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Job Stressors, Self-Reported Stress, and Childbearing Decisions: A Longitudinal Study of Working Women in Germany

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Abstract: Occupational stressors are linked to workers' subjective stress and major life decisions, such as job change, but their role in fertility transitions is unclear. This study examines whether objective occupational stressors and self-reported stress jointly shape childbearing among employed women in Germany. We test two competing hypotheses: women either exit taxing jobs by redirecting resources to family life, or preserve occupational resources by delaying or foregoing childbirth. We combine occupation-level stressor measures from the German BIBB/BAuA Employment Survey with data on 4,205 women from the 2011–2021 German Family Panel (Pairfam). Mixed-effects logistic regression models are applied by parity and adjusted for confounders. Among mothers, high stressors and self-reported stress were linked to a higher likelihood of pregnancy, supporting the exit hypothesis. Among childless women, associations were weaker and limited to psychosocial stressors. The stress-fertility link depends on women's subjective stress appraisal and parity, not only on objective job characteristics.

Keywords: fertility, work-life balance, job exposure matrix, self-reported stress

JEL codes: J13, J81, I31

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1. Background

Paid work has become increasingly common among women in reproductive age. While having a job brings multiple important benefits, such as sense of self-mastery or having own income, it also exposes women to a variety of stressors, such as time pressure, physical strain or environmental hazards. These may affect their job satisfaction as well as impact their mental and physical health or influence childbearing decisions.

While the links between workplace stressors and health outcomes have been examined quite extensively (Nixon et al. 2011; Niedhammer et al. 2021), research on the association between workplace stressors and fertility behaviours remains scarce. Furthermore, although some objectively existing job demands may be classified as potentially stressful, it is ultimately the workers' own emotional response to their environments that determines their subjective stress levels. It is therefore important to include both, objectively existing stressors and self-reported stress to be able to examine the topic comprehensively. This study investigates how objectively existing job stressors interact with female workers' self-reported psychological stress (which we also refer to as subjective stress) and how those are associated with their fertility behaviours. We focus on women, because they bear the primary physical and structural burdens associated with childbearing, including a reduction in their earning potential (Kleven et al. 2019) and challenges related to combining work and family (Taouk et al. 2025).

By examining this topic, we also contribute to existing literature on the impact of job stressors from selective occupations (Dehkordi et al. 2025) by extending it to a broader occupational spectrum. Importantly, while the majority of studies on job stress and fertility rely on clinical data or case-control designs (Dehkordi et al. 2025; Qu et al. 2017), we use representative longitudinal survey data that is not restricted to individuals undergoing infertility treatment or those actively planning to conceive in the short run. The findings of the present study therefore pertain to the general population and might be generalisable to other developed societies.

1.1. Objective job stressors and self-reported stress

Work-related stress encompasses both objectively existing stressors and individuals' subjective appraisal of those stressors (self-reported stress). Objectively existing stressors refer to work-related conditions and exposures that may impact workers' health and well-being (Milner et al. 2018; Hurrell et al. 1998; Nixon et al. 2011). Among those, there are psychosocial stressors and physical stressors. Psychosocial stressors capture job-level mental, social,

and temporal demands. Examples include strict production targets, weak co-worker support, and irregular shift schedules. Physical stressors comprise ergonomic strain and environmental hazards, such as heavy lifting or exposure to noise and chemical agents. Objective stressors are specific to the occupation, and they persist as long as an individual remains in this occupation, requiring a continuous investment of personal resources to cope (Ilies et al. 2007; ten Brummelhuis and Bakker 2012). Studies have shown that objective job stressors lead to an immediate stress response, such as psychological, physical and behavioural reactions (Nixon et al. 2011).

Subjective or self-reported stress, in contrast, reflects an individual's cognitive appraisal of their own stress levels. While job stressors represent objective job demands, high levels of self-reported stress arise when an individual appraises a given situation as threatening or taxing, exceeding their available resources to cope with the stressors (Cohen et al. 1983; Hobfoll 1989; Lazarus 1998). The list of possible coping resources is extensive and includes emotional intelligence (Bayraktar and Battal 2025), self-efficacy (Clauss et al. 2021), and interpersonal support (Skakon et al. 2010). According to the transactional model, stress is not an inherent property of the workplace but emerges from a dynamic transaction between the person and their environment (Lazarus and Folkman 1984). Thus, the same objective work demands may trigger different levels of stress response in different individuals, depending on their personality (Luo et al. 2023) or available resources (Häusser et al. 2010). Importantly, subjective stress response may also develop into a broad range of physical and mental health symptoms (Nixon et al. 2011).

1.2. Relationship between Job Stressor, Self-reported Stress, and Childbearing

As outlined above, objective job stressors interact with individuals' cognitive appraisal of their circumstances and their perceived coping resources. Consequently, women are likely to respond not only to the presence of demanding working conditions but also to how taxing they perceive those conditions to be. Subjective stress may therefore moderate the relationship between objective workplace stressors and any important decisions, including those related to fertility.

Women working in highly stressful jobs who also report high levels of perceived stress may find this situation mentally, physically or psychologically depleting. In the context of fertility behaviours, they may respond to it in two ways. First, as argued by the Work-Home Resources (W-HR) model, job stressors may compromise their family plans by creating

a resource deficit that makes it more difficult to face other life demands beyond work (ten Brummelhuis and Bakker 2012). In line with this reasoning, women whose jobs are resource-demanding (that is characterised by high levels of occupational stressors) and who also report high self-reported stress would want to preserve their remaining physical, emotional or other resources and therefore they would be less likely to pursue the highly energy- and emotionally-demanding task of childbearing.

A second, opposite scenario is also possible. Namely, women who are under high job demands and feel high subjective levels of stress will take steps to exit the taxing job situation. This reasoning is based on the Selection, Optimisation, and Compensation (SOC) framework which argues that individuals do not preserve but rather reallocate their resources when faced with potential or actual resource loss (Baltes and Heydens-Gahir 2003). Physical or psychological job stressors are positively associated with turnover (Podsakoff et al. 2007), which supports this claim. In the case of work and childbirth, job stressors may serve as "push factors" that diminish job satisfaction and organisational commitment (Jamal 1990). Simultaneously, the cultural and personal significance of motherhood remains a powerful "pull factor" (Suppes 2020). Women may therefore move their resources, such as time and energy, to the family domain to (temporarily) escape a resource-depleting work life (Edwards and Rothbard 2000). Consequently, high self-reported stress may be positively associated with childbearing. For short, we refer to the first alternative outlined above as the "preserve" strategy, and to the second alternative as the "exit" strategy.

In the context of the above options, the major factor that might influence which strategy a woman eventually takes to lower her overall depletion due to job-related stress is whether she already has children or not. As regards childless women, both the "preserve" and the "exit" options are, in theory, equally available to them, making it difficult to formulate a directional hypothesis. We therefore propose two competing hypotheses: H1, childless women in highly stressful jobs who also report high self-reported stress will be less likely to have a child compared to those who do not report high self-reported stress ("preserve" strategy); and H2, childless women in highly stressful jobs who also report high self-reported stress will be more likely to have a child compared to those who do not report high self-reported stress ("exit" strategy).

Women who are mothers differ significantly from childless women. They have already made a decision to have a child, so they have already self-selected into childbearing, indicating their higher willingness to invest resources in the family domain (Snir et al. 2009). Notably,

in Germany, our country of study, the ideal number of children remains around two (Sobotka and Beaujouan 2014), so having one child is still below this threshold. Mothers also typically face more intensive contextual demands arising from combining household labour and childcare, and thus have higher overall stress levels (Chandola et al. 2019; ten Brummelhuis and Bakker 2012). On the other hand, having already experienced how demanding raising a child can be, mothers may recognise that having another child would further deplete their resources, and therefore prefer to preserve their remaining resources at work rather than take on this additional burden. However, in the context of high job demands (reflected by intense job stressors), mothers cannot, in most cases, reduce their family commitments by withdrawing resources from an existing child. They are still able to withdraw resources from the job and redirect them towards family life by having another child, making the "exit" strategy a feasible solution to the problem in this category of workers as well. Given these countervailing considerations, we propose two further competing hypotheses: H3, mothers in highly stressful jobs who also report high self-reported stress will be less likely to have another child compared to those who do not report high self-reported stress ("preserve" strategy); and H4, mothers in highly stressful jobs who also report high self-reported stress will be more likely to have another child compared to those who do not report high self-reported stress ("exit" strategy).

2. Methods

2.1. Data and sample

To investigate the association between objective job stressors, self-reported stress, and childbearing, we used data from the German Family Panel (Pairfam), spanning the years 2011 to 2021 (Brüderl et al. 2022; Huinink et al. 2011). The Pairfam study is an annual survey based on a nationwide random population sample that tracks four birth cohorts: 1971-1973, 1981-1983, and 1991-1993 surveyed since Wave 1, alongside a younger cohort born in 2001-2003 introduced in Wave 11. We used waves 4 to 13 because in those waves the data on self-reported stress was collected.

We selected heterosexual women aged 16-45 (N=7,127 women). As we focused on job stressors, we included women who worked in the preceding wave with occupation information available (N=4,495 women). Respondents who did not answer the questions regarding self-reported stress in the preceding wave were removed from the sample (N=4,207 women), and we removed two additional women whose reported first birth ages were below 16 (N=4,205).

We define our outcome as conception/becoming pregnant, to maximise sample size and ensure that all successful pregnancy attempts are captured, as the theorised mechanisms operate at the level of conception intention (childbearing decision) rather than live-birth success. Our final sample included 1,959 childless women, with 408 pregnancies reported for this category, and 2,431 mothers, with 387 higher-order pregnancies. Because we follow our respondents for 11 years, we have information on more than one conception (including pregnancies that ended in miscarriage) for 391 women in the dataset.

2.2. Job stressors and self-reported stress

We measure objective job occupation-level stressors using the Job Exposure Matrix (JEM) developed by Kroll (2011, 2015). The JEM is a widely used approach in occupational health research to map specific job stressors across occupations. The construction of JEM is based on the 2012 Survey of the Working Population on Qualification and Working Conditions in Germany (BIBB/BAuA Employment Survey). The survey covered approximately 20,000 employees aged 15 or older who worked at least 10 hours per week. During the survey, respondents were asked about their occupations, working conditions including exposure to stressors, and socio-demographic backgrounds. In the measures, psychosocial stressors consist of temporal and scheduling stressors (e.g., time pressure), work intensity (e.g., strict work targets), and social-organisational stressors (e.g., lack of support from co-workers). Meanwhile, physical stressors comprise ergonomic and environmental stressors, with typical examples being heavy lifting and exposure to noise, respectively. A comprehensive list of the psychosocial and physical stressors included in the index construction can be found in the Supplementary materials, Table S1.

To construct the JEM, Kroll (2011, 2015) aggregated individual job stressor exposures to the occupational level using multilevel linear regression, while controlling for sex, age, weekly working hours, and tenure within the occupation. Individual items were first categorised into psychosocial and physical stressor groups, aggregated into sum scores, and standardised to account for varying item counts. Next, a three-level random intercept model was used to predict occupation-specific stressor values across the 2-, 3-, and 4-digit levels of the International Standard Classification of Occupations 2008 (ISCO-08). These values were calculated using a top-down approach by adding lower-level random effects to higher-aggregated base values, which controlled for individual characteristics and corrected for varying sample sizes across occupational groups. The predicted values were then distributed into deciles ranging from 1 (lowest exposure) to 10 (highest exposure) to reflect the level

of occupational stress. The JEM developed by Kroll (2011, 2015) has demonstrated external validity and has been applied across various research contexts using diverse datasets, including pension insurance records and the German Microcensus (e.g., Brünger et al. 2020; Meyer and Künn-Nelen 2014).

We use the occupation-level job stressors (grouped into physical and psychosocial) from the JEM and convert the measures in deciles into a binary indicator by classifying occupations in deciles 1 through 5 as low exposure and those in deciles 6 through 10 as high exposure. We do so due to the small number of observations in Pairfam. Next, we match our binary variables to individual-level data from the German Family Panel (Pairfam) using the 3-digit ISCO-08 classification. Choosing the 3-digit over the 4-digit level allows us to optimise statistical power and prevent estimation instability while maintaining a reasonable level of detail. Using 4-digit categories in Pairfam would create a cell-sparsity problem, leaving many occupations with zero or very few observed conceptions. Statistically, these low-count cells inflate variance and introduce substantial noise, which artificially inflates standard errors and makes detecting true associations impossible. Furthermore, at JEM construction level, occupations with fewer than 10 workers are heavily affected by empirical Bayes shrinkage (Kroll 2011), which automatically pulls their scores toward the broader group average anyway. Aggregating to the 3-digit level eliminates this classification noise and ensures stable, well-populated categories that yield precise and reliable estimates of the association between job stressors and fertility outcomes.

In Pairfam, self-reported stress was measured using three items: “How have you been feeling stressed/over-burdened/under pressured during last four weeks?” Responses were recorded on a 5-point scale ranging from 1 (not at all) to 5 (Absolutely). To construct our composite measure of self-reported stress, we evaluated the internal consistency of these three items. The resulting scale demonstrated high internal reliability (Cronbach's α=0.96), indicating that these items successfully capture a unified underlying construct. We then calculate the mean score across these items for each respondent each wave, classifying those with a mean value greater than 3 as having high self-reported stress, and all others as low.

2.3. Confounders

Job stressors, particularly the physical job stressors, are likely to affect fecundity among working women (Dehkordi et al. 2025; Mínguez-Alarcón et al. 2017). To rule out physiological mechanisms underlying the relationship between job stressors and childbearing, we controlled

for self-rated health, a valid proxy for individual health status when objective measures are unavailable (Jylhä 2009). Our analytical strategy also tests for whether we observe any direct effects of objective physical or psychosocial stressors alone on conceptions (more on this below).

We controlled for two additional work-related variables: working time (full-time vs. part-time) and job security, captured by whether the woman held a permanent contract. Working time may influence the duration of exposure to job stressors, while also leaving less time for family or personal life. Job insecurity can also generate stress (De Witte et al. 2015) as well as shape childbearing decisions (Alderotti et al. 2021).

We also controlled for common covariates of fertility behaviours. Age group (16-25, 26-35, and 36 or older), educational background (low, middle, and high), and monthly household net income (below 1,400 euros, 1,400 to 2,300 euros, 2,301 to 3,500 euros, and over 3,500 euros) were included in all models. In addition to those, we included two variables capturing the partner's employment status. Partner's employment was categorised as full-time employment, part-time/irregular/self-employment, non-employment, parental leave, or missing/not applicable for respondents without a partner in the preceding wave[1]. All models also controlled for regional differences (East vs. West Germany) and period effects (including COVID-19).

To account for fertility history, for higher-order conceptions, we included three additional variables. Mother's age at first birth reflects her baseline fertility schedule and long-term career-family trade-offs. The number of existing children captures family size, which can directly influence both maternal stress and career trajectories. Finally, we controlled for whether the mother was on parental leave to account for temporary labour market detachment and its potential effect on childbearing decisions.

Finally, fertility intentions can influence both women's risk of conception and their occupational choices. Individuals who prefer larger families or place a greater emphasis on family life tend to select occupations that are more compatible with having a family (Hakim 2002). To account for potential reverse causality and selection bias, we construct a measure capturing occupation-specific fertility intentions. We use a two-level linear mixed model to predict individual fertility intentions measured by the ideal number of children reported in each wave, while controlling for age. The model accounts for the longitudinal nature

[1]We included unpartnered women because some may have formed a partnership between waves.

of the data by including random intercepts for both individuals and occupations. Due to the limited sample size of the Pairfam data, occupation-specific random intercepts are extracted at the broader 2-digit ISCO-08 level. This multilevel approach applies empirical Bayes shrinkage to stabilise estimates for small occupations by pulling them toward the grand mean. Finally, these occupational scores are divided into tertiles and dichotomised into a low-to-medium group (bottom two tertiles) and a high fertility intention group (top tertile) before being merged into the final dataset. By including this indicator in our models, we effectively control for variation in birth outcomes driven by occupational selection based on family preferences. Descriptive statistics for all variables are presented in Table 1.

Table 1. Descriptive statistics by parity

Variable	Childless women n (%) or M (SD) [range]	Mothers n (%) or M (SD) [range]
Person-wave observations, N	7,151	11,019
Women, n	1,959	2,431
Conceived (outcome)		
No	6,743 (94%)	10,632 (96%)
Yes	408 (6%)	387 (4%)
Occupational psychosocial stressor		
Low exposure	4,137 (58%)	5,592 (51%)
High exposure	3,014 (42%)	5,427 (49%)
Occupational physical stressor		
Low exposure	4,716 (66%)	6,784 (62%)
High exposure	2,435 (34%)	4,235 (38%)
Self-reported stress		
Low	3,711 (52%)	5,919 (54%)
High	3,440 (48%)	5,100 (46%)
Employment schedule		
Part-time	1,005 (14%)	3,262 (30%)
Full-time	6,089 (85%)	7,708 (70%)
Missing	57 (1%)	49 (0%)
Job security		
Temporary contract	1,998 (28%)	1,347 (12%)
Permanent contract	4,857 (68%)	8,805 (80%)
Missing	296 (4%)	867 (8%)
Self-rated health		
Poor	990 (14%)	1,344 (12%)
Satisfactory	1,671 (23%)	2,826 (26%)
Good	3,109 (43%)	5,200 (47%)

Variable	Childless women n (%) or M (SD) [range]	Mothers n (%) or M (SD) [range]
Very good	1,377 (19%)	1,649 (15%)
Missing	4 (0%)	0 (0%)
Household net income		
Under €1,400	1,078 (15%)	603 (5%)
€1,400–€2,300	1,598 (22%)	1,693 (15%)
€2,301–€3,500	1,710 (24%)	3,632 (33%)
Over €3,500	1,839 (26%)	4,257 (39%)
Missing	926 (13%)	834 (8%)
Partner's employment status		
Full-time work	3,081 (43%)	7,641 (69%)
Part-time or other work	466 (7%)	1,349 (12%)
Non-working	1,209 (17%)	793 (7%)
Missing / not applicable	2,395 (33%)	1,236 (11%)
Age group		
16–25	2,924 (41%)	141 (1%)
26–35	2,874 (40%)	2,929 (27%)
36 or older	1,353 (19%)	7,949 (72%)
Education		
Enrolled (in education)	1,486 (21%)	93 (1%)
Low or middle education	3,588 (50%)	7,777 (71%)
High education	2,077 (29%)	3,149 (29%)
Region		
West Germany	5,673 (79%)	7,280 (66%)
East Germany	1,478 (21%)	3,739 (34%)
Period		
Pre-pandemic	5,339 (75%)	9,693 (88%)
COVID-19 pandemic	1,812 (25%)	1,326 (12%)
Occupational fertility intentions		
Low/Medium	4,147 (58%)	6,450 (59%)
High	2,989 (42%)	4,569 (41%)
Number of existing children, no.	—	1.94 (0.86) [1–7]
Age at first birth, years	—	26.70 (4.93) [16–43]
Parental leave (mother)		
No	—	10,732 (97%)
Yes	—	287 (3%)

Note. n = frequency; % = percentage of the column's sample; M = mean; SD = standard deviation. Values in brackets are the observed range. All variables are lagged by one wave relative to the outcome.
Source: Authors' own elaboration based on the German Family Panel (pairfam; Brüderl et al. 2022) and the BIBB/BAuA Employment Survey Job Exposure Matrix (Kroll 2015).

2.4. Analytical strategy

We use mixed-effects logistic regression to test the association between objective occupation-level job stressors, subjective (self-reported) stress, and the probability of conceiving. Mixed-effects models are well suited to panel data. They combine fixed effects, which capture population-level associations between predictors and the fertility outcome, with a random intercept at the individual level, accounting for the correlation among a woman's repeated observations over time under the assumption that this intercept is uncorrelated with the regressors.

To assess whether this assumption holds, we follow Neuhaus and Kalbfleisch (1998) and run a Wald test to check whether each woman's average occupational stressor exposure and average self-reported stress are associated with conception beyond what the original variables already capture. The results suggest that self-reported stress, our main variable of interest, is not systematically correlated with unobserved individual-level heterogeneity. For the occupational stressor measure, some correlation cannot be ruled out for the sample of working mothers. Although around a quarter of women in our sample change occupation at least once during the observation period, only 8 to 12 percent ever move between the low- and high-stressor categories, indicating that most occupational changes occur within, rather than across, stressor brackets. A fixed-effects specification would therefore identify the occupational stressor's effect from a small, non-representative group of women who cross stressor categories, at a substantial cost in precision. Mixed-effects logistic regression, which uses both within- and between-person variation, remains the more suitable choice for our data.

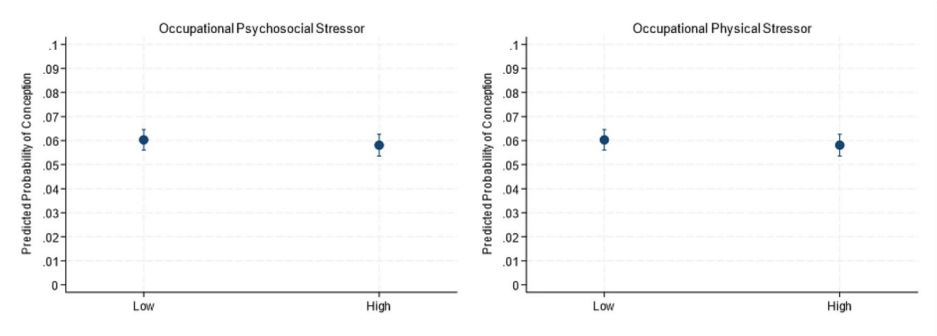
All independent and control variables are lagged by one wave to ensure that we capture pre-pregnancy conditions. First, we estimate the baseline, non-stratified model without interactions to test whether the occupation-level physical and psychosocial stressors alone (based on the JEM) form a significant association with births for the whole sample. That would indicate that our main estimates might be affected by an association that is independent of individuals' subjective stress or coping strategies.

Next, in order to test our three hypotheses, we run a set of models stratified by parity (childless women or mothers) and include interaction terms between the levels of objectively-measured job stressors at work (separately physical and psychosocial) and self-reported stress. All analyses were estimated using the melogit command in Stata 18.

3. Results

The associations between objective occupational stressors and probability of conception are shown in Figure 1. An 83% confidence interval was used to identify significant differences between the two means with a p-value of 0.05 (Austin and Hux 2002). The results of the null model suggest that objective occupational stressors alone are not associated with conceptions. In other words, it is unlikely that there exist underlying physiological or hormonal mechanisms that would universally link those stressors with (lower) probability of conception for all women. Full estimates for all the models, including all covariates, are reported in Table S2 of the Supplementary Materials.

Figure 1. Association between objective occupational-level stressors (physical and psychosocial) and conceptions; whole Pairfam sample

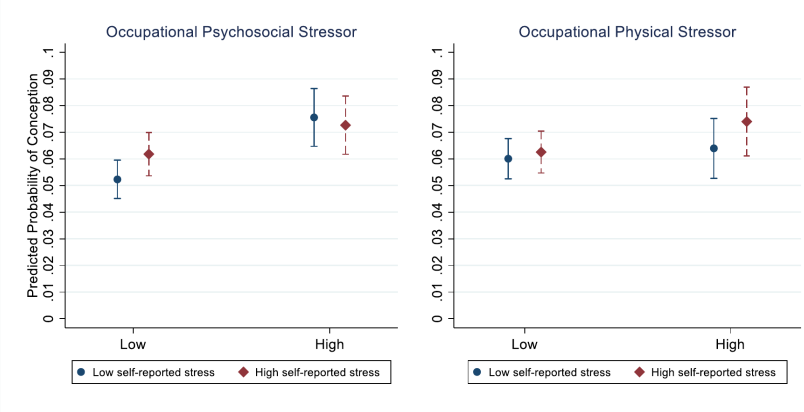


Notes: Full model results are presented in Table S2 of the Supplementary Materials.

Source: Authors' own elaboration based on the German Family Panel (pairfam; Brüderl et al. 2022) and the BIBB/BAuA Employment Survey Job Exposure Matrix (Kroll 2015).

Next, we test the theorised mechanisms that link job stress to a childbearing decision. Figure 2 shows the predicted probability of conception among childless women for the interaction between objective occupational stressors and women's self-reported stress levels. We observe no significant differences in the association between physical stressors and pregnancy. However, women in occupations with high levels of psychosocial stressors are more likely to be pregnant a year later compared to women who are in jobs with low objective stress levels and also report low self-reported stress. This association does not seem to be driven by differences in self-reported stress alone, as the difference in conception risk is not statistically significant between women with low objective stressors but high self-reported stress and women with high objective psychosocial stressors (regardless of their self-reported stress levels). While there seems to be a gradient in the effects of self-reported stress for low levels of psychosocial stressors and for physical stressors, the differences are not significant.

Figure 2. Probability of conception by occupational stressors and self-reported stress: childless women

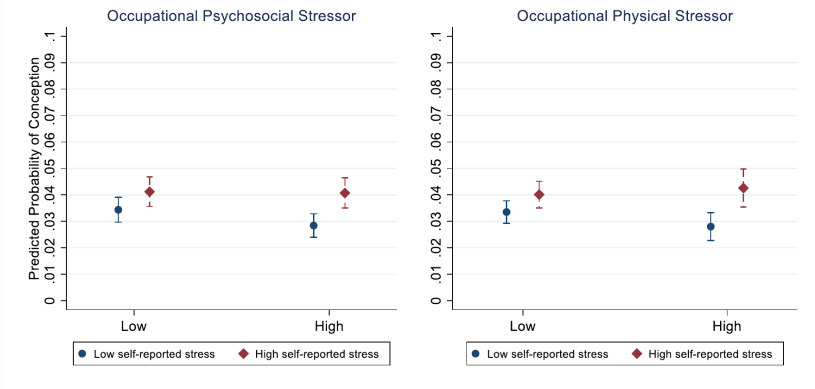


Notes: Full model results are presented in Table S2 of the Supplementary Materials.

Source: Authors' own elaboration based on the German Family Panel (pairfam; Brüderl et al. 2022) and the BIBB/BAuA Employment Survey Job Exposure Matrix (Kroll 2015).

The predicted probability of conception for the interaction between objective and subjective stressors among working mothers is shown in Figure 3. The pattern that only begins to emerge among childless women becomes much more pronounced in this group: higher self-reported stress is associated with an increased likelihood of becoming pregnant. Mothers with high self-reported stress are more likely to conceive in the subsequent year compared to those who reported low self-reported stress. Notably, these differences are statistically significant exclusively among mothers who hold objectively more psychosocially or physically stressful jobs. The direction of the association is the same for those in jobs with low levels of objective stressors but the differences are not statistically significant.

Figure 3. Probability of conception by occupational stressors and self-reported stress: mothers with 1+ children



Notes: Full model results are presented in Table S2 of the Supplementary Materials.

Source: Authors' own elaboration based on the German Family Panel (pairfam; Brüderl et al. 2022) and the BIBB/BAuA Employment Survey Job Exposure Matrix (Kroll 2015).

3.1. Robustness check

As an alternative to the 3-digit ISCO-08 classification used in the main models, we re-estimate the models using job stressors measured at the broader 2-digit occupational level. This approach captures job characteristics at a more aggregate level, helping to reduce potential measurement error arising from small sample sizes for some 3-digit occupations in the BIBB survey. The corresponding estimates are presented in Figures S1 to S4 (Supplementary materials). Across most specifications, specifically for physical job stressors among all women and psychosocial stressors among mothers, the 2-digit models yield results that are highly consistent with our baseline findings. A divergence emerges for childless women facing intensive psychosocial job stressors (Figure S1). Under the 2-digit specification, only women reporting high self-reported stress exhibit a significantly higher likelihood of conception relative to the group combining low job stressors and low self-reported stress.

While this finding aligns better with our hypothesis, it constitutes a divergence from the findings in the main models. To identify the source of this divergence, we compared the psychosocial stressor score assigned to each 3-digit occupation with the score assigned to its 2-digit parent category, and identified three major 3-digit occupational groups for which this comparison implies a change in the binary high/low stressor classification when moving from the 3-digit to the 2-digit level, and which account for a substantial share of their parent 2-digit category's caseload[2]. As a diagnostic exercise intended to identify the source of the divergence, rather than as an alternative preferred specification, we re-estimated the 2-digit model excluding these three boundary cases. As shown in Figures S5, this model demonstrates high consistency with our baseline results. This indicates that the divergence for childless women is attributable to a small number of specific sub-occupations whose stress classification is sensitive to the level of occupational aggregation used, rather than to a general lack of robustness in our core findings.

[2]The three boundary occupations correspond to ISCO-08 minor groups 233 (Secondary Education Teachers), 325 (Other Health Associate Professionals, such as medical assistants), and 341 (Legal, Social and Religious Associate Professionals, such as social work associates). In each case, the affected 3-digit group accounts for a substantial share of its parent 2-digit category's caseload. Reclassification is not uniform in direction: groups 233 and 341 are scored as lower psychosocial stress at the 3-digit level than their respective 2-digit parent categories, while group 325 is scored as higher psychosocial stress at the 3-digit level than its parent category.

4. Discussion

This study examined how objective occupation-level job stressors combined with individuals' self-reported stress are related to childbearing transitions among working women in Germany. We proposed a theoretical framework based on the argument that the association between job stressors and fertility depends not simply on objectively measured job stressors but also on a woman's subjective appraisal of those conditions. In response to the existing job stressor and her own levels of subjective stress, a woman may either choose to preserve her resources at work by delaying (or foregoing) childbearing or, conversely, exit the taxing work situation and direct all of her resources towards family life. We proposed this decision will also depend on whether a woman already has a child (or children).

We found that among mothers, experiencing high self-reported stress in the context of objectively stressful jobs was associated with a higher likelihood of having another child, supporting the proposed "exit" strategy. In other words, among mothers who held objectively resource-demanding jobs, their self-reported stress levels were positively associated with the likelihood of a subsequent birth, regardless of stressor type (physical or psychosocial). Conversely, the results among childless women were mixed and more inconclusive. For this group we found that women with a combination of less psychosocially stressful jobs and low self-reported stress had a significantly lower probability of conception compared to women with more stressful jobs, regardless of their self-reported stress levels. The differences for physical job stressors were non-significant in all cases. While the results for mothers support our H4 rather than H3, the results for childless women do not yield sufficient support either for H1 or H2. The clear finding for this category is that women in jobs with low levels of psychosocial stressors and who also did not feel stressed were least likely to become mothers compared to women in jobs with high levels of psychosocial stressors. That may indicate some support for the "exit" strategy (but only in selected cases), and a stronger relationship between psychosocial jobs conditions and the childbearing decisions as opposed to physical stressors. As this finding does not align with what we theorised, it is important to discuss why among childless women this association was observed exclusively for psychosocial job stressors, not physical stressors. Compared to physical job stressors, psychosocial stressors are more likely to generate a spillover effect that causes work-family conflict. This occurs because intensive psychosocial stressors can lead to emotional fatigue (Ilies et al. 2015) and poor psychological detachment from workplace to home (Sonnentag et al. 2010). While women in this group did not have a child, they mostly had a partner. It is possible that psychosocial job

stressors had an impact on the quality of their partnership or their leisure time, which resulted in the motivation to take a leave from work to protect their personal lives.

Another important thing to consider is the fact that women in jobs characterised by high levels of physical stressor are more likely to be employed in lower-skilled manual and elementary occupations. While we account for job security and household income, those occupations are also structurally associated with more precarious working conditions, and, often, limited maternity protections (Fletcher et al. 2011). In contrast, high psychosocial stress is concentrated more common in professional or managerial occupations as well as white-collar service personnel. These jobs also typically offer more institutional support for family formation and make it easier to return to work after childbirth (Elser et al. 2022). Those systemic occupational differences may also have shaped childbearing decisions among childless women.

As far as mothers are concerned, our findings aligned with the theorised “exit” strategy as high objective job stress levels combined with high self-reported stress were associated with a higher probability of withdrawal from the labour market (becoming pregnant with another child). In this context it is worthwhile to emphasise that high self-reported stress may also signal a mother's difficulty in balancing work and family responsibilities, indicating a shortage of resources to sustain both roles simultaneously (Dugan and Barnes-Farrell 2020). Faced with this resource shortfall, mothers may resolve it by prioritising one domain over the other. Because caregiving obligations tend to be more persistent and less deferrable than job demands, mothers experiencing high stress in demanding jobs may be more likely to prioritise family, favouring childbearing as a route to reducing labour-force involvement, regardless of the type of job.

Overall, our findings suggest that it is not objectively measured occupational stressors alone that matter for childbearing behaviours. Instead, the combination of objective stressors, subjective stress and a particular personal situation might shape childbearing transitions among working women. This is an important contribution to our understanding of how workplace conditions and subjective stress levels are linked to individuals' fertility behaviour.

This study comes with several important limitations. The main limitation of our data is the inability to isolate the specific source of self-reported stress, namely whether it stems from employment, domestic responsibilities, work-life conflict or, perhaps, personality traits that are not related to work or family domain. Some personal characteristics may increase individuals' propensity to experience stress or, what is more important in the context of our theoretical framework, may increase the willingness to avoid (or exit) a situation that is seen as stressful.

We are not able to account for individuals' propensity to become stressed, we also are not able to analyse in greater detail their general coping strategies. Furthermore, our data lack objective health indicators. Although self-rated health offers a general baseline of respondents' well-being, we cannot fully rule out the possibility that some job stressors also influence the probability of conception through physiological pathways, especially in the long term. Next, we look at conceptions as opposed to looking at live births. This is a methodological decision that helped us focus on the decision to conceive rather than the ability to maintain a successful pregnancy. While our outcome may still be confounded by unaccounted for difficulties to become pregnant, it is substantially less confounded than an alternative outcome which is live birth. Live births are, however, also important to analyse in the context of job-related exposures and accompanying stress. There is evidence that both, objective physical stressors, such as long standing, heavy lifting or exposure to heat and self-reported stress increase the risk of pregnancy loss (Bonde et al. 2012; Qu et al. 2017). Future studies should therefore look also at how the interaction between objective occupational stressors and subjective stress influences the chances of life birth or the risk of pregnancy complications.

5. Conclusion

Our findings demonstrated that job stressors are linked to fertility decisions but those links depend on the stressor type, women's subjective stress levels, and parity. We found that psychosocial job stressors were positively correlated with the probability of pregnancy among childless women. Specifically, women in objectively stressful jobs were more likely to become pregnant than women in low-stress jobs who also had low self-reported stress levels. This finding yielded only limited support for our “exit” hypothesis but spoke strongly against the “preserve” strategy. Among mothers, subjective stress levels predicted a higher probability of becoming pregnant, in particular for those in objectively stressful jobs, with the same association observed for both physical and psychosocial stressors. These findings strongly supported our “exit” hypothesis stating that when working women are exposed to stressful jobs and face potential resource loss, they may utilise childbearing as an “exit” strategy to temporarily withdraw from their jobs.

Data availability

The data used in this study are third-party data and are not publicly redistributable by the authors owing to data protection restrictions. The German Family Panel (pairfam) data are available to registered researchers via the pairfam data distribution (GESIS/LMU Munich) subject to a data use agreement (see Brüderl et al. 2022). The Job Exposure Matrix and the accompanying code can be downloaded from the official GESIS website: https://search.gesis.org/research_data/SDN-10.7802-1102?doi=10.7802/1102. The original BIBB/BAuA Employment Survey data can be obtained by contacting GESIS – Data Services for the Social Sciences: https://www.gesis.org/en/institute/about-us/departments/data-services-for-the-social-sciences.

Ethics statement

This study is a secondary analysis of anonymised data. Individual-level data come from the German Family Panel (pairfam), for which ethical approval was obtained by the original study team. Occupation-level job stressor scores come from the Job Exposure Matrix (JEM; Kroll 2015), a pre-constructed, publicly documented index derived from the BIBB/BAuA Employment Survey; the authors used this index directly and did not process the underlying BIBB/BAuA individual-level survey data themselves. No new data involving human participants were collected for this study.

Declaration of generative AI and AI-assisted technologies in the manuscript preparation process

During the preparation of this manuscript, the authors used Claude (Claude 3.5 Sonnet) and Gemini solely to assist with language editing, improving grammatical readability, and debugging code/syntax within the analysis pipeline. These AI tools were not used to analyse data, interpret findings, or generate scientific conclusions.

Following the use of these tools, the authors thoroughly reviewed, verified, and edited all content and code. The authors take full responsibility for the accuracy, content, and integrity of the published article.

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