Occupational Stressors, Perceived Stress, and Women's Fertility in Germany

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Abstract

This study examines how occupational stressors influence employed women's likelihood of conception in Germany, focusing on the physical and psychosocial mechanisms linking work conditions to fertility behaviour. Job-related stressors have intensified across occupations in recent decades, raising concerns about their long-term effects on health and well-being (Sonnentag et al., 2023). Previous research has highlighted how stress affects fertility through infertility, treatment outcomes, and miscarriage (Dehkordi et al., 2025; Qu et al., 2017), yet these studies mostly address short-term effects in clinical or selective populations. Moreover, individuals vary in their responses to job stressors (Limm et al., 2010), leading to differences in perceived stress even among those in similar jobs, and these differences may, in turn, affect fecundity and childbearing decisions (Mínguez-Alarcón et al., 2023). However, few studies have explored how the interaction between objective job stressors and subjective stress perceptions shapes reproductive outcomes.

Using the German Family Panel (pairfam) combined with occupation-level stress indicators from the 2012 Survey of the Working Population on Qualification and Working Conditions in Germany, we assess whether women in more stressful occupations are more or less likely to conceive in the following year. Logistic regression models show that women in physically demanding occupations have a lower probability of conception, whereas those in psychosocially demanding occupations are more likely to conceive. Moreover, women reporting higher self-perceived stress exhibit increased conception likelihood in psychosocially demanding jobs, while those with lower stress show similar probabilities across occupations.

Background

Over the past decades, the labour market has undergone profound transformations. Advances in technology, globalization, and the structural shift toward service have substantially reshaped the nature of work and workers' well-being. Technological progress, particularly the widespread adoption of Information and Communication Technology (ICT), has increased the demands placed on workers. Employees are now expected to respond to clients and colleagues more quickly and flexibly (Karimikia et al., 2021). Furthermore, ICT has also increased the number of interruptions during work, making workers less productive and more stressed (Fonner & Roloff, 2012). The frequent introduction of new technologies requires continuous skill updating and rapid learning, leading to an increase in cognitive workload (Mauno et al., 2019). Consequently, these changes have contributed to rising levels of workplace stress, strain, and burnout (Karimikia et al., 2021). In addition, globalization has intensified cross-border collaboration, leading to irregular working hours and increased demands for flexibility to handle unexpected requests or events from international clients, both of which represent significant mental job stressors (Javorcik et al., 2024). Moreover, the expansion of service occupations, has also increased workers' exposure to physical stressors, including prolonged sitting or standing, repetitive tasks, and restricted movement, which can lead to musculoskeletal strain and fatigue (Krause et al., 2010). Overall, these developments have led to an environment where job stressors are increasingly complex, persistent, and pervasive across occupations.

In this study, we distinguish two main categories of job stressors: the psychosocial job stressors capture mental, social, and temporal demands at work, including time pressure, low decision latitude, conflicts with colleagues or supervisors, and high-performance expectations. On the other hand, physical job stressors refer to work conditions involving bodily strain or adverse environmental exposure, such as heavy lifting, repetitive movements, noise, or contact with chemicals. Both categories of job stressors may affect women's childbearing through physiological and psychological mechanisms. Physiologically, psychosocial job stressors can elevate individuals' stress levels, leading to disruptions of the menstrual cycle and infertility (Lewiński & Brzozowska, 2022; Speroff & Fritz, 2005). High levels of job-related stress have also been linked to increased oxidative stress (Biganeh et al., 2022), which may contribute to the development of conditions such as polycystic ovary syndrome, endometriosis, and infertility (Hazra et al., 2014). Physical job stressors pose potential threats to reproductive health as well. Shift work, long working hours, heavy lifting, and prolonged standing have been associated with disrupted circadian regulation (Gamble et al., 2013), altered hormonal balance (Mahoney, 2010), and mental and physical fatigue (Mozurkewich et al., 2000), which in turn can reduce conception rates and increase the risk of miscarriage. Psychologically, job stressors—particularly psychosocial ones—increase women's mental load. As women perform a larger share of mental labor related to childcare and parenting decisions (Reich-Stiebert et al., 2023), they may find it challenging to combine work and motherhood, leading to the

postponement or abandonment of childbearing. Conversely, some women in highly stressful jobs may view maternity leave as an opportunity to escape work-related stress (Belkin, 2018). In such cases, women experiencing exceptionally high levels of job stressors may become more likely to transition to motherhood as a means of coping with or withdrawing from their demanding work environment.

Although numerous studies have examined the health consequences of job stress, few have explored its association with women's childbearing behaviour. Existing research has largely focused on adverse reproductive outcomes such as infertility, preterm birth, and miscarriage (Adane et al., 2024; Dehkordi et al., 2025; Qu et al., 2017), often addressing short-term effects in clinical or selective populations with limited sample sizes. Moreover, most studies rely heavily on self-reported questionnaires (Dehkordi et al., 2025), which capture job stressors subjectively. Yet individuals differ substantially in their responses to work-related stress (Limm et al., 2010), making such measures strongly dependent on personality traits and socioeconomic background. To address these gaps, this study examines the association between objectively measured job stressors and conception, while considering the moderating role of self-perceived stress. We hypothesize that job stressors are negatively associated with women's likelihood of conception, and that this relationship is more pronounced among those experiencing higher levels of perceived stress. By integrating both objective and subjective measures of stress, this study contributes to a more comprehensive understanding of how workplace conditions influence women's reproductive behaviour.

Data & Method

We use data from the 2012 Survey of the Working Population on Qualification and Working Conditions (BIBB) in Germany to measure job stressors. It is a large-scale labour market survey includes around 20,000 employed individuals aged 15 and above who work at least 10 hours per week. For each respondent, detailed information on their occupation was collected, along with an extensive set of items on working conditions that capture the frequency and nature of specific job demands. Many of these items were also followed by subjective questions on whether respondents found these conditions stressful. Following the method developed by Kroll (2011), we construct separate indices for physical and psychosocial job stressors. These indices are derived from the random intercepts of four-level hierarchical linear regression models that control for individual characteristics such as age, gender, working hours, and tenure in the occupation. By capturing the occupation-specific component of perceived job demands while adjusting for personal differences, these measures represent the average stressors level associated with each occupation and can therefore be considered relatively objective indicators, independent of individual subjective perception.

We then link the occupation-specific job stressor indices to the German Family Panel (Pairfam), a longitudinal survey that provides rich information on individuals' life histories, including family, relationships, employment, and well-being. The linkage is

based on the respondents' two-digit International Standard Classification of Occupations (ISCO-08) codes. Pairfam has been conducted annually since 2008 and follows a nationally representative sample of three birth cohorts (1971–73, 1981–83, and 1991–93). Our analytical sample includes 3,433 employed women with 619 recorded births.

The binary dependent variable indicates whether a woman conceived in the observed year. It is based on self-reported pregnancy information and supplemented by imputing pregnancies that occurred between survey waves using birth data from the subsequent wave. Self-perceived stress is measured using three questions asking whether respondents feel stressed, overburdened, or under pressure. We calculate the mean value across these items; each measured on a five-point scale ranging from 1 ("very low") to 5 ("very high"). Due to the relatively small number of births, respondents with an average score of 4 or higher are coded as highly stressed, and all others as not highly stressed. We estimate logistic regression models controlling for self-rated health, relationship status, migration background, household income, partner's employment status, age group, education, region (East vs. West Germany), birth order, and occupation group. All control variables are lagged by one year.

Preliminary Findings

In Figures 1 and 2, we present the predicted probability of conception by the level of physical and psychosocial stressors, respectively. As shown in Figure 1, physical stressors are negatively associated with conception, indicating that women in more physically demanding occupations are less likely to conceive within one year. In contrast, compared to women with low psychosocial job demands, those exposed to medium or high levels of psychosocial stressors appear more likely to conceive in the following year. However, the differences between groups are not statistically significant.

In the second step, we test the moderating effect of self-perceived stress. As shown in Figure 3, the level of self-perceived stress does not appear to influence the association between physical stressors and the predicted probability of conception. By contrast, women exposed to medium levels of psychosocial job stressors who also report feeling stressed and overburdened are significantly more likely to conceive than their counterparts who do not feel stressed. Meanwhile, the combination of the least psychosocially demanding jobs and high self-perceived stress predicts the lowest probability of conception. Additionally, among women with low levels of self-perceived stress, the likelihood of conception does not differ significantly across levels of psychosocial stressors. These results suggest that self-perceived stress moderates the relationship between psychosocial stressors and conception.

Figure 1. Predicted probability of conception, by the level of physical stressors

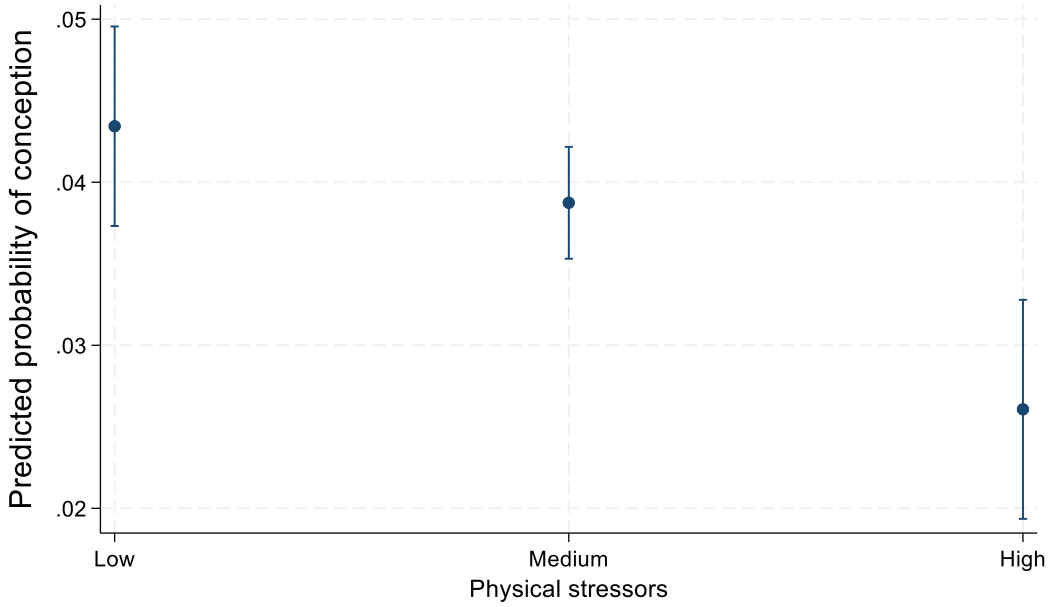


Figure 2. Predicted probability of conception, by the level of psychosocial stressors

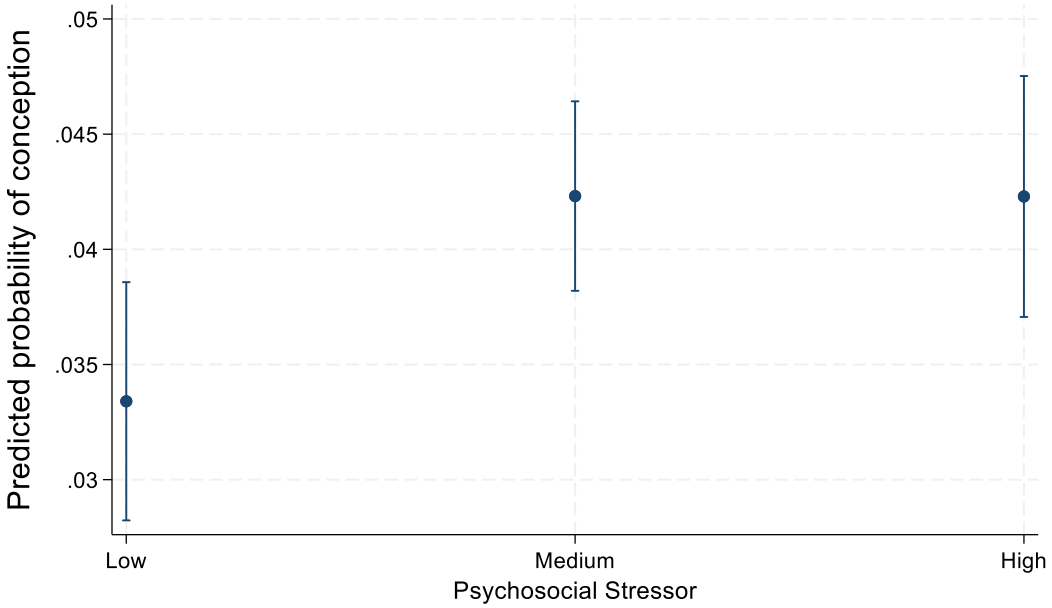


Figure 3. Predicted probability of conception, by the level of physical stressors and the level of self-perceived stress

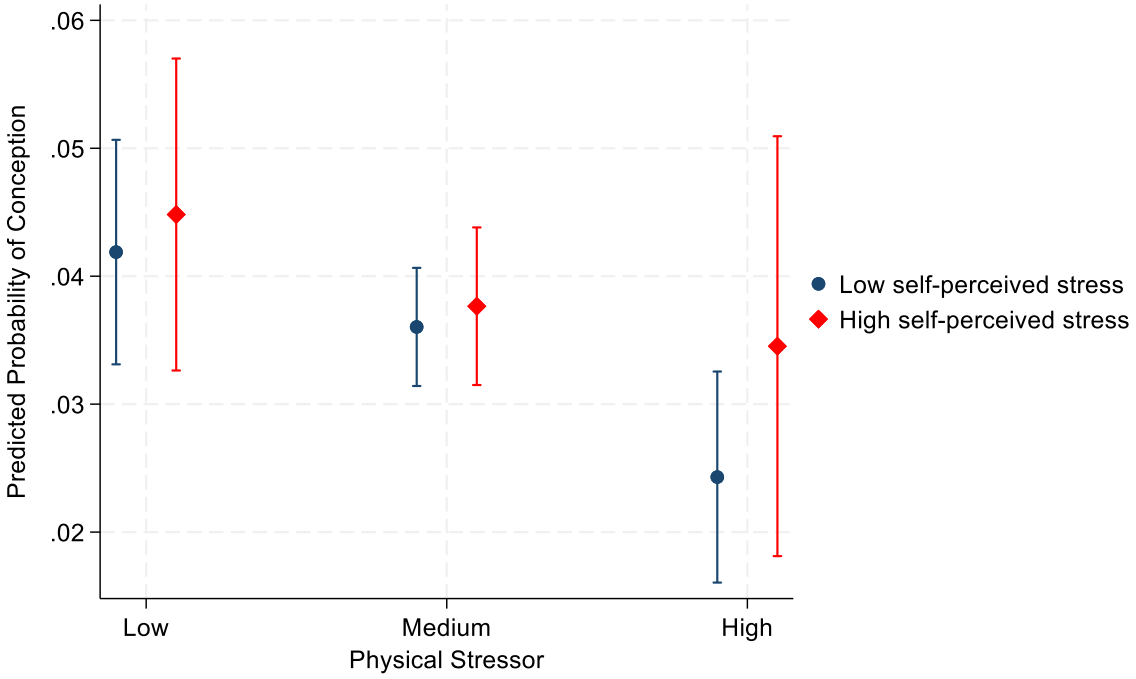
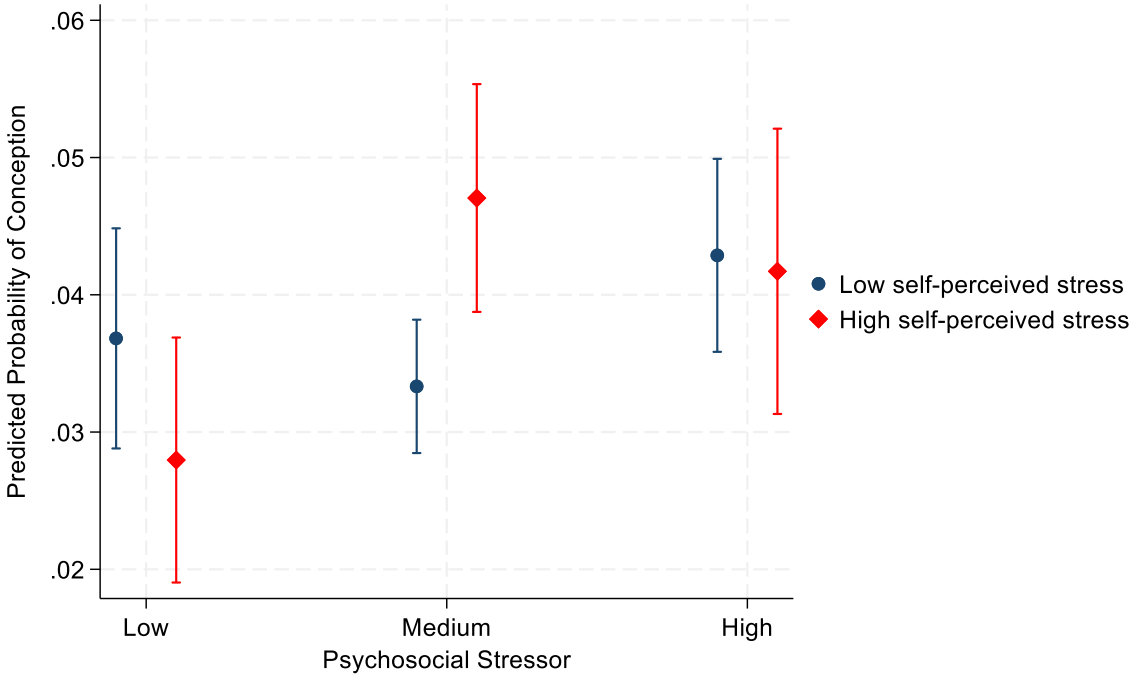


Figure 4. Predicted probability of conception, by the level of psychosocial stressors the level of self-perceived stress



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