Int J Public Health (2015) 60:375–387
DOI 10.1007/s00038-015-0654-2

SSPH+ SWISS SCHOOL OF PUBLIC HEALTH +

ORIGINAL ARTICLE

The impact of social and family-related factors on women's stress experience in household and family work

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Received: 18 February 2014 / Revised: 13 November 2014 / Accepted: 12 January 2015 / Published online: 23 January 2015

Abstract
Objectives This study explores the contribution of social and family-related factors to women's experience of an effort–reward imbalance (ERI) in household and family work.
Methods Using a population-based sample of German mothers ($n = 3{,}129$), we performed stepwise logistic regression analysis in order to determine the relative impact of social and family-related factors on ERI.
Results All factors investigated showed a significant association with at least one ERI component. Considering all predictors simultaneously in the multivariate analysis resulted in a decrease in significance of socioeconomic status in explaining the effort–reward ratio while the impact on low reward partly remained significant. In addition, age of youngest child, number of children, lower levels of perceived social support, domestic work inequity and negative work-to-family spillover, irrespective of being half- or full-time employed, revealed to be important in predicting ERI.
Conclusions The experience of ERI in domestic work is influenced by the social and family environment. Particularly among socially disadvantaged mothers, lack of social recognition for household and family work proved to be a relevant source of psychosocial stress.

Keywords Social factors · Family characteristics · Effort–reward imbalance · Household · Family · Stress

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Introduction

Research on the relationship between stress and poor health outcomes can be assigned to two different theoretical concepts, the 'job framework' and the 'gender framework'. While the job framework addresses stressful experiences in the work environment, the gender framework focuses on stress related to social roles and conflicts caused by the necessity to fulfil multiple roles (Griffin et al. 2002). Most studies within the gender framework conclude that women performing multiple roles, for example, being mother, partner and paid-worker at the same time, tend to be healthier than those exercising fewer roles (Fokkema 2002; Lahelma et al. 2002; Mastekaasa 2000; McMunn et al. 2006). However, some authors have argued that recent studies mainly focused on health-related consequences of role accumulation by neglecting the strain and workload of domestic and family obligations (Staland-Nyman et al. 2008, Walters et al. 2002). Similarly, research on stressful life-events, long-term stressors, and daily hassles lacks of specificity in the measures to accurately evaluate domestic and family work.

In order to address this issue, research was carried out on the application of work-related conceptual frameworks to domestic and family labour. The 'demand-control model' of occupational stress (Karasek and Theorell 1990) is the most common approach that has been transferred to unpaid work in order to capture the stress experience at home. It postulates job strain as the result of an interaction between high demands and low control at work. Studies suggest that full-time housework compared to paid work is more subject to interruptions, more physically demanding and more routine, but also involves more autonomy and fewer time pressures (Lennon 1994; Matthews et al. 1998; Rosenfield 1989). Griffin et al. (2002) found that lack of

control in household and family work was not evenly distributed across different social positions and that this stress experience was associated with increased risks of developing depression and anxiety in women but also in men. Staland-Nyman et al. (2008), also addressing the demand-control model, could show that strain in domestic work, including perceived inequity in the relationship with a cohabiter, was associated with lower self-rated health.

More recently, the theoretical framework of Effort–Reward Imbalance (ERI) at work (Siegrist 1996) has been adapted to unpaid household and family work (Sperlich et al. 2012). The ERI model claims that lack of reciprocity between efforts spent and rewards received at work, elicits strong negative emotions and sustained stress reactions which in the long run adversely affect physical and mental health (Siegrist 2009; van Vegchel et al. 2005). The application of the ERI model to unpaid work was based on the assumption that women's engagement in household and family work is not only an additional social role beyond work, but also a specific form of labour. Although it may be difficult to adequately weight rewards against efforts, it can be assumed that fairness of exchange in terms of the balance between efforts spent and subsequent rewards received is also essential for household and family work (Sperlich et al. 2012).

First evidence suggests that the ERI model is applicable to unpaid work and provides an explanatory framework to assess stressful experiences in household and family work (Sperlich et al. 2013). However, hitherto little is known about the social and family environment that contributes to ERI in domestic and family work. A former investigation of construct validity suggested that the perception of ERI at home differs according to social factors, such as income and school education (Sperlich et al. 2012). The present study investigates more closely the conditions under which ERI in household and family work occurs. The emphasis was placed on the impact of environmental conditions, namely social (socioeconomic position, employment status and perceived social support) as well as family-related factors (number of children, age of youngest child, family status, division of housework and negative work-to-family spillover) on the perception of high 'effort', low 'reward' as well as the imbalance of 'effort' and 'reward (effort–reward ratio) in household and family work.

Methods

Sample

The cross-sectional survey was conducted by TNS Healthcare on behalf of the Department of Medical Sociology at Hannover Medical School, Germany. The ethics committee of Hannover Medical School approved the study. The data were collected in 2009 by means of mail survey. A total of 3,183 German mothers have participated in the survey, corresponding to a return rate of 62.3 %. Subsequently, 54 mothers were excluded due to being outside of the inclusion criteria (in particular, the youngest child was >18 years of age). Consequently, the final sample consists of 3,129 mothers. The sample was weighted according to German federal states, school education, mother's age, marital status and number of children and thus can be considered as representative for German mothers regarding these characteristics. For more details on the dataset used, refer to Sperlich et al. (2012). Table 1 displays the sample characteristics according to social and family-related factors.

Measurements

Effort–reward imbalance (ERI) in household and family work

In order to assess ERI in household and family work a new questionnaire was used including, analogous to the original questionnaire (Siegrist 1996), the subscales effort and reward (Sperlich et al. 2012). The ERI model additionally contains a specific pattern of personal coping, characterized by excessive work-related overcommitment. Although a short questionnaire for assessing the inability to withdraw from household and family work obligations is available (Sperlich et al. 2012), we focus on effort, reward and the effort–reward ratio in order to not exceed the framework of this study.

Effort was measured by eight items assessing demanding aspects of household and family work by emphasizing quantitative workload (e.g. "Often I feel as never being off duty"). Reward was measured by 11 items, divided into four dimensions: (1) intrinsic value of family and household work (3 items, e.g.: "I often question the meaning of household and family work, since I have to start all over again every day"), (2) societal esteem (3 items, e.g.: "Nowadays, a person is regarded disapprovingly if he/she is 'only' involved in household and family work"), (3) recognition from spouse/partner (3 items, e.g.: "Often my partner does not notice my work in the household and for the family"), and (4) affection from child(ren) (2 items, e.g.: "I receive a great deal in return from my children/child for my efforts at home"). Response formats were constructed analogous to the original ERI (see Sperlich et al. 2012). Also in line with Siegrist et al. (2004) the effort–reward ratio was computed for each respondent according to the formula: $e/(r \times c)$, where e is the sum score of the effort scale, r is the sum score of the reward scale and c defines a correction factor accounting for different

Table 1 The study sample ($n = 3{,}129$), Germany 2009

	n	%		*n*	%
Age of mother (years)			Employment status		
20–29	291	9.4	Unemployed	97	3.2
30–39	1,328	42.8	Housewife/parental leave	566	18.4
40–49	1,339	43.2	Early retirement	28	.9
50–59	137	4.4	Working ≤19 h/week	669	21.8
Missing	34		Working 20–37 h/week	1,163	37.8
Age of youngest child (years)			Working ≥38 h/week	550	17.6
0–2	479	15.5	Missing	56	
3–5	500	16.2	Work-to-family spillover		
6–11	1,008	32.6	Marked	599	19.9
12–15	687	22.2	Not marked	1,742	55.7
16–18	420	13.6	Currently do not work	663	21.2
Missing	35		Missing	124	
School education (years)			Employment status/Spillover[a]		
≤9	1,008	32.6	Unemployed	97	3.2
10–11	1,256	40.6	Full-time housewife[b]	594	19.6
≥12	830	26.8	≤19 h/week + spillover not marked	603	26.2
Missing	35		≤19 h/week + spillover marked	67	2.2
Net equivalent income			20–37 h/week + spillover not marked	796	26.4
<60 % median	799	30.4	20–37 h/week + spillover marked	335	11.0
<100 % median	1,045	39.8	≥38 h/week + spillover not marked	333	11.0
>100 % median	780	27.7	≥38 h/week + spillover marked	198	6.5
Missing	505		Missing	107	
Job position			Social support		
Lowest	306	10.4	High	2,432	78.4
Low	1,494	50.8	Low to middle	670	21.6
Middle	821	27.9	Missing	27	
High	271	9.2	Division of housework		
Not yet ever been working	49	1.7	Mainly woman (single mothers)	503	16.3
Missing	188		Mainly woman (partnered mothers)	1,960	63.7
Single motherhood			Woman and man alike	616	19.7
Yes	506	16.8	Others (e.g. grandparents)	53	1.7
No	2,511	83.2	Missing	62	
Missing	112				
Number of children					
3 and more	469	16.0			
2	1,277	43.5			
1	1,187	40.5			
Missing	196				

h/week hours a week

[a] Combined variable based on 'employment status' and 'negative work-to-family spillover'

[b] The category 'full-time housewife' includes 'parental leave' and 'early retirement'

numbers of items in the numerator and denominator. If there are no missing values, *c* equals .73 (8 items 'effort' divided by 11 items 'reward'). In case of more than two missing values (subscale 'effort') or three missing values (subscale 'reward'), the complete case was excluded from the calculation. Since the dimension 'recognition from spouse' is not applicable to single mothers, here the ERI score is based only on the three remaining reward-dimensions.

All components of the effort–reward imbalance model were transformed into binary variables contrasting high

versus low distress, namely the ratio (≤1 vs. >1), the subscales 'effort' and 'reward' as well as the four dimensions of reward. Mean values (ranging from 1 to 5) larger than or equal with 3 (burdens me moderately) were considered to denominate high distress (Table 2).

Socioeconomic status

Socioeconomic status was measured using the following variables: school education, job position, per capita income and employment status. With respect to 'job position' the women were asked to indicate their current or last professional status out of seven response categories, which have been aggregated into four categories: (1) lowest: unskilled workers, (2) low: semi-skilled workers; simple blue- and white-collar workers/employees, (3) intermediate: middle grade workers and employees, and (4) high: executive workers and employees. We categorized the household income into three categories: (1) <60 % of the German median income, (2) between 60 and 100 % of the German median income, and (3) above 100 % of the German median income.

Table 2 Frequency distribution of effort–reward imbalance ($n = 3{,}129$), Germany 2009

Effort–reward imbalance	*n*	%
Effort–reward ratio >1	598	19.3
Effort–reward ratio <1	2,499	80.7
Missing	32	
Effort		
High distress	1,249	40.0
Low distress	1,876	60.0
Missing	4	
Reward		
High distress	492	15.9
Low distress	2,608	84.1
Missing	28	
Intrinsic value		
High distress	456	14.8
Low distress	2,620	85.2
Missing	53	
Societal esteem		
High distress	1,184	38.5
Low distress	1,893	61.5
Missing	52	
Affection from child		
High distress	810	26.1
Low distress	2,288	73.9
Missing	32	
Recognition from spouse		
High distress	919	36.0
Low distress	1,631	64.0
Missing/not applicable[a]	579	

Mean values of the subscales larger or equal than 3 ('burdens me moderately') were considered to express high distress

[a] Not applicable to single mothers

Family characteristics

Family characteristics were assessed by the following variables: single motherhood (i.e. living alone with at least one dependent child in the household), number of children in the household and age of youngest child. In addition, division of housework was assessed by asking the participants the following question: "Who is responsible for housework, i.e. for all work arising such as cleaning, washing, caring and cooking?" The respondents could choose from four possible answers: (1) entirely/mainly me, (2) me and my partner in the same way, (3) entirely/mainly my partner, and (4) by others, e.g. grandparents. We differentiated between the responses of single and partnered mothers in order to be able to compare single mothers (who are as such mainly responsible for household and family work) and partnered mothers who are mainly responsible for household and family work. The variable contains three categories: (1) single mothers, (2) partnered mothers who are mainly responsible for household and family work and (3) partnered mothers who are equally sharing the household and family work with the partner/spouse.

Social support

Perceived social support was measured by the 'Social Support Questionnaire' containing statements about social contacts rated by a five-point Likert scale ('not true at all' to 'completely true'). In the present study, a short form with 14 items (F-SozU K-14) was used, which had formerly been developed from the 54-item-standard version (Fydrich et al. 2009). The statements refer to the domains of emotional support (8 items), instrumental support (3 items), and to social integration (4 items). The scale value, as the complete score of the social support experienced, was calculated as the mean rating for all scale items. Based on the mean rating, we calculated a dichotomous variable taking the value 1 to indicate high levels of social support (mean rating ranging from 4 to 5) and 2 to indicate low to middle levels of social support (mean rating ranging from 1 to 3).

Negative work-to-family spillover

We assessed the degree to which strain-based-pressures in the work role impair performance in the family role with the following three statements (Siegrist 2002): (1) "Due to job strain I am often too tired for joint activities with my

partner/my child/ren", (2) "Due to job strain I am often so exhausted that household and family work are setting me under strain", and (3) "My partner/my family is annoyed that I am absorbed by occupational affairs when being at home". Each statement has five categories ranging from (0) 'no, not applicable' to (4) 'yes, and this burdens me very greatly'. A dichotomous variable was calculated taking the value 1 to indicate spillover is 'not marked' (each of the items was answered with 'does not burden me') and the value 2 to indicate spillover 'is marked' (at least each item was answered with 'burdens me somewhat'). Due to the strong overlap of negative work-to-family spillover and employment status, we combined these both variables for multivariate analysis into a new variable with the following categories: (1) being unemployed and searching for a job, (2) working ≤19 h/week (3) working 20–37 h/week without marked spillover, (4) working 20–37 h/week with marked spillover, (5) working ≥38 h/week without marked spillover and (6) working ≥38 h/week with marked spillover. The reference category was 'housewife'. For the category working ≤19 h/week no differentiation was made due to the small number of cases of marked spillover (2.2 %, Table 1).

Analyses

Firstly, we explored the bivariate relationships between effort–reward imbalance (ERI) and each single social and family-related predictor, performing a set of bivariate logistic regression analyses. In a second step, we considered all possible predictors on ERI simultaneously. As at this stage we had not yet theoretical assumptions about the relative importance of the social and family-related factors considered, we used stepwise logistic regression analysis (method: forward selection, likelihood quotient) in an explorative sense. This procedure considers a number of possible multiple regression models, and selects subsets of parameters to test for possible addition to the model or elimination from the model. We present the results adjusted for mother's age of the 'final model' which lists all significant predictors ($p < .05$) and display odds ratios, their significance level and the fit of the model to the data (Nagelkerkes R^2) separately for the effort–reward ratio, the subscales 'effort' and 'reward' as well as the four dimensions of 'reward'.

Results

Associations between social and family-related factors and ERI

Women aged 30 to 39 years reported significantly higher levels of effort compared to those aged 50 to 59 years (42.6 versus 31.8 %), while levels of distress related to low reward of household and family work revealed to be lower in this age group (although not statistically significant) (15.6 versus 20.9 %) (Table 3). The imbalance between effort and reward was lowest when the youngest child was ageing between 0 and 2 (14.4 %) and highest in the next age group of 3 to 5 year-old toodlers (23.5 %). In addition, the effort–reward ratio increased significantly with number of children from 16.9 % (caring for one child) to 24.1 % (caring for at least three children). Lack of reciprocity was also higher in single (27.5 %) than in partnered mothers (17.8 %). Similarly, low-income mothers had higher rates of ERI in household and family work compared to more affluent women, holding for high levels of effort (45.2 versus 36.9 %) and in particular for high levels of distress due to lack of reward (21.7 versus 10.8 %). A social gradient in the effort–reward ratio was also found for school education and in part for job position. These associations, however, were mainly caused by higher rates of distress related to lack of reward among women of lower social status. With respect to employment status only 'being currently unemployed' was associated with significantly higher distress related to lack of reward in household and family work (25.8 %) compared to full-time housewives (15.2 %). A clear association with all components of ERI could be found for perceived social support and negative work-to-family spillover. In addition, it shows that, compared to mothers equally sharing household and family work with the partner or spouse, singles as well as partnered mothers who are mainly responsible for household and family work reported significantly higher levels of distress related to high efforts and low rewards.

Associations between social and family-related factors and the four dimensions of reward

Table 4 provides a closer insight into the relationships between social and family-related factors and the different dimensions of 'reward'. The results showed that the strong associations between social and family-related factors and the subscale 'reward' (Table 3) mainly held for 'intrinsic value', 'societal esteem', and 'affection from child'. Only 'recognition from spouse' revealed to be less influenced by the environmental factors considered. With respect to employment status, the findings indicated that being unemployed was associated with significantly higher odds of distress related to 'intrinsic value' and 'affection from the child'. Particularly compared to full-time working mothers, being housewife was associated with increased odds of distress due to lack of societal esteem while odds of distress due to lack of intrinsic value and affection from child were significantly lower in full-time housewives.

Table 3 Bivariate relationships between social and family-related factors and effort–reward imbalance in household and family work, Germany 2009

	Ratio (n = 2,846)			Effort (n = 2,846)			Reward (n = 2,846)		
	>1			High distress			High distress		
	%	OR	p	%	OR	p	%	OR	p
Age (years)			.715			**.026**			.403
20–29	18.0	.84	.507	42.0	1.55	.055	14.1	.63	.100
30–39	18.8	.89	.606	42.6	**1.59**	**.020**	15.6	.71	.145
40–49	20.3	.97	.909	38.3	1.33	.147	16.2	.75	.204
50–59	20.9	Ref.		31.8	Ref.		20.9	Ref.	
Age of youngest child (years)			**.001**			**≤.001**			**.001**
0–2	14.4	.96	.854	42.2	**2.03**	**≤.001**	10.0	**.56**	**.006**
3–5	23.5	**1.76**	**.002**	47.8	**2.56**	**≤.001**	15.6	.93	.702
6–11	20.2	**1.45**	**.024**	42.8	**2.09**	**≤.001**	16.0	.96	.822
12–15	21.7	**1.59**	**.007**	37.8	**1.69**	**≤.001**	19.8	1.25	.192
16–18	14.9	Ref.		25.5	Ref.		16.5	Ref.	
Number of children			**.010**			**≤.001**			.094
3 and more	24.1	**1.57**	**.001**	48.3	**1.60**	**≤.001**	19.0	**1.39**	**.027**
2	19.9	1.22	.066	39.9	1.14	.140	16.7	1.20	.127
1	16.9	Ref.		36.9	Ref.		14.4	Ref.	
Missing[a]	21.8	1.38	.118	42.4	1.27	.156	13.3	.90	.669
Single motherhood			**≤.001**			**.001**			**≤.001**
Yes	27.5	**1.74**	**≤.001**	47.1	**1.40**	**.001**	24.8	**2.09**	**≤.001**
No	17.8	Ref.		38.7	Ref.		13.7	Ref.	
School education (years)			**.003**			.162			**≤.001**
≤9	23.1	**1.47**	**.002**	41.8	1.01	.989	20.6	**1.83**	**≤.001**
10–11	18.3	1.09	.485	37.9	.86	.108	14.5	**1.19**	**.212**
≥12	17.0	Ref.		41.6	Ref.		12.4	Ref.	
Net equivalent income			**≤.001**			**.010**			**≤.001**
<60 % median	24.9	**1.68**	**≤.001**	45.2	**1.41**	**.001**	21.7	**2.29**	**≤.001**
<100 % median	18.5	1.15	.288	39.6	1.12	.261	14.6	**1.42**	**.020**
>100 % median	16.5	Ref.		36.9	Ref.		10.8	Ref.	
Missing[a]	17.7	1.09	.612	38.4	1.07	.833	17.7	**1.78**	**.001**
Employment status			.360			.455			**.044**
Unemployed	17.0	.96	.877	38.6	1.06	.809	25.8	**1.91**	**.017**
Working ≤19 h/week	21.3	1.23	.157	40.2	1.14	.288	17.1	1.15	.378
Working 20–37 h/week	20.3	1.15	.284	42.0	1.22	.060	16.1	1.07	.623
Working ≥38 h/week	17.2	.94	.726	40.0	1.13	.330		.84	.312
Full-time housewife[b]	18.0	Ref.		37.1	Ref.		15.2	Ref.	
Job position			**.047**			.158			**≤.001**
Lowest[c]	21.0	1.23	.435	40.0	.78	.141	23.8	**2.27**	**.001**
Low	21.2	1.19	.426	40.6	.80	.110	16.9	1.47	.068
Middle	15.9	.85	.583	38.8	**.74**	**.040**	12.6	1.04	.866
High	18.3	Ref.		46.1	Ref.		12.0	Ref.	
Missing[a]	21.5	1.23	.435	34.2	**.64**	**.020**	13.5	1.13	.689
Social support			**≤.001**			**≤.001**			**≤.001**
Low to middle	38.3	**3.72**	**≤.001**	61.5	**3.07**	**≤.001**	32.8	**3.84**	**≤.001**
High	14.3	Ref.		34.3	Ref.		11.3	Ref.	

Table 3 continued

	Ratio (n = 2,846)			Effort (n = 2,846)			Reward (n = 2,846)		
	>1			High distress			High distress		
	%	OR	p	%	OR	p	%	OR	p
Work-to-family spillover			**≤.001**			**≤.001**			**≤.001**
Marked	44.9	**6.26**	**≤.001**	77.3	**8.40**	**≤.001**	31.0	**3.69**	**≤.001**
Currently do not work	17.7	**1.66**	**≤.001**	36.8	**1.44**	**≤.001**	16.2	**1.58**	**.001**
Not marked	11.5	Ref.		28.8	Ref.		10.9	Ref.	
Division of housework						**≤.001**			**≤.001**
Mainly woman (single mothers)	27.4	**5.96**	**≤.001**	47.2	**2.55**	**≤.001**	24.7	**6.00**	**≤.001**
Mainly woman (partnered m)	21.9	**4.43**	**≤.001**	43.0	**2.16**	**≤.001**	17.2	**3.79**	**≤.001**
Woman and man alike	5.9	Ref.		25.9	Ref.		5.2	Ref.	

Significant odds ratios and p values are in bold, ref. means reference category

[a] If more than 5 % of cases have no valid information, the category 'missing' is additionally displayed

[b] The category 'full-time housewife' includes 'parental leave' and 'early retirement'

[c] The category 'lowest' includes 'not yet ever been working'

Multivariate analysis: factors influencing ERI

The multivariate approach revealed that age of youngest child as well as number of children was still relevant in explaining high effort and low reward in household and family work (Table 5). In addition, lower levels of perceived social support and women's statement to be mainly responsible for household and family work, irrespective of being single or partnered mother, remained significantly associated with higher odds of ERI. However, differences between single mothers and partnered mothers who are mainly responsible for household and family work decreased compared to the unadjusted analysis (Table 3). Similarly, the effects of socioeconomic disadvantages (low levels of school education, low income and lower occupational status) on ERI declined when considering all factors simultaneously. In the multivariate approach only the effect of school education on the 'ERI ratio' and the subscale 'reward' remained statistically significant. Women facing marked work-to-family spillover reported higher levels of distress related particularly to high effort but also to low reward compared to full-time housewives. This held true irrespective of being half-time or full-time employed. Conversely, employed women who are not affected by negative work-to-family spillover showed significantly lower odds of ERI in comparison with full-time housewives.

Multivariate analysis: factors influencing the four dimensions of reward

Socioeconomic disadvantages (lower levels of school education and low income) and number of children remained significant in predicting low societal esteem in household and family work (Table 6). In predicting high distress related to lack of affection from child, age of youngest child and number of children revealed to be important. Lower levels of perceived social support and holding the main responsibility for household and family work (irrespective of being a single or partnered mother) proved to be powerful in explaining higher levels of distress related to all dimensions of reward. Compared to mothers equally sharing household and family work with the partner or spouse, single mothers reported higher levels of stress related to lack of intrinsic value and societal esteem while partnered mothers who are mainly responsible for housework are particularly affected by distress related to lack of recognition from spouse.

Marked work-to-family spillover in half-time and full-time working women contributed mainly to distress related to lack of intrinsic value and lack of recognition from spouse. Only in half-time working mothers marked spillover also increased the odds of distress related to lack of affection from child compared to full-time housewives. On the contrary, working women, whether or not affected by negative work-to-family spillover, tended to show lower odds of distress related to lack of societal esteem compared to their non-working counterparts.

Discussion

First evidence suggests that the application of ERI to unpaid work contributes to a better understanding of psychosocial factors influencing women's health (Sperlich et al. 2012, 2013). However, so far little is known about the living circumstances that may increase or decrease the risk of experiencing lack of reciprocity in household and family

Table 4 Bivariate relationships between social and family-related factors and the dimensions of 'reward', Germany 2009

	Intrinsic value (n = 2,846)			Societal esteem (n = 2,846)			Affection from child (n = 2,846)			Recognition from spouse (n = 2,377)		
	High distress			High distress			High distress			High distress		
	%	OR	p	%	OR	p	%	OR	p	%	OR	p
Age (years)			.417			.888			**≤.001**			.542
20–29	14.9	.72	.250	37.3	1.10	.684	11.8	**.28**	**≤.001**	36.4	1.13	.641
30–39	14.1	.68	.110	38.5	1.15	.463	24.0	**.66**	**.039**	37.9	1.20	.415
40–49	15.4	.76	.263	38.3	1.15	.481	31.2	.95	.811	35.0	1.06	.803
50–59	19.4	Ref.		34.9	Ref.		32.6	Ref.		33.3	Ref.	
Age of youngest child (years)			**≤.001**			.406			**≤.001**			**.029**
0–2	7.9	**.49**	**.002**	38.0	1.19	.239	10.9	**.22**	**≤.001**	34.0	1.20	.269
3–5	14.8	.99	.957	39.0	1.24	.136	20.2	**.45**	**≤.001**	39.9	**1.55**	**.007**
6–11	15.5	1.04	.833	38.1	1.19	.168	25.9	**.62**	**≤.001**	38.9	**1.48**	**.007**
12–15	19.1	1.33	.100	40.2	1.30	.051	36.5	1.02	.869	35.2	1.26	.133
16–18	14.9	Ref.		34.0	Ref.		36.0	Ref.		30.1	Ref.	
Number of children			.889			**≤.001**			**≤.001**			.567
3 and more	14.6	.93	.668	44.7	**1.71**	**≤.001**	31.7	**1.69**	**≤.001**	33.8	.88	.353
2	15.0	.97	.776	39.9	**1.41**	**≤.001**	29.1	**1.49**	**≤.001**	37.4	1.04	.715
1	15.4	Ref.		32.1	Ref.		21.6	Ref.		36.6	Ref.	
Missing[a]	13.3	.84	.461	47.6	**1.92**	**≤.001**	25.5	1.23	.288	33.8	.88	.505
Single motherhood[b]			**≤.001**			**≤.001**			**.001**			
Yes	20.3	**1.60**	**≤.001**	46.9	**1.57**	**≤.001**	32.8	**1.48**	**.001**	–	–	–
No	13.8	Ref.		36.0	Ref.		24.9	Ref.		–	–	–
School education (years)			**.045**			**≤.001**			**≤.001**			.318
≤9	17.3	**1.38**	**.021**	47.7	**2.13**	**≤.001**	30.9	**1.61**	**≤.001**	34.3	.92	.452
10–11	14.3	1.10	.492	35.2	**1.30**	**.009**	26.0	**1.27**	**.031**	37.8	1.07	.516
≥12	13.2	Ref.		30.1	Ref.		21.6	Ref.		36.2	Ref.	
Net equivalent income			.300			**≤.001**			**.026**			.283
<60 % median	16.8	1.32	.064	48.8	**2.03**	**≤.001**	27.4	**1.32**	**.024**	36.2	1.01	.928
<100 % median	14.5	1.11	.451	38.6	**2.80**	**≤.001**	28.6	**1.40**	**.003**	38.4	1.12	.305
>100 % median	13.3	Ref.		25.4	Ref.		22.2	Ref.		35.8	Ref.	
Missing[a]	15.6	1.20	.299	40.7	**1.85**	**≤.001**	26.8	1.28	.076	32.6	.87	.296
Employment status			**.006**			**≤.001**			**.006**			.241
Unemployed	19.1	**1.94**	**.030**	60.2	1.41	.143	35.2	**2.01**	**.004**	45.8	1.76	.063
Working ≤19 h/week	16.0	**1.60**	**.007**	44.1	**.74**	**.009**	26.6	**1.35**	**.030**	37.7	1.24	.092
Working 20–37 h/week	17.1	**1.72**	**.001**	33.2	**.47**	**≤.001**	28.8	**1.51**	**.001**	37.1	1.21	.105
Working ≥38 h/week	12.9	1.25	.248	21.9	**.26**	**≤.001**	25.6	1.29	.083	35.9	1.15	.353
Full-time housewife[c]	10.7	Ref.		51.7	Ref.		21.1	Ref.		32.7	Ref.	
Job position			.101			**≤.001**			**.041**			.621
Lowest[d]	19.0	**2.01**	**.006**	46.3	**2.99**	**≤.001**	32.1	**1.58**	**.019**	34.8	.93	.738
Low	14.9	1.51	.067	43.0	**2.60**	**≤.001**	27.3	1.26	.156	35.8	.99	.926
Middle	14.7	1.48	.094	31.4	**1.58**	**.008**	23.7	1.04	.809	38.5	1.11	.559
High	10.4	Ref.		32.4	Ref.		22.8	Ref.		36.3	Ref.	
Missing[a]	14.8	1.47	.219	35.1	**1.87**	**.007**	26.2	1.19	.476	32.6	.84	.477
Social support			**≤.001**			**≤.001**			**≤.001**			**≤.001**
Low to middle	28.6	**3.20**	**≤.001**	53.2	**2.21**	**≤.001**	39.0	**2.15**	**≤.001**	57.4	**3.03**	**≤.001**
High	11.1	Ref.		33.9	Ref.		22.9	Ref.		30.8	Ref.	

Table 4 continued

	Intrinsic value (n = 2,846)			Societal esteem (n = 2,846)			Affection from child (n = 2,846)			Recognition from spouse (n = 2,377)		
	High distress			High distress			High distress			High distress		
	%	OR	p	%	OR	p	%	OR	p	%	OR	p
Work-to-family spillover			**≤.001**			**≤.001**			**≤.001**			**≤.001**
Marked	30.1	**3.47**	**≤.001**	48.0	**2.21**	**≤.001**	39.5	**2.16**	**≤.001**	50.4	**2.04**	**≤.001**
Currently do not work	11.3	1.02	.882	53.0	**2.69**	**≤.001**	22.6	.97	.966	34.0	1.04	.730
Not marked	11.1	Ref.		29.5	Ref.		23.3	Ref.		33.2	Ref.	
Division of housework			**≤.001**			**≤.001**			**≤.001**			**≤.001**
Mainly woman (single mothers)	20.2	**3.51**	**≤.001**	47.1	**2.94**	**≤.001**	32.8	**1.93**	**≤.001**	–	–	–
Mainly woman (partnered mothers)	16.2	**2.68**	**≤.001**	40.6	**2.26**	**≤.001**	26.8	**1.45**	**≤.001**	43.3	**4.57**	**≤.001**
Woman and man alike	6.8	Ref.		23.2	Ref.		20.2	Ref.		14.3	Ref.	

Significant odds ratios and p values are in bold, ref. means reference category

[a] If more than 5 % of cases have no valid information, the category 'missing' is additionally displayed

[b] The dimension 'recognition from spouse' is not applicable to single mothers

[c] The category 'full-time housewife' includes 'parental leave' and 'early retirement'

[d] The category 'lowest' includes 'not yet ever been working'

work. Against this background, we examined the relevance of different social and family-related factors in explaining ERI in unpaid work. In our framework, the social and family-related determinants are supposed to be environmental measures (potential stressors) that are shaping the experience of ERI in domestic and family work.

Our study revealed that all factors considered in bivariate analyses showed a significant association with at least one ERI component. This refers to age of mother and youngest child, number of children, single motherhood, employment status, socioeconomic disadvantages, lack of perceived social support, negative work-to-family spillover, and women's perception of holding the main responsibility for household and family work. However, it can be assumed that the strength of these relationships tends to be overestimated in bivariate analyses when the variables considered are strongly correlated (Sperlich et al. 2011). In addition, there is probably some conceptual overlap between some of the determinants, e.g. between responsibility for domestic work and social support. Therefore, in a second step we performed multivariate data analyses in order to control for such a source of bias.

As expected, the number of variables that was significantly associated with ERI decreased after considering all predictors simultaneously. In particular, socioeconomic status as measured by levels of school education, job position and per capita income became less important in the presence of other social and family-related factors. Detailed investigations revealed strong correlations between the socioeconomic indicators as well as between socioeconomic status, employment status and perceived social support (data not shown). Hence, there is reason to assume that a proportion of the association between socioeconomic status and ERI is attributable to lower levels of participation in the workforce and lack of perceived social support in socially disadvantaged mothers. However, the strong link between socioeconomic status and a specific type of reward, namely societal esteem of household and family work remained significant in the multivariate analysis. This indicates that lack of social recognition of household and family work is a source of stress in socially disadvantaged women which so far has not been systematically assessed. Given that ERI in household and family work is associated with elevated health risks (Sperlich et al. 2013), this theoretical framework may add to our understanding of the social patterning of women's health.

In contrast to socioeconomic status, family-related characteristics such as age and number of children remained largely significant in the multivariate model. This result is in line with previous studies that emphasized the impact of children on strain in household and family work (e.g. Staland-Nyman et al. 2008; Tao et al. 2010; Umberson and Gove 1989). Three predictors have proven particularly crucial in determining lack of reciprocity at home. These are 'social support', 'domestic work inequity' and 'employment status combined with negative work-to-family spillover', which will be considered in more detail below.

Effect of social support on ERI

Empirical evidence suggests that social support influences the coping process and buffers the effects of stressors on

Table 5 Results of stepwise logistic regression of effort–reward imbalance on social and family-related factors—final model, Germany 2009

	Ratio (n = 2,808)		Effort (n = 2,808)		Reward (n = 2,345)	
	>1		High distress		High distress	
	OR	p	OR	p	OR	p
Age of youngest child (years)				**≤.001**		**.026**
0–2			**2.69**	**≤.001**	**.58**	**.020**
3–5			**2.45**	**≤.001**	.71	.092
6–11			**2.01**	**≤.001**	.76	.127
12–15			**1.49**	**.013**	1.03	.858
16–18			Ref.		Ref.	
Number of children		**.003**		**≤.001**		**.035**
3 and more	**1.72**	**.001**	**1.84**	**≤.001**	**1.46**	**.025**
2	**1.37**	**.012**	**1.22**	**.046**	**1.35**	**.024**
1	Ref.		Ref.		Ref.	
Missing[a]	1.41	.134	1.37	.100	.89	.663
School education (years)		**.018**				**≤.001**
≤9	**1.43**	**.010**			**1.65**	**.001**
10–11	1.08	.554			1.08	.641
≥12	Ref.				Ref.	
Employment status/spillover[b]		**≤.001**		**≤.001**		**.001**
Unemployed	.84	.595	1.17	.536	1.47	.195
≤19 h/week	1.32	.066	**1.39**	**.011**	1.11	.540
20–37 (h/week) + spillover not marked	**.58**	**.002**	.92	.533	**.65**	**.022**
20–37 (h/week) + spillover marked	**4.38**	**≤.001**	**8.45**	**≤.001**	**2.35**	**≤.001**
≥38 (h/week) + spillover not marked	**.51**	**.009**	.81	.248	**.50**	**.011**
≥38 (h/week) + spillover marked	**3.22**	**≤.001**	**6.40**	**≤.001**	**1.77**	**.017**
Full-time housewife[c]	Ref.		Ref.		Ref.	
Social support		**≤.001**		**≤.001**		**≤.001**
Low to middle	**3.13**	**≤.001**	**2.70**	**≤.001**	**3.24**	**≤.001**
High	Ref.		Ref.		Ref.	
Division of housework		**≤.001**		**≤.001**		**≤.001**
Mainly woman (single mothers)	**4.84**	**≤.001**	**2.17**	**≤.001**	**4.53**	**≤.001**
Mainly woman (partnered mothers)	**4.15**	**≤.001**	**2.11**	**≤.001**	**3.33**	**≤.001**
Woman and man alike	Ref.		Ref.		Ref.	
Number of steps	5		5		6	
Nagelkerkes R^2	.239		.253		.188	

Results of the final model of stepwise logistic regression analysis, containing exclusively the results of predictors that were statistically significant in explaining ERI. 'Single motherhood' was not included in the analysis due to strong overlap with the variable 'division of housework'

Significant odds ratios and p values are in bold, ref. means reference category

[a] If more than 5 % of cases have no valid information, the category 'missing' is additionally displayed

[b] Combined variable based on 'employment status' and 'negative work-to-family spillover'

[c] The category 'full-time housewife' includes 'parental leave' and 'early retirement'

health (Cohen and Wills 1985; Cohen and Janicki-Deverts 2009). So far, numerous studies have thoroughly dealt with the effect of social support on work-related stress and work-family conflicts (Michel et al. 2010; Selvarajan et al. 2013) while less attention has been paid to its effect on stressful experience in household and family work. In our study, a large part of the mothers (78.4 %) reported that they are socially well integrated and that they can rely on emotional and practical support from affiliated persons. However, those mothers reporting low to middle levels of social support were at considerable higher risk of ERI. This was found for both ERI subscales, indicating that social

Table 6 Results of stepwise logistic regression of 'reward' on social and family-related factors—final model, Germany 2009

	Intrinsic value (n = 2,808)		Societal esteem (n = 2,808)		Affection from child (n = 2,808)		Recognition from spouse (n = 2,345)	
	High distress		High distress		High distress		High distress	
	OR	p	OR	p	OR	p	OR	p
Age of youngest child (years)		**.008**				**≤.001**		
0–2	**.54**	**.012**			.20	**≤.001**		
3–5	.80	.288			.36	**≤.001**		
6–11	.90	.555			.53	**≤.001**		
12–15	1.18	.388			.86	.282		
16–18	Ref.				Ref.			
Number of children				**≤.001**		**≤.001**		
3 and more			**1.39**	**.010**	1.78	**≤.001**		
2			**1.39**	**.001**	1.57	**≤.001**		
1			Ref.		Ref.			
Missing[a]			**1.89**	**≤.001**				
School education (years)				**≤.001**				
≤9			**1.67**	**≤.001**				
10–11			1.19	.103				
≥12			Ref.					
Net equivalent income				**.001**				
<60 % median			**1.61**	**≤.001**				
<100 % median			**1.35**	**.010**				
>100 % median			Ref.					
Missing[a]			**1.58**	**.001**				
Employment status/spillover[b]		**≤.001**		**≤.001**		**≤.001**		**≤.001**
Unemployed	1.46	.238	1.24	.380	1.65	.060	1.73	.095
≤19 h/week	**1.47**	**.038**	**.78**	**.021**	1.08	.599	1.27	.075
20–37 (h/week) + spillover not marked	.96	.845	**.40**	**≤.001**	.88	.390	1.24	.111
20–37 (h/week) + spillover marked	**3.18**	**≤.001**	.92	.560	**2.03**	**≤.001**	**2.27**	**≤.001**
≥38 (h/week) + spillover not marked	.76	.292	**.20**	**≤.001**	.82	.299	1.31	.153
≥38 (h/week) + spillover marked	**1.97**	**.005**	**.60**	**.008**	1.43	.082	**2.50**	**≤.001**
Full-time housewife[c]	Ref.		Ref.		Ref.		Ref.	
Social support		**≤.001**		**≤.001**		**≤.001**		**≤.001**
Low to middle	**2.75**	**≤.001**	**1.88**	**≤.001**	**2.02**	**≤.001**	**2.87**	**≤.001**
High	Ref.		Ref.				Ref.	
Division of housework[d]		**≤.001**		**≤.001**		**.005**		**≤.001**
Mainly woman (single mothers)	**2.42**	**≤.001**	**2.40**	**≤.001**	**1.58**	**.007**	–	–
Mainly woman (partnered mothers)	**2.33**	**≤.001**	**1.79**	**≤.001**	**1.36**	**.014**	**4.75**	**≤.001**
Woman and man alike	Ref.		Ref.		Ref.		Ref.	
Number of steps	4		6		5		3	
Nagelkerkes R^2	.135		.175		.129		.171	

Results of the final model of stepwise logistic regression analysis, containing exclusively the results of predictors that were statistically significant in explaining ERI. 'Single motherhood' was not included in the analysis due to strong overlap with the variable 'division of housework'

Significant odds ratios and p values are in bold, ref. means reference category

[a] If more than 5 % of cases have no valid information, the category 'missing' is additionally displayed

[b] Combined variable based on 'employment status' and 'negative work-to-family spillover'

[c] The category 'full-time housewife' includes 'early retirement'

[d] The dimension 'recognition from spouse' is not applicable to single mothers

support may protect against distress due to high effort as well as low reward. Given the importance of social support for stress experience in domestic and family work, research should focus on further effects of social support on unpaid work.

Effect of domestic work inequity on ERI

The importance of housework distribution on women's well-being has been stressed by Staland-Nyman et al. (2008) who found inequity in the division of household and family work to be a greater contributory factor to women's psychological distress than the amount of domestic work. In our study, single mothers reported higher degrees of stress due to lack of reward than women who were doing housework together with their partners. This applies particularly to the dimensions 'intrinsic value' and 'societal esteem'. Partnered mothers who are mainly responsible for the housework predominantly reported higher distress due to lack of recognition from their partners as compared with women sharing the housework with their partners. This indicates that perceived household work inequity contributes to conflicts between the couples. Interestingly, levels of effort did not differ significantly between single mothers and partnered mothers who are mainly responsible for housework. Both groups showed approximately the same odds of effort compared to mothers sharing household and family work with the spouse or partner.

Effect of employment status and negative work-to-family spillover on ERI

Several studies have pointed out that negative work-to-family spillover hamper marital satisfaction and functioning (e.g. Allen et al. 2000). Our study confirmed that women who reported that work interferes with family functioning showed higher domestic- and family-related stress compared with full-time housewives. This held for all employed women, irrespective of working full- or half-time. Contrary, employed women who are not affected by negative work-to-family spillover showed significantly lower odds of effort–reward imbalance compared to full-time housewives. Hence, it can be assumed that not employment as such but the experience of negative work-to-family spillover contributed to ERI in household and family work. Remarkably, one exception to this was found: distress related to lack of societal esteem tended to be higher in full-time housewives even when working mothers reported marked work-to-family spillover. The finding suggests that lack of societal esteem for family work is an important stressor particularly among full-time housewives. This may contribute to health disadvantages compared to working women who are able to compensate stress with positive experiences in the role as employee (Fokkema 2002; Lahelma et al. 2002; Mastekaasa 2000; McMunn et al. 2006).

Limitations

The cross-sectional design of the study made it impossible to draw conclusions about the causal relationship between social or family-related factors and ERI in household and family work. In addition, as our study is based exclusively on subjective data, the association between ERI and influencing factors (e.g. perceived social support) should be interpreted cautiously as there is some evidence that individual differences in personality traits may affect the reporting of domestic stress and lack of social support alike. Furthermore, as reported by Kamo (2000) it could be possible that the respondents in our study tended to overestimate their own contributions to family work.

Conclusions

The perception of household and family work as a low-prestige activity is a relevant source of stress in socially disadvantaged women. Our findings suggest that neither being full-time housewife nor being half- or full-time employed seem to be the best choice for avoiding ERI at home. Instead, it was shown that the effect of employment on ERI strongly depends on the experience of strain-based-pressures in the work role. Generally, our findings draw attention to the necessity of distinguishing between different dimensions of reward as they seemed to be influenced by different social and family-related factors. Further research should be conducted in order to clarify whether the different dimensions of reward may also vary in their effects on health. Taking the increasing involvement of men in family work into account (Eggebeen 2002), the application to fathers in childcare responsibility should guide future research.

Acknowledgments This study was funded by the German Research Foundation (DFG) under Grant Number GE 1167/7-1.

Conflict of interest None declared.

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