論文

ベストワースト尺度法による日本企業が取り組む就業時間関連の子育て支援に対する選好分析

Best–Worst Scaling on Working-time-related Corporate Support for Child Care and Upbringing in Japan

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With many OECD countries, including Japan, recently reforming the available support for improving work–life balance, corporate support for child care and upbringing has received increasing attention. To better understand employees' preferences for working-time-related support for child care and upbringing, we conducted a best–worst scaling (BWS) survey in Japan. We confirmed the presence of heterogeneous preferences with regard to the work-reducing and -retaining characteristics of support.

近年，日本を含む多くの OECD 諸国では，ワークライフバランス関連の支援体制改善に関する施策が講じられている．とりわけ，企業が取り組む子育て支援に対する注目度が高いため，就業時間関連の子育て支援に対する日本の従業員選好を把握するために，ベストワースト尺度法を含む調査を実施した．分析の結果，就業時間を減らす性質の支援と，就業時間を保持する性質の支援について，多様な選好が観察された．

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1. Introduction

Many OECD countries, including Japan, have recently considered the available support for work–life balance, evidenced in Japan by the appointment of a Minister of State for Special Missions in the Cabinet Office and the designation of a Minister of State for Gender Equality in 2001 and a Minister of State for Measures for Declining Birthrate in 2006. Likewise, observing the gap between Japan's future population projections and the population level needed to ensure appropriate social security, the Ministry of Health, Labor, and Welfare (MHLW) has become increasingly concerned with issues concerning childbirth, parenting, and work style.[i] The Child Care and Family Care Leave Act consists of several measures to overcome this situation, including the child-care leave system, measures to reduce working hours, and limits on overtime, especially as it appears that most of these measures focus on working-time-related measures (MHLW 2012). Therefore, it is obvious that work–life balance, including support for the care and upbringing of the children of employees, is one of the most important political issues currently in Japan.

While there are at least two support agents in this area, including governments and corporates, there has been an increasing focus in Japan on the role of corporates, whilst there are many relevant non-government/non-profit organizations. For example, commendations are available for workplaces with sound work–life balance practices, including "Kobe Danjo Iki-iki Jigyo-sho Hyosho (Commendation of Office with Lively Men and Women in Kobe)," [ii] "Hyogo Shigoto to Seikatsu no Balance Kigyo Hyosho (Commendation of Corporate with Work–Life Balance in Hyogo)," [iii] and "Kurumin", to encourage companies to support the care and upbringing of their employees' children.[iv] Thus, support for the care and upbringing of employees' children has also been a major concern for Japanese companies.

Previous studies have paid much attention to the support available for employee working hours, with many studies considering the advantages of improving parental leave. For example, Waldfogel et al. (1999) examined the employment rates and decisions of females with young children by utilizing panel data in the US, the UK, and Japan. They concluded that family leave coverage positively influenced female job retention after childbirth, especially in Japan. Similarly, Nepomnyaschy and Waldfogel (2007) found that males taking longer parental leave were more involved in child-care activities, including changing diapers and feeding, in the US. Elsewhere, using a border theory perspective proposed by Clark (2000), Allard et al. (2007) found evidence of better gender equality among fathers with access to flexible parental leave as a means of balancing work and family conflict in Sweden. Tanaka and Waldfogel (2007) suggested that policies that provide parental leave or shorten working hours could increase the involvement of fathers with their young children with regard to the main caregiving activities, including diapering, feeding, and getting up during the night. In Canada, Baker and Milligan (2008) concluded that longer post-birth maternity leave led to more time at home and increased the likelihood of job retention. In general, support relating to working hours appears to be one of the more promising ways to manage work–life balance.

However, other studies have failed to demonstrate the significant effects of support policy as it relates to working hours. For instance, Misra et al. (2011) suggested that work-reducing policies, such as parental leave, had mixed effects on female hours of work and wages. When it comes to shorter parental leave, the policy can have positive effects, but there are trade-offs. Employing Swedish data, where they implemented a parental leave reform known as the "daddy month," Ekberg et al. (2013) suggested that there was no significant effect on the male share of leave taken for the care of sick children,

but it did influence wages and employment. In Germany, Kluve and Tamm (2013) found that while monetary transfers provided an incentive for mothers to reenter the labor market, the two daddy months did not have a significant impact on the amount of time fathers devoted to child care. In order to implement effective policies with regard to work–life balance in Japan, it is therefore important to evaluate employees' preferences for support as they relate to working hours, as well as considering the particular circumstances each employing firm faces. Thus, we decided to survey employees' preferences for corporate support of child care and upbringing in Japan, but focusing only on working-time-related measures.

For this purpose, we employ a best–worst scaling (BWS) survey, which is one of the more promising approaches to eliciting preferences by inducing a certain trade-off structure. First introduced by Louviere and Woodworth (1990), Finn and Louviere (1992) published the first application of the technique, with the probability properties outlined by Marley and Louviere (2005). Since then, BWS has been applied to many research areas, including food-related concerns such as wine marketing (Cohen 2009, among others) and psychological areas including ethical beliefs on social issues (Auger et al. 2007), as well as health-related areas such as general social care (Potoglou et al. 2011). However, we are unaware of any existing research applying BWS to labor policy.

The structure of the remainder of this article is as follows. In Section 2, we summarize our survey design and discuss the econometric method. In Section 3, we present the estimated results. In Section 4, we summarize our analysis and detail some topics for future research.

2. Material and Method

We administered an online survey to workers with a listed occupation using the Web-based research panel of Nikkei Research Inc. in several cities around Kobe, Hyogo, Japan. We organized our questionnaire as follows. First, we asked respondents about their work situation. Second, we questioned them about the availability of corporate support for child care and upbringing to ensure that respondents were familiar with all elements of the support available. Third, we used BWS to analyze their working-time-related support, as described below. Finally, we gathered respondents' views on their workplace and their socioeconomic characteristics. We administered our survey during the period February 23–27, 2013. We distributed 17,986 surveys and received 2,004 responses (a response rate of 11.2%). Table 1 provides a summary of the basic demographics of our sample.

To organize the BWS choice set, we select seven items with reference to "Ryoritsu Shien no Hiroba"[v]: child-care leave (CCL), sick and/or injured child-care leave (SIL), reduced working hours (RWH), flexible working hours (FWH), advancing or delaying starting and finishing times (AD), working from home (WH), and exemption from overtime work (EOW). Table 2 lists the items, and the questionnaire is in the Appendix. See also Ohdoko (2014) for details. When assigning items with choice sets, we employed R 3.0.0 and the function "bibd" in the R package OPDOE 1.0–7 (Rasch et al. 2011) with $B(7,3,7,3,1)$. Consequently, we created seven choice sets for respondents along with the choice set ordering.

Each response to a best–worst question results from choosing the two items that maximize the difference between the items on an underlying scale of importance. If a choice set has J items, there are $J(J-1)$ possible best–worst combinations that respondent $n\ (n = 1, \cdots, N)$ could choose. When a respondent selects a particular pair of items as best and worst, it denotes a choice out of all $J(J-1)$ possible pairs that maximize the difference in importance.

Following previous studies such as Lusk and Briggeman (2009), let us assume that γ_i is the location of the value of item i, chosen as the best item, and γ_j is that of item j, chosen as the worst

Table 1: Demographics

Item	Subitem	Resp.	Item	Subitem	Resp.
Gender	Male	1,137	No. of family members	1	18
	Female	867		2	320
Age	30	162		3	409
	40	585		4	522
	50	781		5	544
	60	476		6	146
Marital status	Married	1,317		7+	45
	Unmarried	687	No. of children (6 to 14 years)	0	1,463
No. of employees	–4	145		1	315
	–9	224		2	194
	–19	267		3+	32
	–29	151	No. of children (5 years or younger)	0	1,721
	–39	118		1	207
	–49	88		2+	76
	–99	254	Income (JPY million)	–200	75
	–199	232		–400	345
	–299	87		–600	482
	300+	438		–800	408
Occupation	Board Member	47		–1,000	246
	Full-time Worker	1,392		–1,200	140
	Part-time Worker	282		–1,400	75
	Temporary Payroll	76		–1,600	37
	Dispatched Worker	73		–1,800	17
	Contracted Employee	119		1,800+	19
	Nonregular Staff	15		None	160

Note: Resp. = Number of responses.

item, on the underlying scale of importance. We then assume the random utility model $U_i = \gamma_i + \varepsilon_i$ and $U_j = \gamma_j + \varepsilon_j$, where ε_i and ε_j are the respective random error terms. When respondent n chooses item i and item j as the best and worst, respectively, the choice probability out of a choice set with J items is equal to the probability that the difference in U_i and U_j is greater than all other $J(J-1)-1$ possible differences in the choice set. When ε_i and ε_j are distributed i.i.d. Type I extreme values, this probability takes the familiar multinomial logit form, as follows:

$$P_{ij} = \exp(\gamma_i - \gamma_j) / \left(\sum_{l=1}^{J} \sum_{m=1}^{J} \exp(\gamma_l - \gamma_m) - J\right) . \quad \text{(Eq. 1)}$$

Table 2: List of Items on Working-time-related Corporate Support for Employees' Child Care and Upbringing

Item (Variable name)	Description
Child-care leave (CCL)	In principle, employees can obtain child-care leave from the child's birth to the day before the child's first birthday.
Sick and/or injured child-care leave (SIL)	Employees can obtain this child-care leave if the child suffers from an acute disease and/or injury.
Reduced working hours (RWH)	Reduction in the prescribed daily, weekly, or monthly number of working hours.
Flexible working hours (FWH)	There exists a core period of the day when employees are expected to be at work; however, employees can choose when they work during the remaining hours, subject to a total prescribed number of working hours.
Advancing or delaying starting and finishing times (AD)	For example, suppose those who plan to work between 9:00 and 17:00 (with a one-hour lunch break) change their working hours to 9:30 to 17:30 (with a one-hour lunch break), with total working hours unchanged.
Working from home (WH)	A work arrangement in which employees do not commute to a central place of work. Instead, they work from home with total working hours unchanged.
Exemption from overtime work (EOW)	Working beyond the prescribed number of hours is not allowed for employees who have children who are less than three years old.

The estimated γ_i or γ_j denotes the importance of item i or j relative to an item that was normalized to zero[vi].

Revelt and Train (1998) demonstrated that a random parameter logit (RPL) with the use of repeat data could relax the assumptions of a multinomial logit, namely, preference homogeneity and the independence of irrelevant alternatives. The choice probability of respondent n is given as follows within the parameter space Ω:

$$\pi_n = \int \prod_{t=1}^{T} P_{nijt} \cdot f(\gamma|\Omega) d\gamma, \quad \text{(Eq. 2)}$$

where $t\,(t = 1, \cdots, T)$ denotes the number of replications of BWS questions, P_{nijt} is the form of Equation 1, and $f(\gamma|\Omega)$ is known as a mixing distribution. Previous studies have frequently employed the normal distribution for $f(\gamma|\Omega)$, which we also used. We estimated the parameters by maximizing a simulated log-likelihood function, evaluated at 100 pseudorandom Halton draws.[vii]

In particular, we can specify the estimated importance parameter for respondent n and item i as $\hat{\gamma}_{ni} = \tilde{\gamma}_i + \sigma_i \mu_{ni}$, where $\tilde{\gamma}_i$ and σ_i are the mean and standard deviation parameter of γ_i in the population, respectively, and μ_{ni} is a random term normally distributed with mean zero and unit standard deviation. A standard deviation parameter denotes the degree of heterogeneity in preferences.

We employed Limdep 10 + NLOGIT 5 (Econometric Software, Inc., NY) to estimate RPL. As to the seven variables in the choice sets, we employed effects coding following Bech and Gyrd-Hansen (2005), and omitted EOW in the

estimation. In searching for the best-fit model, we gave a high priority to the significance of the standard deviation parameters in order to grasp the structure of the preference heterogeneities. Then, we induced cross terms with various combinations of the covariates in Table 1.

3. Result

Table 3 provides our list of variables, with the two sets of results shown in Table 4 comprising Model 1, which consists of only the item variables in the BWS questions, and Model 2, which contains the significant cross terms. We use the former to gauge the overall ranking structure of the support items with preference heterogeneities and the latter to interpret our result in detail. In estimating Model 2, we calculated a per capita income variable using income and number of family members (PCI), and a "permanent dummy" to indicate whether respondents' occupations indicated whether they were regular workers (PERM). Additionally, as per effects coding, we defined the reference point or the omitted item (EOW) as the negative sum of the coefficients with regard to the levels of attributes incorporated into the estimation (Bech and Gyrd-Hansen 2005).

Table 3: List of Variables

Variable	Description
CCL	Takes a value of 1 if the chosen item is 'child-care leave'; –1 if it is 'exemption from overtime work', which is an omitted variable; 0 otherwise.
SIL	Takes a value of 1 if the chosen item is 'sick and/or injured child-care leave'; –1 if it is 'exemption from overtime work', which is an omitted variable; 0 otherwise.
RWH	Takes a value of 1 if the chosen item is 'reduced working hours'; –1 if it is 'exemption from overtime work', which is an omitted variable; 0 otherwise.
FWH	Takes a value of 1 if the chosen item is 'flexible working hours'; –1 if it is 'exemption from overtime work', which is an omitted variable; 0 otherwise.
AD	Takes a value of 1 if the chosen item is 'advancing or delaying starting and finishing times'; –1 if it is 'exemption from overtime work', which is an omitted variable; 0 otherwise.
WH	Takes a value of 1 if the chosen item is 'working from home'; –1 if it is 'exemption from overtime work', which is an omitted variable; 0 otherwise.
EOW	Estimated value from other-effect coded variable estimates.
MALE	Takes a value of 1 if the respondent is male; 0 otherwise.
AGE	Numerical value.
EMPL	Numerical value.
PERM	Takes a value of 1 if the respondent is a board member or full-time worker; 0 otherwise.
PCI	Numerical value, calculated from income and number of family members.

Table 4: RPL Results

		Model 1		Model 2	
Variables		Coefficient	t-value	Coefficient	t-value
Mean parameters					
CCL		1.381***	33.600	1.950***	9.650
SIL		0.277***	10.350	–0.124	–0.880
RWH		0.269***	12.120	0.366***	9.810
FWH		–0.245***	–8.100	–1.057***	–6.610
AD		0.015	0.600	0.106***	3.100
WH		–1.022***	–28.420	–1.292***	–21.720
EOW		–0.675			
Cross terms					
CCL*MALE	Male Dummy			–0.328***	–3.720
CCL*AGE	Age			–0.019***	–4.070
CCL*EMPL	No. of Employees			0.002***	6.010
CCL*PERM	Permanent Dummy			0.289***	3.210
SIL*MALE	Male Dummy			–0.389***	–6.860
SIL*AGE	Age			0.018***	5.490
SIL*PCI	Per capita Income			–0.001***	–3.860
RWH*MALE	Male Dummy			–0.163***	–3.390
FWH*MALE	Male Dummy			0.315***	4.840
FWH*AGE	Age			0.014***	3.790
AD*EMPL	No. of Employees			–0.001***	–4.520
WH*MALE	Male Dummy			0.386***	5.170
SD parameters					
CCL		1.445***	36.280	1.466***	33.050
SIL		0.927***	28.490	0..917***	28.940
RWH		0.619***	18.390	0.669***	21.010
FWH		1.097***	30.440	1.123***	29.530
AD		0.823***	25.110	0.866***	25.570
WH		1.400***	32.890	1.402***	33.030
No. of Samples		2,004		1,826	
No. of Obs.		14,028		12,782	
Halton Replication		100		100	
Log-likelihood		–21319.460		–19263.258	
McFadden's ρ^2		0.152		0.159	

Note: *** denotes significance at the 1% level. SD standard deviation.

As shown by the results for Model 1, we estimated every standard deviation parameter as being significant, which indicates that preference heterogeneities prevail among all forms of working-time-related corporate support for employee child care and upbringing. Overall, respondents ranked the items as follows: CCL first, SIL second, RWH third, AD fourth which is statistically zero, FWH fifth, EOW sixth and WH last. With reference to Model 2, the various covariates are also significant. With regard to the cross terms with CCL, the estimates for the male dummy (MALE) and age (AGE) are both negative, while the number of employees (EMPL) and the permanent dummy (PERM) are both positive. As to SIL, the estimates for the male dummy (MALE) and per capita income (PCI) are both negative, while that for age (AGE) is positive. With RWH, the estimate for the male dummy (MALE) is negative, and with FWH, the male dummy (MALE) and age (AGE) estimates are positive. Finally, with the estimates for AD, the number of employees (EMPL) is negative, while for WH, the male dummy (MALE) is positive.

In brief, females (the negative value for CCL*MALE), younger employees (the negative value for CCL*AGE), those with more workfellows in their workplace (the positive value for CCL*EMPL), and regular workers (the positive value for CCL*PERM) tend to evaluate postpartum child-care leave more positively. In contrast, those that are female (the negative value for SIL*MALE), older (the positive value for SIL*AGE), and with lower per capita incomes (the negative value for SIL*PCI) tend to evaluate sick/injured child-care leave more positively. Elsewhere, females (the negative value for RWH*MALE) tend to evaluate a reduction in working hours more positively, while those that are male (the positive value for FWH*MALE) and older (the positive value for FWH*AGE) tend to evaluate flexible working hours more positively. Finally, employees with fewer workfellows (the negative value for AD*EMPL) tend to evaluate advancing or delaying starting and finishing times more positively, while males (the positive value for WH*MALE) tend to evaluate working from home more positively. We interpret these results in greater detail in the following section.

4. Discussion and Conclusion

Overall, we can summarize the BWS items into two categories; work-reducing support including postpartum child-care leave (CCL), sick/injured child-care leave (SIL), and reduced working hours (RWH), including exemption from overtime work (EOW), and work-retaining support, including advancing or delaying starting and finishing times (AD), flexible working hours (FWH), and working from home (WH). As shown by the results for Model 1, work-reducing support is generally preferred to work-retaining support except exemption of overtime work, which reduces irregular working hours, although preference heterogeneities prevail. On average, respondents prefer work-reducing corporate support for child care and upbringing in order to enable them to concentrate on life with their children either immediately postpartum or while the children are young.

As shown by the results for Model 2, certain differences prevail among the sample employees in their preferences for work-reducing support. It would seem that the respondents who prefer child-care leave are typically female, younger, have more workfellows in their work place, and are regular workers (CCL*MALE, CCL*AGE, and CCL*EMPL in Table 4). This suggests that younger female workers in larger organizations prefer either job retention or a return to their former workplace. Those workers wish more to be fulfilled work place with child care leave system. In contrast, respondents who prefer sick/injured child-care leave are typically female, older, and have lower per capita incomes (SIL*MALE, SIL*AGE, and SIL*PCI in Table 4). Because young children tend to become sick more often, older female workers who are unable to afford to employ help like a babysitter prefer a sick/injured child-care leave system to be in place. This corresponds with the result indicating that female respondents prefer a reduction in working hours (RWH*MALE in Table 4).

As to work-retaining support, there are also several differences at the mean. In general, advancing or delaying starting and finishing times appears preferable for workers with fewer workfellows (AD*EMPL in Table 4), and this suggests that those who have less workfellows wish to retain working hours in order to struggle with many tasks

because less stuffs tend to lead to more tasks per person. Those respondents who prefer flexible working hours are typically male and older (FWH*MALE and FWH*AGE in Table 4). This suggests that male veteran or manager-level workers may seek more flexible working hours when they have young children. However, male managers may also wish to retain their working hours to maintain their existing level of income or their position on the career ladder. This concurs with the result indicating the preference of respondents for working from home (WH*MALE in Table 4).

Clearly, there are significant preference heterogeneities for corporate child care and upbringing support among employees in Japan, both across individual characteristics and between work-reducing and work-retaining support characteristics. To obtain effective working-time-related support in Japan, we should concern ourselves with these heterogeneous employee preferences from the demand side, whereas Suzuki et al. (2008) investigated the support for working parents at the firm level from the supply side, concluding that there are two basic characteristics, namely, progressiveness and time flexibility.

As to future topics of research, because we have employee views on workplace diversity data, latent class or clustering analysis (see Greene and Hensher 2003) would be a promising approach to include attitudinal covariates, as in some existing BWS applications (Mueller and Rungie 2009; Dekhili et al. 2011; Sirieix et al. 2011; Lagerkvist et al. 2012; Loose and Lockshin 2012).

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Appendix: Best–Worst Scaling Question

The subsequent questions were provided to our respondents as best–worst exercises (see Ohdoko 2014).

"We will provide seven choice sets consisting of three out of seven items on working-time-related corporate support for employees' child care and upbringing. Please choose what you think is the most and the least important item in accordance with the example below. Even if you don't have any children, if you have finished your own child upbringing, or your workplace don't have any such supports, please answer the questions with thorough consideration, which will enable us to obtain more meaningful results from this survey. For example, when you think that advancing or delaying starting and finishing times is the most important item and exemption from overtime work is the least important item out of the three presented, you should respond as follows."

Most Important		Least Important
☑	Advancing or delaying starting and finishing times	□
□	Working from home	□
□	Exemption from overtime work	☑

Q. 1 Please choose what you think is the most and the least important item out of the three.

Most Important		Least Important
□	Child-care leave	□
□	Sick and/or injured child-care leave	□
□	Reduced working hours	□

Q. 2 How about the three items below?

Most Important		Least Important
□	Child-care leave	□
□	Flexible working hours	□
□	Advancing or delaying starting and finishing times	□

Q. 3 How about the three items below?

Most Important		Least Important
□	Child-care leave	□
□	Working from home	□
□	Exemption from overtime work	□

Q. 4 How about the three items below?

Most Important		Least Important
□	Sick and/or injured child-care leave	□
□	Flexible working hours	□
□	Working from home	□

Q. 5 How about the three items below?

Most Important		Least Important
□	Sick and/or injured child-care leave	□
□	Advancing or delaying starting and finishing times	□
□	Exemption from overtime work	□

Q. 6 How about the three items below?

Most Important		Least Important
□	Reduced working hours	□
□	Flexible working hours	□
□	Exemption from overtime work	□

Q. 7 How about the three items below?

Most Important		Least Important
□	Reduced working hours	□
□	Advancing or delaying starting and finishing times	□
□	Working from home	□

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[i] MHLW website (URL: http://www.mhlw.go.jp/english/policy/affairs/dl/05.pdf, retrieved on Sep. 12 2013).

[ii] Kobe City website (URL: http://www.city.kobe.lg.jp/life/community/cooperation/ikiikijimusho/, retrieved on Sep. 12 2013) [Japanese only].

[iii] Hyogo Work and Life Center website (URL: http://www.hyogo-wlb.jp/modtreepage01_1774/, retrieved on Sep. 12 2013) [Japanese only].

[iv] Kurumin is the "Next-generation authorization mark" in accordance with the Act on Advancement of Measures to Support Raising Next-Generation Children in Japan (MHLW 2012, p. 172).

[v] The MHLW (URL: http://www.ryouritsu.jp/index.html, retrieved on Sep. 12 2013) maintains a comprehensive website concerning work–life balance in Japan.

[vi] In estimating a multinomial logit model, the estimated parameters include a scale parameter that is inversely proportionate to the variance of the error term (Swait and Louviere 1993; Louviere et al. 2000). For simplicity, we set the scale parameter to a value of one.

[vii] Train (2009) provides additional computational details for the RPL.