

Determinants of the Stress of Female Managers in Japanese Firms

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Abstract

Our study examines the determinants of the stress of female managers in Japanese firms in order to promote more female workers to managerial positions. We find that the alleviation of role conflict is a top priority and cross-gender agenda. Overtime hours is a positive significant factor in stress for female workers, though it is shorter than male workers.

1. Research Objectives

The current cabinet in Japan tackles to promote more female workers to managerial positions. In August 2015, the Diet just passed a bill aiming to promote the role of women in the workplace in the depopulating economy. The law will oblige large companies, along with central and local governments, to set numerical targets for the employment and promotion of women.

Table 1 shows the international comparison of gender difference in proportion of managerial position, wage and job tenure at 2010. Women occupy only 10.6 percent of the managerial positions in Japan, while more than 30 percent of managers are women in Western countries. Wage and job tenure for women are also at the lowest level among the developed countries.

Table 1: International comparison of gender difference in labor at 2010

	Proportion of Women to Managerial Positions	Gender Wage Gap	Gender Job Tenure Gap
Japan	10.6	69.3	66.9
United States	43.0	81.2	91.3
United Kingdom	35.7	80.1	92.6
Germany	29.9	82.2	88.1
France	38.7	82.5	98.8
Sweden	31.2	86.0	107.5
South Korea	9.4	68.4	62.9

Source: ILO LABORSTA (<http://laborsta.ilo.org/>), Notes: Managerial positions refer to legislators, senior officials and managers. Gender wage and job tenure gaps are obtained as male is 100.0.

There are various studies on activating women, such as gender disparities of the proportion of managerial positions (Kato et al., 2013; Yamaguchi, 2013) and the problems of work-family conflict (Kato, 2010). In general, managers are exposed to stronger stress, which is highly related to serious problems such as suicide from overwork, than any other occupations (Iwata, 2013).

As stress caused by becoming managers is one of major managerial problems, we should consider alleviation of workplace stress to promote female managers. Our study examines the determinants of stress felt by female managers in Japanese firms.

2. Review of the literatures

Women and Stress

Nelson and Burke (2000) present a fine literature review on women and stress. Though there are a growing number of researches on women and stress since the early 1980s, their review indicate that there is no clear-cut answer to

the long-standing question whether men and women experience work stress differently or not. Some pioneering researches suggest that role conflict, role ambiguity and responsibility for people are common stressors for both men and women (Burke, 1996; Lindquist et al., 1997). Job stressors such as monotonous work and conflicting demands are equally found for men and women, while some studies report poorer psychosocial work conditions for women. There are some stressors that are important especially for women in managerial positions. Nelson and Burke (2000) suggest that these include organizational politics, barriers to achievement, overload, sexual behavior and work-home conflict.

Employers have assisted employees achieve their “work-life balance” by admitting flexible ways of working. Recently business leaders and researchers have argued the importance of “work-life integration.” The image of work-life balance suggests that there are the boundaries between work and life. On the other hand, work-life integration is an approach that creates more synergies between all areas that compose "life," including work, home, family, community, personal well-being, and health (Haas School of Business, 2016). This idea implies the importance of the environmental arrangements that, regardless of age and sex, both employees and managers can take both home and work responsibilities comprehensively and not separately.

Many female executives have had more difficulties to pursue the responsibilities for domestic care such as housework, childcare and eldercare than male executives (Valerio, 2009) and many jobs are designed as if workers have no family responsibilities (Bailyn et al., 2001). However, facing the aging society, more and more male executives have begun to take responsibilities for housework and eldercare. Furthermore, male workers must take consideration to ease the burden of their wives’ responsibilities for domestic care, because women are expected to hold more important positions in the firms.

Women and Stress in Japanese Firms

There are not so much researches focusing on women and stress in Japanese firms (Sato and Kume, 1997; Nakata et al., 2001; Ozono, 2009; Ozono, 2010; Usho et al., 2015). Sato and Kume (1997) studied the occupational stressor and strain in Japanese female workers. Their results suggest that gender related stressors reduce mental health and general stressors worsen both mental health and job satisfaction. The score of general stressor resulting from the role conflict and overwork is higher in management track (*Sogoshoku*) than non-management track (*Ippanshoku*). It is because managerial workers feel strong role conflicts and are forced to overwork.

Nakata et al. (2001) examined the relationship between perceived job stress and sleep habits in Japanese daytime female workers of an electric equipment manufacturing company, using mailed questionnaires. They assessed perceived job stress by means of the Japanese version of the NIOSH job stress questionnaire, which is mentioned below.

The results suggest that workers with skill underutilization tend to obtain long daily sleeping hours and those involved in tasks with cognitive demands receive less dozing or napping in daytime and fewer excessive daytime sleepiness at work. In addition, workers with social support tend to have good quality of sleep and overtime leads to insufficiency of sleep.

Ushio et al. (2015) clarified that stress reaction of male manager is significantly higher than male non-manager and those of female manager and non-manager are further higher than it with significance. It means that women perceive stronger stress than men. Workplace stress factors for female managers include less discretion, complaints for promotion and pay raise and insufficient support from supervisor and colleagues. Furthermore, female managers are assigned to smaller portion and lower level of tasks than male counterparts.

To summarize, women perceive stronger stress than men, managers tend to feel stronger stress than non-managers, and stressors are different across vocations and ways of working. Children increase stress for work-life balance, job satisfaction is higher for female managers than male, and physical fatigues for female managers are alleviated by the measures to make working time and workplace more flexible such as assistance for childcare and eldercare and introduction of teleworking.

Job Stress Models

We consider the studies of both stress and overwork death to explore the determinants of stress peculiar to women. The reason is that both studies consider depression or depressive state as major factors. The relationship between stress and suicide is considered as stronger stress tends to higher possibility of suicide. However it is hard to say that the study of stress and that of overwork death are interconnected or examined jointly. Though they are closely related, they are examined by different methods in different fields and are not well understood in a cross-sectional manner.

Stress is the state that a distortion is caused to mind and body by external force. It can be decomposed into stressor as a cause, strain as a reaction, and moderator that stands between the two. The scholars have studied what constitutes stressor, how stressor causes strain, and what kind of moderator interferes with the process. We show the following three models as representative ones in this field.

The first is the job stress model of Cooper and Marshall (1976). Their model showed a theoretical framework that describes the process that workplace stressor causes disease. The characteristics of this model is that sources of stress proceed to disease through individual characteristics and symptoms of

occupational ill health.

The second is job demand-control model of Karasek (1979). This model examines the worker's stress by two factors; job demands and job decision latitudes. The characteristics of this model is that jobs are categorized into four groups; "active jobs" with high job demands and high job decision latitudes, "passive jobs" that both are low, "high strain job" with high demands and low latitudes, and "low strain job" with low demands and high latitudes. Karasek found that "high strain job" tends to actual disease.

The third is the NIOSH job stress model of Hurrell and McLaney (1988).¹⁾ Job stressors cause strains (acute reaction) and lead to diseases through three components such as individual factors, non-work factors, and buffer factors.

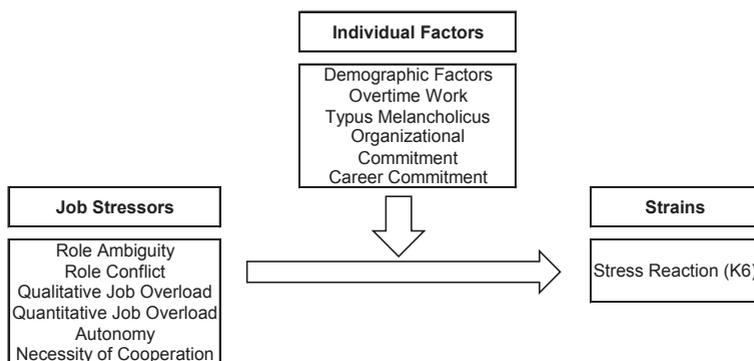
3. Methodology

This study analyzes the results of our original questionnaire that adopted the scale of stress reaction. Our research framework is constructed from the studies of both stress and suicide from overwork (Figure 1). Specifically, we apply the NIOSH job stress model (Hurrell and McLaney, 1988) and adopt the items that previous studies of overwork death have considered. The NIOSH job stress model has a broad applicability as a stress model and is applied to *the New Brief Job Stress Questionnaire* that is widely utilized in Japan.²⁾ We investigate the determinants of stress felt by female managers, comparing the results of both men and women.

¹⁾ NIOSH stands for the National Institute for Occupational Safety and Health.

²⁾ The English version of the New Brief Job Stress Questionnaire can be obtained from the following website of the Ministry of Health, Labour and Welfare. Ando et al. (2015) developed the English version of the questionnaire and presented the reliability and validity of it. (<http://www.mhlw.go.jp/bunya/roudoukijun/anzeneisei12/dl/150803-2.doc>)

Figure 1: Research Framework



We select role ambiguity, role conflict, qualitative and quantitative job overloads, autonomy, and necessity of cooperation as job stressors. These factors are based on Kanai and Wakabayashi (1988) and the Japanese Version of *the NIOSH Generic Job Stress Questionnaire* (Haratani et al., 1993). Quantitative job overloads have relationships with physical overloads, while qualitative job overload, role ambiguity and role conflict concern with psychological overloads.

Role conflict is defined as “the simultaneous occurrence of two (or more) sets of pressure such that compliance with one would make more difficult compliance with the other” (Kahn et al, 1964, p.19). Role ambiguity is “conceived as the degree to which required information is available to a given organizational position” (Kahn et al, 1964, p.25). To the extent such information is clearly communicated, role requirements and organizational positions are certainly defined. When communications about the scope of responsibilities is lacking, it leads to experienced ambiguity.

Broader concept of role ambiguity includes unclearness of the targets and expected outcomes of assigned jobs (Suzuki and Fumoto, 2009). As role conflict and role ambiguity concern with the target setting or the quota performance, it

also concerns with the death from overwork.

Next, we consider autonomy and need of cooperation to examine flexible job structure (Ohno, 2003). Japanese firms have ambiguous scope of jobs in order to complete jobs by cooperating with other workers. Quoting the job characteristic model of Hackman and Oldham (1976), we examine how much workers have discretion to do autonomously and need cooperation to complete assigned jobs.

We include organizational commitment, career commitment and Typus melancholicus (Tellenbach, 1983; Kasahara, 1984) into our model, though they are not contained in the NIOSH job stress model. Organizational commitment (continuance and emotional commitment) can be thought to measure the employee's loyalty to organization, which is taken to be important for Japanese firms. Especially, continuance commitment (Becker, 1960) as one of organizational commitments, have a strong relationship with the studies of overwork death. Career commitment (Blau, 1985) is considered to examine worker's career orientation. Typus melancholicus such as conscientious, interpersonal dependence and orderliness are also related to overwork death.

Finally, strain (stress reaction) is measured by K6 scales³⁾ (Furukawa et al., 2003; Kessler et al., 2003), not by the scale that *the New Brief Job Stress Questionnaire* adopts. The K6 scales are developed to assess the risk of suicide and are close to the studies of suicide from overwork. Our study exclude the moderators to explore the causes of overwork death. We understand the importance of moderators, but our study leave them for future works.

We include sex, age, profession⁴⁾, monthly average overtime hours, education,

³⁾ The questionnaire to measure K6 scale can be obtained from the following website. (http://www.hcp.med.harvard.edu/ncs/k6_scales.php)

⁴⁾ Professional/technical jobs, clerical jobs, and sales/service jobs are explicitly differentiated among professions, because these three categories of jobs have strong connection with suicide from overwork.

turnovers, marriage, child, tenure, job experience, years in job title, company size, and the ratio of non-regular workers, as demographic factors.

Now we present three hypotheses to be examined as follows.

H1: There are gender differences in the causes of stress.

H2: There are gender differences in average overwork hours.

H3: There are gender differences in the relationships between stress and average overwork hours.

Our analysis is based on the web questionnaire⁵⁾, which targets are regular employees aged from 20 to 60 who obtain managerial positions. The number of respondents is 832; 655 males and 177 females. Sort by their positions, there are 342 unit chiefs, 183 subsection chiefs, 192 section chiefs and 115 division chiefs. The respondents are randomly extracted from monitors of the research firm.

4. Major Results

Factor Analysis

We examine the factor analyses (by maximum-likelihood methods with Promax rotations) for job stressors, Typus melancholicus, commitments, and strains. We extract the factors with eigenvalues of more than one. Then we can extract five factors from the factor analysis for 23 items of job stressors (Table 2). The first factor is role conflict (eigenvalue = 6.799, $\alpha = .873$), the second factor is named as job overloads (eigenvalue = 3.903, $\alpha = .846$). The third factor is role ambiguity (eigenvalue = 1.888, $\alpha = .912$), the fourth is necessity of cooperation (eigenvalue = 1.535, $\alpha = .836$), and the fifth is autonomy (eigenvalue = 1.241, $\alpha = .806$).

⁵⁾ The web questionnaire is executed from December 12 to 15, 2013 in association with Macromill, Inc.

Next, the factor analysis for 15 items of *Typus melancholicus* extracted the following three factors, after dropping the items with the factor score of less than .350. The results are shown in Table 3. The first is named as conscientious and demanding (eigenvalue = 3.781, $\alpha = .780$), the second is interpersonal dependence (eigenvalue = 2.417, $\alpha = .751$), the third is orderliness (eigenvalue = 1.403, $\alpha = .886$).

Table 2: Factor analysis for job stressors

	I	II	III	IV	V
Role conflict (eigenvalue = 6.799, $\alpha = .873$)					
I have to do things that do not have to do.	.877	-.039	-.025	-.019	.034
I work under incompatible policies and guidelines.	.831	-.076	-.027	.069	-.073
I do things that are apt to be accepted by one person and not accepted by others.	.783	-.082	.050	.029	.094
I receive incompatible requests from two or more people.	.712	.102	.019	-.006	-.036
Job overloads (eigenvalue = 3.903, $\alpha = .846$)					
I have to do extremely so much jobs.	.018	.855	-.012	-.048	-.058
I cannot process my job in time.	.037	.807	.056	-.032	-.106
I must work hardly.	-.105	.764	.011	.026	.079
I must always think about my job during office hours.	-.032	.550	-.011	.152	.023
I need to concentrate my attention so much.	-.023	.473	-.022	.198	.124
I am assigned to a job, even though manpower is lacking.	.446	.469	-.044	-.115	.006
My job is difficult that requires highly specialized knowledge and techniques.	-.041	.359	-.042	.043	.203
Role ambiguity (eigenvalue = 1.888, $\alpha = .912$)					
I understand well what my responsibility is.	.003	-.004	.915	.021	-.006
I understand what the objectives or goals of my job are.	.033	-.032	.892	-.009	.040
I understand how much authority I have.	-.012	.030	.823	.030	-.025
I understand what others expect me.	-.024	.020	.769	-.045	-.004
Necessity of cooperation (eigenvalue = 1.535, $\alpha = .836$)					
I can not do my job well if I do not pay attention to coworker's progress.	.060	-.013	.014	.806	-.010
My job is not done completely without coworker's cooperation.	-.077	-.004	-.019	.769	.019
My job is affected by coworker's results.	.083	-.007	-.017	.746	.035
I must always consult my coworkers to complete your job.	.002	.194	.031	.571	-.112
Autonomy (eigenvalue = 1.241, $\alpha = .806$)					
I complete a job by myself if I begin to do it.	.052	.029	.083	-.044	.758
I carry my job through to the end at my responsibility.	.001	-.005	-.058	-.021	.738
I can do a job at my discretion when no direction is given from my boss.	-.006	-.015	-.050	-.006	.723
I can change the way or procedure to do a job at my discretion.	-.018	-.003	.011	-.040	.633
Inter-factor Correlations					
I	—				
II	.467	—			
III	.077	-.231	—		
IV	.387	.624	-.205	—	
V	.120	.387	-.517	.274	—

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Table 3: Factor analysis for *Typus melancholicus*

	I	II	III
Conscientious and demanding (eigenvalue = 3.781, α = .780)			
I have a strong responsibility.	.850	-.060	-.059
I value sense of duty	.761	.025	-.027
I want to do it thoroughly if you begin it.	.709	-.118	.053
I like to work.	.537	-.083	.020
I value commonsense.	.418	.323	.075
Interpersonal dependence (eigenvalue = 2.417, α = .751)			
I am timid.	-.192	.738	-.054
I am not good at conflicting with others.	-.036	.712	-.043
I am anxious about what I am seen.	-.009	.569	.056
I am not good at standing out.	-.058	.527	.028
I avoid extremes.	.103	.513	.063
I cannot say no if I am asked.	.385	.404	-.059
Orderliness (eigenvalue = 1.403, α = .886)			
I am cleanly person.	.018	-.009	.952
I like clearance.	-.022	.031	.838
Inter-factor correlations			
	I	II	III
I	—		
II	.269	—	
III	.397	.067	—

Then, we examined the factor analysis for 16 items of commitments and obtained the following three factors as we have expected (Table 4). The first factor is named as career commitment (eigenvalue = 5.883, α = .901), the second is emotional commitment (eigenvalue = 2.715, α = .836), and the third is continuance commitment (eigenvalue = 1.622, α = .815). Finally, the factor analysis for 6 items of strains extracted one factor and we name K6 (α = .943).

Correlation Matrix

Correlation matrix for women (N=177) is presented in Table 5. The factors that correlate significantly with stress reaction (K6) are role conflict ($r=.584$), job overload ($r=.353$), continuance commitment ($r=.312$), weekly overtime hours ($r=.233$), necessity of cooperation ($r=.216$) and interpersonal dependence ($r=.213$). All the factors mentioned above correlate significantly with K6 for both men and women, and only the difference is that role ambiguity positively correlates with K6 for men.

Table 4: Factor analysis for commitments

	I	II	III
Career commitment (eigenvalue = 5.883, $\alpha = .901$)			
I want to continue this vocation because I like it.	.951	-.113	.063
I want to do the present vocation if you change your employer.	.868	-.144	.034
The present vocation is ideal for your lifework.	.858	.004	.023
I am content with the present vocation.	.765	.024	-.026
I want a career in this vocation.	.725	.084	.013
I continue my vocation if I can make money without working.	.612	.099	-.056
I read so many journals/books concerning about the present vocation.	.492	.143	-.124
I want to do the present vocation even if my salary decreases.	.390	.300	-.015
Emotional commitment (eigenvalue = 2.715, $\alpha = .836$)			
I care about the company's reputation or performance as myself.	-.020	.843	.009
I am willing to put in a great deal of effort beyond that normally expected in order to help this organization be successful.	-.002	.737	.027
I find that my values and the organization's values are very similar.	.088	.710	.039
I would accept almost any type of job assignment in order to keep working for this organization.	-.019	.681	-.035
Continuance commitment (eigenvalue = 1.622, $\alpha = .831$)			
I am afraid of what might if I quit my job.	-.007	.062	.831
It would be very hard for me to leave my organization right now, even if I wanted to.	-.035	.013	.713
I believe that I have too few options to consider leaving this organization.	-.021	-.088	.692
One of the major reasons I continue to work for this organization is that leaving would require considerable personal sacrifice.	.036	.043	.654
Inter-factor correlations			
I	—		
II	.523	—	
III	.008	.190	—

Test of differences between men and women

We find the following differences between men and women through t test as is shown in Table 6. The variables (factors) that men are significantly higher than women are age, graduates dummy, child dummy, weekly overtime hours, job experience, occupational experience and role ambiguity. The variables (factors) that women are significantly higher than men are sales and services job dummy, single dummy, proportion of non-regular worker (over 30%) dummy, conscientious, interpersonal dependence, career commitment and necessity of cooperation.

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Table 5: Correlation matrix for women

Women (N=177), *p<.05, **p<.01	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Age	37.80	10.698	-												
2. Specific and technical job (Dummy)	.50	.501	-.144	-											
3. Sales and service job (D)	.42	.495	.062	-.852**	-										
4. Clerical job (D)	.06	.242	.143	-.289**	-.218**	-									
5. Overtime hours (monthly)	21.05	25.066	.022	-.121	-.040	.289**	-								
6. University graduates (D)	.53	.501	-.109	.141	-.112	.010	.196**	-							
7. Turnover (D)	.54	.500	.230**	-.029	-.049	.143	.136	-.033	-						
8. Single (D)	.46	.500	-.373**	-.051	.085	-.005	-.016	-.157**	-.034	-					
9. Child (D)	.36	.480	.339**	.078	-.080	-.094	-.085	-.144	.043	-.643**	-				
10. Tenure	10.16	8.503	.553**	-.057	-.018	.105	-.076	-.100	-.259**	-.174**	.123	-			
11. Job experience	12.78	8.814	.767**	-.039	-.033	.129	.037	-.108	.074	-.312**	.216**	.627**	-		
12. Occupational experience	4.46	4.827	.548**	-.071	.021	.097	.020	-.024	-.008	-.186**	.066	.627**	.640**	-	
13. Large firm (over 300, D)	.54	.500	.114	.153*	-.187**	.049	-.245**	-.260**	.181*	-.125	.114	-.077	.081	.105	-
14. Proportion of Non-regular (over 30%, D)	.69	.465	-.044	-.195*	.166**	.064	-.081	-.077	.097	-.014	.013	-.104	-.064	-.063	-.141
15. Conscientious	20.06	2.888	.099	.065	-.058	-.006	.112	.001	.110	-.008	.004	-.050	.122	.068	-.173
16. Interpersonal dependence	21.88	3.825	-.070	.051	-.020	.033	.140	.016	-.024	-.005	-.016	-.116	-.059	-.083	.015
17. Orderliness	6.49	2.331	.117	.028	-.015	.047	-.119	.062	.016	-.058	.043	.089	.121	.177**	.070
18. Continuance commitment	14.19	3.552	.087	-.088	.098	.039	.045	-.062	-.048	-.004	.014	.060	.122	.063	-.003
19. Emotional commitment	11.64	4.013	.082	.091	-.084	.023	.085	.002	.028	-.120	.047	.070	.079	.059	.104
20. Career commitment	26.00	7.775	.109	.270**	-.253**	-.018	.022	.149	.148**	-.115	.178**	.020	.134	.038	.132
21. Job overload	25.66	5.411	-.089	.068	-.041	.029	.294**	-.141	.160**	.013	-.073	-.158**	-.100	-.147	-.052
22. Necessity of cooperation	15.03	3.509	-.144	-.031	.082	-.009	.156**	.050	.079	.044	-.084	-.108	-.145	-.167**	-.151**
23. Autonomy	16.06	2.703	-.041	.056	-.083	.011	.080	.018	.072	.029	.092	-.051	.042	.061	.122
24. Role ambiguity	6.52	2.299	-.132	.092	-.102	.023	-.036	-.036	-.118	.096	-.096	.008	-.182**	-.111	-.059
25. Role conflict	10.78	4.626	-.078	.001	.038	-.054	.130	.018	.057	.030	-.011	-.106	-.071	-.094	-.005
26. K6	14.59	6.710	-.019	-.119	.124	-.002	.233**	.023	-.031	.096	-.092	-.071	-.050	-.038	-.043

*p<.05, **p<.01	14	15	16	17	18	19	20	21	22	23	24	25	26
14. Proportion of Non-regular (over 30%, D)	-												
15. Conscientious	-.130	-											
16. Interpersonal dependence	-.119	.113	-										
17. Orderliness	-.245**	.261**	-.001	-									
18. Continuance commitment	-.007	.075	.289**	-.012	-								
19. Emotional commitment	-.093	.302**	.000	.004	.232**	-							
20. Career commitment	-.101	.406**	.034	.131	.012	.564**	-						
21. Job overload	.060	.209**	.099	-.091	.195**	.331**	.261**	-					
22. Necessity of cooperation	.002	-.122	.098	.077	.126	.088	.095	.607**	-				
23. Autonomy	-.070	.404**	.050	.084	.008	.170**	.305**	.220**	.097	-			
24. Role ambiguity	-.092	-.396**	-.058	-.186**	-.004	-.193**	-.197**	-.087	-.064	-.356**	-		
25. Role conflict	-.099	.027	.023	.072	.276**	.039	.010	.472**	.338**	.137	.043	-	
26. K6	-.135	-.035	.213**	-.051	.312**	.090	-.037	.353**	.216**	.066	.093	.584**	-

Table 6: Results of t test

	Total (N=832)		Male (N=655)		Female (N=177)		t value
	Mean	SD	Mean	SD	Mean	SD	
1. Age	41.25	9.880	42.19	9.441	37.80	10.698	4.965 ***
2. Specific and technical job (D)	.56	.497	.58	.494	.50	.501	1.754
3. Sales and service job (D)	.32	.468	.30	.457	.42	.495	-2.955 **
4. Clerical job (D)	.06	.236	.06	.234	.06	.242	-.207
5. Overtime hours (monthly)	35.17	30.801	38.98	31.110	21.05	25.066	8.001 ***
6. University graduates (D)	.63	.484	.65	.476	.53	.501	3.086 **
7. Turnover (D)	.52	.500	.52	.500	.54	.500	-.550
8. Single (D)	.30	.457	.25	.434	.46	.500	-5.125 ***
9. Child (D)	.54	.499	.59	.493	.36	.480	5.630 ***
10. Tenure	13.37	9.669	14.23	9.788	10.16	8.503	5.464 ***
11. Job experience	15.53	9.737	16.27	9.847	12.78	8.814	4.556 ***
12. Occupational experience	5.59	5.332	5.90	5.424	4.46	4.827	3.414 **
13. Large firm (over 300, D)	.49	.500	.47	.500	.54	.500	-1.669
14. Proportion of Non-regular (over 30%, D)	.53	.499	.48	.500	.69	.465	-4.697 ***
15. Conscientious	18.82	3.263	18.48	3.279	20.06	2.888	-5.821 ***
16. Interpersonal dependence	20.90	3.967	20.64	3.966	21.88	3.825	-3.702 ***
17. Orderliness	6.39	2.043	6.36	1.960	6.49	2.331	-.649
18. Continuance commitment	14.16	3.712	14.15	3.756	14.19	3.552	-.102
19. Emotional commitment	11.59	3.556	11.58	3.425	11.64	4.013	-.172
20. Career commitment	24.77	6.814	24.44	6.498	26.00	7.775	-2.451 *
21. Job overload	25.71	5.252	25.73	5.212	25.66	5.411	.157
22. Necessity of cooperation	14.56	3.255	14.44	3.174	15.03	3.509	-2.150 **
23. Autonomy	15.73	2.678	15.64	2.665	16.06	2.703	-1.886
24. Role ambiguity	6.91	2.770	7.01	2.876	6.52	2.299	2.396 *
25. Role conflict	11.23	4.461	11.35	4.411	10.78	4.626	1.501
26. K6	14.47	6.562	14.44	6.526	14.59	6.710	-.271

*p<.05, **p<.01, ***p<.001

Regression analysis of stress reaction (K6 scale)

As there is not a significant difference of stress reaction (K6) between men and women, we examine gender differences of the determinants of stress through regression analysis of K6 by sex.⁶⁾

Table 7: Results of regression analysis

Dependent Variable:K6	Male (N=655)	Female (N=177)
Age	-.024	.050
Sales and service job (D)	.069 *	.111
Overtime hours (monthly)	.005	.125 *
Tenure	.021	-.016
Conscientious	-.032	-.077
Interpersonal dependence	.182 ***	.177 **
Orderliness	.015	-.025
Continuance commitment	.109 **	.076
Emotional commitment	.007	.095
Career commitment	-.025	-.057
Job overload	.195 ***	.068
Necessity of cooperation	.016	-.039
Autonomy	-.052	.043
Role ambiguity	.196 ***	.095
Role conflict	.411 ***	.512 ***
Adj R ²	.391	.394
F	28.990	8.619

*:p<.05, **:p<.01, ***:p<.001

Note: The figures are standard partial regression coefficients.

Explanatory variables for K6 are job dummy, weekly overtime hours, tenure, Typus melancholicus, commitments (career, continuance and emotional) and job stressors (job overload, role ambiguity, role conflict, necessity of cooperation and autonomy). The results are shown in Table 7.

The significant and positive factors for women are monthly overtime hours ($\beta = .125, p < .05$), interpersonal dependence ($\beta = .177, p < .01$) and role conflict ($\beta = .512, p < .001$). On the other hand, the significant and positive factors for

⁶⁾ We omitted some individual factors from explanatory variables due to multicollinearity.

men are sales-service job dummy ($\beta = .069$, $p < .05$), interpersonal dependence ($\beta = .182$, $p < .001$), continuance commitment ($\beta = .109$, $p < .01$), job overload ($\beta = .195$, $p < .001$), role ambiguity ($\beta = .196$, $p < .001$), role conflict ($\beta = .411$, $p < .001$).

Examination of Hypotheses

H1 is supported because there found gender differences in the determinants of stress. Specifically, role conflict is the only factor for women to explain stress among job stressors. On the other hand, there are three factors for men such as job overload, role ambiguity, and role conflict. Job stressors for women are concentrated to role conflict, while overtime hours is a characteristic factor only for women to explain stress.

H2 and H3 are also supported from the fact that overtime hours are significantly longer for men than for women and it is a positive significant factor to explain stress reaction (K6) only for women. Overtime working gives larger psychological impacts for women than for men.

5. Results and Discussions

We find the following determinants of the stress of female managers in Japanese firms. First, role conflict is the strongest explanatory factor among job stressors. As it also holds for male managers, the alleviation of role conflict is a top priority cross-gender agenda. Second, interpersonal dependence is a strong explanatory factor among Typus melancholicus. As it holds for male managers, it is an important factor for both men and women. To implement a necessary policy concerning personality factor, we should treat carefully the individual information that relates to it.

Third, overtime hours is a positive significant factor in stress for female managers, though it is shorter than male workers. As women have less physical power than men, additional overwork makes women feel more stress than men. Furthermore, as women tend to weigh work-life balance from the responsibility for housework and childcare, long working hours give more stress for women.

Forth, we cannot find gender difference in stress reaction (K6). Ozono (2009) examined a gender difference in managers' stress and suggest that women tend to answer that they feel stress, compared to men. In her analysis, significant gender differences are found in the effects of work-life balance, working hours, and holidays. However, as the questionnaire that she used just asked whether respondents feel stress or not, her study did not measure stress reaction as we did. Our study suggest that overtime hours give a large effect on stress in female managers.

Ozono (2009, 2011) examined gender differences in physical fatigue and psychological stress, focusing on workers who hold managerial positions⁷⁾. Her studies suggest that women tend to feel physical fatigue and overwork give a positive effect on it. Though Ozono (2011) have a problem to measure psychological stress as is mentioned above, our results are partly supported by it.

For men, there are so many same-sex workers whose overtime hours are long in the same workplace, on the other hand, for women, there is fewer same-sex worker whose working hours are long in the workplace. It makes female workers tend to feel the inequity among the same sex and overtime hours possibly become a strong stressor for women.

In Japanese firms, long working hours are virtually a necessary condition to obtain managerial positions (Kato et al., 2013; Yamaguchi, 2013; Murota and

⁷⁾ A series of her studies are depend on the high-effort/low-reward model of Siegrist (1996).

Sugiura, 2014). We should introduce an evaluation axis that is independent from working hours in order to promote more women for managerial positions in Japanese firms. Because, for women feeling stronger stress from overwork than men, it is difficult to accept overwork and become candidates for managers. Low orientation to leadership is one of the reasons why there are fewer female managers (Homma, 2010). We should consider the stressor that is peculiar to women for the leadership education. As female managers tend to have stronger career commitment than male, it is also effective to develop career orientation.

The followings are left for future works. First, as samples are biased to male workers, we should equalize the number of managers by gender. Second, we should examine the impact of overtime hours on stress for female managers. The previous studies (Iwata 2012; 2013) found that the impact of overtime hours on stress is weak or none, but the impact for female managers is not weak. Therefore, a reduction in working hours is important for female managers and we should consider this problem from the viewpoint of work-life balance.

Third, though this study explores the determinants of stress, it does not include the moderators to alleviate stress. To examine the ability or way to ease the stress for female managers, we should consider job demands-resources model (Demerouti et al., 2001) that focuses on personal resources, for future works.

Notes

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