

## How Job Demands Affect an Intimate Partner: A Test of the Spillover-Crossover Model in Japan

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**Abstract: How Job Demands Affect an Intimate Partner: A Test of the Spillover-Crossover Model in Japan: Akihito SHIMAZU, et al. Department of Mental Health, The University of Tokyo, Graduate School of Medicine—Objectives:** The present study examined how job demands affect an intimate partner's well-being. We hypothesized that job demands have a negative influence on partner well-being through the experience of work-family conflict (WFC) and an impaired quality of the relationship (reduced social support and increased social undermining towards the partner). **Methods:** The participants of this study were 99 couples of dual-earner parents in Japan. **Results:** Consistent with hypotheses, men's job demands (i.e. overload and emotional demands) were positively related to their own reports of WFC, and indirectly to women's ratings of men's WFC. Consequently, women's ratings of men's WFC were negatively related to the quality of the relationship (i.e. decreased social support from and increased social undermining by men), which, in turn, led to women's ill-health (i.e. depressive symptoms and physical complaints). We found similar findings for the model starting with women's job demands; gender did not affect the strength of the relationships in the model. **Conclusions:** These findings suggest that high job demands initiate a process of work-family conflict and poor relationship quality, which may eventually affect the intimate partner's well-being in an unfavorable way. (*J Occup Health 2009; 51: 239–248*)

**Key words:** Crossover, Depression, Job Demands, Spillover-Crossover model, Well-being, Work-family conflict

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Research has suggested that Japanese employees are highly committed to their work<sup>1</sup>. Indeed, the Japanese work longer hours than employees in most other industrial nations<sup>2</sup>. These long work hours may become a problem for employees' intimate relationships with their partners when efforts to fulfill the demands of work interfere with the ability to fulfill the demands of the roles as a spouse, parent, or caregiver<sup>3</sup>.

The present study among Japanese dual-earner couples will focus on the impact of job demands on *partner well-being*. Specifically, we will examine whether high job demands may initiate a process of work-family conflict and consequently affect the quality of the relationship (i.e., increased social undermining and reduced social support provided to an intimate partner), which eventually affects partner well-being in an unfavorable way. We will use the recently formulated Spillover-Crossover model<sup>3, 4</sup> to test our hypotheses.

### *The Spillover-Crossover model*

Earlier studies have identified two different ways in which strain is carried over from the work to the family domain<sup>5, 6</sup>. Work-family conflict or *spillover* is a within-person across-domains transmission of demands and consequent strain from one area of life to another. Previous research has primarily focused on how experiences in the work domain are transferred to and interfere with the non-work domain for the same individual<sup>7</sup>. In contrast, *crossover* involves transmission across individuals, whereby demands and their consequent strain have effects on between closely related persons<sup>6</sup>. Thus, in crossover, stress experienced in the workplace by an individual may lead to stress being experienced by the individual's partner at home. Whereas spillover is an *intra-individual* transmission of stress or strain, crossover is a dyadic, *inter-individual* transmission of stress or strain. The Spillover-Crossover model<sup>3, 4</sup> integrates both approaches.

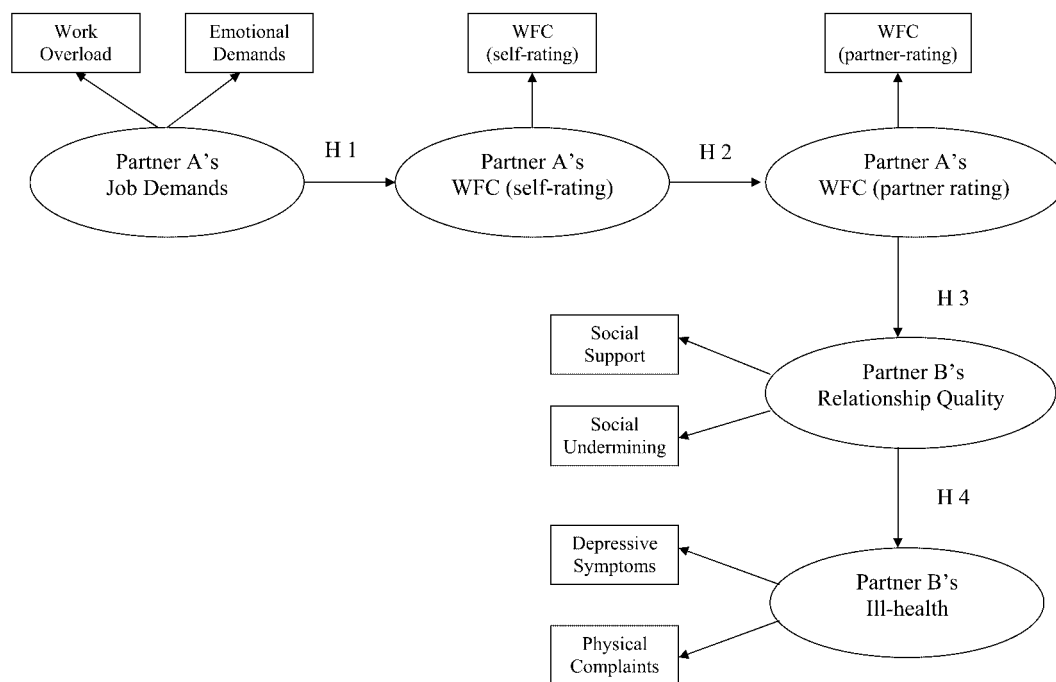


Fig. 1. The Hypothesized Spillover-Crossover Model. WFC=work-family conflict.

Bakker *et al.*<sup>3)</sup> demonstrated that for both men and women job demands foster their own work-family conflict (using self-reports and partner ratings), which, in turn, contributes to *their* partners' home demands, family-work conflict, and consequently to partner exhaustion. In addition, they found that social undermining mediates the relationship between individuals' work-family conflict and their partners' home demands. In a similar vein, Bakker *et al.*<sup>4)</sup> found that for both men and women workaholism was related to reduced support provided to the partner (as rated by the partner), through work-family conflict, and that individuals who received considerable support from their partners were more satisfied with their relationship. Finally, they showed a direct crossover of relationship satisfaction between partners. These two studies integrate spillover and crossover theories and outline how they can have different origins that are nevertheless interrelated at the interpersonal, dyadic level.

The earliest crossover studies examined job demands reported by employees (usually males) and the satisfaction and well-being of their spouses (usually females)<sup>8-13)</sup>. These studies typically found that higher levels of job demands reported by employees were associated with marital dissatisfaction and poorer psychological well-being of their spouses. More recent crossover studies have incorporated partner *dyads*<sup>14-16)</sup>, and investigated the process that translates job demands into impaired partner well-being. Job and family demands are the common antecedents of the crossover process.

Westman<sup>17)</sup> suggested several possible mechanisms to explain the crossover process. First, direct crossover can take place between the two partners through empathic processes. That is, since partners spend considerable time together they become aware of and affected by each others' affective states<sup>18)</sup>. Second, partners may share some common stressors (e.g., financial pressures, life events) that may lead to increased levels of common strains (e.g., negative affect). Third, crossover may be an indirect process, where the crossover of strain is mediated by the communication and interaction of the partners (e.g., by coping strategies, social undermining, and lack of social support). In the current study, we particularly focus on the latter process. In line with the Spillover-Crossover model<sup>3, 4)</sup>, we expect that one partner's job demands have a negative influence on the other partner's well-being, through the experience of work-to-family conflict (WFC) and negative interactions with one's partner (i.e., reduced social support and increased social undermining towards the partner) (see Fig. 1).

Work-to-family conflict is defined as "a form of inter-role conflict in which the role pressures from the work and family domains are mutually incompatible in some respect"<sup>19)</sup>. Thus, participation in the family role is made more difficult by virtue of participation in the work role. Several studies have indeed shown a positive relationship between job demands and work-family conflict<sup>20, 21)</sup>. This finding is consistent with the role scarcity hypothesis<sup>22)</sup>.

Accordingly, people possess limited and fixed amounts of resources (e.g., time and energy). Managing multiple roles (of employee and spouse) is problematic as they draw on the same, scarce resources. High job demands make employees devote more resources (e.g., time, effort) to work, leaving them with fewer resources to devote to their family. It can therefore be hypothesized that:

*Hypothesis 1:* Job demands are positively related to work-family conflict.

The person perception literature suggests that individuals in close relationships have the motivation, the opportunity, and the information to accurately perceive their partners<sup>23</sup>. Empirically, Kenny and Acitelli<sup>23</sup> have shown that individuals in close relationships are able to accurately predict their partners' feelings of closeness in the relationship. Moreover, Jones and Fletcher<sup>24</sup> have demonstrated that individuals have accurate perceptions of their partners' jobs. Matthews *et al.*<sup>25</sup> found evidence for the contention that individuals are able to perceive how much their partners' work interferes with the relationship. From a crossover perspective, this is known as a direct crossover effect; the individual's experienced work-to-relationship conflict is positively related to perceptions of work-to-relationship conflict reported by the partner. However, the person perception literature also suggests that individuals in close relationships do not necessarily perceive their partners accurately<sup>26, 27</sup>. This effect is referred to as *bias*. Bias, as it is understood in the person perception literature, does not inherently imply error; but can have accuracy-enhancing effects<sup>23, 28</sup> as is the case when individuals do not always have all the information they need to make a judgment about a partner's feelings and experiences<sup>27</sup>. For this reason, we expect a positive relationship between self- and partner-ratings of work-family conflict but not a high overlap between both ratings.

*Hypothesis 2:* There is a positive relationship between self- and partner-ratings of work-family conflict.

Bowlby<sup>29</sup> claimed that two factors—perceptions of conflict and perceptions of support in relationships—should play overriding roles in how individuals feel about their romantic partners and relationships. In line with this, we focus on social support and social undermining as positive and negative interpersonal transactions. Social support is theorized to consist of transactions with others that provide the target person (i.e. the recipient) with emotional support, affirmation of the self, instrumental support, and information<sup>30</sup>. Social undermining is theorized to consist of behaviors directed toward the target person and to display (a) negative affect, (b) negative evaluation of the person in terms of his/her attributes, actions, and efforts (criticism), and (c) behaviors that compromise or hinder the attainment of instrumental

goals<sup>31</sup>.

The literature on family processes shows that stressed couples exhibit high levels of negative, unsupportive interactions and conflicts<sup>16</sup>. Using a multi-source study among 337 couples, Matthews *et al.*<sup>32</sup> showed that both husbands and wives' WFC was indirectly (through psychological distress) related to hostile interactions and lowered marital warmth and supportiveness between the partners. Bakker *et al.*<sup>3</sup> found that husbands' (wives') work-family conflict was positively related to husbands' (wives') social undermining behavior as reported by their partners. The increased distress associated with the experience of WFC and its accompanying frustration lead an individual to initiate or exacerbate a negative interaction sequence with the partner<sup>33</sup>. In a recent study, Bakker *et al.*<sup>4</sup> found that husbands' (wives') WFC was negatively related to the social support provided to their partners. These studies strongly suggest that WFC leads to an impaired relationship with a partner. Thus, we predict that:

*Hypothesis 3:* Work-family conflict is negatively related to the quality of the relationship with a partner (increased social undermining and reduced social support).

Finally, previous research has suggested that social support has a direct effect and serves a health-restorative role by meeting basic human needs for social contact, regardless of the level of stress present<sup>34</sup>. This generalized beneficial effect of social support occurs because social networks provide positive interactions, affirmation and encouragement that lead to an overall sense of self-worth, self-esteem, and positive affect<sup>35, 36</sup>. In contrast, social undermining leads to reduced mental health<sup>31</sup> and increased strain of the partner<sup>3</sup>. On the basis of this reasoning and findings, we predict that:

*Hypothesis 4:* The quality of the relationship with a partner (high social support and low social undermining) is positively related to well-being.

Taken together, Hypothesis 3 and 4 suggest:

*Hypothesis 5:* The impact of work-family conflict on a partner's well-being will be mediated by the relationship with the partner.

This hypothesis can be justified by the fact that when employees experience work-family conflict, these experiences will be shown to the partner by hostile interactions and lowered marital supportiveness. Thus, social undermining and social support are the behavioral expressions through which work-family conflict of the one partner impairs the well-being of the other partner. The hypotheses are summarized and graphically displayed in Fig. 1.

In recent years, the number of dual-earner couples in

**Table 1.** Comparison of means (and SDs) or numbers (and percentages) of demographic variables between men and women

		Men			Women			Statistical test	p value		
		n <sup>a</sup>	Mean	(SD)	(%)	n	Mean			(SD)	(%)
Age		99	35.6	(5.0)		99	33.9	(3.9)	$t(97)=4.17^b$	<0.001	
Occupation	Worker for private company	68			(68.7)	46			(46.5)	$\chi^2(3)=16.53$	0.001
	Civil servant	8			(8.1)	6			(6.1)		
	Self-employed	11			(11.1)	11			(11.1)		
	Others	12			(12.1)	36			(36.4)		
Job contract	Full-time ( $\geq 40$ h/wk)	92			(96.8)	44			(47.8)	$\chi^2(2)=58.66$	<0.001
	Part-time (<40 h/wk)	1			(1.1)	44			(47.8)		
	Others	2			(2.1)	4			(4.3)		
Work hours/day		83	10.8	(2.7)		83	7.0	(2.4)	$t(82)=10.03^b$	<0.001	

<sup>a</sup>The numbers do not add up to the total number of the participants because of occasional missing data. <sup>b</sup> Paired *t*-test.

Japan is increasing<sup>37</sup>), and more attention has been paid to the effects of the work-family interface on their health. Previous studies in Japan have mainly focused on the effects of (female and male) workers' WFC on their own well-being (e.g., depression, job and family satisfaction)<sup>38-44</sup>. However, there are no empirical studies among Japanese dual-earner couples that have investigated both spillover and crossover processes through which job demands affect an intimate partners' well-being. Therefore, empirical studies to examine both processes simultaneously are especially needed.

## Methods

### Procedure

We approached five nursery schools in Higashi-Hiroshima city, Japan, through the Child-raising Assistance Department of the city in order to ensure that both partners were working. In a next step, we asked the directors of these nursery schools to cooperate with our study with an invitation letter. The letter explained the aims, procedures, and ethical consideration of the present study. Four of the five directors agreed to cooperate with the study.

The data were collected by means of two questionnaires. The researchers left two identical questionnaires, one for each partner, in children's pigeonholes at the nursery schools. The questionnaires were code-numbered to match the partners correctly. Despite this code-numbering the participants remained unidentified as both questionnaires were answered anonymously. Participants were included in the study on a voluntary basis. The partners were kindly requested to fill out the questionnaires independently. Respondents returned their questionnaires in closed and pre-stamped envelopes to the researcher at the university or through special boxes placed in a central position at the entrances of the nursery schools. The dual-earner parents provided information with respect to their levels of job demands,

own work-family conflict (WFC) and WFC of their partner, received social support, social undermining by the partner, depressive symptoms, and physical complaints. Ethical approval for the study was obtained from the ethical committee of the university.

### Participants

The participants in the study were 99 couples of dual-earner parents in Japan. Of the 640 questionnaires distributed, 283 were returned, resulting in a response rate of 44.2%. Eighty-five questionnaires could not be used in the analyses, because only one partner participated, thus leaving 198 questionnaires or 99 couples for data analyses. Table 1 shows the demographic characteristics of our sample, for both genders separately. Men were slightly older and worked longer than women. There were also differences between men and women regarding occupation and job contract. As regards occupation, over half of all men (68.7%) worked for private companies, whereas less than half of all women (46.5%) worked for private companies. Regarding work contract, most of the men (96.8%) worked as full-time workers, whereas about half of the women (47.8%) worked as full-time workers. In addition, all couples had child(ren) younger than seven years old who lived at home.

### Measures

*Work overload* was measured with four items developed by Furda<sup>45</sup>) that refer to quantitative, demanding aspects of the job (e.g., time pressure, working hard). These items were validated in previous studies<sup>46</sup>. Sample items are: "Do you work under time pressure?", and "How often do you have to work extra hard to finish something?" Items are scored on a five-point scale, ranging from (1) 'never' to (5) 'always'.

*Emotional demands* were assessed with six items developed by Van Veldhoven *et al.*<sup>47</sup>). The scale assesses



whether employees have to deal with emotionally charged situations. Example items are: “Is your work emotionally stressful?”, and “Does your work involve people who complain continuously or emotionally appeal to you in other way?” (1=never, 5=always).

*Work-Family Conflict* was assessed with three items that are a selection of the Dutch questionnaire Survey Work-home Interference NijmeGen (SWING)<sup>48</sup>. The authors of the scale generated an item-pool derived from 21 published scales<sup>49,50</sup>, and consequently, using multiple raters, they selected the nine items best fitting to the working definition of WFC (together with other criteria of minimal confounding with health outcomes, or work and home characteristics, as well as meaningful content in the Dutch language). The three items used in the present study<sup>51</sup> are: “How often does it happen that...”: “you do not fully enjoy the company of your spouse/family/friends because you worry about your work?”, “you find it difficult to fulfil your domestic obligations because you are constantly thinking about your work?”, and “your work schedule makes it difficult for you to fulfil your domestic obligations?” Responses could be made on a five-point scale (1=never, 5=always). In the present study, work-family conflict was assessed with self- and partner-ratings.

*Social undermining* was measured with seven items from the scale of Abbey<sup>52</sup>. Respondents were asked to indicate to what extent their partner “acted in an unpleasant or angry manner towards you”, “made your life difficult”, “showed dislike”, and so on (1=not at all, 5=a great deal). Thus, social undermining was assessed by *partners* rather than through self-ratings.

*Social support* was assessed using the 8-item scale of Abbey *et al.*<sup>52</sup>. Respondents were asked to indicate to what extent their partner “gave support when needed”, “said things that strengthened their self-confidence”, “listened to them when they felt the need to talk about things that were very important to them”, and so on. Thus, social support was also assessed by *partners* rather than through self-ratings. The answer format was the same as the one used for social undermining.

*Depressive symptoms* was measured with a subscale of the Brief Job Stress Questionnaire (BJSQ)<sup>53</sup>. The scale includes five items that refer to depressive symptoms. Sample items are: “I feel depressed”, and “I cannot concentrate on things” (1=never, 4=always).

*Physical complaints* was also measured with a subscale of the BJSQ<sup>53</sup> consisting of 11 items, like “I have back pain”, and “I cannot sleep well” (1=never, 4=always).

#### Data analysis

The matched responses of both partners were analyzed with structural equation modeling (SEM) techniques, using the AMOS 7 software package<sup>54</sup>. We analyzed the covariance matrix using the maximum likelihood method

of estimation. Besides the chi-square statistic, the analysis assessed the goodness-of-fit index (GFI), the root mean square error of approximation (RMSEA), the non-normed fit index (NNFI), and the comparative fit index (CFI). The theoretical model we tested is presented in Fig. 1. Because of the large number of items, it was not possible to conduct SEM-analysis on a full disaggregation model. The scales introduced above were used as indicators of the latent factors. All latent factors had two indicators except for (self- and partner-rating of) work-family conflict which had only one indicator (i.e., the average scores of the scale items). To control for random measurement error for this factor, the error variance of WFC was set equal to the product of its variance and one minus the internal consistency<sup>55</sup>.

## Results

### Descriptive statistics

The means, standard deviations, internal consistencies (Cronbach’s alpha), and correlations between the study variables are displayed in Tables 2 (Men to Women) and 3 (Women to Men). As can be seen, all variables have satisfactory reliabilities with Cronbach’s alpha coefficients of 0.79 or higher.

### Test of the Spillover-Crossover model

Results of the SEM-analyses showed that the proposed model (displayed in Fig. 2) fits adequately to the data;  $\chi^2(18)=27.33$ , GFI=0.94, NNFI=0.93, CFI=0.96, RMSEA=0.07 for the model from men to women, and  $\chi^2(18)=25.01$ , GFI=0.94, NNFI=0.95, CFI=0.97, RMSEA=0.06 for the model from women to men.

As far as the model from men to women is concerned, consistent with hypotheses (Hypotheses 1–4), men’s job demands (i.e. work overload and emotional demands) were positively related to their own reports of WFC ( $\beta=0.61$ ,  $p<0.001$ ), which, in turn, was positively related to partners’ (i.e. women’s) ratings of men’s WFC ( $\beta=0.55$ ,  $p<0.001$ ). Women’s ratings of men’s WFC were negatively related to women’s reports of relationship quality (i.e. decreased social support from and increased social undermining by men) ( $\beta=-0.52$ ,  $p<0.001$ ), which, in turn, led to women’s ill-health (i.e. depressive symptoms and physical complaints;  $\beta=-0.44$ ,  $p<0.01$ ).

We found similar relationships in the model from women’s job demands to men’s ill-health (see Fig. 2). That is, women’s job demands were positively related to their own reports of WFC ( $\beta=0.66$ ,  $p<0.001$ ), which was positively related to partners’ (i.e. men’s) ratings of women’s WFC ( $\beta=0.35$ ,  $p<0.01$ ). Men’s ratings of women’s WFC were negatively related to men’s reports of relationship quality ( $\beta=-0.50$ ,  $p<0.001$ ), which, in turn, led to men’s ill-health ( $\beta=-0.51$ ,  $p<0.01$ ).

In a next step, we conducted additional analyses to control for demographic variables (i.e., age, occupation,

**Table 2.** Means, SDs, Cronbach's Alphas, and Correlations of the variables used in the study (Men to Women, N=99 couples)

Measures	Mean	SD	Alpha	2	3	4	5	6	7	8
				Men						
1 Work overload (Men rating)	14.7	4.5	0.92	0.56***	0.40***	0.16	0.15	-0.06	-0.06	0.13
2 Emotional demands (Men rating)	15.8	5.9	0.88		0.45***	0.22*	-0.10	0.03	0.11	0.07
3 WFC (Men rating)	7.0	3.1	0.84			0.48***	-0.11	0.06	0.00	-0.01
4 WFC (Women rating)	6.8	3.0	0.79				-0.42***	0.41***	0.25*	0.17
				Women						
5 Social support from Men (Women rating)	29.0	5.7	0.85					-0.72***	-0.29**	-0.17
6 Social undermining by Men (Women rating)	14.3	4.9	0.91						0.27**	0.24*
7 Depressive symptoms (Women rating)	9.5	3.6	0.85							0.42***
8 Physical complaints (Women rating)	18.4	5.3	0.82							

Men differed significantly from women regarding mean scores for Work overload ( $p<0.001$ ), Emotional demands ( $p<0.001$ ), WFC (Self rating,  $p<0.01$ ), WFC (Partner rating,  $p<0.001$ ), and Social support from partner ( $p<0.01$ ). WFC=work-family conflict.

\* $p<0.05$ , \*\* $p<0.01$ , \*\*\* $p<0.001$ .

**Table 3.** Means, SDs, Cronbach's Alphas, and Correlations of the variables used in the study (Women to Men, N=99 couples)

Measures	Mean	SD	Alpha	2	3	4	5	6	7	8
				Women						
1 Work overload (Women rating)	11.9	4.3	0.90	0.68***	0.54***	0.14	-0.15	0.19	0.13	0.09
2 Emotional demands (Women rating)	12.5	5.7	0.91		0.43***	0.24*	-0.19	0.16	0.06	0.09
3 WFC (Women rating)	5.7	2.3	0.79			0.28**	-0.24*	0.17	0.24*	0.23*
4 WFC (Men rating)	5.0	2.6	0.84				-0.26**	0.37***	0.38***	0.39***
				Men						
5 Social support from Women (Men rating)	31.0	5.0	0.79					-0.63***	-0.26**	-0.25*
6 Social undermining by Women (Men rating)	14.8	4.7	0.87						0.25*	0.31**
7 Depressive symptoms (Men rating)	10.3	3.3	0.84							0.54***
8 Physical complaints (Men rating)	18.9	6.2	0.86							

Men differed significantly from women regarding mean scores for Work overload ( $p<0.001$ ), Emotional demands ( $p<0.001$ ), WFC (Self rating,  $p<0.01$ ), WFC (Partner rating,  $p<0.001$ ), and Social support from partner ( $p<0.01$ ). WFC=work-family conflict.

\* $p<0.05$ , \*\* $p<0.01$ , \*\*\* $p<0.001$ .

and job contract) as potential confounders. Specifically, each control variable was included in the proposed model as a manifest variable and allowed to correlate with all model variables. After controlling for confounding variables, the path coefficients were virtually the same as those of the proposed model, but the model fit worsened somewhat ( $\chi^2(18)=29.81$ , GFI=0.95, NNFI=0.83, CFI=0.94, RMSEA=0.08 for the model from men to women;  $\chi^2(18)=26.03$ , GFI=0.96, NNFI=0.90, CFI=0.97, RMSEA=0.07 for the model from women to men). These results indicate that the relationships of the control variables to the model variables were weak and inconsistent. Importantly, the control variables did not affect the structural paths in the model. Therefore, the control variables were removed from further analyses.

To test gender differences in the strength of the

relationships in the model, multiple group analysis was conducted. Results show that the difference between the unconstrained model and the model in which the paths were constrained to be equal for men and women was *not* significant,  $\Delta\chi^2(7)=6.93$ ,  $p=0.44$ . This indicates that gender did *not* affect the strength of the relationships in the Spillover-Crossover model.

In a final step, we examined the mediating effect of relationship quality in the relationship between partners' ratings of WFC and partners' ill-health (cf. Hypothesis 5). An alternative model, in which the direct path running from partners' ratings of WFC to partners' ill-health was added, was tested. As far as the model from men to women is concerned, the fit of this alternative (i.e., partial mediation) model did *not* improve significantly compared to the proposed (i.e., full mediation) model ( $\Delta\chi^2(1)=0.87$ ,

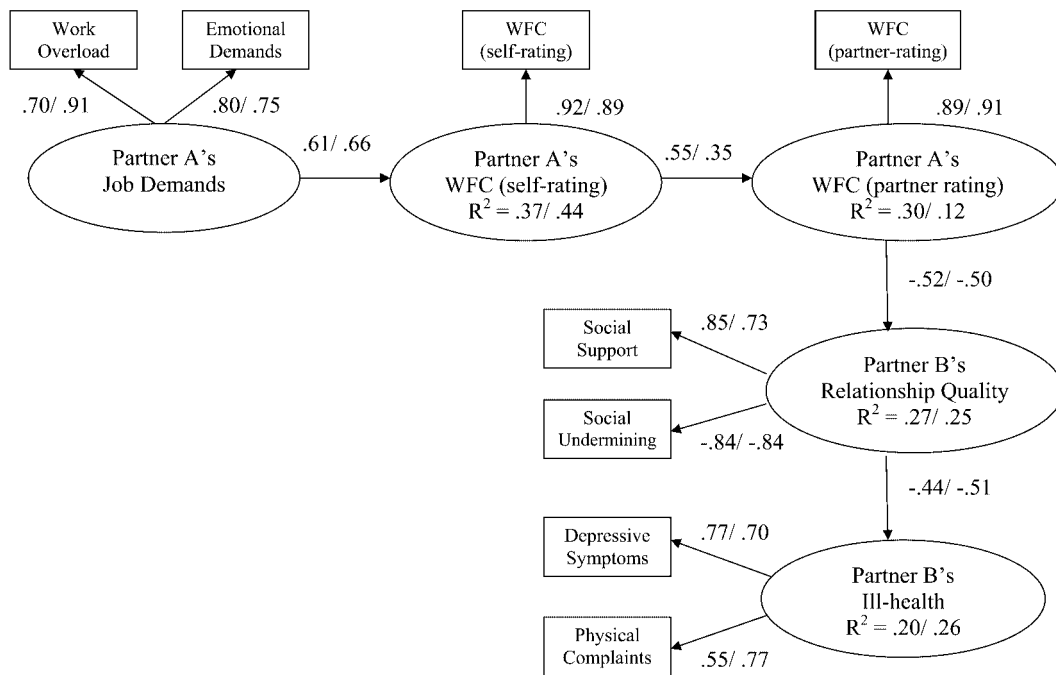


Fig. 2. Standardized solution (Maximum likelihood estimates) of the Spillover-Crossover model. The parameters and explained variance before and after the slash represent the estimates for men and women, respectively. N=99 couples. WFC=work-family conflict.

$p=0.35$ ). In addition, the added direct path from partners' ratings of WFC to partners' ill-health was not significant ( $\beta=0.15, p=0.35$ ). Regarding the model starting with women's job demands, the fit of the alternative model improved significantly compared to the proposed model ( $\Delta\chi^2(1)=11.35, p<0.001$ ). The path from relationship quality to ill-health became nonsignificant ( $\beta=-0.23, p=0.11$ ). This indicates that Hypothesis 5 was confirmed for men, and rejected for women.

**Discussion**

The present study examined how Japanese employees' job demands affect their intimate partners. We hypothesized that job demands have a negative influence on a partner's well-being, through the experience of work-family conflict (WFC) and poor relationship quality (i.e., reduced social support and increased social undermining towards the partner). To our knowledge, this is the first study among Japanese dual-earner couples to examine both spillover and crossover processes through which job demands affect an intimate partners' well-being. The current findings integrate and expand previous studies on WFC and crossover.

Although time away from work has often been considered to provide a restorative recovery function for workers<sup>56</sup>, increasing concern has been raised about the possible deleterious effects of high job demands in the

home domain. Our findings demonstrate that job demands are related to WFC and poor relationship quality (i.e., increased social undermining and decreased social support to a partner) of dual-earner parents. The findings of structural equation modelling analyses suggest that job demands increase the likelihood of conflict between work and family. For both men and women, job demands were highly and positively related to self-reports of WFC, which was positively related to WFC as perceived by the partner. This result is very important because it shows partner sensitivity to others' experience of WFC and therefore the potential for crossover. The finding also demonstrates that the proposed model is applicable to both men and women in general, as the relationship was similar for both men and women.

The most important theoretical contribution of this study is that it offers insight into the possible process of WFC and crossover by using both members of a couple as sources of information. The results show why job demands can lead to negative interactions with a partner. One of the main reasons is that job demands translate into WFC, that is, those with high job demands are unable to relax and recover from their work. This is in line with the study of Bakker *et al.*<sup>3</sup> conducted in The Netherlands, which stated that "those individuals (both men and women) who reported more work overload and emotionally demanding interactions with clients were also

more inclined to act in an unpleasant and angry manner toward their partners (as confirmed by their partners)". High job demands coincide with an increased probability of taking work home (e.g., paperwork, but also thoughts about things that happened at work) and of prioritizing work over family. The possible consequence is unpleasant interactions with a partner, presumably because it fosters inequity regarding household responsibilities<sup>57</sup>.

Furthermore, results show why job demands of the one partner impact the well-being of the other partner. Although a previous spillover-crossover study<sup>3</sup> delineated the relationship between WFC initiated by job demands and partners' well-being through the home domain (i.e., increased home demands and family-work conflict), our model suggests another pathway through the relationship quality (i.e., reduced social support and increased social undermining towards the partner).

Gender did *not* affect the strength of the relationships in the proposed model. In Japan, women play a more important role in child care in dual-earner couples with child(ren) of six years or younger<sup>58</sup>. Nevertheless, our findings are consistent with earlier studies in western, family-friendly societies that found no consistent gender pattern<sup>3, 4, 59, 60</sup>. This suggests that the hypothesized Spillover-Crossover Model does apply equally well in western societies as in non-western societies (at least in Japan).

#### *Study limitations and strengths*

Several remarks regarding the present study can be made. First, this study is based on survey data with self-report measures. Next to self-report bias due to, for example, negative affect, common method variance might have played a role. For example, without controlling for negative affectivity, the associations of work demands with work-family conflicts and the health of employees may be overestimated. So, the true associations might be weaker than the relationships observed in this study. Although several studies have shown that these influences are not as high as could be expected<sup>61-63</sup>, our findings should be replicated with objective measures (e.g., actual time at work as an index of job demands) in the future. However, a special feature of our study is that instead of measuring only self-reported WFC, we asked participants to provide information about the WFC of their partner as well.

Second, we used a cross-sectional design, which precludes causal inferences. This means that the relationships proposed by our model await further testing in longitudinal research.

A third point concerns potential selection biases (i.e., sampling biases and non-response biases). The nursery school directors who consented to cooperate with our study may have been more interested in work-life balance of children's parents compared to the one who did not.

Even if true, it remains unclear how this is related to parents' workload, and work-family conflict. Further, there is a possibility that the parents who engaged in long hours of working or childrearing could not find time to respond the questionnaire<sup>64</sup>. It is also conceivable that parents who had low work-family conflict or enjoyed good health did not participate in this survey because of not feeling the need to do so. However, since we are basically interested in the strengths of the relationships in our model—and less so in the mean scores of the model variables, we believe that the impact of a response bias is limited. Nevertheless, the results should be interpreted with some caution, because the impact of such a bias is unclear.

Fourth, although we conducted additional analyses to control for demographics (i.e., age, occupation, and job contract) as potential confounders, we could not control for other job characteristics (e.g., job control, workplace support) due to the space limitation of the questionnaire. Because such variables may be associated with job demands, WFC and the health of employees, they may be a potential confounder of the model relationships. Future research needs to include and control for those job characteristics.

Finally, the scales used to measure job demands, WFC, and relationship quality have not been standardized and validated in a Japanese setting. Because this study is the first study of an international collaboration between the Netherlands and Japan, there are no previous articles on the translation processes. Therefore, further research is needed to evaluate its reliability and validity in Japanese contexts. However, it should be noted that all our questionnaires have been translated—and back-translated. In addition, all instruments turned out to be reliable, and the Spillover-Crossover model was confirmed.

#### *Practical implications*

Our findings suggest that job demands initiate a process of work-family conflict and poor relationship quality, which may eventually affect an intimate partner's well-being in an unfavorable way. So, the starting point is to decrease overload and emotional demands in the workplace. This is important especially for men, since men reported higher overload and emotional demands compared to women. Our findings also suggest the mediating role of relationship quality in the relationship between WFC and partners' well-being for the model starting with men's demands. So, the next point is to improve relationship quality, by focusing on interpersonal skills such as assertiveness, negotiation skills, conflict management, and seeking and providing social support.

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