
Working Hours of White-Collar Workers in Terms of Work Characteristics and Personal Characteristics

Kazuya Ogura

Waseda University

In order to explore factors causing long working hours, we conducted a survey by interview targeting white-collar workers and reanalyzed data obtained through the survey by questionnaire that we had conducted previously. The results of the interview suggest that the length of working hours vary depending on (i) work characteristics, such as ways of working and relationships with customers, (ii) management of the working staff of a company, such as the workforce and working hours, and (iii) personal characteristics of each worker, such as their willingness to work. We analyzed the factors (i) and (iii), which can be ascertained quantitatively by using surrogate indicators. As a result, we found out that work characteristics affect male workers to some extent, while personal characteristics have rather clear influences on both male and female workers. That is to say, the strength of one's work-oriented attitude affects the length of the total actual working hours.

I. Objectives of This Study

Various surveys we have conducted so far revealed that the top reason for working overtime is that the workload is too heavy to finish within the prescribed working hours (hereinafter referred to as a "heavy workload").

A heavy workload may arise due to a lack of working staff, which results in an increase in each worker's workload, or, in some cases, members of the working staff with a specific capacity or skill may be intensively assigned a heavier workload.

However, it is difficult to objectively measure a heavy workload in numerical terms. In order to objectively measure workloads, we have to examine how many workers spent how many hours to achieve certain performances at a workplace during a certain period of time, under the assumption that all of the working staff have capacity and skills of the same level. In reality, however, each worker's capacity and skill level is different, and therefore a heavy workload concentrates on specific workers. Furthermore, workers who always seek higher-quality results than necessary may unnecessarily increase their workload on their own, compared with those who do not. Means to measure workloads may also differ by workplace or by the content of the work in question.

Therefore, this study does not directly deal with workloads, but tries to explore the causes of long working hours which are common to those working long hours regularly. The major objective is to ascertain the generalizability of those common causes, as explanatory variables, to wide-ranging workers. In this process, we also aim to clarify the necessity of further research into this issue. For that purpose, we employ the following two means.

One is an interview with workers working for a major IT company. We considered that interviews would be more effective than a survey by questionnaire for examining qualitative matters, such as each worker's way of working and their awareness toward work. It is also important to conduct surveys with multiple companies and compare the results by industry and company, but we thought it more appropriate to start with the examination of multiple workers working for a specific company, where the same personnel system is adopted. Therefore, we conducted an interview of ten white-collar workers working for a major IT company representative of Japan.

The other is reanalysis of the past questionnaire results, also based on the results of the interview, to explore in more detail what type of workers are apt to work long hours. We used the micro-data of the surveys we had conducted in the past, and therefore, we could not add new survey items. However, as will be explained later, we focused on features of each worker's ways of working and their willingness to work, which were revealed through our interview, and studied how these features affect their working hours.

II. Survey by Interview

We conducted an interview of ten white-collar workers working for a major IT company, with regard to their work content, ways of working, and working hours.¹ The following are the outline of the interview. Major features of the interview subjects are shown in Table 1.

A and B are sales staff engaged in the "solution sales business," dealing with customer companies' IT equipment and communication networks as a whole, instead of selling single items. They need to handle diversified requests from customers, as well as deal with highly specialized issues such as IT systems. They often have to communicate and coordinate with other departments of the company. Their duty is categorized as consulting work, rather than sales work, requiring a lot of liaison work within the company. A says that increasing new working staff alone is not a solution, as such staff need to be trained. A also points out the problem of the management of supervisors, stating that they should accurately grasp the workloads of their subordinates and make proper judgment on what work to do. B does not work as many hours as his/her subordinate, A. B seems to be aware of the problem of his/her management, but is not willing to change work process due to the shortage of labor, as well as the nature of the duties at hand, which require a lot of liaison work.

C and D are engineers belonging to the development department. D is C's supervisor. This department seems to be a rather busy section, compared with the research department mentioned later. While competition with rival companies has intensified and cost reduction

¹ This paper is a summary of the discussion paper no. 10-02 "Working Hours of White-collar Workers in Terms of Work Characteristics and Personal Characteristics," (Ogura and Fujimoto 2010), the Japan Institute for Labour Policy and Training

Table 1. Major Features

Person	Academic degree	Age	Service years	Managerial post	Job category	Working hour system	Work hours Arrival/Leaving time
A	Bachelor	31	9	×	Solution sales	Discretionary work system	8:30-22:00 (Normally) 8:30-24:00 (Busy periods)
B	Bachelor	39	17	○	Solution sales	Supervising personnel	8:30-20:30 (Normally) 8:30-21:30 (Busy periods)
C	Master	32	8	×	Development	Discretionary work system	8:50-21:30 (Normally) 8:50-23:00 (Busy periods)
D	Bachelor	39	17	○	Development	Supervising personnel	8:50-23:00 (Normally) 8:50-24:00 (Busy periods)
E	Bachelor	35	10	×	SE	Discretionary work system	9:30-22:00 (Normally) 9:30-24:00 (Busy periods)
F	Bachelor	39	17	○	SE	Supervising personnel	9:30-21:30 (Normally) 9:30-22:00 (Busy periods)
G	Master	35	10	×	Application research	Discretionary work system	8:50-19:00 (Normally) 8:50-22:00 (Busy periods)
H	Ph. D.	37	8	×	Application research	Discretionary work system	8:30-19:00 (Normally) 8:30-21:30 (Busy periods)
I	Master	42	18	○	Application research	Supervising personnel	8:00-19:00 (Normally) 8:00-24:00 (Busy periods)
J	Ph. D.	49	24	○	Basic research	Supervising personnel	7:45-17:35 (Every day)

Working Hours of White-Collar Workers in Terms of Work Characteristics and Personal Characteristics
of Interview Subjects

Nature of job	Problems concerning workload (personnel)	Willingness/Awareness
Coordinating various requests from customers with the many departments of the company.	Always lacking in personnel, but increasing new working staff alone is not a solution.	Colleagues often point out that I am too serious.
Attending several meetings every day.	Always lacking in personnel.	Aiming to achieve 80%.
Short job cycle. Often needs to coordinate with partner companies.	Working overtime is a must. All staff work overtime.	Want to go home earlier. Aiming to achieve 80%.
Endless job, as always required to reduce time and cost.	“Administrative time” sometimes exceeds 130 hours per month.	Want to go home earlier.
At the mercy of customer companies.	Lacking in personnel due to low unit prices of orders	Always working overtime in response to sudden requests.
Manager of the overall system.	Workload imbalance due to required speed and cost. Lacking in an environment to foster personnel.	Want to go home earlier. Company regulations function well.
Spending nearly three years for one product. Attending academic meetings and writing articles are also part of the job.	Although there is clerical staff, the scope of their work is limited and I sometimes handle clerical work by myself.	It is difficult to enhance production efficiency by reducing working hours for research work.
Nearly one year on one cycle. Commercialization of research results is a long way off.	I can handle the job on my own, although often not as previously scheduled.	Do not want to be regarded as inefficient.
Professional manager. Coordinating the overall team.	A lot of paperwork, but not so much as at other departments.	It is not always preferable that conversation among workers reduces (due to the limitation on working overtime).
A top-level researcher in the industry. Supervisory personnel.	Lacking in personnel, but working staff cannot be increased all the time.	I do not highly evaluate working overtime but give it some consideration.

and speeding-up has come to be required concurrently, workers are forced to work long hours regularly, often exceeding the company's so-called "administrative time."² Worker-hours in the original schedule include the calculated number of personnel, which is beyond the real number. However, the specifics of the actual work differ from calculated worker-hours and workers have to do overtime so as to keep up with the original schedule. Nevertheless, workloads for respective personnel are often too much and they have no choice but to delay the schedule as a last resort.

E and F are system engineers. F is E's supervisor, but E is also in a managerial post, leading the heads of partner companies (subcontractors). Staff of this department also work long hours regularly. Unlike other departments and job categories, this department is at the mercy of requests from customer companies. As E and F actually work mainly at establishments of customer companies, their working hours depend on those of the respective customer companies. System replacement is often carried out on holidays or after midnight, and the need to respond to sudden changes in specifications or other various troubles makes it difficult for them to decide their working hours autonomously. Depending on unit prices of orders, personnel that can be input are relatively limited, which may also have negative effects.

G, H, and I are researchers belonging to the application research department. I is the supervisor of G and H. Job cycles are relatively longer at their department, compared with other departments, and they seem to have leeway in their working hours, except for certain periods. However, they are researchers and making presentation at academic meetings and writing articles are part of their important duties. They often spend time studying at home for that purpose and cannot clearly draw the line between work and research, feature unique to the staff of this department. We also have to take note of the observation that the nature of research work makes it difficult to enhance production efficiency only by eliminating useless duties. Judging what is useless is a hard task. Furthermore, I, who basically serves as a professional manager, points out the problem of busy paperwork.

J is a researcher belonging to the basic research department. Being personally famous as a researcher in academic circles, J conducts research personally and at the same time has to provide advice to his/her subordinates and assess their performance. J does not place so much importance on the length of working hours to evaluate research performances but does not seem to ignore it either. J points out that companywide regulations on working hours (for the purpose of reducing overtime work) may enhance productivity per unit of time in the short run, but the productivity may decline again in the long run.

As interview subjects, we asked for the cooperation of those who are in managerial posts and those not, from the solution sales department, development department, SE

² The company has adopted a system under which it ascertains the number of hours each worker spends at his/her workplace, from arrival time to leaving time, instead of his/her actual working hours. If the number of hours exceeds the prescribed maximum, the personnel department warns the relevant workers and recommends that they schedule an interview or receive medical check-ups.

department, and research department of the company, with a view to ascertain to what extent the differences in white-collar workers' job categories can reveal the differences in their work characteristics (such as ways of working) and in their personal characteristics (such as their awareness toward work). From such viewpoints, the following qualitative features can be pointed out.

- (i) Relationships with customers, other departments of the company, and partner companies have a significant influence on the working hours of staff members and their ways of working (in the solution sales department, SE department, and development department). If such relationships are not strong, working hours can be decided under workers' discretion and are less prolonged (in the research department).
- (ii) Although wasteful working practices and the lack of personnel for relatively easy work are pointed out (in the solution sales department and development department), concrete solutions have not been worked out or implemented.
- (iii) Almost all departments are aware of the shortage of personnel. As pointed out by Sato (2008), gaps between original schedules and actual work after receiving orders are seen in various departments of the company. However, the point is that, in spite of suffering from personnel shortage, they do not consider it a solution to just increase the number of workers. They are in favor of accepting new personnel with the capacity and skills of a certain level, but share the idea that it is troublesome if they have to accept and train unskilled new recruits.
- (iv) The company has adopted a system to ascertain the number of hours all workers spend at their workplaces and warn those who exceed the prescribed administrative time. This system and other companywide efforts to reduce overtime work have contributed to the reduction in the number of working hours of those who are not in managerial posts, in particular.
- (v) Almost all the survey subjects reply that they do not aim to get a perfect score in pursuing their duties. Even those who seem to the author to be a model of sobriety say that they aim to achieve around 80% (not specifically stating numbers). They all feel strong satisfaction with their present job, but those who regularly work until late at night or on holidays say that they want to go home earlier and get more rest. In contrast, a person who now works shorter hours than in the last year states that he/she would have nothing particular to do outside of work, even if his/her working hours further decrease.
- (vi) All the interview subjects are employed under the discretionary work system or are in managerial posts (treated as supervising personnel), but none of them change their arrival time or leaving time flexibly.

Among (i) to (vi) above, (i) and (ii) are considered to show characteristics related to ways of working and relationships with customers (hereinafter referred to as "work characteristics"). It is pointed out in (iii) that the number of personnel is not enough for any

of the surveyed departments to completely avoid overtime work, yet at the same time not just anyone would be willingly accepted as new additional. Item (iv) touches on the issue of companywide management of working hours. Therefore, these are related to long-term and constant issues of the company's management of working staff. Furthermore, (v) and (vi) indicate characteristics of workers, who do not fully utilize their flexible working hour system, complaining of long working hours but taking for granted overtime work and work on holidays to some extent; such individuals usually aim to achieve 80% in their work (qualities hereinafter referred to as "personal characteristics").

The issue mentioned in (iii) is the personnel shortage, but this does not merely mean the shortage in number but also the scarcity of personnel with the capacity and skills of a certain level. The fact that many companies consider overtime working hours as the major means of employment adjustment suggests their strong guarantee of employment for full-time workers (Ogura and Fujimoto 2007). However, the interview results also reveal the necessity to allot specific personnel to specific types of jobs.

III. Quantitative Analysis

1. Scope of the Analysis

We made a comparison between our target company and other major IT companies through consulting with persons from other companies' personnel departments, and confirmed that the target company is not exceptional. Cases of the target company may not represent those of all Japanese companies but may serve as a useful reference, showing the example of a major manufacturer where various types of white-collar workers work. In this sense, the issue mentioned in (iii) above is an essential cause of prolonged work commonly observed in many Japanese companies. Nevertheless, it is very difficult to explore this issue by analyzing the micro-data of the questionnaire, whose subjects were individual workers. This is because the capacity and skill level of respective workers cannot be properly relativized and the differences between companies' original schedule on personnel management and their actual situations are not clear. Therefore, we have no choice but to limit the scope of the analysis.

Still, we can analyze work characteristics (as mentioned in [i] and [ii]) and personal characteristics (as mentioned in [v] and [vi]) to some extent, based on responses of individual workers. It is important to ascertain whether larger number of white-collar workers share the same work characteristics and personal characteristics. Except for a report by Sato (2008), the relationship between working hours and the factors of work characteristics and personal characteristics have rarely been examined quantitatively. We tried to analyze such relationship to the extent possible, based on the micro-data of the questionnaire we conducted.

We used the micro-data compiled by the Japan Institute for Labour Policy and Training (2009). The survey was conducted for the purpose of grasping the actual state of

diversification of working places, such as telework, and diversification of working hours, including the discretionary work system and systems for managerial employees. It also included questionnaire items relating to work characteristics and personal characteristics, which are the very themes of this paper. These micro-data are the best sources available at present.³

2. Definition of Variables⁴

“Work characteristics” refers to ways of working and maintaining a relationship with customers. The questions relating to this topic are those asking about (i) discretion over one’s work⁵ and (ii) flexibility of workplace.⁶ Unfortunately, as the questionnaires do not include questions for measuring the level of relationships with customers, other departments of the company, and partner companies, we used the above two factors (i) and (ii) as variables mainly relating to ways of working. With regard to personal characteristics, various awareness-related question items are possible, but the questionnaires contain no questions asking about workers’ ideas to aim to achieve 80% as mentioned above. The questionnaires ask about various types of worker satisfaction and stresses, but these can be used as dependent variables rather than as explanatory variables, indicating the results rather than causes of prolonged working hours. Therefore, as a surrogate indicator for personal characteristics, we used (iii) work/leisure-orientedness.⁷ This question asks for

³ Questionnaires were sent by mail to 8,000 cooperative monitors of a survey company, selected by gender and age group from among “employed” people aged 20 to 59 who are “mainly working” based on the National Census in 2005. The collection rate was 88.2% (7,056 respondents). The data were compiled for a total of 6,430 regular employees, excluding those who were not regular employees as of the time of conducting the survey. For other details of the survey, see the Japan Institute for Labour Policy and Training (2009).

⁴ This paper considers the following as “white-collar workers”: “those in charge of general affairs (general affairs, personnel affairs, accounting, etc.)”; “those engaged in sales work (sales and marketing)”; “clerical specialists (those specializing in survey analysis, patent legislation, etc.)”; “technical specialists (those specializing in research and development, design, system engineering)”; and “those engaged in medical or educational work (those specializing in medical services, education, etc.)” The survey originally included “general clerks, reception clerks, and secretaries,” “customer service staff,” “field management and supervision staff,” “manufacturing and construction staff,” “transportation and driving staff,” “security and cleaning staff,” and “others,” but these are excluded from the target population for this study.

⁵ The question is “How much discretion do you have over your work schedules and procedures?” The answer was chosen from among “[1] Considerably,” “[2] To some extent,” “[3] Not much,” and “[4] Very little.”

⁶ The question is “To what extent can you do your work outside of your usual workplace, such as on a train or at a coffee shop?” The answer was chosen from among “[1] Considerably,” “[2] To some extent,” “[3] Not much,” and “[4] Almost impossible.”

⁷ The question is “Please check the one that is most applicable to your idea concerning the balance between work and leisure.” The answer was chosen from among “[1] I feel a strong motivation toward work and devote all my energy to it,” “[2] I devote my energy to work but also enjoy leisure at times,” “[3] I think that both work and leisure are equally important,” “[4] I always try to finish work as soon as possible to enjoy leisure,” “[5] I seek satisfaction in leisure rather than in work.”

respondents' individual idea concerning the balance between work and leisure, separately from other questions, and can be used as an explanatory variable.

3. Comparison of Mean Values

Table 2 below shows the mean values of the total actual working hours per month⁸ by gender and job category of white-collar worker. For both male and female workers, those engaged in sales work and medical or educational work generally work long hours. Working hours of male workers engaged in sales work are significantly longer compared with other job categories, except for medical or educational work. Working hours of male workers engaged in medical or educational work are significantly longer than those of workers in charge of general affairs and clerical specialists. No significant differences are observed among working hours of those in charge of general affairs, clerical specialists, and technical specialists. Female workers engaged in sales work generally work longer hours than those in charge of general affairs, and the same applies to female workers engaged in medical or educational work.

Table 3 shows discretion over one's work by gender and job category. Comparing the male total and the female total, the percentage of those replying "Considerably" is slightly higher for male workers, and that of those replying "Very little" is slightly higher for female workers. This indicates that male workers generally have greater discretion than female workers (or a larger number of male workers replied that they have considerable discretion). Regarding male workers, the percentage of those replying "Considerably" is the highest for clerical specialists, and the lowest for those engaged in medical or educational work, with a gap of over 20 points. As for female workers, the percentage of those replying "Considerably" is the highest for those in charge of general affairs and the lowest for clerical specialists, with a smaller gap of around 14 points.

Table 4 shows flexibility of workplace by gender and job category. Comparing the male total and the female total, the percentages of those replying "Considerably" and "To some extent" are slightly higher for male workers, and the percentage of those replying "Almost impossible" is higher for female workers. Male workers generally enjoy higher flexibility of workplace than female workers. Among male workers, the percentage of those replying "Considerably" is the highest for clerical specialists and the lowest for those in charge of general affairs. The percentage of those replying "To some extent" is also rather

high for clerical specialists. This suggests that male clerical specialists are highly more likely to work outside of their usual workplace than those classified into other job categories. Female workers show different trends, with the percentage of those replying

⁸ The total number of actual working hours during July 2008 (for one month), including hours spent working overtime (with and without pay). Hereinafter, the term "total actual working hours" as used in this paper means the same. In terms of the total working hours for one month of regular employees, 365 cases of less than 80 hours and 11 cases of 600 hours or more are recognized as statistical outliers and are treated as missing values.

Table 2. Multiple Comparison of the Total Actual Working Hours per Month by Job Category

A	Male		Female		Differences (C-D)
	B	Differences (A-B)	C	D	
General affairs Mean value = 201.7 N = 323	Sales work Clerical specialists Technical specialists Medical/educational work	-17.4 ** 2.5 -6.5 -15.9 **	General affairs Mean value = 181.2 N = 264	Sales work Clerical specialists Technical specialists Medical/educational work	-14.8 ** -5.8 -5.9 -15.4 **
Sales work Mean value = 219.1 N = 887	General affairs Clerical specialists Technical specialists Medical/educational work	17.4 ** 19.8 ** 10.9 ** 1.4	Sales work Mean value = 196.0 N = 201	General affairs Clerical specialists Technical specialists Medical/educational work	14.8 ** 9.0 8.9 -0.6
Clerical specialists Mean value = 199.2 N = 107	General affairs Sales work Technical specialists Medical/educational work	-2.5 -19.8 ** -9.0 -18.4 *	Clerical specialists Mean value = 187.0 N = 26	General affairs Sales work Technical specialists Medical/educational work	5.8 -9.0 -0.1 -9.6
Technical specialists Mean value = 208.2 N = 778	General affairs Sales work Clerical specialists Medical/educational work	6.5 -10.9 ** 9.0 -9.4	Technical specialists Mean value = 187.1 N = 93	General affairs Sales work Clerical specialists Medical/educational work	5.9 -8.9 0.1 -9.5
Medical/educational work Mean value = 217.6 N = 252	General affairs Sales work Clerical specialists Technical specialists	15.9 ** -1.4 18.4 * 9.4	Medical/educational work Mean value = 196.6 N = 363	General affairs Sales work Clerical specialists Technical specialists	15.4 ** 0.6 9.6 9.5

Source: From survey data by the Japan Institute for Labour Policy and Training (2009).

Note: **: $P < 0.05$; *: $P < 0.1$.

Table 3. Discretion over One's Work by Gender and Job Category (%)

	Considerably	To some extent	Not much	Very little	Total	N
Male						
General affairs	28.5	51.2	17.6	2.6	100.0	(340)
Sales work	31.5	54.3	11.1	3.1	100.0	(922)
Clerical specialists	38.4	46.4	14.3	0.9	100.0	(112)
Technical specialists	25.7	53.5	16.3	4.5	100.0	(795)
Medical/educational work	17.4	53.6	23.8	5.3	100.0	(264)
Total	28.0	53.2	15.2	3.7	100.0	(2,433)
Female						
General affairs	25.8	57.1	13.5	3.6	100.0	(275)
Sales work	21.9	50.2	20.9	7.0	100.0	(214)
Clerical specialists	11.5	65.4	15.4	7.7	100.0	(26)
Technical specialists	22.4	43.9	24.5	9.2	100.0	(98)
Medical/educational work	16.7	53.5	22.5	7.3	100.0	(383)
Total	20.8	53.2	19.7	6.4	100.0	(996)

Source: From survey data by the Japan Institute for Labour Policy and Training (2009).

Table 4. Flexibility of Workplace by Gender and Job Category (%)

	Considerably	To some extent	Not much	Almost impossible	Total	N
Male						
General affairs	4.7	27.4	35.6	32.4	100.0	(340)
Sales work	6.6	34.1	32.1	27.2	100.0	(922)
Clerical specialists	8.0	35.7	24.1	32.1	100.0	(112)
Technical specialists	6.0	31.0	28.5	34.5	100.0	(797)
Medical/educational work	5.7	27.3	28.0	39.0	100.0	(265)
Total	6.1	31.5	30.6	31.8	100.0	(2,436)
Female						
General affairs	3.3	23.0	33.9	39.8	100.0	(275)
Sales work	8.9	29.9	27.6	33.6	100.0	(215)
Clerical specialists	0.0	34.6	26.9	38.5	100.0	(26)
Technical specialists	4.1	25.5	25.5	44.9	100.0	(98)
Medical/educational work	3.4	19.1	26.9	50.7	100.0	(383)
Total	4.5	23.5	28.8	43.1	100.0	(997)

Source: From survey data by the Japan Institute for Labour Policy and Training (2009).

Table 5. Work/Leisure-Orientedness by Gender and Job Category (%)

	[1] I feel a strong motivation toward work and devote all my energy to it.	[2] I devote my energy to work but also enjoy leisure at times.	[3] I think that both work and leisure are equally important.	[4] I always try to finish work as soon as possible to enjoy leisure.	[5] I seek satisfaction in leisure rather than in work.	Total	N
Male							
General affairs	2.6	26.2	40.3	23.5	7.4	100.0	(340)
Sales work	2.9	25.9	43.8	20.7	6.6	100.0	(922)
Clerical specialists	3.6	25.9	43.8	20.5	6.3	100.0	(112)
Technical specialists	2.1	21.8	44.5	24.4	7.2	100.0	(795)
Medical/edu- cational work	3.4	35.2	36.4	18.6	6.4	100.0	(264)
Total	2.7	25.6	42.7	22.1	6.9	100.0	(2,433)
Female							
General affairs	1.1	19.6	48.0	24.4	6.9	100.0	(275)
Sales work	0.9	21.0	41.1	30.8	6.1	100.0	(214)
Clerical specialists	0.0	26.9	50.0	19.2	3.8	100.0	(26)
Technical specialists	1.0	17.3	40.8	33.7	7.1	100.0	(98)
Medical/edu- cational work	2.6	21.9	48.8	21.1	5.5	100.0	(383)
Total	1.6	20.8	46.2	25.3	6.1	100.0	(996)

Source: From survey data by the Japan Institute for Labour Policy and Training (2009).

“Considerably” being the highest for those engaged in sales work and the lowest for clerical specialists.

Table 5 shows work/leisure-orientedness by gender and job category. Comparing the male total and the female total, the percentages of those replying “[1] I feel a strong motivation toward work and devote all my energy to it” and “[2] I devote my energy to work but also enjoy leisure at times” are higher for male workers, while the percentage of those replying “[4] I always try to finish work as soon as possible to enjoy leisure” is

slightly higher for female workers. Among male workers, the percentage of those choosing [1] is the highest for clerical specialists and the lowest for technical specialists. The percentage of those choosing [3] is relatively lower for those engaged in medical or educational work, compared with other job categories. The percentage of those choosing [2] is rather high among those engaged in medical or educational work, as a result of lower percentages of those choosing [3] and [4]. With regard to female workers, the percentage of those choosing [1] is the highest for those engaged in medical or educational work and the lowest for clerical specialists. However, even among clerical specialists, the percentage of those choosing [2] is rather high, while that of those choosing “[5] I seek satisfaction in leisure rather than in work” is low.

4. Regression Analysis

Based on cross tabulation and comparison of the mean values we have made so far, we will next examine how working hours are affected by the differences in discretion over one’s work, flexibility of workplace, and work/leisure-orientedness, assuming that the impact of other factors is the same.

The dependent variable here is the total actual working hours (LN), and major explanatory variables are job category, discretion over one’s work, flexibility of workplace, and work/leisure-orientedness. In order to adjust other factors’ impacts to be the same, annual income (LN), age (LN), being married or single, post, company size, and whether or not the company has a labor union are also input as factors.

Table 6 shows the analysis results for male workers. Looking at major explanatory variables, we found the following:

- (i) Although Table 2 shows that working hours are longer for those engaged in sales work than those classified into other job categories, except for medical or educational work, when we assume that the impact of other factors is the same, their working hours turn out to be shorter than those of workers in charge of general affairs. Working hours are also relatively short for technical specialists.
- (ii) Discretion over one’s work has only a little influence on the mean values of the total actual working hours as mentioned above, but the total working hours of workers who have discretion to some extent tend to be shorter than those of workers who have very little discretion. This suggests the possibility that the level of discretion has certain impacts.
- (iii) Regarding flexibility of workplace, working hours are longer for workers choosing “To some extent” and “Not much.” Considering that the benchmark is “Almost impossible,” it can be construed that the higher the flexibility workers have to work outside their office, the longer hours they tend to work.
- (iv) Work/leisure-orientedness shows rather clear tendencies. Compared with the benchmark (workers choosing “[3] I think that both work and leisure are equally important”), working hours are longer for those choosing “[1] I feel a strong

Table 6. Determinant for the Total Actual Working Hours (Male Workers)

Dependent variable: Total actual working hours (LN) Method: 2SLS		N=2104 R ² =0.06 F= 5.24 (P=0.00) Sargan χ^2 = 73.29 (P=0.00) Basmann χ^2 = 74.49 (P=0.00)		
Explanatory variables		Coefficient value	Standard error	Z-value
Annual income (LN)		0.054	0.038	1.400
Job category [General affairs]	Sales work	-0.039	0.014	-2.830 **
	Clerical specialists	-0.036	0.029	-1.240
	Technical specialists	-0.066	0.016	-4.090 **
	Medical/educational work	0.014	0.015	0.920
Discretion over one's work [Very little]	Considerably	-0.026	0.022	-1.160
	To some extent	-0.046	0.020	-2.230 *
	Not much	-0.030	0.022	-1.340
Flexibility of workplace [Almost impossible]	Considerably	0.013	0.023	0.570
	To some extent	0.021	0.013	1.650 *
	Not much	0.035	0.012	2.960 **
Work/leisure-orientedness [[3] Equal]	[1] Devote all energy to work	0.065	0.030	2.160 **
	[2] Enjoy leisure at times	0.042	0.012	3.400 **
	[4] Finish work earlier to enjoy leisure	-0.023	0.012	-1.850 *
	[5] Seek satisfaction in leisure	-0.058	0.020	-2.920 **
Age (LN)		-0.070	0.013	-5.380 **
Married or single		0.033	0.013	2.560 **
Post [Rank-and-file workers]	Unit head or chief	0.002	0.012	0.170
	Section chief level	0.028	0.016	1.780 *
	Department head level	-0.022	0.022	-0.990
Company size [99 or fewer employees]	100 to 999 employees	-0.011	0.013	-0.880
	1,000 or more employees	-0.046	0.014	-3.310 **
Whether or not the company has a labor union		-0.033	0.011	-2.840 **
Constant term		5.319	0.239	22.260 **

Source: From survey data by the Japan Institute for Labour Policy and Training (2009).

Note : { } shows the reference group for each dummy variable. **: P<0.05; *: P<0.1.

motivation toward work and devote all my energy to it” and “[2] I devote my energy to work but also enjoy leisure at times,” and shorter, in contrast, for those choosing “[4] I always try to finish work as soon as possible to enjoy leisure” and “[5] I seek satisfaction in leisure rather than in work.”

Table 7 shows the analysis results for female workers. The findings concerning major explanatory variables are as follows:

- (i) Although Table 2 shows that working hours are longer for those engaged in sales work and medical or educational work, when we assume that the impact of other features is the same, working hours of those engaged in sales work turn out to be neither long or short.

Table 7. Determinant for the Total Actual Working Hours (Female Workers)

Dependent variable: Total actual working hours (LN) Method: 2SLS		N=884 R ² =0.05 F= 2.89 (P=0.00) Sargan χ^2 = 32.11 (P=0.00) Basmann χ^2 = 31.82 (P=0.00)		
Explanatory variables		Coefficient value	Standard error	Z-value
Annual income (LN)		0.045	0.041	1.080
Job category {General affairs}	Sales work	-0.007	0.018	-0.360
	Clerical specialists	-0.062	0.034	-1.820 *
	Technical specialists	-0.036	0.021	-1.720 *
	Medical/educational work	0.033	0.022	1.490
Discretion over one's work {Very little}	Considerably	-0.033	0.029	-1.160
	To some extent	-0.032	0.025	-1.260
	Not much	-0.007	0.027	-0.250
Flexibility of workplace {Almost impossible}	Considerably	0.051	0.041	1.250
	To some extent	0.001	0.017	0.060
	Not much	0.016	0.015	1.020
Work/leisure-orientedness {[3] Equal}	[1] Devote all energy to work	0.119	0.062	1.930 *
	[2] Enjoy leisure at times	0.019	0.017	1.130
	[4] Finish work earlier to enjoy leisure	-0.032	0.015	-2.050 **
	[5] Seek satisfaction in leisure	-0.041	0.027	-1.530
Age (LN)		-0.053	0.015	-3.500 **
Married or single		-0.050	0.014	-3.430 **
Post {Rank-and-file workers}	Unit head or chief	0.003	0.019	0.140
	Section chief level	0.064	0.052	1.240
	Department head level	0.050	0.096	0.520
Company size {99 or fewer employees}	100 to 999 employees	-0.026	0.016	-1.630
	1,000 or more employees	-0.050	0.018	-2.760 **
Whether or not the company has a labor union		0.007	0.015	0.470
Constant term		5.203	0.265	19.620 **

Source: From survey data by the Japan Institute for Labour Policy and Training (2009).

Note: { } shows the reference group for each dummy variable. **: P<0.05; *: P<0.1.

- (ii) Discretion over one's work has only a little influence on the mean values of the total actual working hours as mentioned above, and the results of the regression analysis are the same.
- (iii) Flexibility of workplace causes certain differences in the mean values of working hours as shown above, but its impact seems to diminish under the assumption that the impact of other features is the same.
- (iv) Work/leisure-orientedness causes relatively clear differences, although not as strongly as in the case of male workers. Compared with the benchmark (workers choosing [3]), working hours are longer for those choosing [1] and are shorter for

those choosing [4].

What is common between male and female workers, concerning major explanatory variables, is that being highly work-oriented tends to increase total actual working hours. It is suggested that a greater discretion over one's work serves to shorten total actual working hours in the case of male workers, but not in the case of female workers. Flexibility of workplace seems to have a slight impact on total actual working hours of male workers but has no impact on those of female workers.

Regarding variables other than major explanatory variables, it is found that younger workers tend to work longer hours, irrespective of gender, and that the number of total actual working hours is shorter at companies with 1,000 or more employees than at those with 99 or fewer employees. Male workers at the section chief level generally work longer hours but this does not apply to female workers in the managerial posts. Furthermore, being married is a factor that lengthens total actual working hours of male workers, but this works conversely for female workers, shortening their total actual working hours. In the case of married male workers, their wives are highly likely to take charge over housework and child-care duties, which enables them to work longer hours. In contrast, married female regular workers often bear such duties (on top of work) and inevitably have to shorten their working hours. This also reveals the difference in work-life balance between men and women and the issue of their working hours.

IV. Conclusion

We have analyzed data, mainly aiming to ascertain cause-and-effect relationship between the length of working hours and the factors of work characteristics and personal characteristics. Based on our interview, and the results obtained through the above method, it has become clear that work characteristics have a certain influence on the length of male workers' working hours and that the impact of personal characteristics is more clearly detected both for male and female workers. However, discretion over one's work and flexibility of workplace, which we used as surrogate variables, represent only part of work characteristics that we had supposed they would, based on the interview, and variables related to the level of relationships with customers, other departments of the company, and partner companies, which seem to be more important, are not included. This poses a problem that we need to consider in the future. Nevertheless, work/leisure-orientedness, which is a surrogate variable for personal characteristics, revealed rather clear results. Even when the impact of various features are assumed to be the same, those who are highly work-oriented work longer hours (irrespective of gender), while those (especially male workers) who are highly leisure-oriented work shorter hours.

Some deal with the problem of long work hours only as the problem of legal systems or company personnel management. However, when considering the problem of long work hours, it should be noted that work hours are also affected by personal characteristics, such

as each worker's willingness to work and their level of work/leisure-orientedness. Needless to say, overwork should never be highly evaluated, and there may be some workaholics who are obsessed with the idea that they work long hours because they like it, though this is not the case. However, the analysis results also suggest that it is not a practical solution to utterly deny overtime work even for those who really want to work. We need to conduct further, more multilateral surveys on worker attitudes and ideas toward work and their actual behaviors. This would enable us to examine the relationship between these features and working hours, from such viewpoints as whether certain workers are prone to become workaholic, or whether they are career-oriented. We are going to continue studying how many workers nationwide are like those who replied that they aim to achieve 80%, and more specifically, what ideas they have and how they actually work. At the same time, we are planning to analyze work characteristics in more detail, by adding survey items that ask about ways of working and relationships with customers, other departments of the company, and partner companies, as much as possible.

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