週實際情形為主）

二. 您的工作班別及區域：

(一)工作班別為：固定班→工作時間:1僅白天班 2含下午班或小夜班
3大夜班（需於深夜12點工作）

輪班→是否需要於深夜12點工作：4是 5否

不固定班別→是否需要於深夜12點工作：6是 7否

(二)工作區域為：1室內作業 2戶外有日曬作業(含汽機車駕駛) 3戶外無日曬作業

三. 您**上週**工作日每日平均（以3月10日~16日資料標準週實際情形為主）

(一) 睡眠時間為____小時____分鐘

(二) 上下班通勤時間(來回總計)為____小時____分鐘

(三) 上班時間為____小時____分鐘

(四) 非勞動的生活時間(包括飲食、洗澡與休閒娛樂等)為____小時____分鐘

四. 您在**3月10日至3月16日**這一週**主要**工作共工作幾天？____天

五. 您覺得您**上週**的睡眠時間是否足夠？

1足夠

不夠→2不影響工作或生活 3會影響工作或生活

六. 家庭狀況

(一)請問您是家庭支出主要負擔者嗎？1是 2否

(二)請問您家中同住人口有幾人(包括自己)：_____人

其中有無需要被照顧的失能者或6歲以下幼兒？

1無

有→您是家中主要照顧他/她(們)的人嗎？ 2是 3否

七. 您平時是否有運動的習慣（每次至少持續十五分鐘，且有流汗、會喘）？

1沒有 2每月1~3次 3每週1~2次 4每週約3~4次 5幾乎每天

八. 您的身高_____公分，體重_____公斤

九. 您**目前**的吸菸狀況？

1未曾吸菸

2已戒菸半年(含)以上

3已戒菸但未達半年

吸菸→每天約吸：4少於5根 55~10根 611~20根 7超過20根

十. 您**目前**的喝酒狀況？

1完全沒有或幾乎很少喝

每星期平均約喝幾次： 21~2次 33~4次 45次及以上

→有喝者請繼續回答下列4小題

項目(請每項都要填答)	①是	②否
01 您曾經不想喝太多，卻無法控制而喝過量嗎？	<input type="checkbox"/>	<input type="checkbox"/>
02 有家人或朋友為了您好而勸您少喝嗎？	<input type="checkbox"/>	<input type="checkbox"/>
03 對於您喝酒這件事，您會覺得不好或是感到愧疚(或不應該)嗎？	<input type="checkbox"/>	<input type="checkbox"/>
04 您曾經早上一起床尚未進食前，就要喝一杯才覺得比較舒服穩定？	<input type="checkbox"/>	<input type="checkbox"/>

十一. 請問您每日的蔬果攝取量

- (一) 是否攝取一份以上水果？ 1是 2否 (一份：相當於中型橘子、蘋果或芭樂)
(二) 是否攝取二份(碟)以上蔬菜？ 1是 2否 (一份(碟)：15公分盤或半碗以上)

[女性受訪者請繼續填答第十二題，男性受僱者請直接跳至第十三題、雇主及自營作業者請直接跳至第十九題繼續填答]

十二. 請問您是否已停經？

1已經完全停經

■未停經→請問您在最近一次生理期期間，是否有經痛情形？

2沒有經痛

■有經痛 [會疼痛者，請繼續填答下列兩題]

→疼痛程度：3輕微疼痛 4普通疼痛 5非常疼痛

→經痛是否影響您的工作或生活？6不影響 7會影響

*[受僱者請繼續填答(甲)部分，雇主或自營作業者請直接跳到下頁(乙)第十九題繼續填答]

(甲) 受僱者：

十三. 勞動契約關係：

(一) 就目前的主要工作，您和僱用者間的契約關係 (書面上或口頭上) 屬於哪一種？

1長期僱用，通常能夠續任(即勞基法所稱「不定期契約」)

2約聘僱、臨時性、短期性、季節性契約 (即勞基法所稱「定期契約」)

3暫僱、工讀、臨時工、代班 (代課) 等非長期，且無明確僱用期間的「臨時人員」

4其他_____

(二) 就目前的主要工作，您與工作單位的關係為何？

1受僱關係 2承攬關係 3派遣關係 4其他_____

十四. 您目前工作的給薪方式是：

1固定薪資 (含基本薪與各種固定加給)

2底薪加上績效獎金、紅利或加班費(薪資以獎金為主)

3無底薪，按件計酬

4無底薪，按時計酬或按日計酬

十五. 您初進目前工作單位時，雇主或公司有沒有安排下列事情？

(一) 安全衛生相關教育訓練課程，例如預防工作傷害、急救、消防、緊急應變等？

1有 2沒有

(二) 是否充分告知工作可能會有那些危險性？

1很充分 2充分 3不充分 4完全沒有

十六. 您是否加入工會組織？

1否 ■是→2職業工會 3產業工會 4企業工會

十七. 公司是否有安排安全衛生在職教育訓練？

1是 2否

十八. 您的健康檢查情形：

(一) 初進目前工作單位時，雇主有沒有要求做職前的體格檢查？

1沒有 ■有→2您自費檢查 3雇主負擔部分費用 4雇主負擔全部費用

(二) 進入目前工作單位後，雇主有沒有安排定期健康檢查？

1不知道，因剛到此公司工作

2沒有

3有，且本人有參加

4有，但本人未參加

[受僱者請跳到第貳部分工作環境繼續填答]

(乙) 雇主或自營作業者：

十九. 您是否曾接受安全衛生相關教育訓練課程？

1 否

■ 是 → 請問課程舉辦單位為何？（可複選）

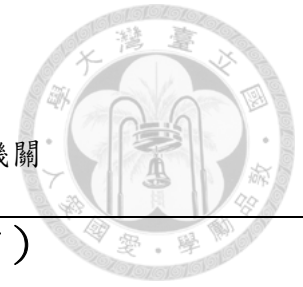
2 工會或公會

3 民間安全衛生組織

4 政府機關

5 工作場所的公司

6 其他，請說明_____



第貳部分：工作環境（請您在適當位置勾選或填寫）

一. 您在工作環境中可能會遭遇下列那些危險？（可複選）

01 跌倒、滑倒

07 衝撞及被撞

13 密閉空間可能缺氧

02 墜落

08 火災、爆炸

14 中暑或熱疾病

03 物體倒塌或飛落

09 燙傷、燒傷

15 其他（請說明_____）

04 夾傷、捲傷

10 毒氣中毒

16 不清楚是否有這些危害

05 切、割、擦傷

11 化學品接觸

17 皆不會遭遇這些危害

06 觸電

12 凍傷

* 前述您認為會遭遇的危險中，何者最可能發生？請填入前述01-15一個代碼：_____

二. 您的工作環境有沒有下列情形？

項目（請每項都要填答）	①完全沒有	②偶爾有	③經常有
01 灰塵很多（如粉末、棉絮、石綿、油煙、金屬粉末等懸浮在空氣中的微小粒子）	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
02 異味或臭味	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
03 二手菸	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
04 聲音很大	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
05 很熱	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
06 很冷或低溫	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
07 採光照明不好	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
08 使用含鉛物質（如合金鉛、鉛蓄電池、軟焊等）	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
09 使用化學品（如酸鹼、溶劑、農藥、電鍍液）	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10 接觸可能致病的病菌等生物危害	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11 暴露於輻射或強光中，如X光、電焊強光、紫外線、紅外線、雷射光等	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

三. 您工作時有沒有下列身體姿勢或動作上的問題？

項目（請每項都要填答）	①完全沒有	②偶爾有	③經常有
01 全身振動（如由地板、座椅震動傳到整個身體）	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
02 局部振動手部的工具（如研磨機、鑿岩機、電鑽）	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
03 手部反覆同一種單調的動作（如打字、伸手取物、裝配等）	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
04 使用很重的手工具	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
05 搬運重物	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
06 姿勢不自然（如身體扭轉或長時間蹲跪）	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
07 長時間站立或走動	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
08 皮膚接觸堅硬或銳利的物件（如手掌拍打、膝蓋碰撞）	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
09 作業速度無法自行控制（如輸送帶作業）	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10 長時間使用電腦	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11 工作桌、工作台或工作椅高度不適合	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

四. 您的工作環境對可能發生的危險所做的安全防護措施如何？

- 1很好 2好 3普通 4不好 5很不好 6不需要安全防護措施
7不知道做得如何

五. 您在工作中是否被要求使用下列防護具？以及您的使用情形為何？

防護具類 (請每項都要填答)	是否被要求使用		使用情形	
	①是	②否	①經常使用	②不常使用
01 口罩或呼吸防護具	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
02 耳塞、耳罩	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
03 工地用安全帽	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
04 工地用安全帶	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
05 安全鞋	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
06 防護眼鏡或護目鏡	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
07 防護手套	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
08 防護衣	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

六. 過去一年，您本身是否曾經在工作時遭遇到下列狀況？

項目 (請每項都要填答)	①是	②否
01 肢體暴力 (如毆打、踢、推、捏、拉扯等)	<input type="checkbox"/>	<input type="checkbox"/>
02 言語暴力 (如辱罵、言語騷擾、冷嘲熱諷等)	<input type="checkbox"/>	<input type="checkbox"/>
03 心理暴力 (如威脅、恐嚇、歧視、排擠、霸凌、欺凌、騷擾等)	<input type="checkbox"/>	<input type="checkbox"/>
04 性騷擾 (如不當的性暗示與行為)	<input type="checkbox"/>	<input type="checkbox"/>

七. 您認為職業災害預防工作，是需要被重視的問題嗎？

- 1很需要 2需要 3還好 4不需要 5很不需要

八. 您覺得您的工作環境中，需要改善的安全衛生問題有那些？(可複選)

- 01空氣太髒，包括灰塵、臭味、油煙、二手菸等
02聲音太大
03光線不好
04環境太熱或太冷
05振動
06輻射或強光
07有害化學物
08致病菌等生物危害
09工作姿勢不自然
10機械引起的傷害
11電氣造成的傷害
12環境髒亂或狹小
13其他(請說明_____)
14沒有需要改善的問題

*前述您認為需要改善的問題中，何者最優先需要改善？請填入前述01-13一個代碼：_____

九. 您對目前工作環境之安全衛生條件滿不滿意？

- 1很滿意 2滿意 3普通 4不滿意 5很不滿意

第參部分：身心健康狀況 (請您在適當位置勾選或填寫)

一. 一般說來，您認為您目前的健康狀況如何？

- 1很好 2好 3普通 4不好 5很不好

二. 您是否領有身心障礙手冊？

- 1否

- 是→在手冊上您的障礙類別為：2肢體障礙 3重要器官失去功能
4聽覺機能障礙 5慢性精神病患者 6智能障礙 7其他：_____

三. 過去一年，您是否曾因工作關係而受傷或罹患疾病？

- 1沒有

■有→就醫方式為何(可複選)？

- 2自行用藥 3自費就醫 4使用健保就醫 5使用職業災害診療單就醫

四. 過去一年，您身體有沒有下列不舒服情形發生？與工作相關性如何？

不舒服情形，若有任何不舒服情形，請回答與工作關係。(請每項都要填答)	有沒有不舒服？				與工作有無關係？		已就醫
	①沒有	②偶爾	③有時	④經常	①沒有關係	②可能有關	
01皮膚(過敏、癢、起疹等)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
02眼睛(眼睛痠痛、發癢、視力變差等)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
03耳部(耳鳴、聽力受損等)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
04呼吸(過敏、氣喘、呼吸不順等)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
05心血管(高血壓、心臟病、心律不整等)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
06消化系統(腸胃不適、潰瘍等)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
07睡眠(睡不著、睡不好等)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
08肌肉骨骼痠痛(腰、背、肩頸等痠痛或行動困難等)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
09頭痛	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

五. 您認為您的工作會不會影響您的健康？

1會 2不會 3不知道

六. 過去一年，您身體各部位有沒有發生痠痛？痠痛對您工作的影響如何？

身體部位 (每部位都請填答)	有沒有痠痛？		痠痛對您工作的影響？				
	①沒有	有	②沒影響	③影響工作表現但沒請假	④請假少於4天	⑤請假4天及以上	
01脖子	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
02肩膀	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
03上背	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
04手肘	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
05下背或腰部	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
06手或手腕	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
07臀或大腿	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
08膝蓋	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
09腳踝或腳	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

七. 請勾選您現有或曾經經醫師確定診斷或治療的疾病或傷害？

項目(請每項都要填答)	①有	②無
01 肌肉骨骼疾病	<input type="checkbox"/>	<input type="checkbox"/>
02 心臟疾病(心肌梗塞、心絞痛、心臟功能不全等)	<input type="checkbox"/>	<input type="checkbox"/>
03 消化器官疾病(胃或十二指腸潰瘍、胃炎、大腸炎、肝膽胰臟疾病等)	<input type="checkbox"/>	<input type="checkbox"/>
04 高血壓	<input type="checkbox"/>	<input type="checkbox"/>
05 糖尿病	<input type="checkbox"/>	<input type="checkbox"/>

八. 以下問題想瞭解您最近一星期的疲勞狀況，請勾選最符合的一項。

項目(請每項都要填答)	①總是	②常常	③有時	④不常	⑤從未
01您常覺得疲勞嗎？	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
02您常覺得身體上體力透支(累到完全沒有力氣)嗎？	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
03您常覺得情緒上心力交瘁(心情上非常累)嗎？	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
04您常會覺得，「我快要撐不下去了」嗎？	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
05您常覺得虛弱，好像快要生病了嗎？	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

九. 請依據您最近的工作狀況與感受回答下列各題。

項目(請每項都要填答)				
(一)工作負荷	①很不同意	②不同意	③同意	④很同意
01我的工作步調很快。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
02我的工作很辛苦。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
03我的工作很耗費體力。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
04我的工作不會過量。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
05我有足夠的時間來完成工作。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
06我的工作會需要我長時間集中注意力。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
07我的工作非常忙碌。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
08我工作場所有人力不足的現象。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(二)工作控制	①很不同意	②不同意	③同意	④很同意
01在工作中，我需要學習新的事物。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
02我的工作內容，很多是重複性的工作。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
03在工作中，我必須具有創新的想法。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
04在工作中，很多事我可以自己作主。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
05我的工作需要高度的技術。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
06對於如何執行我的工作，我沒有什麼決定權。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
07我的工作內容是很多元的。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
08對於工作上發生的事，我的意見具有影響力。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
09在工作中，我有機會發展自己特殊的才能。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10我的職位很有保障。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11我的事業發展與晉升的前景很好。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12我曾經歷(或預料會經歷)工作處境變壞。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13在工作遇到困難時，我會得到適當的幫助與支持。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14我有恰當的薪資收入。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
受僱者 請繼續填寫15-23題。				
雇主或自營作業者 不需填寫以下15至23題，請跳到 第十題 繼續填寫。				
(三)職場關係	①很不同意	②不同意	③同意	④很同意
15主管或管理部門對員工是信任的。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16主管或管理部門所傳達的訊息內容是可信的。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17主管或管理部門對員工的工作安排與責任分派是公平的。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18主管或管理部門對於員工薪資福利的安排是公平的。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19主管或管理部門對員工的績效評估是公平的。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20主管或管理部門在重要決策過程中，會主動告知並提供充分的資訊給員工。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21主管或管理部門以尊重的方式對待員工。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22在我的職場中，有捍衛受僱者利益的工會或工作者組織。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23在我的職場中，有足以影響公司決策的工會或工作者組織。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

十. 您覺得工作會帶給您很大的壓力嗎？

1從未有 2很少有 3有時有 4常常有 5一向有

十一. 整體而言，您對現在的工作感覺滿意嗎？

1很滿意 2滿意 3普通 4不太滿意 5很不滿意

十二. 您的工作需要提供服務給他人嗎？服務對象包括：客戶、顧客、病患、學生等，但是不包括您的同事或下屬。

1 不需要

■ 需要 → 請繼續填答下列問題

以下問題想瞭解最近一星期，您對服務對象的感受，請勾選最符合的一項。

項目(請每項都要填答)	①總是	②常常	③有時	④不常	⑤從未
01 您會覺得和服務對象互動有困難嗎？	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
02 服務對象會讓您感到很累嗎？	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
03 您會希望減少和服務對象接觸的時間嗎？	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
04 您對服務對象感到厭煩嗎？	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
05 您會覺得您為服務對象付出比較多，而得到回饋比較少嗎？	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
06 您會想要趕快把服務對象打發掉嗎？	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

十三. 請就您最近一星期在工作中所產生下述疲累情形的頻率，勾選最符合的一項。

項目(請每項都要填答)	①總是	②常常	③有時	④不常	⑤從未
01 我因為工作上的壓力，在工作中分心，或是無法集中注意力工作的頻率為？	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
02 我因為工作上的壓力，在工作中發生一些大小錯誤而必須重做的頻率為？	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
03 我因為工作上的壓力，在工作中感到疲勞而無法正常進行工作的頻率為？	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
04 我因為工作上的壓力，在工作中感覺越做越慢且無力的頻率為？	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
05 我曾經因為過多的工作時間緊迫，使我感到焦慮、神經質，或是沉重的壓力。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
06 我曾經因為工作造成的心理勞累，使我感到焦慮、神經質，或是過度的壓力。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

十四. 以下想瞭解您最近一星期心情上的變化，給您帶來困擾感受的程度，請勾選最符合的一項。

項目(請每項都要填答)	①完全沒有	②輕微	③中等程度	④厲害	⑤非常厲害
01 我遇到睡眠困難，譬如難以入睡、易醒或早醒。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
02 我會感覺到緊張不安。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
03 我會感覺容易苦惱或動怒。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
04 我會感覺憂鬱、心情低落。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
05 我會覺得比不上別人。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

十五. 以下題項欲瞭解您的工作家庭衝突狀況，請勾選最符合的一項。

項目(請每項都要填答)	①很不同意	②不同意	③不同意也不反對	④同意	⑤很同意
01 工作上的負荷，會影響我的家庭生活。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
02 工作所需要的時間量，使我難以照顧家庭。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
03 工作上的負荷，讓我難以完成在家想做的事。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
04 工作帶來的壓力，讓我難以履行家庭責任。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
05 工作帶來的相關責任，使我必須改變家庭活動的安排。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

謝謝您寶貴的意見，題目到此結束，請您再檢查一下，是不是有漏答的部分，如果有遺漏的情形，請再將它完成，謝謝您！問卷如有任何問題，請您向調查員詢問，或與本所承辦人郭智宇助理研究員或林洺秀副研究員聯絡
電話：(02) 26607600轉275或263，傳真：(02) 26607731

本欄受訪者請勿填寫

指 導 員		審 核 員		調 查 員	
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