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Research Article

Women work-hours constraint is associated with their own depression and their partners' low relationship satisfaction: Evidence from the *Growing up in Ireland Infant Cohort Study*

Eamonn Barron¹, Jennifer Mulligan-Rabbitt³ and Ela Polek^{1,2*}

¹School of Psychology, University College Dublin, Ireland

²Tavistock Relationships, London

³School of Psychology, Trinity College Dublin

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ABSTRACT

This study examined the effect of work-hours constraint, i.e., the discrepancy in women's actual and ideal hours worked, on couple's mental health (depression symptoms assessed with a questionnaire) and relationship satisfaction. Irish dual-earner couples (N=3,928), participants of a large cohort study the Growing Up in Ireland, were assigned to three groups based on women's work-hours constraint: overemployed, underemployed and adequately employed. Group comparison carried out with MANCOVA indicated that adequately employed women had lower depression than over- and underemployed women, but no group differences were found in women's relationship satisfaction. We also found lower levels of relationship satisfaction in partners of over- and underemployed women. It was hypothesized that negative crossover between partners would be accentuated under situations of greater stress (i.e., in over- and underemployed groups). Multiple group pathway analysis showed a stronger negative crossover effect from partner's depression to women's relationship satisfaction in the overemployed group, but not in underemployed group. These findings suggest that greater attention should be directed at a governmental and organizational level to facilitate correspondence between actual and preferred working hours for mothers of infants and their partners.

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Introduction

Rapid changes in gender composition of the global work force have been witnessed in recent decades. Within a European context, dual-earner families were found to represent on average 60% of all families in OECD countries in 2008 [1]. These changes have been particularly evident in

Ireland, where women, having been traditionally assigned the role of homemakers, accounted for only 26% of the workforce in 1961 [2]. After Ireland's accession to the European Economic Community and the abolition of The Marriage Bar, women's employment rate increased to 35% in 1987 and reached 56% in 2011 [2, 3]. The evolution witnessed in the gender composition of many world economies has been accompanied by increases in the prevalence of work-hours constraint, which is defined as

* Correspondence to Ela Polek, Tavistock Relationships, 70 Warren Street, London W1T 5PB

E-mail address: ela.polek@ucd.ie

the discrepancy between actual working hours and preferred working hours [4, 5].

Extensive research has examined the significance of number of working hours for women's psychological well-being and marital well-being [6, 7]. However, there exists a paucity of research examining the significance of discrepancy between actual and preferred working hours for depression, and in particular in relation to relationship satisfaction [8]. Of the two dimensions of work-hours constraint, *underemployment* (working fewer hours than preferred) has been marginally better studied than *overemployment* (working more hours than preferred). To date, work hour constraints have been shown to be related to various indicators of well-being: poorer self-assessed health, lower self-esteem, lower life satisfaction, elevated levels of depression, alcohol abuse, and higher incidence of suicide [5, 9-13]. Additionally, work-hours constraint has been linked to important outcomes for employers, such as job satisfaction, staff turnover, absenteeism, commitment, and productivity [5, 10].

Work-hours constraints, and depression and relationship satisfaction

Hitherto work-family research has suggested a link between work-time demands and depression [14, 15]. Yet, few studies have focused on the effect of discrepancy between actual and preferred working hours on marital relations. Using data from the Americans' Changing Lives survey, Herzog, House and Morgan's (1991) study found underemployment to be linked to depression symptoms in middle-aged and elderly American adults. However, using the same survey data, found that underemployment was unrelated to current depression when controlling for prior depression and a range of other background variables (including gender) [11]. Research by Prause and Dooley (1997) demonstrated a relationship between underemployment and lower self-concept. In another study, based on a large representative American sample from the National Longitudinal Survey of Youth found that after controlling for background variables (including gender), moves to underemployment were associated with higher levels of depression [16]. Otterbach's (2012) longitudinal study, using the British Household Panel Survey, also observed underemployment lead to higher rates of depression, with findings broadly similar across genders [5]. Otterbach (2012) observed that overemployment had more deleterious effects on depression than underemployment for both genders [5].

Work-family conflict, depression and relationship satisfaction: Crossover effects

Whisman, Uebelacker and Weinstock (2004) observed cross-partner associations of depression and relationship satisfaction [17]. No gender differences in the magnitude of the crossover relationships were observed. Renshaw, Blais and Smith (2010), however, in their cross-sectional study, found only limited evidence of cross-partner associations between depression and relationship satisfaction. Integrating self- and partner-reports on depression, only correlations between *self-reported* depression and relationship satisfaction were significant [18].

In Fincham, Beach, Harold, and Osborne's (1997) longitudinal study, no cross-partner relationships between depression and relationship satisfaction were observed [19]. Beach, Katz, Kim and Brody (2003), however, in their longitudinal study observed a cross-partner causal effect of relationship

satisfaction on depressive symptoms. Kouros and Cummings found that husbands' depression predicted wives' relationship satisfaction, though wives' depression did not predict husbands' depression [20, 21]. Furthermore, wives' relationship satisfaction was found to affect their husbands' depression, while husbands' relationship satisfaction did not affect wives' depression. Gustavson et al.'s study found depression and relationship satisfaction to be mutually predictive across partners, whereby gender was not found to exercise a moderating role [22]. The above-reviewed longitudinal studies differ across multiple criteria: the temporal lag for follow-up assessment, the nationality of participants, and the operationalization of relationship satisfaction. None of those, however, controlled for the effect of work-family conflict or work hours constrain – the gap, which this study aims to fill in.

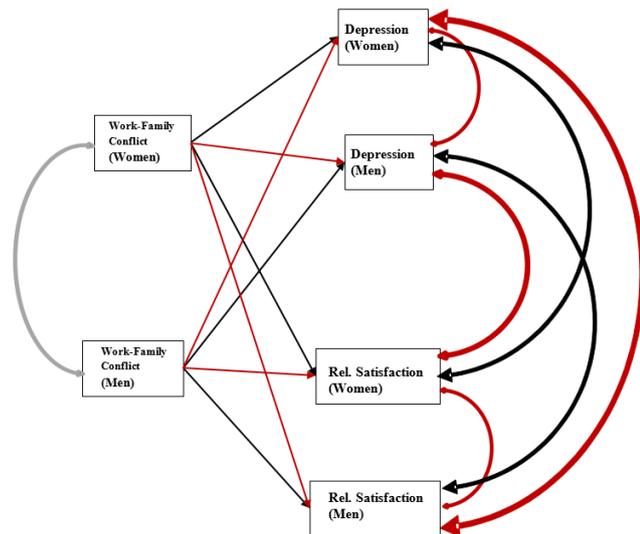
The Present Study

Drawing on a large population-based study of Irish dual-earner families with 9-month old infants, this study's first objective was to investigate the association of women's work-hours constraint with depression and relationship satisfaction of women and their partners. It was hypothesized that underemployed and overemployed women and their partners will show higher levels of depression and lower levels of relationship satisfaction in comparison with those who are adequately employed.

The second objective was to investigate to the effect of work-hours constraint on couple dynamics, as reflected by crossover effects in the three groups: underemployed, overemployed and adequately employed. Larson and Almeida suggested that emotional transmission between intimate partners is intensified in stressful situations [23]. Thus, we generally expected stronger negative crossover effects (here understood as a strain that is transmitted and creates or exacerbates another type of strain in the other person from one partner's work-family conflict to the other partner's depression and relationship satisfaction), where couples are burdened by the strain associated with women's underemployment or overemployment [24, 25].

The couple dynamics of crossover effects is depicted in the hypothesized model (see Figure 1) proposed based on the reviewed studies referenced below. The work-family conflicts, depressive symptoms, and relationship satisfaction of one partner was hypothesized as being correlated with work-family conflict, depression and relationship satisfaction of the other partner [26-30]. Work-family conflict was hypothesized to predict higher levels of depression and lower levels of relationship satisfaction at an intra-individual level for both sexes [31-34]. Work-family conflict was also modeled as predicting depression and relationship satisfaction of a partner [31]. Depression was modeled as being associated with relationship satisfaction at an intra-individual level both – depression and relationship satisfaction were hypothesized to crossover to partner's depression and relationship satisfaction [19, 31].

Figure 1: Hypothesized pathway model tested in the study: Black arrows depict intra-individual effects; red arrows depict cross-partners effects. Double-headed curved arrows depict correlations pathways; single-headed straight arrows depict regression pathways. The control variables (not shown in the picture) included difficulties arranging childcare, equalised household income, women’s education, household size, and women’s ethnicity



Though not visually depicted in Figure 1, a number of control variables – difficulty arranging childcare, income, mothers’ education, mothers’ race/ethnicity, and household size were modeled as predictors of women’s and their partner’s work-family conflict, depression and relationship satisfaction as suggested by earlier studies [35]. Income was additionally modeled as a predictor of difficulty arranging childcare (not depicted in Figure 1 as both variables are treated as controls) [35].

Methodology

Participants and procedure

We used the Growing Up in Ireland ‘Infant Cohort’ Study, which is a representative for an Irish population, longitudinal study following of 9-month old children living in the Republic of Ireland, and their parents (N=11,134) [36]. Data for the first wave (used in this study) were collected between September 2008 and April 2009. The current study was carried out only on dual-earner, heterosexual couples, that is, women and their male partners who both indicated their usual work situation as being “employed”, “self-employed”, or a “farmer”. As an additional inclusion criterion, women within dual-earner couples were further required to indicate that they were working at least one hour of paid work weekly (those on full-time maternity leave have been excluded from this study). Where preferred number of working hours exceeded actual working hours, couples were assigned to the ‘underemployed’ group (n= 335). Where actual working hours matched preferred working hours, couples were assigned to the ‘adequately employed’ group (n=1124). Where actual working hours exceeded desired working hours, couples were assigned to the

‘overemployed’ group (n=2469). As follows, the effective sample selected for this study was N= 3,928 (35% of the total number of *Growing up in Ireland* sample, Infant Cohort). The dataset was obtained from the Irish Social Sciences Data Archive upon receipt of a signed data contract. The study received approval from the University College Dublin Ethics Committee.

Measures

Women’s work-hours constraints categorization was determined using two questions: “How many hours do you normally work per week, including any regular overtime work? If you work at more than one job, please include the hours in all jobs”; and “If you were completely free to choose, how many hours a week (paid work) would you like to work overall?”

Depression symptoms were assessed using an 8-item version of the Centre for Epidemiological Studies Depression Scale CES-D, including items such as “I thought my life had been a failure”. Cronbach Alpha for women was .88 and .84 for men in this study [37].

Relationship satisfaction was measured using a 7-item version of the Dyadic Adjustment Scale, including items such as “Roughly how often would you and your spouse/partner argue?”, with higher scores indicating higher satisfaction [38]. Cronbach Alpha of .63 for women and .63 for men were computed in this study. Validity has been demonstrated in that the scale differentiated between those married, separated, and divorced couples [38].

A composite score was computed of the two items pertaining to work-to-family conflict to create the work-family conflict variable used throughout analyses. Participants rated their agreement in considering whether, on account of their work responsibilities, they have “missed out on home or family activities that you would have liked to have taken part in” and “your family time is less enjoyable and more pressured”. Each item was measured on 5-point Likert scales ranging from *Strongly Disagree* to *Strongly Agree*. The alpha coefficients observed for women and their partners were, respectively, .69 and .69.

Control Variables

A composite score of seven items was computed to create the ‘difficulty arranging childcare’ variable. Women indicated whether or not, since the study child had been born, difficulty in arranging childcare ever: *Prevented you looking for a job, made you turn down or leave a job, stopped you from taking on some study or training*, etc. The option of identifying a further negative consequence resulting from difficulty arranging childcare was also given. For each item ticked, a score value of 1 was assigned. Summed scores ranged from 0 to 7.

Women’s education was coded as ordered-categorical variable with 6 categories, ranging from (1) *No Formal Education or Primary* to (6) *Postgraduate level* education, as reported in Table 1. Women’s ethnicity was defined in the analyses as either *Irish* (0) or *Non-Irish* (1). Household size was based on the number of people living in the family home and ranged from 3 to 7 or more. In order to enable comparison of income levels between households of differing size and composition, equalised household income was available in the dataset [36].

Data Analysis

Missing data accounted for: 5% on the income variable; 1% on both women's and their partners' depression variables; 1% and 2%, respectively, for women's and their partners' relationship satisfaction variables; and 6% and 2% for women's and their partners' work-family conflict variables. Multiple imputations were used to predict group membership (over-, under-, and adequately employed) for 34 missing cases and to predict missing values for all other variables utilized in this study [39]. Inter-correlations, means, and standard deviations of observed variables included in the study are reported for each of the three groups in Supplementary Table 1 and Table 2.

Multivariate analysis of covariance (MANCOVA) comparing means of the three groups (over-, under-, and adequately employed), while controlling for the range of covariates, was performed with SPSS IBM 20.

AMOS 20 was used to compute pathway model in the three groups using the multiple group method. In this pathway model women and men's work-family conflict was used as a predictor of depression and relationship satisfaction (the latter two variables were modelled as correlated (see Figure 1); and control covariates were included (not depicted in Figure 1)) as predictors of work-family conflict, depression and relationship satisfaction of both women and men. The control covariates in both MANCOVA and pathway analysis included: difficulties arranging child care, women's education, equivalised household income, women's ethnicity, and household size. The bootstrapping procedure with 500 samples was used with maximum likelihood estimation [40]. The model was modified in an iterative process, in which pathways found to have the highest (and non-significant in all of the three groups) *p*-values were deleted one-by-one and the model was re-computed until we obtained the final adjusted model in which each pathway was significant in at least one of the three groups (see Figure 2). Four goodness-of-fit indices were implemented in assessing the fit of the adjusted model: The χ^2 statistic, Normed Fit Index (NFI),

Comparative Fit Index (CFI) and Root Mean Square Error of Approximation (RMSEA). To compare pathway individual coefficients, we used Preacher's test for the difference between two coefficients [41].

Results

Mean equivalised income (SD) for underemployed, adequately employed, and overemployed groups was, respectively: €21,321 (€11,765); €25,248 (€14,821); and €29,314 (€13,289). The average relation duration in the effective sample was 6.78 years (SD= 3.67). The demographic characteristics of women and their partners are described in Table 1.

Overemployed, Underemployed, and Adequately Employed: Group Differences

The results of multivariate test indicated significant main effects of women's work-hours constraint ($F(14, 3921) = 32.04, p < .001, \eta^2 = .054$). Univariate tests further indicated significant differences on women's depression ($F(2, 3921) = 10.01, p = .005, \eta^2 = .004$), women's work-family conflict ($F(2, 3921) = 192.23, p < .001, \eta^2 = .089$), and partners' relationship satisfaction ($F(2, 3921) = 3.33, p = .036, \eta^2 = .002$). Significant differences were *not* observed for the women's relationship satisfaction, partners' depression, and partners' work-family conflict.

Adequately employed women showed significantly lower levels of depression in comparison with both underemployed and overemployed women (Table 2) and partners of adequately employed women enjoyed significantly higher levels of relationship satisfaction in comparison with the partners of underemployed and overemployed women. Demonstrating the validity of women's classification as underemployed, overemployed, and adequately employed, overemployed women showed significantly higher levels of work-family conflict compared with underemployed and adequately employed women.

Table 1: Demographic Characteristics of the Current Sample (Percentages)

Variable	Underemployed (n=335)		Adequately Employed (n=1124)		Overemployed (n=2469)	
	Women	Partners	Women	Partners	Women	Partners
Education						
None/Primary	1	1	1	1	0	1
Lower & Higher Secondary	35	52	33	52	26	46
College non-degree	25	16	23	16	22	19
First degree at university	15	11	14	11	18	13
Professional Qualification	9	11	13	9	14	10
Postgraduate Education	15	10	16	11	21	13
Ethnicity						
Irish	72	73	85	85	88	86
Other	27	26	15	15	12	14
Marital Status						
Married couples	72	71	80	80	81	80
Age						
Mean	32.21	34.45	32.57	34.87	32.74	34.70
SD	4.95	5.84	4.47	5.42	4.17	5.08
Employment Status						
Part-time employed	96	8	83	7	34	7
Full-time employed	4	92	17	93	66	93

<i>Usual Work Situation</i>						
Employee	82	73	88	72	92	77
Self-Employed	18	24	12	23	8	20
Farmer	0	2	0	5	0	4

Note: Percentages may not total 100 due to rounding and missing data

Table 2: Comparison of the under-, over-, and adequately employed groups: Estimated marginal means (adjusted for the effects of covariates) and confidence intervals obtained in MANCOVA

<i>Intervals Obtained in MANCOVA</i>		99% Confidence Interval			
		Mean	SE	Lower Bound	Upper Bound
Women					
Relationship Satisfaction	Underemployed	25.26	.26	24.60	25.92
	Adequately Employed	25.52	.14	25.16	25.88
	Overemployed	25.31	.09	25.07	25.55
Depression	Underemployed	2.35 ^{a**}	.16	1.92	2.77
	Adequately Employed	1.67 ^b	.09	1.44	1.90
	Overemployed	1.99 ^{a*}	.06	1.84	2.15
Work-Family Conflict	Underemployed	2.28 ^b	.05	2.14	2.42
	Adequately Employed	2.28 ^b	.03	2.20	2.35
	Overemployed	2.91 ^{a**}	.02	2.86	2.96
Men					
Relationship Satisfaction	Underemployed	25.27 ^b	.26	24.60	25.93
	Adequately Employed	26.04 ^{a*}	.14	25.68	26.40
	Overemployed	25.56 ^b	.09	25.32	25.80
Depression	Underemployed	1.38	.13	1.05	1.71
	Adequately Employed	1.15	.07	.97	1.33
	Overemployed	1.33	.05	1.21	1.46
Work-Family Conflict	Underemployed	2.74	.06	2.60	2.88
	Adequately Employed	2.61	.03	2.54	2.69
	Overemployed	2.68	.02	2.62	2.73

Note: Comparisons were carried out when controlling for covariates: difficulty arranging childcare, women's education, household size, women's ethnicity and equalised household income. Different subscripts (a, b) point to significantly different mean scores on that variable, with a > b. Significance levels: ** $p < .001$. * $p < .05$

Testing the hypothesized model of couple dynamics

In relation to the second objective (the exploration of cross-partner and intra-individual associations by group) we found only one significant crossover regression effect in the adjusted model: partners' work-family conflict predicted women's relationship satisfaction. This was observed only in the adequately employed group; this association was found to be significantly higher than that for the overemployed group.

As for modelled cross-partner correlations, we found that men's depression was negatively associated with women's relationship satisfaction in overemployed group only. We found very small in magnitude (between 0.03 and 0.16), positive correlation between partner's depression measures in all three groups which was the highest in adequately employed group. There was medium in magnitude correlation in partners' relationship satisfaction, which was positive in over- and underemployed group, and negative in adequately employed group.

As for intra-individual associations, we found that women’s work-family conflict predicted their depression (only in over- and adequately employed group), men’s work-family conflict predicted negatively their relationship satisfaction (only in over- and adequately employed group). The magnitude of negative intra-individual association between depression and relationship satisfaction was the strongest in

overemployed group for women, and in underemployed group for men. The adjusted model was found to provide a reasonably good fit to the data across the three groups based on the criteria identified by Browne and Cudeck as markers of good fit [42].

Figure 2: Final adjusted pathway model (after deletion of non-significant pathways in an iterative way). Additional pathways involving the control variables found significant in at least one group (not depicted in the model) were: difficulties arranging child care predicting women’s and men’s depression; women’s education predicting women’s and men’s relationship satisfaction as well as women’s depression; income predicting women’s relationship satisfaction

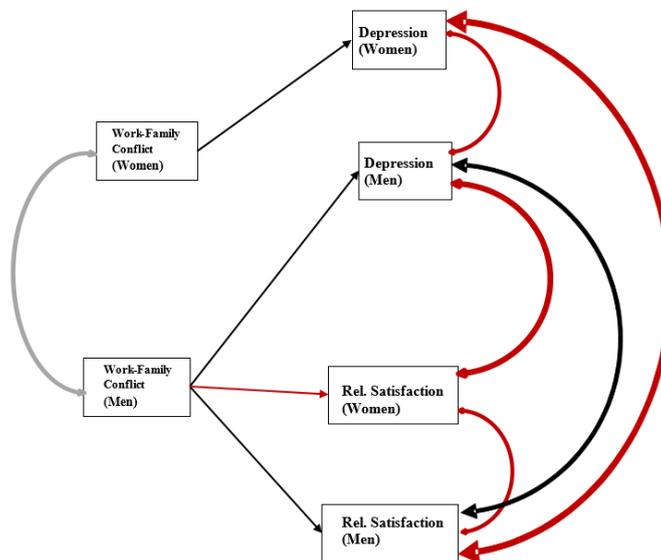


Table 3: Standardised Coefficients in the Adjusted Model and Fit Indices in Multiple Group Pathway Analysis (df=17)

	Underemployed		Adequately Employed		Overemployed	
	Estimate	SE	Estimate	SE	Estimate	SE
Work-family conflict (W) ↔ Work-family conflict (M)	0.10	0.05	0.08	0.03	0.13**	0.02
Work-family conflict (W) → Depression (W)	0.06	0.19	0.1**	0.09	0.1**	0.06
Work-family conflict (M) → Depression (M)	0.19**	0.13	0.15**	0.07	0.13**	0.05
Work-family conflict (M) → Relationship satisfaction (M)	-0.11	0.25	-0.17**	0.14	-0.11**	0.09
Work-family conflict (M) → Relationship satisfaction (W)	-0.03	0.29	-0.12**b	0.14	-0.04b	0.09
Depression (W) ↔ Depression (M)	0.03a	0.43	0.16**ab	0.18	0.07b	0.14
Depression (W) ↔ Relationship satisfaction (W)	-0.2	0.08	-0.10**b	0.05	-0.21**b	0.03
Depression (M) ↔ Relationship satisfaction (M)	-0.27**	0.10	-0.18**	0.06	-0.17**	0.04
Depression (M) → Relationship satisfaction (W)	-0.09	0.12	-0.03b	0.06	-0.12**b	0.04
Relationship satisfaction (W) ↔ Relationship satisfaction (M)	0.41**a	1.30	-0.29**a	0.63	0.30**	0.42
χ ²	33.94		47.27		68.13	
p	0.009		0.000		0.000	
RMSEA (95% C.I.)	0.055 (.027 - .081)		0.040 (.027 - .04)		0.035 (.026 - .044)	
NFI	0.870		0.914		0.947	
CFI	0.925		0.941		0.959	

Note. Levels of significance: **p<.001; *p<.01; “a” denotes a significant difference between coefficients in under- and adequately employed at the level of p<.05; “b” denotes a significant difference between coefficients in over- and adequately employed at the level of p<.05

Discussion

The main aim of this study was to examine the effect of women's work-hours constraint on couple's mental health (with a focus on their questionnaire-assessed symptoms of depression) and relational well-being. We found evidence that situations of women's adequate employment for couples with small infants (< 1-year old) were advantageous over under- and overemployment not only for mental health of women, but also for their partners' relationship satisfaction.

Over- and underemployed women showed higher levels of depression than adequately employed women. This finding reflects those of a number of studies implementing cross-sectional and longitudinal designs [5, 12, 43]. In concordance with earlier studies we found that women's underemployment and overemployment have limited effect on their own relationship satisfaction but may have more serious implications for the relationship satisfaction of their partners who reported lower levels of relationship satisfaction – a novel finding [6, 7].

The results partially supported the hypothesis that greater crossover effects would be observed under situations of stress associated with work-hours constraint (over- and underemployed group). Work-hours constraint was found to moderate the cross-partner association of depression with relationship satisfaction: men's higher depression was associated with lower women's relationship satisfaction when women were overemployed; we did not find evidence that the same is true for the underemployed group. The above-noted pattern of couple dynamic in overemployed group is in agreement with Larson and Almeida theorizing that emotional transmission between partners intensifies under conditions of environmental stress: the situation of stress association with women's overemployment may lead to the depletion of couple's psychological resources, leaving them poorly equipped to be able to protect their own mental well-being and to support the partner [23].

We found that only men's work-family conflict predicted women's relationship satisfaction (but not vice-versa) – gender asymmetry, which was, again, the strongest for overemployed group. The observed gender effect in crossover processes is consistent with a large body of crossover research reporting crossover mainly from husband to wife [17, 21, 22, 44,]. Larson and Almeida suggest that husbands are generally the senders of emotions and wives, generally being more empathic and emotionally sensitive than their husbands, are the receivers [23]. Given that the above-mentioned crossover effect was observed only in adequately and overemployed groups (with no significant differences between the two groups), it is suggested that some benefits of underemployment should be noted. First, it was associated with lesser negative crossover effects from men's work-family conflict to women's relationship satisfaction,

and in this group, we observed the lowest association between men's depression and women's relationship satisfaction. This is a novel finding, here interpreted as the evidence that women in underemployed group were under lower levels of stress compared to overemployed and adequately employed women, thus being able to cope more effectively with their partner's work-family conflict.

Limitations

Caution needs to be taken when considering generalizing the findings of the present study to clinical populations and making causal inferences. Different relationships among the study variables may potentially be anticipated in dual-earner couples afflicted by clinical levels of depression, in couples with older or younger children, or couples without children [21, 45]. Common method variance, a form of systematic error variance, was introduced to the study by the use of a single method of data collection (interview) for both women and their partners [46]. Furthermore, the contributions of other important work-related characteristics (e.g., job-pressure, workplace social support, schedule flexibility, etc.) and the length of relationship were not controlled for in the analyses as they were not available in the dataset. The association of number of working hours with couple financial resources was reflected by the differences in income between the three groups (the lowest in underemployed group), however we controlled for the possible confounding effect of income. Finally, there was a difference in sizes of the three groups; we employed bootstrapping to improve the precision of prediction and minimize the bias related to the relatively smaller number of participants in the overemployed group.

Policy Implications and Future Research

We suggest that greater attention should be paid by policy makers and employers to women's work-hours constraint, particularly when women have infant children: 71% of women in the present study's sample reported work-hours constraints, and only a fraction of the total GUI sample (35%) was working outside of home [5]. Historically, governments have focused on the improvement of levels of participation in the labor force and on the reduction of unemployment among women [5]. However, due attention should be given to situations of underemployment and overemployment, in recognition of the apparent individual, familial, and organizational risks associated with such work situations [5, 9, 10, 12, 13, 47,]. Significantly, overemployed and underemployed mothers (of infants) may be identified as 'subpopulations' at increased risk for depression in work place screening for mental health issues. In addition, overemployed women and their partners may be at greater risk of having strained and discordant relationships.

Longitudinal data may help to infer about causality in cross-partner effects between mental health and relational well-being. Future studies should further investigate why work hours preferences are not attained, and the meanings ascribed to these preferences [48]. The impact of partners' work-hours constraint (not available in the dataset used in this study), and the interactive effects of women's and their partners' work-hours constraint, may also be worthy of future examination.

Conclusion

This study addresses a gap within the literature in becoming the first study to examine associations between women's work-hours constraint, depression and relationship satisfaction in a population-based, large cohort sample. By assessing the cross-partner relationships between work-family conflict and depression, and relationship satisfaction, this study is also the first to attempt to develop understanding of how women's work-hours constraint may influence interpersonal dynamics within couples. The representativeness of the sample used of dual-earner parents of infants allows for greater generalizability of the findings. The findings indicate detrimental effects of women's underemployment and overemployment for both women and their partners. It is hoped that the present findings will be informative for policy makers, employers and marital counselors.

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