Erasmus University Rotterdam

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Master Thesis Economics of Sustainability

How does remote work affect the work-life balance and well-being of mothers?

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Abstract

This study investigates how remote work influences the work-life balance and well-being of mothers, comparing these effects with those experienced by fathers and considering the impact of children's ages. Using data from the German Socio-Economic Panel spanning five waves from 1997 to 2014, this research employs fixed effects models to analyse various outcome variables related to work hours, childcare, housework, and satisfaction levels. The study finds that the interaction between daily work from home (WFH) and having a child is associated with an increase in contracted work hours per week for mothers with younger children. No evidence was found that this interaction further increases mothers' time spent on childcare and housework, the opposite is found to be the case, the interaction showing decreased time spent on childcare by mothers of younger children, consequently decreasing the gender childcare gap. The effects of the interaction between WFH and having a child on the various satisfaction indicators were mixed and mostly statistically insignificant. The study highlights and discusses the importance of carefully crafted remote work policies that consider the relationships between gender, parenthood, and children's ages. I also argue gender-neutral WFH accommodations for new parents are not enough, they should be combined with proactive signals and nudges pointed towards fathers to incentivise their participation in childcare. The findings of this study should be interpreted cautiously, given the inherent limitations of the research design. Time-variant unobserved factors and potential self-selection into remote work arrangements may influence the estimated outcomes. These constraints limit the ability to draw definitive causal inferences from the results.

Keywords: Remote work, Work-life balance, Gender equality, Parenting, Flexible work arrangements, Child penalty

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Contents

1. Introduction

How work is done has changed significantly in recent decades, with technological advancements enabling new forms of flexible work arrangements. Among these, remote work or working from home (WFH) has emerged as a prominent trend, reshaping the traditional boundaries between professional and personal life. This shift has been particularly pronounced in Europe and other developed countries, where remote work has steadily increased (Lund et al., 2020; Oakman et al., 2020). The COVID-19 pandemic has further accelerated this trend, normalising remote work practices and pushing many organisations to adopt flexible working arrangements on an unprecedented scale (Barrero et al., 2021).

As remote work becomes more common, it is crucial to understand its implications for different segments of the workforce, particularly for those who often face unique challenges in balancing work and family responsibilities. Mothers, in particular, stand at the intersection of professional ambitions and familial obligations, making them a critical demographic to consider in the context of remote work arrangements. The potential of remote work to alleviate or exacerbate existing gender disparities in the labour market and home life presents an important area of study.

This master's thesis explores the question: *"How does remote work influence the work-life balance and well-being of mothers?"* By examining this question, I seek to contribute to the growing body of literature on flexible work arrangements and their impacts on gender equality, work-life balance, and overall well-being. The focus on mothers is particularly relevant given the persistent challenges they face in the workplace, including the well-documented "child penalty" (Andresen & Nix, 2022) and the disproportionate burden of domestic responsibilities they often shoulder.

The scope of this research surrounds various aspects of work-life balance and well-being, including work participation, time allocation for childcare and housework, job satisfaction, as well as overall life, leisure and family life satisfaction. By analysing these factors in relation to remote work practices, this study aims to provide a better understanding of how working from home affects mothers' professional and personal lives. Furthermore, by comparing the effects on mothers with those on fathers and considering the age of children in the household, this research seeks to uncover how remote work interacts with gender roles and parental responsibilities.

The relevance of this research is highlighted by the ongoing debates surrounding gender equality in the workplace and the search for policies that can support women's career progression while acknowledging their-often disproportionate role in family care. As Goldin (2014) points out, existing corporate reward structures often favour employees who can work long and unconventional hours, disadvantaging many women, especially those with childcare responsibilities. Remote work is seen as a potential tool to address these inequalities by providing greater flexibility. However, as highlighted by Chung and Van der Lippe (2020), flexible working arrangements can have both positive and negative outcomes, potentially reinforcing traditional gender roles even as they offer new opportunities for work-life balance.

My research aims to address several key objectives:

1. To analyse how remote work affects mothers' work participation, measured through contracted work hours and overtime.
2. To examine the impact of remote work on mothers' time allocation for childcare and housework.
3. To investigate the effects of remote work on mothers' job satisfaction, overall life satisfaction, leisure time satisfaction and family life satisfaction.
4. To compare these effects between mothers and fathers, and between parents of younger (0-7 years) and older (8-16 years) children.
5. To explore how the intensity of remote work (daily vs. frequent) influences these outcomes.

To achieve these objectives, I utilise data from the German Socio-Economic Panel (SOEP), a longitudinal survey spanning from 1984 to 2021. My analysis focuses on five waves of data (1997, 1999, 2002, 2009, and 2014) that include specific questions about remote work practices. Using Fixed Effects models, I examine various outcome variables related to work hours, childcare, housework, and satisfaction levels, comparing the effects of remote work across different parental groups and child age categories.

The structure of this thesis is as follows: Chapter 2 provides a theoretical framework, reviewing existing literature on gender convergence in the workplace, the rise of remote work, its impacts on productivity and career progression, and the challenges and benefits it presents for work-life balance, while also introducing the existing concept of the "child penalty" and its relevance to the research question. The hypotheses are formed according to this literature review. Chapter 3 details the data and methodology used in this study, describing the German Socio-Economic Panel dataset, the sample selection process, and the empirical strategy employed in the analysis. Chapter 4 presents the main results of the study, including both the primary analysis and a secondary analysis that explores the effects of discontinuing remote work. Chapter 5 addresses the robustness of the findings, presenting additional analyses with alternative control variable specifications and exploring the effects of excluding very young children (0-1 years) from the analysis. Chapter 6 discusses the implications of the findings, contextualising them within the broader literature and considering their policy implications, while also acknowledging the limitations of the study and providing suggestions for future research. Finally, Chapter 7 concludes the thesis by summarising the key findings and their significance for understanding the complex relationship between remote work, gender roles, and work-life balance for parents, particularly mothers.

By exploring these highly important questions, this master's thesis aims to contribute valuable insights to the ongoing discussion about flexible work arrangements, gender equality in the workplace, and the challenges of balancing professional and family responsibilities.

2. Theoretical framework

My research consists of several areas of literature which divide the theoretical framework into five subtopics. This literature overview is used as the foundation on which I formulate hypotheses that will help answer the research question.

2.1 The grand gender convergence

Goldin (2014) examines the convergence of men's and women's roles in the economy and society, highlighting persistent challenges to achieving gender equality. The research reveals that existing corporate reward structures often favour employees who can work long and unconventional hours, depriving many women, especially those with childcare and caregiving responsibilities.

Given that flexible work arrangements are likely a key factor in closing the gender pay gap, it is crucial to explore strategies for addressing this issue. This could be achieved through two primary avenues: shifting societal and corporate norms around work hour flexibility (Goldin, 2014), and where job nature demands time flexibility, improving access to flexible work arrangements through alternative means, such as remote work opportunities (Chung, 2024).

2.2 Rise of remote work

Remote working, telecommuting or working from home all refer to the practice of employees performing their work outside of their organisation's traditional office setting, either from their home or another location. Over the last few decades, remote work has changed significantly, enabled by ICT development and the widespread use of computers and smartphones. The occurrence of remote work has greatly increased in Europe and other developed countries (Lund et al., 2020; Oakman et al., 2020).

The COVID-19 pandemic has also played a role in normalising the use of remote work due to the required social distancing, pushing many firms to enable remote work for their employees where possible (Barrero et al., 2021). In addition to an increase in remote work, the COVID-19 pandemic has also significantly increased the adoption of other types of flexible working arrangements such as flexitime, which allows employees to choose their working hours within agreed limits, and part-time work.

2.3 Productivity and career progression

The research of Bloom et al. (2014), which looked at a remote work experiment conducted at a Chinese travel agency, showed significant increases in productivity, work satisfaction, and reduction in attrition for remote workers. However, it also showed that the promotion rate, conditional on performance, fell, which at first glance appears contradictory. Several factors are considered that could explain this: home workers suffer from reduced visibility and perception, as their physical absence from the office may lead to a managerial "out of sight, out of mind" effect, diminishing awareness of their achievements.

There is also potential managerial bias, with managers possibly perceiving office-based employees as more committed due to their physical presence. Furthermore, home workers miss out on informal interactions that facilitate networking and relationship-building, which can be crucial for career advancement. Additionally, the performance metrics used may fail to capture the full quality and impact of remote work, often emphasising quantitative over qualitative results, further disadvantaging home workers in promotions.

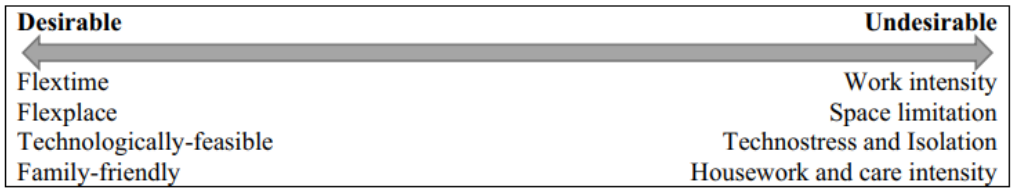
Some of these factors such as employee social interaction with the managers being advantageous for one's career progression already disproportionately negatively affect women even without the remote work context (Cullen et al., 2019). While remote work might seem like a potential tool to reduce the gender pay gap through better access to temporally flexible work, it can exacerbate other gender inequalities.

2.4 Other work-life balance benefits and challenges with remote work

A paper by Shirmohammadi et al. (2022) analysed 40 recent empirical studies that examined work-life balance while working from home during the pandemic. They found four main themes that all have a desirable and undesirable side to them as shown in Figure 1. The authors suggest that an individual's position on the spectrum of these four themes is determined by two factors: the compatibility between the worker and their remote work environment, as well as the remote workers' preferences and expectations regarding remote work. A good fit increases work-life balance and leads to positive individual and professional outcomes, meanwhile, a bad fit achieves the opposite effect.

Figure 1

Desirable vs. Undesirable aspects of remote work



Source: Shirmohammadi et al., 2022.

While remote work can potentially reduce work-family balance conflicts depending on the before-mentioned fit, it may also reinforce traditional gender roles. This reinforcement can result in women taking on more domestic responsibilities, a situation often exacerbated during remote work due to blurred lines between professional and personal duties (Chung, 2024).

Increased flexibility might encourage women to pursue better positions, even if their personal circumstances, such as having children, change. Otherwise, significant life changes might lead women, more often than men, to reduce their hours or take career breaks, potentially derailing

career advancement. Remote work can help mitigate such interruptions, allowing for continued professional growth (Villamor, 2023).

Remote work can open career opportunities that might otherwise be inaccessible, such as positions in other countries without the need to relocate. This flexibility can facilitate steady advancement or enable the pursuit of new challenges (Villamor, 2023). However, women opting for flexible arrangements often face more stigma than men, as it is frequently perceived as prioritising family over work. Performance assessments for women requesting flexible work tend to be weaker, leading to lower earnings and reduced visibility within the company compared to male counterparts who primarily work on-site (Villamor et al., 2023). Additionally, women might hesitate to take on remote leadership or global roles due to increased travel requirements, which can disrupt family life. Even when global roles can be undertaken from one's home country, excelling without relocation can be challenging (Villamor, 2023). These factors combined suggest that while remote work offers new opportunities, it may also present unique challenges for women's career progression.

2.5 The Child Penalty

Young women's career and income prospects are significantly disadvantaged by the "child penalty" or its anticipation (Andresen & Nix, 2022). This penalty stems from gender norms, discrimination, and differing preferences for childcare between genders. A CPB paper by Rabaté and Rellstab (2021) looks at this effect specifically for the Netherlands and finds that childbirth significantly impacts mothers' earnings in the Netherlands, with a 46% decrease compared to pre-birth trajectories, while fathers' earnings remain unaffected. They also find that gender norms are strongly correlated to the "child penalty". Flexible work arrangements have the potential to alleviate some aspects of this phenomenon, possibly enabling mothers to maintain higher levels of workforce participation.

2.6 The research question and subsequent hypotheses

This master's thesis explores the question: *"How does remote work influence the work-life balance and well-being of mothers?"*

To address this research question, I have developed a set of hypotheses based on existing studies about remote work and its effects on work-life balance and well-being. Before I lay out the hypotheses and their background I will first point out and acknowledge the main drawbacks and limitations of this study.

Time-variant unobservable characteristics and self-selection are likely affecting the outcomes in this research, particularly regarding how individuals might choose jobs based on the availability of remote work options, necessary home office equipment and available network infrastructure. Together these elements are essential in understanding the varied work-life balance outcomes among mothers with differing levels of access to remote work. Consequentially this issue prevents me from conducting a causal analysis. In addition, technology, access to technology, work practices, and organisational culture have all evolved significantly concerning remote work since

2014 – especially in the post-COVID era. The widespread adoption of more advanced communication and collaboration tools, improved home internet infrastructure, and shifting attitudes towards remote work has likely changed the WFH landscape considerably. These changes must be taken into account when attempting to apply the findings of this study, which uses data up to 2014, to the current state of remote work. The findings should be viewed as a historical snapshot that provides valuable insights but does not fully capture the realities of post-COVID remote work.

The hypotheses centre on the relationship between the frequency of WFH and having a child in the household. The primary objective is to analyse whether this interaction affects various outcome variables. Drawing from current literature and considering the complex nature of remote work's impact on work-life balance, I propose the following hypotheses:

Main Hypothesis:

H1: Remote work has differential effects on parents' work-life balance and well-being, varying by the parent's gender, child age, and intensity of remote work.

H1 is supported by research from Chung & Van der Lippe (2020) and Lott (2018), as well as additional studies (Chung, 2024) that highlight the importance of remote work intensity and child age.

Chung & Van der Lippe (2020) provide a framework for understanding the relationships between flexible working, work-life balance, and gender equality. They point out that flexible working can lead to both positive and negative outcomes, depending on factors such as gender, parental status, and organisational culture. Notably, they observe that while flexible working can help mothers maintain their positions in the labour market, it may also reinforce traditional gender roles and lead to increased work intensity.

Lott (2018) specifically examines how flexible working-time arrangements, including remote work, affect the way work-related thoughts and stress carry over into home life for both women and men in Germany. This study also uses the SOEP and it highlights the gendered nature of flexible work outcomes, showing that women and men experience different effects from similar working arrangements. Additionally, research by Lyttelton et al. (2020) indicates that the presence of young children in the household significantly affects the distribution of housework and childcare responsibilities when parents work remotely.

Sub-hypotheses:

H2a: Remote work increases mothers' work participation.

H2b: Remote work increases mothers' time spent on childcare and housework.

These hypotheses are based on studies by Kelliher & Anderson (2009), and Sullivan & Lewis (2001). Kelliher & Anderson (2009) investigate the paradoxical nature of flexible working

practices, finding that while such arrangements can lead to reduced work-life conflict, they often result in work intensification. Their study showed that remote workers often work longer hours and more intensively, supporting my hypothesis about increased work participation. They explain this intensification through three mechanisms: imposed intensification (e.g., increased workloads), enabled intensification (e.g., fewer interruptions), and intensification as a form of reciprocation or exchange.

Sullivan & Lewis (2001) provide valuable insights into the gendered nature of home-based remote work, examining how it affects the coordination of work and family life. Their findings indicate that while telecommuting can offer greater flexibility, it often leads to an increase in domestic responsibilities, particularly for women. This aligns with my hypothesis about increased time spent on childcare and housework. However, they also note that women often viewed this positively as an opportunity to better combine work and family responsibilities, while men tended to use remote work to extend their work hours.

H3: Remote work increases mothers' work satisfaction.

These hypotheses are drawn from research by Gajendran & Harrison (2007) and Bloom et al. (2014). Gajendran & Harrison's (2007) meta-analysis of remote work research found generally positive effects on job satisfaction, performance, and work-family conflict. They also note potential drawbacks in workplace relationships, especially when telecommuting intensity is high. The research of Bloom et al. (2014) also found an increase in work satisfaction, however, neither of these studies focused on mothers specifically, and I set out to assess this hypothesis in this study.

H4: Remote work effects are more pronounced for mothers with younger children.

This hypothesis is based on the understanding that younger children (0-7 years) have more intensive care needs compared to older children (8-16 years), making it more challenging to separate work and family responsibilities when young children are present.

H5: Remote work effects differ between fathers and mothers.

This hypothesis draws from research by Chung & Van der Horst (2018) and Sullivan & Lewis (2001). Chung & Van der Horst (2018) examine women's employment patterns after childbirth and their perceived access to and use of flexitime and teleworking. Their findings suggest that while flexible working arrangements can help mothers maintain their labour market position, particularly their working hours, they may also reinforce traditional gender roles. They found that mothers using flexitime were less likely to reduce their working hours after childbirth. This supports my hypothesis about increased work participation for remote-working mothers (*H2a*) but also displays the potential for remote work to reinforce gendered divisions of labour.

3. Data and Methodology

In this section, I present the data and methodology used in this study to examine the impact of remote work on the work-life balance and well-being of mothers. The section is in two parts. 3.1 introduces the German Socio-Economic Panel (SOEP), a longitudinal survey that provides the dataset used in this master's thesis. This section details the scope of the SOEP, the waves used in the analysis, and the process of data preparation and sample selection. It also presents descriptive statistics of the key variables and demographic characteristics of the survey respondents.

Section 3.2 outlines the empirical strategy employed in this study. It describes the fixed effects model used to analyse the various outcome variables related to work hours, childcare, housework, and satisfaction levels. This section also explains the reasoning behind the fixed effects model choice. Additionally, it addresses the limitations of the methodology, particularly regarding endogeneity concerns and potential self-selection issues and concludes by presenting the regression equation and detailing the control variables included in the analysis.

3.1 The German Socio-Economic Panel

The German Socio-Economic Panel is a longitudinal survey of 15,000 private households and 30,000 individuals in Germany, tracked from 1984 to 2021. It provides in-depth information on individual and household attributes. The panel provides a rich set of relevant variables for this research question and a large number of participating individuals.

Several of my choices on data cleaning and control variables are based on the paper “Working from home, hours worked and wages: Heterogeneity by gender and parenthood” by Melanie Arntz, Sarra Ben Yahmed and Francesco Berlingieri (2022). The paper also focuses on remote work and uses the SOEP dataset with their main differentiating focus being wages.

In SOEP a survey on WFH frequency was conducted in five waves (1997, 1999, 2002, 2009, 2014). For my estimation sample, I exclude all other waves and only include individuals who have a WFH frequency answer in two or more selected waves (This includes those who answered “no“). Respondents were asked if they ever worked from home and, if so, how often (daily, weekly, monthly, only if necessary).

Table 1 and Table 2 contain the statistics regarding the respondents that I narrowed down to during data preparation. Appendix A contains Table 9 which provides the summary statistics and all categories of categorical variables used in the main analysis.

I exclude individuals aged under 18 and over 65, and those who are self-employed, in training and have marginal employment (an individual income of less than €300 per month), leaving only individuals who do full-time or regular part-time work, the same exclusion is made for individuals with an average monthly household income of less than €300. Income is given in an annual form and is derived from all employment sources, encompassing wages and salaries from primary and secondary jobs, self-employment, and training. This includes regular pay and additional compensation such as bonuses, overtime, profit-sharing, and extra monthly payments like 13th

and 14th-month pay. I also only include individuals in private households and those who have completed their surveys fully.

The average age of respondents is 42, with 45% being female and 55% male. Across all the observations 67 % of individuals are married, 22% are single and 8% are divorced. 2.5% are married but separated and 1.2% are widowed. I drop other marital status categories due to low observation numbers.

16% have at least one child in their household aged 7 or under and 31% have at least one child in their household with an age from 8 to 16 years old. To get my estimates I create two children in household dummy variables, one of them indicating whether there is one or more children in their household aged 7 or under and the other indicating whether there is one or more children in the household aged from 8 years to 16 years old. For this study, I categorise children into two age groups: "younger children" (aged 7 or under) and "older children" (aged 8 to 16 years). This distinction allows for an examination of how parental work patterns and well-being may differ based on whether they have young children who typically require more care, or older children who are generally more independent.

Regarding WFH frequency, 5.8% of individuals report working from home daily, while 7.6% work remotely frequently. The "frequent WFH" category combines two response options: "several times a week" and "every 2 to 4 weeks". The remaining category (86.6%), "no WFH", comprises individuals who either rarely work from home (only when necessary) or never work from home at all. This categorisation allows for a clear distinction between regular remote workers and those who primarily work on-site, and it is used in all tables and figures in this paper unless stated otherwise.

Notably, the survey initially presented a yes/no question about WFH and only participants who answered "Yes" were asked to further specify their WFH frequency. Consequently, the dataset includes a WFH frequency variable that lacks a "No" category. To address this, I integrated the "No" responses from the yes/no WFH variable with my new WFH frequency variable, resulting in a "No" category in place of missing values where appropriate.

I acknowledge Arntz and colleagues' (2022) assertion that unobserved factors influencing the adoption and discontinuation of WFH likely differ. The decision to adopt WFH is more likely influenced, at least partially, by factors beyond the control of the firm and the individual. These factors include the widespread availability of broadband internet, which is a factor worth considering as the observed waves were in 1997, 1999, 2002, 2009 and 2014. During this period the share of German internet users increased from 7% to 86% (World Bank, 2022).

In contrast, the decision to discontinue WFH is more likely solely influenced by firm-specific and individual-specific factors, some of which remain unobservable. Examples of these unobservable factors include the quality of the work arrangement and changes in childcare responsibilities (Arntz et al., 2022).

For the main analysis, the final sample includes individuals who always WFH, never WFH, and those who pick up WFH. For my secondary analysis, I also checked a separate sample of individuals that included those that always WFH, never WFH across the five observed waves and those that made the transition from doing WFH to not doing WFH, while excluding those that take up WFH.

The ISCED-1997 (International Standard Classification of Education) statistical framework is the basis of the education variable, which I divide into three categories: low, intermediate, and higher. The low category encompasses levels 1 and 2, corresponding to primary and lower secondary education, respectively. Levels 3 (upper secondary education) and 4 (post-secondary non-tertiary education) comprise the intermediate category. Levels 5 (first stage of tertiary education) and 6 (second stage of tertiary education, leading to an advanced research qualification) make up the higher education category. Among the observed individuals, 8% fall into the lower level, 55% into the intermediate level, and 37% into the high educational level.

The employment status variable is split into two categories: full-time work and regular part-time work. I assign full-time work status for those that have more than 36 hours per week of contracted work, and part-time work to those that have more than 0 and fewer than 36 hours per week of contracted work. Full-time work accounts for 82% of the individuals' work status, while regular part-time employment makes up the remaining 18%.

The outcome hour variables in Table 1 are measured in hours spent per week on those activities. The outcome satisfaction variables are based on the survey participants' perceived satisfaction with work, life overall, leisure time and family life and are measured on an 11-point Likert scale. An example of the survey question: "Now we would like to ask you about your satisfaction with your life in general. How satisfied are you with your life, all things considered? Please answer on a scale from 0 to 10, where 0 means completely dissatisfied, and 10 means completely satisfied.". Family life satisfaction data is only available in the 2009 and 2014 waves.

The variable of firm size was divided into three groups: less than 200 workers (53%), more than 200 (40%), and unknown (7%). This categorisation was necessary because only workers who changed jobs and first-time participants were required to update their details, while I filled in most of the missing values by carrying over the firm size information across the five waves approximately 7% of data is still missing, which accounts for those who joined the study before 1997 and did not change jobs during the five observed waves. To examine the possible bias introduced by this missing data, regressions were run with the unknown category included and excluded, and the results were not significantly different in terms of magnitude and significance. The categorisation of firm sizes into "less than 200 workers" and "more than 200 workers" was necessitated by the inconsistency in category sizes across different waves of the survey. This binary classification was chosen as a

standardised approach to accommodate these variations, allowing for consistent analysis across all waves of the dataset.

Additional controls include job tenure and working experience (in years). Dummy variables are also used for region type (urban/rural), public sector employment, whether a partner works from home (at least on a monthly basis), disability status and whether the individual has changed jobs in the previous year. Overtime hours were calculated by subtracting contracted hours from average work hours. Negative values and the top 1% (above 24 hours per week) of overtime hours were cut.

Yearly individual and household income are included, as are 1-digit industry codes and ISCO-88 2-digit occupation codes. The ISCO-88 (International Standard Classification of Occupations, 1988 version) is a system for classifying and aggregating occupational information. The original dataset provided 4-digit ISCO-88 codes, which offer the most detailed level of occupational classification. However, for this analysis, these were converted to 2-digit codes, which represent broader occupational groups. This conversion allows for a more manageable number of categories while still maintaining meaningful occupational distinctions. For example, a 4-digit code like "2211" (Biologists, botanists, zoologists and related professionals) would be condensed to the 2-digit code "22" (Life science and health professionals).

Table 1 reveals significant gender disparities across multiple variables. Women report substantially lower contracted hours (M = 31.89) compared to men (M = 38.63), suggesting a higher prevalence of part-time work among female employees. This disparity is mirrored in overtime hours, with men reporting nearly double the hours (M = 4.18) of women (M = 2.60).

Particularly noteworthy are the differences in time allocated to household responsibilities. Women devote significantly more time to housework (M = 1.98 hours) and childcare (M = 1.50 hours) compared to their male counterparts (M = 0.66 and M = 0.62 hours, respectively). These figures point to a persistent gendered division of domestic labour.

Despite these disparities, women report marginally higher levels of work satisfaction (M = 7.06) and life satisfaction (M = 7.16) compared to men (M = 7.05 and M = 7.13, respectively). However, women report slightly lower leisure satisfaction (M = 6.50) than men (M = 6.46).

These gender differences mostly persist across all WFH frequency categories, with the gap often more pronounced among frequent remote workers. This suggests that while remote work offers flexibility, it may also reinforce traditional gender roles in the allocation of paid work and caretaking responsibilities.

Table 1

Descriptive statistics. Summary statistics of gender statistics and dependent variables by WFH frequency and gender

Panel 1: Gender statistics	
N	30,928
[1] Male	17,071 (55.20%)
[2] Female	13,857 (44.8%)

Panel 2a: Outcome variables, Female. Mean values grouped by WFH frequency				
	Daily WFH	Frequent WFH	No WFH	Total
N	903 (7.4%)	833 (6.8%)	10,479 (85.8%)	12,215 (100.0%)
Overtime hours	6.188 (6.829)	4.421 (5.061)	2.326 (3.527)	2.598 (3.919)
Contracted hours	28.307 (9.726)	30.143 (11.056)	32.170 (9.417)	31.890 (9.564)
Housework hours	2.051 (1.264)	1.882 (1.293)	1.983 (1.251)	1.981 (1.255)
Childcare hours	2.142 (4.023)	2.494 (4.246)	1.369 (2.952)	1.504 (3.165)
Work satisfaction 0 to 10	7.291 (1.847)	7.353 (1.833)	7.021 (1.928)	7.063 (1.919)
Life satisfaction 0 to 10	7.318 (1.594)	7.385 (1.480)	7.131 (1.590)	7.162 (1.584)
Leisure satisfaction 0 to 10	6.359 (2.392)	6.451 (2.132)	6.511 (2.158)	6.495 (2.175)
Family Life satisfaction 0 to 10	7.811 (1.811)	7.883 (1.751)	7.799 (1.845)	7.809 (1.832)
Panel 2b: Outcome variables, Male. Mean values grouped by WFH frequency				
N	905 (6.0%)	1,513 (10.0%)	12,777 (84.1%)	15,195 (100.0%)
Overtime hours	7.577 (6.919)	8.075 (6.232)	3.792 (4.762)	4.179 (5.084)
Contracted hours	37.875 (8.436)	38.905 (5.440)	38.631 (4.351)	38.632 (4.585)
Housework hours	0.723 (0.733)	0.562 (0.618)	0.663 (0.737)	0.657 (0.726)
Childcare hours	0.627 (1.527)	0.555 (1.126)	0.624 (1.363)	0.617 (1.352)
Work satisfaction 0 to 10	7.186 (1.943)	7.317 (1.748)	7.009 (1.947)	7.050 (1.930)
Life satisfaction 0 to 10	7.158 (1.700)	7.274 (1.525)	7.109 (1.550)	7.128 (1.557)
Leisure satisfaction 0 to 10	6.014 (2.456)	6.106 (2.158)	6.528 (2.136)	6.456 (2.165)
Family Life satisfaction 0 to 10	7.752 (1.886)	7.727 (1.899)	7.839 (1.799)	7.817 (1.820)

Note. The table displays summary statistics on the outcome variables by WFH status. Source: SOEP, sample of 11,466 employed workers (30,928 observations) from the 1997, 1999, 2002, 2009 and 2014 waves.

Table 2

Descriptive statistics. Control variables

Panel 1: Continuous variables.	N	Mean	Std. Dev.	Min	Max
Child in household (0-16)	30928	.6710424	.9288941	0	10
Child in household (0-7)	30928	.2187338	.5310322	0	5
Child in household (8-16)	30928	.4523086	.7565507	0	6
Age	30928	42.20457	10.77675	18	65
Individual income	30928	20108.68	20550.32	3600	1113981
Household income	30928	61063.65	43190.06	3620	2425238
Working experience	30889	16.54915	11.1435	0	50.167
Tenure	29544	11.43313	9.920498	0	49.5

Panel 2: Dummy variables. Grouped by WFH frequency

WFH Frequency	Daily	Semi-frequent, at least monthly	No WFH	Total
N	1,808 (5.8%)	2,346 (7.6%)	26,774 (86.6%)	30,928 (100.0%)
Child in household (0-7) dummy				
0	1,524 (84.3%)	1,860 (79.3%)	22,341 (83.4%)	25,725 (83.2%)
1	284 (15.7%)	486 (20.7%)	4,433 (16.6%)	5,203 (16.8%)
Child in household (1-7) dummy				
0	1,565 (86.6%)	1,936 (86.6%)	23,176 (82.5%)	26,677 (86.3%)
1	243 (13.4%)	410 (13.4%)	3,598 (17.5%)	4,251 (13.7%)
Child in household (8-16) dummy				
0	1,178 (65.2%)	1,551 (66.1%)	18,482 (69.0%)	21,211 (68.6%)
1	630 (34.8%)	795 (33.9%)	8,292 (31.0%)	9,717 (31.4%)
Child in household (0-16) dummy				
0	1,014 (56.1%)	1,250 (53.3%)	15,723 (58.7%)	17,987 (68.6%)
1	794 (43.9%)	1,096 (47.7%)	11,051 (41.3%)	12,941 (41.8%)
Employment status				
Full-Time Employment	1,378 (76.2%)	1,925 (82.1%)	22,113 (82.6%)	25,416 (82.2%)
Regular Part-Time Employment	430 (23.8%)	421 (17.9%)	4,661 (17.4%)	5,512 (17.8%)
Disability status				
Does not have a disability status	1,732 (95.9%)	2,250 (96.0%)	25,391 (94.9%)	29,373 (95.0%)
Has a disability status	74 (4.1%)	94 (4.0%)	1,364 (5.1%)	1,532 (5.0%)
Region type				
Urban regions	1,183 (65.4%)	1,737 (74.1%)	17,863 (66.8%)	20,783 (67.3%)
Rural regions	625 (34.6%)	608 (25.9%)	8,878 (33.2%)	10,111 (32.7%)
Partner WFH				
Partner Not working remotely	1,198 (66.3%)	1,719 (73.3%)	23,913 (89.3%)	26,830 (86.7%)
Partner Working Remotely	610 (33.7%)	627 (26.7%)	2,861 (10.7%)	4,098 (13.3%)
Public sector				
Does not work in public sector	1,013 (56.0%)	959 (40.9%)	12,478 (46.6%)	14,450 (46.7%)
Works in public sector	795 (44.0%)	1,387 (59.1%)	14,296 (53.4%)	16,478 (53.3%)
Job change in past year				
No	1,610 (89.0%)	2,005 (85.5%)	22,060 (86.8%)	25,675 (86.8%)
Yes, changed job last year	198 (11.0%)	341 (14.5%)	3,351 (13.2%)	3,890 (13.2%)

Note. The table displays summary statistics on the main control variables by WFH status. Descriptive statistics of categorical variables are in Appendix A, Table 8. Source: SOEP, sample of 11,466 employed workers (30,928 observations) from the 1997, 1999, 2002, 2009 and 2014 waves.

Figures 2 and 3 showcase the evolution of WFH frequency for women and men, respectively, from 1997 to 2014. Both genders show a general upward trend in WFH adoption, particularly in the "Frequent WFH" category. However, the total increase in WFH appears more pronounced for women, increasing by 10 p.p. for women compared to 8 p.p. for men across the five observed waves. By 2014, approximately 13% of employed men were engaging in frequent WFH, compared to about 10% of women. The proportion of daily WFH remained relatively stable for men, hovering around 5-6% throughout the observed period, while for women it rose slowly over time, from 5% to 7%.

The graphs indicate a notable jump in WFH frequency between 2002 and 2009, likely reflecting advancements in technology and changing work cultures during this period. The trend continues to rise, albeit more gradually, from 2009 to 2014.

Figures 4 and 5 present a view of satisfaction levels (work, life, leisure, and family life) for women and men respectively, categorised by WFH frequency. For women, those engaged in both daily and frequent WFH consistently report higher levels of work and life satisfaction compared to those who never work from home. This difference is particularly noticeable in the later years of the study. Leisure satisfaction, however, shows a different pattern, with those never working from home reporting slightly higher satisfaction levels in most years.

For men, the satisfaction patterns are less clear-cut. While those engaged in daily or frequent WFH often report higher work satisfaction, the differences in life satisfaction are less pronounced. Interestingly, men who never work from home consistently report higher leisure satisfaction across all years, contrasting with the pattern observed for women. Family life satisfaction, which was measured only in 2009 and 2014, shows higher levels for women engaged in WFH in 2014.

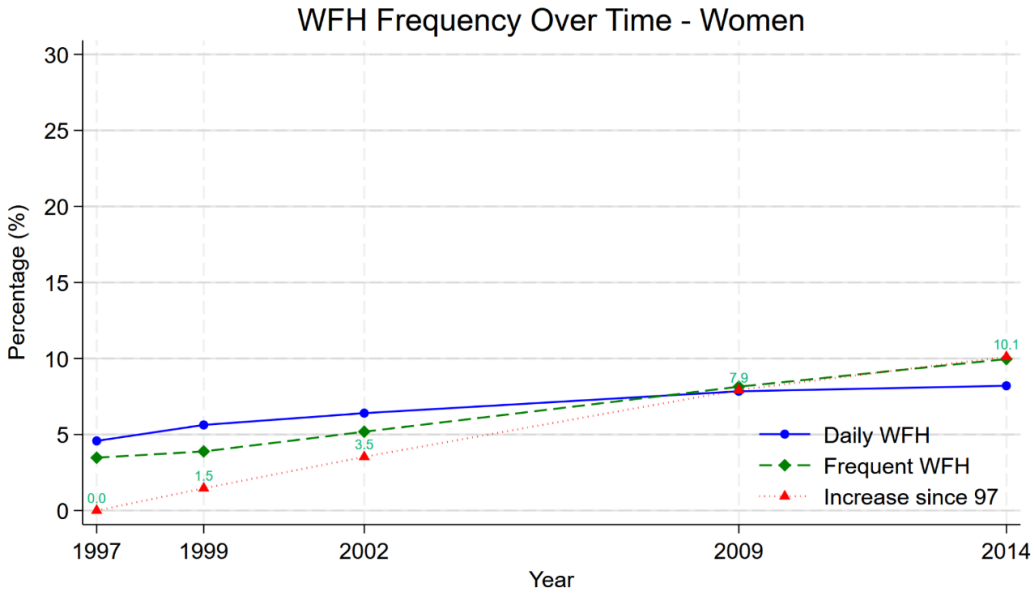
Figures 6 and 7 focus on WFH frequency among parents with children of different age groups. Parents with older children (Figure 6) show a steady increase in WFH adoption over time, with WFH rising more from 1997 to 2014 amongst parents compared to women and men without children.

Parents with younger children (Figure 7) demonstrate an even more pronounced increase in WFH adoption. This suggests that parents with younger children may be more likely to seek or be offered flexible work arrangements. The difference in WFH adoption between parents of younger and older children could reflect the greater caregiving demands associated with younger children, making flexible work arrangements more appealing or necessary for these parents.

Overall, these figures paint a picture of increasing WFH adoption across all groups, with variations based on gender and parental status. They also suggest complex relationships between WFH arrangements and various types of satisfaction, which appear to differ between men and women.

Figure 2

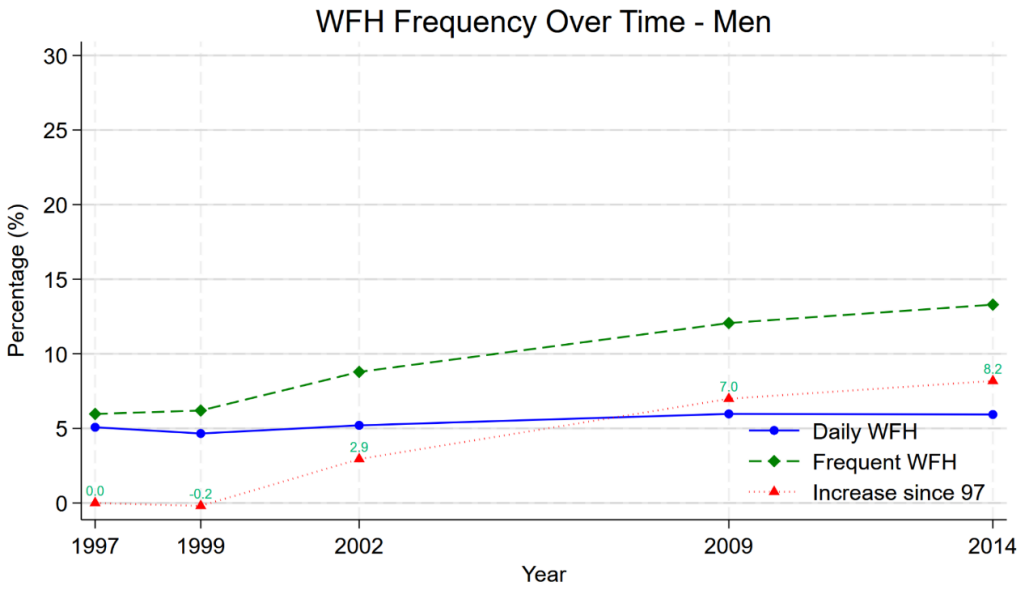
WFH frequency over time for women



Note: The graph is based on the SOEP sample used in the main analysis. Source: SOEP, 1997, 1999, 2002, 2009 and 2014 waves. The line named »Increase since 97« shows a total change in WFH participation for the combination of both daily and frequent WFH categories.

Figure 3

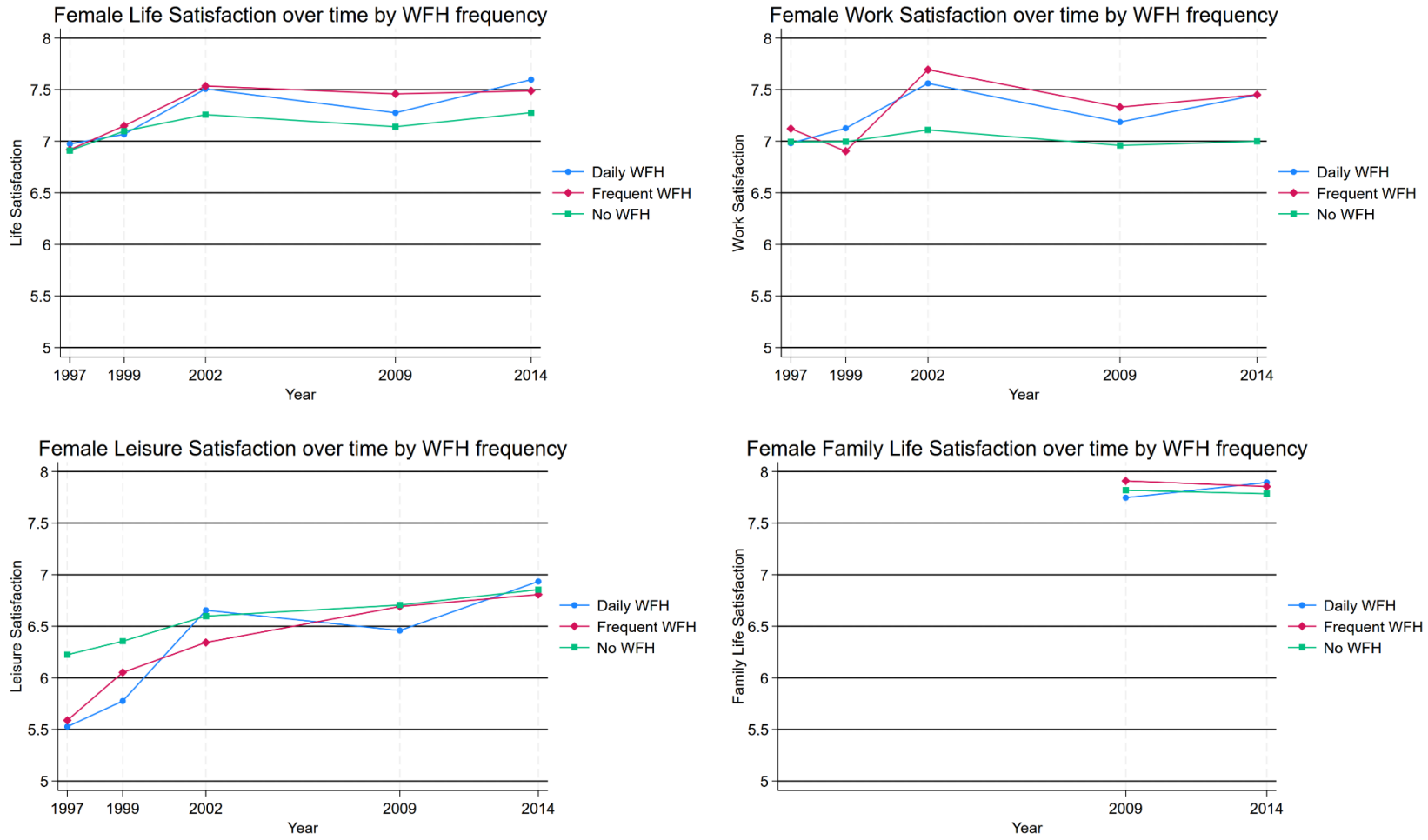
WFH frequency over time for men



Note: The graph is based on the SOEP sample used in the main analysis. Source: SOEP. 1997, 1999, 2002, 2009 and 2014 waves. The line named »Increase since 97« shows a total change in WFH participation for the combination of both daily and frequent WFH categories.

Figure 4

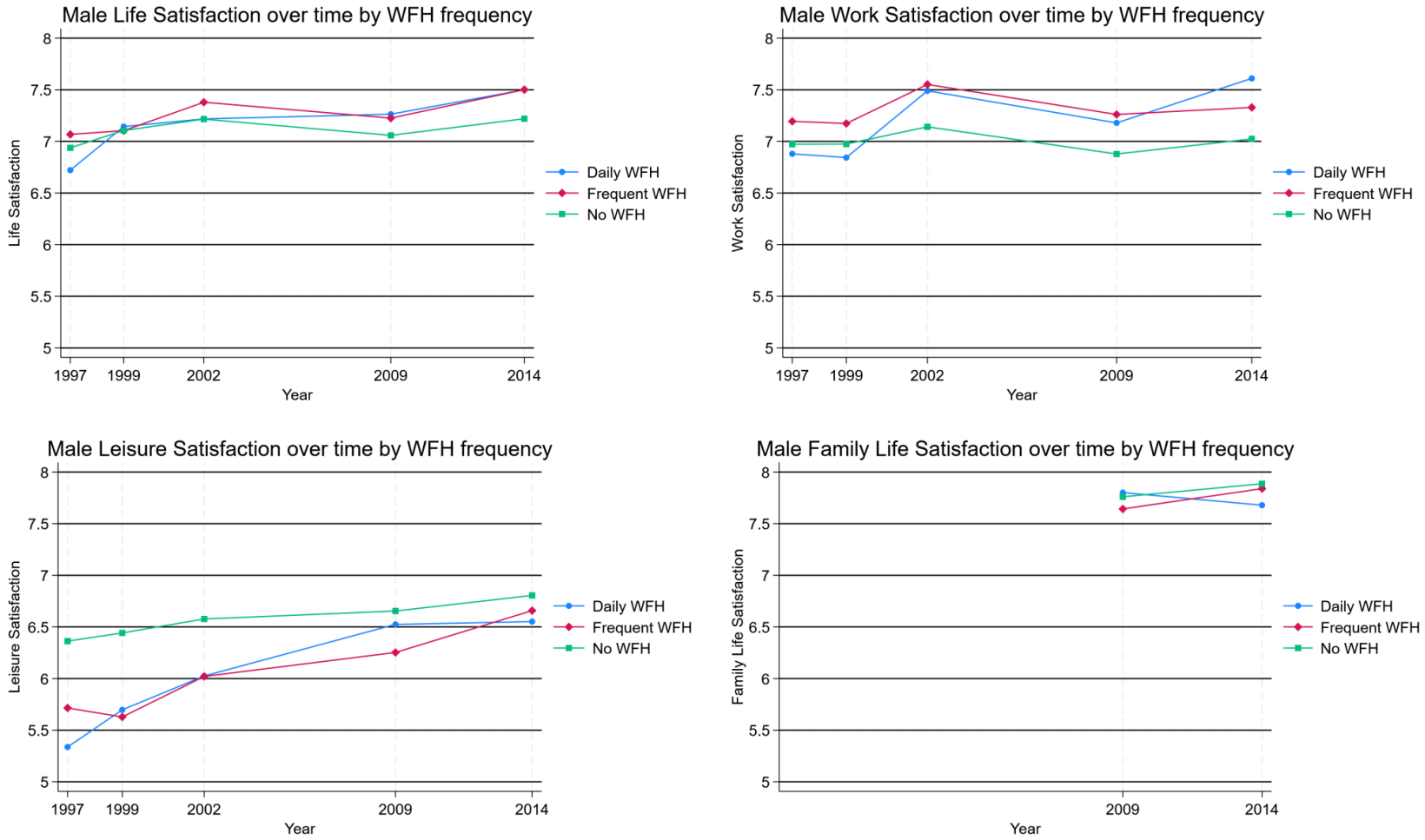
Satisfaction variables over time for women, grouped by WFH frequency



Note: The graph is based on the SOEP sample used in the main analysis. Source: SOEP. 1997, 1999, 2002, 2009 and 2014 waves.

Figure 5

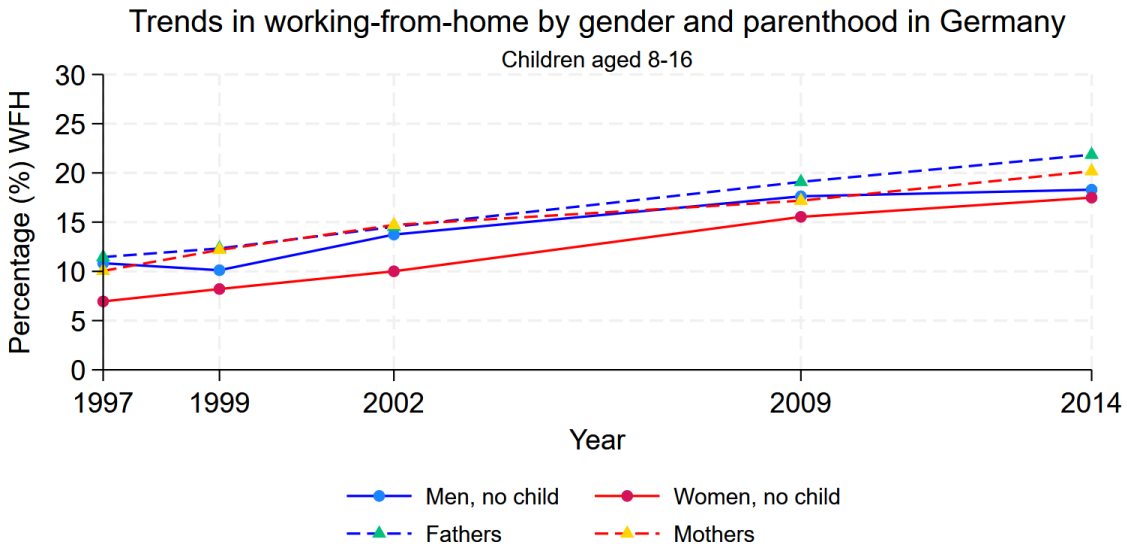
Satisfaction variables over time for men, grouped by WFH frequency



Note: The graph is based on the SOEP sample used in the main analysis. Source: SOEP. 1997, 1999, 2002, 2009 and 2014 waves.

Figure 6

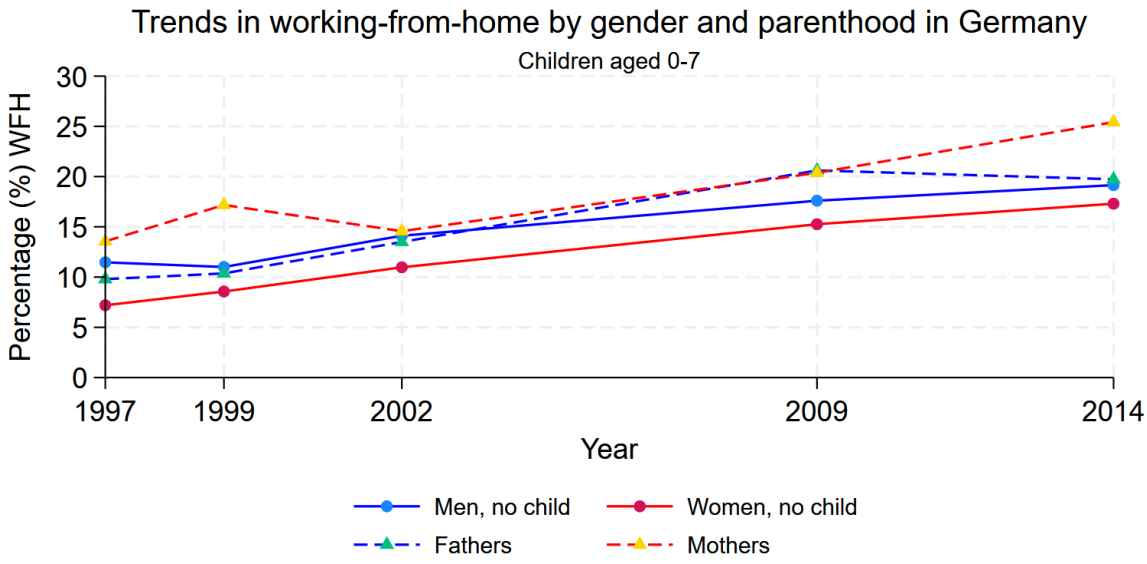
WFH frequency over time for parents with children aged 8 to 16



Note. The graph is based on the SOEP sample used in the main analysis. Source: SOEP. 1997, 1999, 2002, 2009 and 2014 waves.

Figure 7

WFH frequency over time for parents with children aged 0 to 7



Note. The graph is based on the SOEP sample used in the main analysis. Source: SOEP. 1997, 1999, 2002, 2009 and 2014 waves.

3.2 Empirical strategy

The primary objective of this study is to explore and understand the impact of remote work on the work-life balance and overall well-being of mothers. It aims to compare these effects between mothers and fathers and those who work remotely and on-site, also taking into account the distinction between parents with younger children and those with older children. To address the research question, this study utilises the Fixed Effects (FE) method and runs a total of 32 regressions for the main analysis. These regressions are derived from 8 outcome variables, with the effects being estimated separately for the parents of younger and older children, and different parent genders.

To determine whether a FE or Random Effects (RE) model is appropriate for my estimates, I conducted a Hausman test. The Hausman test is used to compare the FE and RE models to determine which is more appropriate. A significant test statistic ($p < 0.05$) indicates that the FE model is preferred, as it suggests that the unique errors are correlated with the regressors. The test revealed systematic differences between the two models, indicating that time-invariant unobserved heterogeneity influences the results. Consequently, the results of the Hausman test suggest that the FE model, which accounts for all time-invariant unobserved heterogeneity, is more suitable. The RE model, which does not account for time-invariant unobserved heterogeneity, yields biased estimates according to my Hausman test results.

I also conducted a statistical test to compare model choices using Correlated Random Effects (CRE), which models the relationship between time-invariant unobserved heterogeneity and the time-averages of time-variant explanatory variables. The CRE approach allows me to partially relax the assumption that the time-invariant unobserved heterogeneity is uncorrelated with the time-variant explanatory variables. By including the time averages of time-variant variables as additional regressors, I can test whether the remaining time-invariant unobserved heterogeneity is correlated with the time-variant explanatory variables. This statistical test confirmed my previous findings from the Hausman test; the outcome suggests that the FE model, which accounts for all time-invariant heterogeneity, is the preferable choice of estimator for my analysis.

The FE model mitigates biases from time-invariant unobserved heterogeneity by accounting for all time-invariant factors affecting results. This strengthens the findings' validity by ensuring observed effects are more likely due to variables of interest (i.e., working from home and having children) rather than unmeasured confounders. However, potential endogeneity remains a concern, as time-variant factors like changes in family circumstances or career aspirations, correlated with both WFH decisions and outcome variables, could bias estimates. While I control for many observable time-varying factors, unobservable ones may still influence results.

Further complicating the analysis is the potential self-selection into WFH-friendly jobs by mothers and the variability in the availability and quality of home office setups. Workers, particularly mothers, may choose jobs based on the availability of remote work options, which could significantly affect the study's results. For instance, mothers who prioritise work participation or work-life balance might actively seek out positions offering remote work flexibility, potentially

leading to an overestimation of the positive effects of remote work on work-life balance. This self-selection process additionally limits my ability to draw causal inferences, as I cannot randomly assign mothers to remote or non-remote work conditions.

Moreover, the quality of the remote work experience can vary greatly depending on individual circumstances. Factors such as access to high-speed internet, the availability of a dedicated workspace at home, and possession of necessary technology (e.g., computers, computer screens, stable internet connection) can significantly influence the effectiveness and impact of remote work. This is further exacerbated by the fact that the newest wave was observed in 2014, and the oldest in 1997, with access to computer hardware and internet improving significantly since. These variations in home office setups further complicate the analysis and may introduce additional confounding factors. Given these limitations, including the potential for residual confounding and the complexity of conducting a causal analysis in this context, the results should be interpreted with caution. The FE model does not solve these self-selection issues related to job choice or home office conditions.

The regression (1) differs depending on which of the dependent variables I am trying to estimate the effects on. The dependent variable Y_{it} indicates the effect for respondent i at time t, and is in hours per week when it is one of the hour-based outcome variables, meanwhile, when looking at satisfaction outcome variables, they are based on the 11-point Likert scale.

$$Yit = \alpha + \beta 1 FreqWFHit + \beta 2 Childhh + \beta 3 (FreqWFH \times Childhh) it + Xit + \epsilon it \quad (1)$$

The coefficient $\beta 3$ of the interaction terms quantifies the additional impact of combining WFH and having a child in the household on the dependent variable. The estimation's sample's specifications vary depending on whether I am analysing the effect of having at least one child aged 0 to 8, or 8 to 16 in the household. When examining the effect of one of these two groups, the other group is excluded from the analysis. For instance, if I examine the effect of having children aged 0 to 8, parents with children aged 8 to 16 are excluded from the sample.

In the regression model (1), X_{it} contains control variables representing respondents' characteristics and fixed effects. These control variables include year-fixed effects, demographic factors (age, age squared, marital status, disability status), human capital factors (education, actual work experience), job characteristics (tenure, tenure squared, firm size, change in employer in the past year), urban and rural area dummies, partner's WFH status (whether they do WFH on at least a monthly basis), public service dummy, and occupation and industry fixed effects. Additionally, the model includes log individual and household income and employment status dummy (part-time or full-time work). Estimations are run separately by parent gender.

The estimates for the satisfaction and hour-based outcome variables all use the same control variables and fixed effects, with a difference where the estimations for satisfaction-based variables also include the other relevant satisfaction variables as controls. Family life satisfaction is not used as a control variable due to the data only being available for the years 2009 and 2014. Standard errors are clustered at the individual level, and ϵ_{it} is the error term.

To conclude, it is important to note that while the study utilises a representative dataset and several control variables, caution is exercised in causally interpreting the results due to the possibility of unobservable characteristics and self-selection affecting the outcomes.

4. Results

Tables 3 and 4 present the results I use to assess my hypotheses. Table 3 provides data for evaluating *H2a* and *H2b*, while Table 4 offers data for *H3*. I use the combined findings from both tables to assess *H1*, *H4*, and *H5*.

To show an example of result interpretation, I'll examine the results for overtime hours for mothers with a younger child (Table 3, A1).

$$\text{-0.947} \quad (2)$$

$$0.769 - 0.947 - 2.490 = -2.668 \quad (3)$$

$$-2.668 + 0.947 = -1.721 \quad (4)$$

On average, women with younger children work 0.947 fewer overtime hours per week than women without younger children (2). Women with younger children at home who frequently do WFH work an average of 2.668 fewer overtime hours per week than women who do not WFH and do not have younger children at home (3). Furthermore, women with younger children at home who do not do WFH work an average of 1.721 fewer overtime hours per week than women with younger children at home who frequently WFH (4).

Before assessing my hypotheses, I will first examine the non-interaction variables. The presence of a child in the household consistently shows significant effects across multiple outcomes. For women with younger children, having a child in the household is associated with an average decrease in contracted hours of 5.133 hours per week at a 1% significance level (Table 3, A2), and an average increase in childcare hours of 5.296 hours per week at a 1% significance level (Table 3, A4). These findings show the substantial impact of childcare responsibilities on women's work patterns when they become mothers. For men, the overall effects of having a child in the household are generally much smaller in magnitude and less consistently significant, highlighting gender differences in how parenthood affects work and caretaking patterns.

Regarding WFH patterns for women, daily WFH shows larger and more frequently significant effects when looking at overtime hours compared to women who do frequent WFH. Women engaging in daily WFH experience an average increase in overtime hours of 2.621 hours per week at a 1% significance level (Table 3, A1), while the effect for frequent WFH is smaller and not statistically significant. This suggests that the frequency of remote work matters when discerning its impact on work patterns, even before considering the effects of parenthood.

Turning to the satisfaction variables in Table 4, most interaction effects are insignificant. However, I observe some interesting patterns in the non-interaction effects of WFH and having children in the household. For women daily WFH is associated with an average decrease in life satisfaction of 0.192 points on the 11-point Likert scale, though this effect is not statistically

significant (Table 4, A1). However, frequent WFH for these women is associated with a statistically significant average decrease in life satisfaction of 0.281 points at a 5% significance level (Table 4, A1). This suggests that even without children, women who work from home frequently may experience some negative impacts on their overall life satisfaction.

The presence of a child in the household shows varying effects on different satisfaction measures for women. Having a younger child is associated with an average increase in work satisfaction of 0.265 points at a 10% significance level (Table 4, A2), but an average decrease in leisure satisfaction of 0.497 points at a 1% significance level (Table 4, A3). For men, having a younger child is associated with an average decrease in leisure satisfaction of 0.338 points at a 1% significance level (Table 4, C11), but shows no significant effect on work satisfaction.

Now, I'll assess each hypothesis based on the interaction variables results presented in Tables 3 and 4:

H2a: Remote work increases mothers' work participation.

The results partially support this alternative hypothesis; however, I cannot reject the null hypothesis. For mothers with younger children, daily WFH is associated with an average increase in contracted hours of 4.864 hours per week at a 1% significance level (Table 3, A2). This effect suggests that remote work may enable these mothers to maintain higher levels of work participation. However, this effect is not significant for mothers with older children or for mothers who engage in frequent (but not daily) WFH. For fathers with younger children, the effect of the daily WFH interaction term is statistically significant at a 10% level and shows an average increase of 3.8 hours per week on contracted hours (Table 3, C10).

When looking at overtime hours, a different pattern emerges. For women with younger children, the interaction between frequent WFH and having a child in the household is associated with an average decrease of 2.490 overtime hours per week, which is statistically significant at the 5% level (Table 3, A1). Similarly, for mothers with older children, this interaction shows an average decrease of 1.765 overtime hours per week, also statistically significant at the 5% level (Table 3, B5). These results point towards this interaction effect reducing work intensification for mothers.

H2b: Remote work increases mothers' time spent on childcare and housework.

I fail to reject the null hypothesis. The data does not provide strong support for remote work universally increasing time spent on childcare and housework for mothers. I observe only one significant effect on childcare hours for mothers with younger children who do daily WFH, showing an average decrease of 0.794 hours per week at a 10% significance level (Table 3, A4). For fathers, I find negative and insignificant effects on housework and childcare hours, with one exception being an average decrease of 0.503 hours spent on childcare per week for fathers with older children, this effect being statistically significant at a 1% level (Table 3, D16).

H3: Remote work increases mothers' work satisfaction.

I fail to reject this null hypothesis. My results do not provide support for the alternative hypothesis *H3* for increased work satisfaction among mothers who work remotely. The interaction effects between WFH and having children are not statistically significant for mothers' work satisfaction (Table 4, A2, A6). 3 out of the 4 coefficients have a negative sign, but only one is statistically significant at a 10% level (Table 4, B6). The signs of non-interaction explanatory variables seem to be in line with existing literature, which shows an increase in work satisfaction when working remotely, however, these coefficients are all statistically insignificant in my results and appear to be negative (but still mostly statistically insignificant) when combined with parenthood.

H4: Remote work effects are more pronounced for mothers with younger children.

I reject this null hypothesis. My results generally support *H4*, as I observe more statistically significant effects with larger magnitudes for mothers with younger children compared to those with older children across various outcome variables. This is sensible as taking care of a younger child demands more childcare and changes in the parents' work engagement and participation compared to when taking care of an older child.

H5: Remote work effects differ between fathers and mothers.

I reject this null hypothesis; the findings support the alternative hypothesis *H5*. For example, daily WFH is associated with an average increase in contracted hours of 4.864 hours per week at a 1% significance level for mothers with younger children (Table 3, A2), but not for fathers. Additionally, the effects on satisfaction variables differ between mothers and fathers (Table 4). The results mostly support existing literature which suggests that flexible working arrangements help mothers continue working, while also having the potential to reinforce traditional gender roles (Chung & Van der Horst, 2018).

H1: Remote work has differential effects on parents' work-life balance and well-being, varying by the parent's gender, child age, and intensity of remote work.

I reject this null hypothesis. The combined results generally support *H1*. I observe varied effects across different outcome variables, genders, child age groups, and WFH intensities. However, the specific effects are not always in line with my initial expectations, displaying the complex nature of the relationship between remote work and work-life balance for parents.

Additional findings include some interesting observations. Daily WFH interaction term is associated with an average decrease in childcare hours of 0.503 hours per week at a 1% significance level for fathers with older children (Table 3, D16), while no significant effect is observed for mothers. In terms of family life satisfaction, daily WFH shows an average positive effect of 1.016 and 0.561 for mothers with both younger and older children respectively (Table 4, A4, B8), however, these effects are insignificant. These findings further display the complex and sometimes counterintuitive nature of remote work's impact on work-life balance and well-being.

Table 3

Main analysis results. Time spent on work, housework and childcare

	Child in household aged 0-7, Sample: Females				Child in household aged 8-16, Sample: Females				Child in household aged 0-7, Sample: Males				Child in household aged 8-16, Sample: Males			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	Overtime hours	Contracted hours	Housework hours	Childcare hours	Overtime hours	Contracted hours	Housework hours	Childcare hours	Overtime hours	Contracted hours	Housework hours	Childcare hours	Overtime hours	Contracted hours	Housework hours	Childcare hours
Daily WFH	2.621***	-0.750	0.135	0.094	3.224***	-0.107	0.061	0.112	0.724	-0.350	-0.003	0.037	1.371	0.001	-0.003	0.150**
	(0.911)	(0.801)	(0.105)	(0.205)	(0.775)	(0.741)	(0.090)	(0.193)	(1.099)	(0.874)	(0.060)	(0.066)	(1.051)	(0.758)	(0.053)	(0.062)
Frequent WFH	0.769	-0.127	-0.004	-0.015	0.951*	-0.212	-0.018	-0.155	0.400	0.442	-0.060	0.055	0.6901	0.734***	-0.035	0.043
	(0.724)	(0.555)	(0.097)	(0.169)	(0.553)	(0.505)	(0.083)	(0.182)	(0.465)	(0.312)	(0.046)	(0.043)	(0.438)	(0.278)	(0.042)	(0.040)
Child in household	-0.947***	-5.133***	0.346***	5.296***	-0.351**	-1.424***	0.218***	1.760***	-0.118	-0.105	-0.108***	1.798***	-0.271	-0.104	-0.020	0.729***
	(0.320)	(0.551)	(0.086)	(0.306)	(0.149)	(0.198)	(0.040)	(0.088)	(0.236)	(0.215)	(0.040)	(0.076)	(0.178)	(0.128)	(0.028)	(0.045)
(WFH × Child in hh)																
Daily WFH	-1.525	4.864***	-0.106	-0.794*	-1.765**	-1.566	-0.029	0.253	0.010	3.801*	0.084	0.897	2.978*	0.854	0.119	-0.503***
	(1.698)	(1.875)	(0.227)	(0.471)	(0.805)	(0.972)	(0.122)	(0.352)	(1.776)	(2.154)	(0.166)	(0.545)	(1.525)	(1.161)	(0.078)	(0.185)
Frequent WFH	-2.490**	2.143	0.225	0.801	-0.937	0.809	-0.059	0.128	0.140	0.350	0.071	-0.143	1.016	-0.309	-0.002	-0.159
	(1.233)	(1.790)	(0.184)	(0.725)	(0.750)	(0.887)	(0.130)	(0.428)	(0.972)	(0.560)	(0.089)	(0.163)	(0.618)	(0.314)	(0.064)	(0.109)
Observations	6,715	6,870	7,660	7,088	8,523	8,712	9,749	9,111	8,785	7,996	9,153	8,796	9,031	9,305	10,705	10,227
Within R-Squared	0.0558	0.5712	0.0714	0.5268	0.0420	0.4862	0.0745	0.2515	0.0362	0.3278	0.0333	0.3792	0.0389	0.2770	0.0310	0.1446

Note. These results are for female and male employees who have at least one child aged 0 to 7 years (A, C), or 8 to 16 years (B, D). The estimation is specified to exclude parents with children in the other child age category (for example: estimation for having a child in a household aged 0-7 excludes all parents who have one or more children aged 8-16 years old). The reference WFH category consists of the following two answers: "no WFH" or "rarely, only if necessary". Control variables include year-fixed effects, demographic controls (age, age squared, marital status, disability dummy), human capital controls (education according to the ISCED standard and actual working experience), job characteristics (tenure, tenure squared, firm size, employer change) and urban and rural area dummies, occupation and industry fixed effects, log individual and household income, dummy indicating partner WFH status and employment status dummy (part-time or full-time work). Standard errors are clustered at the individual level, $* p < 0.10$, $** p < 0.05$, $*** p < 0.01$.

Table 4

Main analysis results. Satisfaction outcome variables

	Child in household aged 0-7, Sample: Females (A)				Child in household aged 8-16, Sample: Females (B)				Child in household aged 0-7, Sample: Males (C)				Child in household aged 8-16, Sample: Males (D)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	Life satisfaction	Work satisfaction	Leisure satisfaction	Family life satisfaction	Life satisfaction	Work satisfaction	Leisure satisfaction	Family life satisfaction	Life satisfaction	Work satisfaction	Leisure satisfaction	Family life satisfaction	Life satisfaction	Work satisfaction	Leisure satisfaction	Family life satisfaction
Daily WFH	-0.192	0.196	0.045	-0.213	-0.158	0.254	-0.214	-0.267	-0.093	0.047	-0.147	-0.603**	-0.066	-0.102	-0.046	-0.503**
	(0.142)	(0.210)	(0.206)	(0.314)	(0.125)	(0.172)	(0.177)	(0.287)	(0.123)	(0.153)	(0.198)	(0.268)	(0.112)	(0.152)	(0.174)	(0.248)
Frequent WFH	-0.281**	0.115	0.103	-0.102	-0.210*	0.013	0.145	-0.069	-0.097	0.082	-0.013	-0.437*	-0.121	0.071	-0.025	-0.203
	(0.128)	(0.187)	(0.203)	(0.295)	(0.116)	(0.167)	(0.179)	(0.253)	(0.095)	(0.112)	(0.133)	(0.228)	(0.086)	(0.113)	(0.128)	(0.201)
Child in household	0.017	0.265*	-0.497***	0.664*	-0.047	0.205***	-0.208***	-0.061	0.097	0.082	-0.338***	0.312	0.038	0.095	-0.091	0.263**
	(0.113)	(0.157)	(0.160)	(0.396)	(0.056)	(0.074)	(0.076)	(0.139)	(0.062)	(0.091)	(0.099)	(0.220)	(0.047)	(0.061)	(0.068)	(0.119)
(WFH × Child in hh)																
Daily WFH	0.346	-0.293	0.179	1.016	0.058	-0.353*	0.076	0.561	-0.064	-0.337	0.458	-0.045	-0.183	-0.116	0.055	0.230
	(0.303)	(0.413)	(0.486)	(0.723)	(0.179)	(0.204)	(0.251)	(0.357)	(0.323)	(0.368)	(0.422)	(0.650)	(0.159)	(0.185)	(0.244)	(0.337)
Frequent WFH	0.254	-0.006	-0.664*	0.114	0.051	0.153	0.049	0.029	0.195	-0.166	-0.465*	-0.392	-0.080	0.075	0.064	0.011
	(0.221)	(0.360)	(0.386)	(0.583)	(0.154)	(0.226)	(0.238)	(0.270)	(0.187)	(0.220)	(0.252)	(0.411)	(0.117)	(0.177)	(0.180)	(0.257)
Observations	7,626	7,626	7,626	3,269	9,730	9,730	9,730	3,967	9,491	9,491	9,491	3,592	11,133	11,133	11,133	4,270
Within R-Squared	0.1535	0.1386	0.1316	0.2768	0.1368	0.1305	0.1274	0.2745	0.1504	0.1514	0.0784	0.2752	0.1406	0.1456	0.0818	0.2828

Note. Data for family life satisfaction are only available for the years 2009 and 2014. These results are for female and male employees with at least one child aged 0 to 7 years (A, C), or 8 to 16 years (B, D). The estimation is specified to exclude parents with children in the other child age category (for example: estimation for having a child in a household aged 0-7 excludes all parents who have one or more children aged 8-16 years old). The reference WFH category consists of two answers: "no WFH" or "rarely, only if necessary". Control variables include year-fixed effects, demographic controls (age, age squared, marital status, disability dummy), human capital controls (education according to the ISCED standard and actual working experience), job characteristics (tenure, tenure squared, firm size, employer change) and urban and rural area dummies, occupation and industry fixed effects, log individual and household income, dummy indicating partner WFH status and employment status dummy (part-time or full-time work). Life, work, and leisure satisfaction are used as control variables. Standard errors are clustered at the individual level, $* \ p < 0.10$, $** \ p < 0.05$, $*** \ p < 0.01$.

4.1 Secondary Analysis

To further explore the robustness of my findings and investigate potential differences in effects between those who adopt remote work and those who discontinue it, I conducted a secondary analysis. This analysis focuses on individuals who always work from home, those who never work from home, and those who transition out of remote work arrangements. This contrasts with my main analysis, which included those who picked up remote work and excluded those who dropped out of WFH. This secondary analysis only focuses on parents with younger children.

Table 5 presents the results of this secondary analysis, which largely follows the findings from my main analysis but also reveals some differences.

For women with younger children, the secondary analysis shows a stronger positive effect of daily WFH on family life satisfaction, with on average a large increase of 1.825 points at a 5% significance level (Table 5, A4). This effect is more pronounced than in the main analysis, which showed an increase of 1.016 points without statistical significance (Table 4, A4). These results might suggest that women who have experience with WFH and then stop may particularly value its impact on family life, or those who stop WFH appreciate the flexibility more once it is no longer available.

The secondary analysis also reveals a significant positive effect of frequent WFH on childcare hours for women with young children, showing an average increase of 2.346 hours per week at a 5% significance level (Table 5, B8). This effect was not observed in the main analysis (Table 3, A4), indicating that women who stop WFH may have initially had increased childcare hours while working remotely. Meanwhile, the effect of the daily WFH interaction term becomes stronger and statistically significant at a 5% level (Table 5, B8), showing an average decrease of 1.481 hours per week spent on childcare. The effect of overtime for frequent WFH interaction and the effect on contracted hours for daily WFH interaction both become insignificant, however, the signs remain the same and magnitudes similar.

For men with younger children, the secondary analysis shows a significant positive effect of daily WFH on contracted hours, with an average increase of 5.425 hours at a 5% significance level (Table 5, D14). This effect was observed in the main analysis (Table 3, C10), however at a lower significance level and magnitude, suggesting that men who discontinue WFH may have initially increased their work hours while working remotely.

These differences between the main and secondary analyses highlight the complexity of remote work's effects and suggest that the experience of adopting versus discontinuing WFH may have distinct impacts on work-life balance and well-being. However, it's important to note that the overall patterns remain largely consistent between the two analyses, reinforcing the robustness of my main findings.

Table 5

Secondary analysis results. Individuals who drop out of WFH

	Child in household aged 0-7, Sample: Females (A) Satisfaction outcome variables				Child in household aged 0-7, Sample: Females (B) Hour outcome variables				Child in household aged 0-7, Sample: Males (C) Satisfaction outcome variables				Child in household aged 0-7, Sample: Males (D) Hour outcome variables			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	Life satisfaction	Work satisfaction	Leisure satisfaction	Family life satisfaction	Overtime hours	Contracted hours	Housework hours	Childcare hours	Life satisfaction	Work satisfaction	Leisure satisfaction	Family life satisfaction	Overtime hours	Contracted hours	Housework hours	Childcare hours
Daily WFH	0.099	0.081	0.215	0.454	1.014	-0.753	-0.021	-0.146	-0.005	-0.183	-0.191	0.287	1.836*	-0.217	0.020	-0.022
	(0.190)	(0.253)	(0.225)	(0.431)	(1.071)	(1.068)	(0.101)	(0.287)	(0.142)	(0.173)	(0.237)	(0.378)	(1.020)	(0.671)	(0.066)	(0.074)
Frequent WFH	0.020	-0.273	0.358	0.038	1.061	-0.396	-0.106	-0.128	0.047	0.170	-0.249	-0.038	0.537	0.150	-0.040	0.049
	(0.175)	(0.243)	(0.249)	(0.430)	(1.069)	(0.617)	(0.118)	(0.238)	(0.088)	(0.120)	(0.165)	(0.301)	(0.586)	(0.256)	(0.053)	(0.046)
Child in household	-0.040	0.330**	-0.523***	0.387	-1.090***	-5.021***	0.342***	5.346***	0.098	0.115	-0.335***	0.084	-0.084	-0.110	-0.112***	1.790***
	(0.111)	(0.157)	(0.159)	(0.390)	(0.309)	(0.553)	(0.088)	(0.310)	(0.062)	(0.091)	(0.098)	(0.217)	(0.245)	(0.212)	(0.039)	(0.075)
(WFH × Child in hh)																
Daily WFH	0.077	-0.304	-0.076	1.825**	3.073	4.505	-0.001	-1.481**	0.085	-0.232	0.302	-0.621	-0.585	5.425**	0.038	0.554
	(0.441)	(0.533)	(0.566)	(0.895)	(2.695)	(3.422)	(0.411)	(0.597)	(0.412)	(0.394)	(0.491)	(0.689)	(1.807)	(2.567)	(0.141)	(0.422)
Frequent WFH	-0.058	0.130	-0.610*	0.566	-3.536	3.059	0.010	2.346**	0.196	-0.425	-0.490	-1.122	-1.157	1.140	0.140	-0.261
	(0.275)	(0.443)	(0.352)	(0.523)	(2.251)	(2.986)	(0.249)	(1.087)	(0.308)	(0.347)	(0.352)	(1.177)	(1.854)	(0.799)	(0.117)	(0.182)
Observations	7,527	7,527	7,527	3,165	6,656	6,801	7,557	6,982	9,410	9,410	9,410	3,494	7,728	7,955	9,071	8,716
Within R-Squared	0.1484	0.1352	0.1290	0.3117	0.437	0.5659	0.0619	0.5134	0.1524	0.1508	0.0782	0.2701	0.0325	0.3178	0.0337	0.3760

Note. Data for family life satisfaction are only available for the years 2009 and 2014. These estimates include individuals who never WFH, always WFH, and those who stop WFH. Those who take up WFH are excluded. These results are for female and male employees with at least one child aged 0 to 7 years. The estimation is specified to exclude all parents who have one or more children aged 8-16 years old. The reference WFH category consists of two answers: "no WFH" or "rarely, only if necessary". Control variables include year-fixed effects, demographic controls (age, age squared, marital status, disability dummy), human capital controls (education according to the ISCED standard and actual working experience), job characteristics (tenure, tenure squared, firm size, employer change) and urban and rural area dummies, occupation and industry fixed effects, log individual and household income, dummy indicating partner WFH status and employment status dummy (part-time or full-time work). Life, work, and leisure satisfaction are used as control variables. Standard errors are clustered at the individual level, $* \, p < 0.10$, $** \, p < 0.05$, $*** \, p < 0.01$.

5. Robustness

To evaluate the robustness of my main results, I conducted additional analyses using alternative samples, control variable specifications and the inclusion of an extra control variable in my estimates. The robustness check aims to assess whether the main findings hold under different model specifications and to identify any potential sensitivities in the results.

In the main robustness analysis, I made several changes to the model specifications. I created and used a new categorical variable for distance travelled to work, as this factor might influence both the likelihood of WFH adoption and the outcome variables. I replaced the single-digit industry code variable with a more detailed two-digit industry code and substituted the continuous age variable with an age category variable. Additionally, I created a new WFH frequency variable that excludes those who work from home "rarely, only if necessary" from the "No WFH" category. Lastly, I used a firm size variable that excludes the 7% of respondents who answered "unknown" (Which were previously recoded into this answer from missing values). Appendix A, Table 10 contains descriptive statistics of the different control variables used in the main robustness analysis.

Comparing the robustness analysis results (Tables 6 and 7) with the main analysis results (Tables 3 and 4), I find that they generally align in terms of the sign, magnitude, and statistical significance of the coefficients for time spent on work, housework, and childcare. However, there are a few notable exceptions.

For women with younger children, the robustness analysis shows some changes in the effects of WFH on time allocation. The interaction effect of daily WFH and having a younger child on contracted hours remains positive and significant at a 1% level, with a larger coefficient showing that, on average, this combination is associated with an increase of 6.099 hours (Table 6, A2) compared to 4.864 hours in the main analysis (Table 3, A2). The robustness analysis reveals a significant negative effect of the daily WFH interaction term on childcare hours for women with younger children, significant at the 1% level. On average, this is associated with a decrease of 1.834 hours (Table 6, A4). In contrast, the main analysis found this effect significant only at the 10% level, with an average decrease of 0.794 hours (Table 3, A4)

For men with younger children, the robustness analysis shows fewer significant effects compared to the main analysis. The positive effect of daily WFH on contracted hours for fathers with younger children, which was significant at a 10% level with an average increase of 3.801 hours in the main analysis (Table 3, C10), becomes non-significant in the robustness check with a coefficient of 2.806 hours (Table 6, C10).

Regarding satisfaction variables, the robustness analysis reveals some differences for women, though mostly just for the non-interaction independent variables. The negative effect of frequent WFH on life satisfaction becomes more pronounced with an average decrease of 0.452 points (Table 7, A1) compared to 0.281 points in the main analysis (Table 4, A1), both significant at a 5% level. The positive effect of daily WFH on work satisfaction becomes significant at a 10% level with

an average increase of 0.507 points in the robustness analysis (Table 7, A2), while it was non-significant in the main analysis (Table 4, A2). Overall, in the robustness analysis work satisfaction is more consistently shown to be improved for non-interaction WFH categories, aligning better with existing literature, but it still shows to have a negative sign and mostly insignificant effect when looking at the interaction variables.

For women with older children, the robustness analysis shows a stronger negative effect of daily WFH interaction term on work satisfaction with an average decrease of 0.646 points (Table 7, B6) compared to 0.353 points in the main analysis (Table 4, B6), the first becoming significant at a 5% level, compared to the main analysis's coefficient being significant at a 10% level. The positive effect of daily WFH interaction term on family life satisfaction becomes significant at a 5% level with an average increase of 1.095 points in the robustness analysis (Table 7, B8), while it was non-significant and of similar magnitude in the main analysis (Table 4, B8).

For men with older children, the robustness analysis reveals a significant positive effect at a 5% level of frequent WFH on overtime hours, showing that, on average, this is associated with an increase of 1.667 hours (Table 6, D13), which was not significant in the main analysis (Table 3, D13). The negative effect of daily WFH on leisure satisfaction becomes more pronounced with an average decrease of 0.745 points (Table 7, D15) compared to 0.046 points in the main analysis (Table 4, D15), and significant at a 1% level in the robustness check while it was non-significant in the main analysis. The largest difference is seen when looking at the family life satisfaction of fathers with younger children. The frequent WFH interaction term (Table 7, C12) becomes statistically significant at a 1% level at a large magnitude of 1.959 points, while in the main analysis (Table 4, C12) it was insignificant and had a negative sign.

These differences between the main and robustness analyses suggest that some of the effects of remote work on work-life balance and well-being may be sensitive to model specification and the inclusion of the additional control variable. The robustness results generally support the main findings but also reveal some details that were not apparent in the initial analysis. For instance, the significant negative effect on childcare hours for women with younger children who work from home daily suggests that the relationship between remote work and childcare responsibilities may be more complex than I initially thought. This finding could indicate that these women can better outsource childcare when working from home, or that they are more efficiently balancing work and childcare duties.

While the robustness analysis largely supports the main findings, it also reveals some additional complexities in the relationships between remote work, work-life balance, and the well-being of parents, especially mothers. The robustness check strengthens the overall validity of my findings while also revealing areas where further investigation might be warranted. Overall, the previous conclusions I made for my hypotheses do not change when looking at the results of this robustness analysis.

Table 6

Robustness analysis results. Time spent on work, housework and childcare

	Child in household aged 0-7, Sample: Females (A)				Child in household aged 8-16, Sample: Females (B)				Child in household aged 0-7, Sample: Males (C)				Child in household aged 8-16, Sample: Males (D)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	Overtime hours	Contracted hours	Housework hours	Childcare hours	Overtime hours	Contracted hours	Housework hours	Childcare hours	Overtime hours	Contracted hours	Housework hours	Childcare hours	Overtime hours	Contracted hours	Housework hours	Childcare hours
Daily WFH	2.976***	-0.946	0.083	-0.076	3.593***	-0.288	0.066	0.079	1.338	-0.417	-0.064	0.047	1.729	-0.065	-0.131	0.184
	(1.023)	(0.897)	(0.136)	(0.396)	(0.898)	(0.824)	(0.117)	(0.323)	(1.244)	(0.845)	(0.122)	(0.194)	(1.139)	(0.814)	(0.103)	(0.115)
Frequent WFH	1.376*	0.316	-0.060	-0.185	1.360**	0.166	-0.084	-0.034	0.245	0.525	-0.105	0.027	0.361	0.793**	-0.096	-0.008
	(0.774)	(0.832)	(0.132)	(0.292)	(0.603)	(0.678)	(0.106)	(0.222)	(0.614)	(0.371)	(0.074)	(0.068)	(0.567)	(0.347)	(0.066)	(0.071)
Child in household	-1.045***	-5.168***	0.281***	5.526***	-0.281*	-1.401***	0.128***	1.665***	-0.079	-0.193	-0.202***	1.872***	-0.161	-0.067	-0.001	0.768***
	(0.364)	(0.632)	(0.096)	(0.423)	(0.169)	(0.212)	(0.045)	(0.104)	(0.288)	(0.288)	(0.055)	(0.102)	(0.208)	(0.151)	(0.035)	(0.062)
(WFH × Child in hh)																
Daily WFH	-1.048	6.099***	0.154	-1.834***	-1.842**	-1.636	0.015	0.610	-0.914	2.806	0.265	1.298	1.838	1.468	0.096	-0.183
	(1.991)	(1.857)	(0.282)	(0.706)	(0.896)	(1.119)	(0.170)	(0.581)	(2.005)	(2.309)	(0.286)	(1.038)	(1.535)	(1.493)	(0.159)	(0.206)
Frequent WFH	-2.616	2.414	0.465*	-0.124	-0.877	0.394	0.022	0.689	0.231	0.692	0.180	-0.220	1.667**	-0.157	0.023	-0.066
	(1.602)	(2.388)	(0.241)	(1.006)	(0.907)	(1.143)	(0.179)	(0.520)	(1.177)	(0.789)	(0.138)	(0.252)	(0.734)	(0.391)	(0.094)	(0.173)
Observations	4,702	4,744	4,774	4,427	6,040	6,097	6,144	5,752	5,229	5,289	5,206	5,004	6,203	6,280	6,165	5,920
Within R-Squared	0.0695	0.5548	0.0902	0.5220	0.0526	0.4771	0.0862	0.2923	0.0569	0.3471	0.0333	0.3713	0.0503	0.3013	0.0544	0.1659

Note. These results are for female and male employees with at least one child aged 0 to 7 years (A, C), or 8 to 16 years (B, D). The estimation is specified to exclude parents with children in the other child age category (for example: estimation for having a child in a household aged 0-7 excludes all parents who have one or more children aged 8-16 years old). The reference WFH is "no WFH". Control variables include year-fixed effects, demographic controls (age categories, marital status, disability dummy), human capital controls (education according to the ISCED standard and actual working experience), job characteristics (tenure, tenure squared, firm size, employer change) and urban and rural area dummies, occupation and industry fixed effects, log individual and household income, dummy indicating partner WFH status and employment status dummy (part-time or full-time work). Distance to work in kilometres is included as a categorical control variable. Standard errors are clustered at the individual level, $* p < 0.10$, $** p < 0.05$, $*** p < 0.01$.

Table 7

Robustness analysis results. Satisfaction outcome variables

	Child in household aged 0-7, Sample: Females (A)				Child in household aged 8-16, Sample: Females (B)				Child in household aged 0-7, Sample: Males (C)				Child in household aged 8-16, Sample: Males (D)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	Life satisfaction	Work satisfaction	Leisure satisfaction	Family life satisfaction	Life satisfaction	Work satisfaction	Leisure satisfaction	Family life satisfaction	Life satisfaction	Work satisfaction	Leisure satisfaction	Family life satisfaction	Life satisfaction	Work satisfaction	Leisure satisfaction	Family life satisfaction
Daily WFH	-0.041	0.507*	-0.139	-0.242	-0.131	0.461**	-0.525**	-0.429	-0.172	0.401*	-1.114***	0.188	-0.113	0.100	-0.745***	0.281
	(0.217)	(0.302)	(0.303)	(0.475)	(0.179)	(0.232)	(0.258)	(0.409)	(0.248)	(0.215)	(0.297)	(0.470)	(0.226)	(0.229)	(0.268)	(0.419)
Frequent WFH	-0.452**	0.765***	0.215	-0.578	-0.355**	0.427*	0.104	-0.597	-0.186	0.022	0.166	-0.361	-0.141	0.032	0.116	-0.096
	(0.189)	(0.262)	(0.321)	(0.467)	(0.179)	(0.247)	(0.292)	(0.374)	(0.136)	(0.159)	(0.191)	(0.351)	(0.121)	(0.165)	(0.181)	(0.304)
Child in household	0.022	0.007	-0.651***	0.297	-0.037	0.210**	-0.246***	-0.145	0.164**	0.019	-0.318**	0.584**	0.037	0.107	-0.130	0.414**
	(0.138)	(0.192)	(0.199)	(0.423)	(0.067)	(0.087)	(0.093)	(0.167)	(0.083)	(0.119)	(0.128)	(0.293)	(0.060)	(0.078)	(0.085)	(0.162)
(WFH × Child in hh)																
Daily WFH	0.499	-0.069	-0.355	1.159**	0.269	-0.646**	0.101	1.095**	0.296	-0.082	0.710	0.795	0.225	-0.508	-0.091	-0.343
	(0.375)	(0.757)	(0.805)	(0.581)	(0.203)	(0.279)	(0.338)	(0.509)	(0.557)	(0.516)	(0.599)	(0.846)	(0.288)	(0.326)	(0.361)	(0.550)
Frequent WFH	0.025	-0.497	-0.628	0.976	0.280	-0.274	-0.244	0.054	0.342	-0.038	-0.715*	1.959***	0.143	0.137	-0.276	0.045
	(0.348)	(0.533)	(0.640)	(0.791)	(0.237)	(0.338)	(0.412)	(0.401)	(0.394)	(0.323)	(0.400)	(0.378)	(0.169)	(0.223)	(0.255)	(0.376)
Observations	4,771	4,771	4,771	1,941	6,142	6,142	6,142	2,393	5,385	5,385	5,385	1,943	6,391	6,391	6,391	2,340
Within R-Squared	0.1778	0.1580	0.1634	0.2768	0.1526	0.1420	0.1435	0.3142	0.1504	0.1628	0.1168	0.3433	0.1529	0.1525	0.1085	0.3269

Note. Data for family life satisfaction are only available for the years 2009 and 2014. These results are for female and male employees with at least one child aged 0 to 7 years (A, C), or 8 to 16 years (B, D). The estimation is specified to exclude parents with children in the other child age category (for example: estimation for having a child in a household aged 0-7 excludes all parents who have one or more children aged 8-16 years old). The reference WFH category is "no WFH". Control variables include year-fixed effects, demographic controls (age categories, marital status, disability dummy), human capital controls (education according to the ISCED standard and actual working experience), job characteristics (tenure, tenure squared, firm size, employer change) and urban and rural area dummies, occupation and industry fixed effects, log individual and household income, dummy indicating partner WFH status and employment status dummy (part-time or full-time work). Distance to work in kilometres is included as a categorical control variable. Life, work, and leisure satisfaction are used as control variables. Standard errors are clustered at the individual level, $* p < 0.10$, $** p < 0.05$, $*** p < 0.01$.

5.1 Exclusion of very young children (0-1) from the analysis

As an additional robustness check, I conduct an analysis that replicates the main analysis (Table 3 A & C, Table 4 A & C), with one main difference: it focuses on parents with children aged 1-7 and excludes those that have a child aged 0-1 or 8-16 years old. This allows me to examine whether the effects observed in the main analysis are consistent when very young children are excluded from the sample.

In Germany, pregnant employees are entitled to fourteen weeks of maternity leave, during which they can claim maternity benefits (iamexpat.de, n.d.). Each parent can take up to three years of parental leave per child, usable flexibly between birth and the child's third birthday, with the option to save up to 24 months for use until the child's eighth birthday (with employer permission). Mothers can start parental leave after maternity leave, which is deducted from the total allowance. Partners can begin the leave at birth, and both parents can take leave simultaneously or separately. As of January 2024, there are plans for a 10-day paid paternity leave, though not yet implemented (iamexpat.de, n.d.). Isolating the effects of parental leave is not possible with the given data due to the option to save up and use 24 months of parental leave until the child's eighth birthday with the parental leave periods not being captured in the data. I instead focus on the 0-1 age exclusion as it includes both the maternity leave and the largest shock to parents' lives; the childbirth and the first-year changes that occur in the parents' lives.

For women, the robustness check reveals several notable differences compared to the main analysis. The interaction effect of frequent WFH and having a younger child on overtime hours becomes marginally significant in the robustness check, showing an average decrease of 2.298 hours per week at the 10% significance level (Table 8, A1), whereas it was significant at the 5% level in the main analysis with an average decrease of 2.490 hours (Table 3, A1).

Regarding contracted hours, both analyses show a significant positive interaction effect of daily WFH and having a younger child. However, the significance level changes from 1% in the main analysis (Table 3, A2) to 5% in the robustness check (Table 8, A2). The magnitude of the effect remains similar, with an average increase of 4.864 hours in the main analysis and 4.890 hours in the robustness check. The main analysis indicated a marginally significant negative effect of daily WFH on childcare hours for mothers with younger children, showing an average decrease of 0.794 hours at the 10% significance level (Table 3, A4). In contrast, the robustness check finds this effect to be non-significant (Table 8, A4). The sign remains negative for both, and the magnitudes are very similar.

Turning to satisfaction measures, both the main analysis and robustness check show no significant interaction effects for life satisfaction (Table 4, A1; Table 8, B5) or work satisfaction (Table 4, A2; Table 8, B6). However, there is a notable difference in the effect on leisure satisfaction. The robustness check reveals a significant negative effect of frequent WFH on leisure satisfaction for mothers with younger children, showing an average decrease of 0.974 points at the 5% significance level (Table 8, B7). This effect was only marginally significant in the main analysis, with an average decrease of 0.664 points at the 10% level (Table 4, A3).

For men with younger children, the robustness check also uncovers some differences compared to the main analysis. In terms of contracted hours, the main analysis showed a marginally significant positive effect of daily WFH, with an average increase of 3.801 hours at the 10% significance level (Table 3, C10). However, this effect becomes non-significant in the robustness check (Table 8, C10).

The robustness check reveals some new effects for fathers that were not observed in the main analysis. It shows a positive effect of the daily WFH interaction on leisure satisfaction, with an average increase of 0.793 points at the 10% significance level (Table 8, D15). Additionally, the robustness check finds a significant and large negative effect of daily WFH on family life satisfaction for fathers, with an average decrease of 1.365 points at the 1% significance level (Table 8, D16). Neither of these effects were significant in the main analysis (Table 4, C11; Table 4, C12).

Infants and very young toddlers typically require more intense care and attention, which could significantly impact parents' work patterns and satisfaction levels. By focusing on children aged 1-7, the robustness check potentially captures a more homogeneous group in terms of childcare needs. The stronger negative effect on perceived leisure satisfaction for mothers doing frequent WFH in the robustness check might indicate that once the intensive infant care period is over, mothers may become more aware of the trade-offs between work flexibility and personal time. For fathers, the emergence of significant effects on leisure and family life satisfaction in the robustness check could suggest that the impact of WFH on fathers' well-being becomes more pronounced once children are past the infant stage, possibly because they might get more involved in childcare, although the results for childcare hours do not reflect this.

While there are some differences in the significance levels and magnitudes of certain effects, the overall conclusions drawn from the hypotheses remain largely unchanged in the robustness check. These results suggest that the effects observed are relatively consistent across the 0-7 age range, with some small differences when parents with very young children (0-1 years) are excluded from the analysis.

Table 8

Robustness analysis results. Hour and satisfaction outcome variables using main analysis specifications, parents with children aged 1 to 7 years

	Child in household aged 0-7, Sample: Females (A)				Child in household aged 0-7 Sample: Females (B)				Child in household aged 0-7, Sample: Males (C)				Child in household aged 0-7 Sample: Males (D)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	Overtime hours	Contracted hours	Housework hours	Childcare hours	Life satisfaction	Work satisfaction	Leisure satisfaction	Family life satisfaction	Overtime hours	Contracted hours	Housework hours	Childcare hours	Life satisfaction	Work satisfaction	Leisure satisfaction	Family life satisfaction
Daily WFH	2.840***	-0.682	0.145	0.101	-0.185	0.132	0.091	-0.199	0.497	0.274	-0.010	0.059	-0.080	-0.001	-0.161	-0.664**
	(0.903)	(0.807)	(0.106)	(0.201)	(0.144)	(0.211)	(0.207)	(0.326)	(1.138)	(0.816)	(0.061)	(0.051)	(0.129)	(0.157)	(0.199)	(0.274)
Frequent WFH	0.728	-0.108	-0.005	0.029	-0.262**	0.073	0.139	-0.069	0.335	0.587*	-0.054	0.061	-0.100	0.072	-0.007	-0.455*
	(0.722)	(0.555)	(0.098)	(0.161)	(0.129)	(0.190)	(0.203)	(0.305)	(0.485)	(0.307)	(0.048)	(0.042)	(0.098)	(0.115)	(0.135)	(0.235)
Child in household	-0.868***	-4.932***	0.336***	5.272***	-0.044	0.358**	-0.508***	0.618	-0.275	-0.284	-0.092**	1.742***	0.007	0.091	-0.273**	0.079
	(0.333)	(0.561)	(0.091)	(0.319)	(0.110)	(0.163)	(0.169)	(0.419)	(0.256)	(0.251)	(0.044)	(0.085)	(0.069)	(0.102)	(0.115)	(0.268)
(WFH × Child in hh)																
Daily WFH	-2.270	4.890**	0.005	-0.724	0.511	-0.138	0.027	1.174	1.015	4.312	0.011	1.279	-0.237	-0.004	0.793*	-1.365***
	(1.597)	(2.074)	(0.232)	(0.506)	(0.344)	(0.451)	(0.565)	(0.848)	(2.284)	(2.721)	(0.256)	(0.780)	(0.463)	(0.371)	(0.448)	(0.433)
Frequent WFH	-2.298*	1.427	0.307	0.826	0.309	0.113	-0.974**	0.225	0.557	0.209	0.068	-0.147	-0.081	-0.099	-0.561*	-0.695
	(1.282)	(1.873)	(0.224)	(0.813)	(0.261)	(0.440)	(0.445)	(0.741)	(1.062)	(0.474)	(0.095)	(0.195)	(0.214)	(0.248)	(0.288)	(0.473)
Observations	6,670	6,825	7,591	7,019	7,565	7,565	7,565	3,250	7,394	7,618	8,738	8,369	9,059	9,059	9,059	3,484
Within R-Squared	0.0527	0.5633	0.0677	0.5209	0.1555	0.1418	0.1333	0.2768	0.0398	0.3252	0.0320	0.3793	0.1508	0.1523	0.08	0.2856

Note. Data for family life satisfaction are only available for the years 2009 and 2014. These results are for female and male employees with at least one child aged 1 to 7 years. The estimation is specified to exclude parents with children in the other child age categories (0 to 1 and 8 to 16). The reference WFH category consists of two answers: "no WFH" or "rarely, only if necessary". Control variables include year-fixed effects, demographic controls (age, age squared, marital status, disability dummy), human capital controls (education according to the ISCED standard and actual working experience), job characteristics (tenure, tenure squared, firm size, employer change) and urban and rural area dummies, occupation and industry fixed effects, log individual and household income, dummy indicating partner WFH status and employment status dummy (part-time or full-time work). Life, work, and leisure satisfaction are used as control variables in satisfaction outcome variable estimations. Standard errors are clustered at the individual level, $* p < 0.10$, $** p < 0.05$, $*** p < 0.01$.

6. Discussion

H1: Differential Effects of Remote Work

The main hypothesis (*H1*) proposes that remote work has differential effects on parents' work-life balance and well-being, varying by the parent's gender, child age, and intensity of remote work. The results largely support this hypothesis, revealing varied effects across different outcome variables, genders, child age groups, and WFH intensities.

For mothers with younger children, daily WFH was associated with an average increase in contracted hours of 4.864 hours per week (significant at 1% level). This finding suggests that remote work may enable mothers to maintain higher levels of work participation, potentially helping them to stay connected to their careers during a period often characterised by reduced work hours or career breaks. This aligns with research by Chung & Van der Horst (2018) and Chung & Van der Lippe (2020), who found that flexible working arrangements can help mothers maintain their labour market position.

However, contrary to expectations (*H2b*), the study did not find strong evidence that remote work increases mothers' time spent on childcare and housework. In fact, for mothers with younger children, daily WFH was associated with a marginal decrease in childcare hours (-0.794 hours per week, significant at 10% level). The effect was stronger at a higher significance level in the main robustness analysis (-1.834 hours per week, significant at a 1% level). This finding could suggest that daily WFH arrangement allows for more efficient time management or that these mothers might be outsourcing childcare to focus on work during WFH hours. This challenges the notion that remote work necessarily leads to increased domestic responsibilities, especially for women, contrasting with some existing literature, such as Sullivan & Lewis (2001). However the results better align with the study done by Lyttelton et al. (2020), which found that the gender gap in childcare time shrinks among telecommuters, particularly when mothers work full-time.

Gender Differences in Remote Work Effects

The study revealed notable differences in how remote work affects mothers and fathers, supporting hypothesis *H5*. While daily WFH was associated with increased contracted hours for mothers with young children, this effect was mostly insignificant and of a smaller magnitude for fathers. This gender disparity in the impact of remote work on work participation could be interpreted in light of the "child penalty" concept discussed by Andresen & Nix (2022) and Rabaté & Rellstab (2021). Remote work might be providing mothers with a means to mitigate some aspects of the child penalty by enabling them to maintain higher work hours.

Interestingly, for fathers with older children, daily WFH was associated with a significant decrease in childcare hours (-0.503 hours per week, significant at a 1% level), while no such effect was observed for mothers with older children. This difference could be explained by several factors, including persistent gender role expectations, or potential self-selection bias in who chooses daily WFH arrangements. For instance, fathers might view WFH as an opportunity to focus more

intensively on work, possibly to counteract perceived productivity loss or stigma associated with remote work. In contrast, mothers might maintain more consistent childcare involvement regardless of work location or children's age. This finding suggests that the impact of remote work on parental time allocation may depend on both gender and child age, with different mechanisms at play for mothers and fathers. These gender differences in the effects of remote work on time allocation and well-being outcomes align with the findings of Lott (2018), who highlighted the gendered nature of flexible work outcomes. These results extend this understanding by demonstrating how these gendered effects vary not only by the presence of children but also by their age.

Work-Life Balance and Satisfaction

Contrary to hypothesis *H3*, which predicted that remote work would increase mothers' work satisfaction, the results did not provide strong support for this idea. The interaction effects between WFH and having children were not statistically significant for mothers' work satisfaction. When looking at the non-interaction WFH variable, a mostly positive sign on the effect of WFH on work satisfaction was seen in the main analysis; however, it was almost always insignificant. However, when looking at the main robustness analysis (Table 7), this effect was often significant and positive, aligning with existing literature. Overall, the interaction between WFH and having a child in the household does not seem to further exacerbate or change the effects on work satisfaction. The effects on overall life satisfaction were mixed and often not statistically significant, suggesting that the relationship between remote work and life satisfaction for parents is complex and may depend on various factors such as the quality of the remote work environment, expectations and personal preferences when it comes to remote work. These factors were not captured in this study.

Age of Children and Remote Work Effects

The results generally supported hypothesis *H4*, which proposed that remote work effects would be more pronounced for mothers with younger children. This was evident in the stronger and more significant effects observed for mothers with children aged 0-7 compared to those with children aged 8-16. This finding aligns with the understanding that younger children typically require more intensive care, making the flexibility of remote work potentially more impactful for these mothers.

6.1 Policy Implications

The findings of this study have several important implications for policymakers and organisations considering remote work policies:

1. **Supporting Work Participation for Mothers**: The positive association between daily WFH and increased contracted hours for mothers with young children suggests that remote work could be a valuable tool in supporting mothers' career continuity. Access to WFH might mitigate some aspects of the child penalty, however, I believe it is of utmost importance to consider what effects this might have on further reinforcing traditional gender roles. Consequently, I believe additional WFH accommodations for new parents

should be gender-equal to further reduce the child penalty (that would otherwise stem from the additional costs and stigma associated with the additional WFH accommodations being made just for women) and prevent the reinforcement of traditional gender roles through the expectation that women should be privy to more WFH after childbirth to take care of the child. While gender-neutral parental WFH accommodations are likely better than women-specific parental WFH accommodations when it comes to mitigating the reinforcement of traditional gender roles, it is of even greater importance to challenge the existing views around gender roles directly. Despite the existence of gender-neutral parental leave policies, deeply ingrained social norms regarding childcare responsibilities and the persistent gender pay gap often result in mothers being the primary users of such parental leave and WFH accommodation options, especially in the earliest years of parenthood. This trend reinforces traditional gender roles in childcare and caregiving (Korpi et al., 2013). I second the notion by Chung (2024) and believe that governments and organisations should continue such policy interventions that ensure there are sufficient incentives for fathers to take up as much leave and additional WFH accommodations as possible, potentially equal to the leave and WFH accommodations allocated for mothers, especially in the early stages of a child's life.

2. **Work-Life Balance Initiatives**: Given the mixed results on satisfaction measures, organisations should consider implementing additional support mechanisms alongside remote work options. This could include training on time management, setting boundaries between work and personal life when working from home, and the provision of a quality home setup. Both a better remote work environment and adaptation to personal preferences and expectations can result in WFH improving work-life balance and well-being for individuals (Shirmohammadi et al., 2022).

3. **Long-term Career Development**: Policies should address potential career progression challenges associated with remote work, as identified in previous literature (Bloom et al., 2014). This could include ensuring that remote workers have equal access to networking opportunities, mentorship programs, and visibility for promotion considerations.

6.2 Limitations

While this study provides valuable insights into the effects of remote work on parents' work-life balance and well-being, it's important to acknowledge its limitations. The data used in this study predates the COVID-19 pandemic, which has significantly altered the landscape of remote work.

Additionally, the study's reliance on fixed effects models, while addressing some forms of endogeneity, cannot fully account for all potential sources of bias, such as time-varying unobservable characteristics or self-selection into remote work-friendly jobs. It also does not differentiate between having one or more children, I acknowledge this fact most likely has a significant impact on the results.

In my analysis of satisfaction variables, I acknowledge that using the FE model instead of the Fixed Effects Ordered Logit (FEOLOGIT) model presents certain limitations. FEOLOGIT would have been more appropriate for the ordinal nature of satisfaction measures, allowing for nonlinear effects and respecting the natural order of satisfaction levels without assuming equal distances between categories. While my choice to use FE simplifies the analysis and maintains methodological consistency, it assumes a linear relationship between predictors and satisfaction outcomes, which may not fully capture the nonlinear nature of these variables.

Next, I also acknowledge that satisfaction outcomes differ significantly depending on the quality of the remote working environment and the personal preferences and expectations of individuals. Neither were captured in this study. As for the WFH categories used, I believe it would have been better to further separate them; weekly and monthly WFH employees should both have categories of their own instead of being merged into one, this compromise was taken in this study to have a greater sample size to work with. Hybrid WFH arrangements are becoming more common in the post-COVID period, making this differentiation increasingly more important. Lastly, this study did not inspect what happens to the distribution of caretaking responsibilities, work-life balance, and well-being of parents when both do WFH at the same time, this could be an interesting area to explore. Future studies could benefit from quasi-experimental designs with post-COVID data, and different sample cut-offs to address these concerns.

7. Summary and Conclusion

This master's thesis investigates the impact of remote work on the work-life balance and well-being of mothers, comparing these effects with those experienced by fathers and considering the influence of children's ages. Using data from the German Socio-Economic Panel spanning five waves from 1997 to 2014, the research employs fixed effects models to analyse various outcome variables related to work hours, childcare, housework, and satisfaction levels.

The findings reveal a complex and varied picture of how remote work affects parents, particularly mothers. Contrary to my initial expectations, the study found limited evidence that remote work increases mothers' time spent on childcare and housework, to an extent the results support an opposite conclusion, as several results suggest that mothers with younger children who do daily WFH spend fewer hours on childcare. This is more in line with a more recent study done by Lyttelton et al. (2020), which found that the gender gap in childcare time shrinks among those who do WFH, particularly when mothers work full-time.

In addition, for mothers with younger children, daily WFH was associated with a significant increase in contracted work hours, suggesting that remote work may enable mothers to maintain higher levels of work participation during a period of life often characterised by reduced work hours or career breaks. National or organisational policies should consider this and accommodate all parents with newborn children to WFH equally, to mitigate the child penalty for mothers and avoid exacerbating traditional gender roles. While I believe additional access to WFH for new parents should be gender-neutral to prevent further reinforcing of traditional gender roles, gender-

equal WFH opportunities do not tackle the persistence of traditional gender roles in place which manifest even in gender-neutral arrangements, and fathers might need additional nudges and signals to take these opportunities and participate in childcare, especially during the child's earliest years.

Gender differences in the effects of remote work interaction and having a child were evident throughout the study. While daily WFH was linked to increased contracted hours for mothers with young children, this effect was not observed for fathers. Interestingly, fathers with older children who engaged in daily WFH showed a significant decrease in childcare hours, an effect not seen in mothers with older children. This decrease further reinforces the thought that gender-equal WFH opportunities are unlikely to be enough to deal with the gender childcare gap. Traditional gender roles need to be tackled more directly. These findings mostly align with and extend previous research on the gendered nature of flexible work outcomes, demonstrating how these effects vary not only by the presence of children but also by the age of children in the household.

The results regarding satisfaction levels were mixed and rarely statistically significant, indicating a complex relationship between remote work and life satisfaction for parents. Contrary to my expectations, the research did not find strong support for increased work satisfaction among mothers who work remotely. These satisfaction outcomes likely vary significantly depending on the quality of the WFH environment and personal preferences and expectations, and this variation was not captured in this study. The overall effects seen in this study were generally more pronounced for mothers with younger children compared to those with older children, supporting the hypothesis that WFH effects are more significant when children require more intensive care.

The research also highlighted potential drawbacks of remote work, such as the risk of reinforcing traditional gender roles (through poorly targeted policies and existing traditional gender roles manifesting even in gender-neutral arrangements) and the challenges of balancing increased work participation with family responsibilities. My findings showcase the importance of considering both the benefits and potential downsides of remote work policies, particularly in relation to gender equality and work-life balance.

Several limitations were acknowledged, including the use of pre-COVID-19 data and the inability to fully account for all potential sources of bias, such as time-varying unobservable characteristics or self-selection into remote work-friendly jobs. Future research directions were suggested in the form of examining how the effects of remote work on parents may have changed in the post-pandemic era and employing quasi-experimental designs to further address endogeneity concerns.

In conclusion, this study contributes insights into the understanding of how remote work influences the work-life balance and well-being of parents, particularly mothers. It highlights the importance of carefully crafted remote work policies that do not further exacerbate traditional gender roles and take into account the intricate relationships between gender, parenthood, and children's ages. As the nature of remote work continues to evolve, ongoing research in this area will be crucial for developing policies that effectively support working parents and promote gender equality in both the workplace and the home.

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Appendix

A. Additional tables

Table 9

Descriptive statistics: Categorical variables grouped by WFH frequency

WFH Frequency				
	Daily	Semi-frequent, at least monthly	No WFH	Total
N	1,808 (5.8%)	2,346 (7.6%)	26,774 (86.6%)	30,928 (100.0%)
Marital status				
Married	1,325 (73.6%)	1,667 (71.3%)	17,612 (66.0%)	20,604 (66.8%)
Married, But Separated	63 (3.5%)	67 (2.9%)	608 (2.3%)	738 (2.4%)
Single	234 (13.0%)	408 (17.5%)	6,149 (23.0%)	6,791 (22.0%)
Divorced	147 (8.2%)	179 (7.7%)	2,006 (7.5%)	2,332 (7.6%)
Widowed	31 (1.7%)	16 (0.7%)	315 (1.2%)	362 (1.2%)
Education level				
Lower education	58 (3.2%)	33 (1.4%)	2,330 (8.8%)	2,421 (7.9%)
Intermediate education	584 (32.4%)	732 (31.4%)	15,634 (59.1%)	16,950 (55.4%)
Higher education	1,160 (64.4%)	1,566 (67.2%)	8,507 (32.1%)	11,233 (36.7%)
Company size				
Less than 200 employees	982 (54.3%)	1,124 (47.9%)	14,269 (53.3%)	16,375 (52.9%)
More than 200 employees	610 (33.7%)	1,077 (45.9%)	10,828 (40.4%)	12,515 (40.5%)
Did not answer	216 (11.9%)	145 (6.2%)	1,677 (6.3%)	2,038 (6.6%)
Occupation				
Armed forces	0 (0.0%)	0 (0.0%)	1,268 (4.8%)	1,268 (4.2%)
Armed forces	3 (0.2%)	4 (0.2%)	109 (0.4%)	116 (0.4%)
Professionals	56 (3.2%)	213 (9.2%)	1,047 (4.0%)	1,316 (4.3%)
Clerks	68 (3.8%)	71 (3.1%)	827 (3.1%)	966 (3.2%)
Legislators and senior officials	3 (0.2%)	8 (0.3%)	34 (0.1%)	45 (0.1%)
Corporate managers	105 (5.9%)	303 (13.1%)	1,045 (4.0%)	1,453 (4.8%)
Managers of small enterprises	107 (6.0%)	72 (3.1%)	360 (1.4%)	539 (1.8%)
Physical, mathematical and engineering science professionals	23 (1.3%)	106 (4.6%)	333 (1.3%)	462 (1.5%)
Life science and health professionals	36 (2.0%)	55 (2.4%)	352 (1.3%)	443 (1.5%)
Teaching professionals	541 (30.5%)	218 (9.4%)	520 (2.0%)	1,279 (4.2%)
Other professionals	179 (10.1%)	412 (17.8%)	1,639 (6.2%)	2,230 (7.3%)
Physical and engineering science	48 (2.7%)	108 (4.7%)	1,318 (5.0%)	1,474 (4.8%)

associate professionals				
Life science and health associate professionals	29 (1.6%)	47 (2.0%)	1,015 (3.9%)	1,091 (3.6%)
Teaching associate professionals	20 (1.1%)	49 (2.1%)	586 (2.2%)	655 (2.2%)
Other associate professionals	207 (11.7%)	322 (13.9%)	3,397 (12.9%)	3,926 (12.9%)
Office clerks	47 (2.6%)	104 (4.5%)	1,929 (7.3%)	2,080 (6.8%)
Customer services clerks	14 (0.8%)	11 (0.5%)	383 (1.5%)	408 (1.3%)
Personal and protective services workers	57 (3.2%)	41 (1.8%)	1,510 (5.7%)	1,608 (5.3%)
Models, salespersons and demonstrators	9 (0.5%)	10 (0.4%)	810 (3.1%)	829 (2.7%)
Skilled agricultural and fishery workers	78 (4.4%)	13 (0.6%)	186 (0.7%)	277 (0.9%)
Extraction and building trades workers	39 (2.2%)	54 (2.3%)	1,574 (6.0%)	1,667 (5.5%)
Metal, machinery and related trades workers	23 (1.3%)	21 (0.9%)	1,930 (7.3%)	1,974 (6.5%)
Precision, handicraft, craft printing and related trades workers	15 (0.8%)	15 (0.6%)	340 (1.3%)	370 (1.2%)
Other craft and related trades workers	33 (1.9%)	15 (0.6%)	479 (1.8%)	527 (1.7%)
Stationary plant and related operators	1 (0.1%)	4 (0.2%)	384 (1.5%)	389 (1.3%)
Machine operators and assemblers	8 (0.5%)	2 (0.1%)	801 (3.0%)	811 (2.7%)
Drivers and mobile plant operators	5 (0.3%)	10 (0.4%)	865 (3.3%)	880 (2.9%)
Sales and services elementary occupations	15 (0.8%)	17 (0.7%)	670 (2.5%)	702 (2.3%)
Agricultural, fishery and related labourers	1 (0.1%)	1 (0.0%)	34 (0.1%)	36 (0.1%)
Labourers in mining, construction, manufacturing and transport	4 (0.2%)	5 (0.2%)	593 (2.3%)	602 (2.0%)
Industry code				
Other	0 (0.0%)	0 (0.0%)	1,268 (5.3%)	1,268 (4.6%)
Agriculture	95 (6.0%)	30 (1.4%)	254 (1.1%)	379 (1.4%)
Energy	2 (0.1%)	12 (0.6%)	306 (1.3%)	320 (1.2%)
Mining	0 (0.0%)	3 (0.1%)	108 (0.4%)	111 (0.4%)
Manufacturing	177 (11.1%)	406 (19.4%)	6,329 (26.3%)	6,912 (24.9%)

Construction	95 (6.0%)	142 (6.8%)	1,631 (6.8%)	1,868 (6.7%)
Trade	164 (10.3%)	178 (8.5%)	3,109 (12.9%)	3,451 (12.4%)
Transport	35 (2.2%)	77 (3.7%)	1,252 (5.2%)	1,364 (4.9%)
Bank, Insurance	84 (5.3%)	147 (7.0%)	1,111 (4.6%)	1,342 (4.8%)
Services	937 (59.0%)	1,100 (52.5%)	8,725 (36.2%)	10,762 (38.7%)

Note. Source: SOEP, sample of 11,466 employed workers (30,928 observations) from the 1997, 1999, 2002, 2009 and 2014 waves. The table displays summary statistics of categorical control variables by WFH status.

Table 10

Table of descriptive statistics for the main robustness analysis

	freqWFH6			
	Daily	Frequent WFH	No WFH	Total
N	1,808 (6.6%)	2,346 (8.6%)	23,256 (84.8%)	27,410 (100.0%)
Age category				
18-24	16 (0.9%)	25 (1.1%)	1,459 (6.3%)	1,500 (5.5%)
25-30	85 (4.7%)	149 (6.4%)	2,661 (11.4%)	2,895 (10.6%)
31-40	380 (21.0%)	660 (28.1%)	6,485 (27.9%)	7,525 (27.5%)
41-50	654 (36.2%)	820 (35.0%)	7,231 (31.1%)	8,705 (31.8%)
51-65	673 (37.2%)	692 (29.5%)	5,420 (23.3%)	6,785 (24.8%)
2-Digit Industry Code				
Agric., Forestry	95 (6.0%)	30 (1.4%)	235 (1.1%)	360 (1.5%)
Fisheries	0 (0.0%)	0 (0.0%)	1 (0.0%)	1 (0.0%)
Energy, Water	2 (0.1%)	12 (0.6%)	279 (1.3%)	293 (1.2%)
Mining	0 (0.0%)	3 (0.1%)	102 (0.5%)	105 (0.4%)
Chemicals	23 (1.4%)	53 (2.5%)	640 (3.1%)	716 (2.9%)
Synthetics	2 (0.1%)	9 (0.4%)	189 (0.9%)	200 (0.8%)
Earth, Clay, Stone	3 (0.2%)	2 (0.1%)	167 (0.8%)	172 (0.7%)
Iron, Steel	20 (1.3%)	42 (2.0%)	1,359 (6.5%)	1,421 (5.8%)
Mechanical Eng	49 (3.1%)	151 (7.2%)	1,749 (8.4%)	1,949 (8.0%)
Electrical Eng	21 (1.3%)	101 (4.8%)	635 (3.1%)	757 (3.1%)
Wood, Paper, Print	31 (2.0%)	29 (1.4%)	490 (2.4%)	550 (2.2%)
Clothing, Text	13 (0.8%)	5 (0.2%)	196 (0.9%)	214 (0.9%)
Food Industry	15 (0.9%)	14 (0.7%)	396 (1.9%)	425 (1.7%)
Construction	95 (6.0%)	142 (6.8%)	1,490 (7.2%)	1,727 (7.0%)
Wholesale	34 (2.1%)	50 (2.4%)	674 (3.2%)	758 (3.1%)
Retail	99 (6.2%)	119 (5.7%)	1,843 (8.9%)	2,061 (8.4%)
Other Trans.	35 (2.2%)	77 (3.7%)	1,168 (5.6%)	1,280 (5.2%)
Financial Inst	22 (1.4%)	75 (3.6%)	717 (3.4%)	814 (3.3%)
Insurance	62 (3.9%)	72 (3.4%)	243 (1.2%)	377 (1.5%)
Restaurants	31 (2.0%)	9 (0.4%)	392 (1.9%)	432 (1.8%)
Service Industry	137 (8.6%)	244 (11.6%)	832 (4.0%)	1,213 (5.0%)
Trash Removal	6 (0.4%)	2 (0.1%)	55 (0.3%)	63 (0.3%)
Educ., Sport	553 (34.8%)	323 (15.4%)	1,297 (6.2%)	2,173 (8.9%)
Health Service	75 (4.7%)	181 (8.6%)	2,573 (12.4%)	2,829 (11.5%)
Other Services	92 (5.8%)	175 (8.4%)	486 (2.3%)	753 (3.1%)
Volunt., Church	42 (2.6%)	42 (2.0%)	241 (1.2%)	325 (1.3%)
Priv. Household	0 (0.0%)	5 (0.2%)	102 (0.5%)	107 (0.4%)
Public Administration	32 (2.0%)	128 (6.1%)	2,265 (10.9%)	2,425 (9.9%)

Distance to work in kilometres				
0-10	262 (14.9%)	427 (19.5%)	5,924 (27.9%)	6,613 (26.3%)
10-20	128 (7.3%)	277 (12.7%)	3,869 (18.2%)	4,274 (17.0%)
30-50	44 (2.5%)	106 (4.8%)	1,460 (6.9%)	1,610 (6.4%)
50-100	22 (1.3%)	78 (3.6%)	652 (3.1%)	752 (3.0%)
100-150	4 (0.2%)	22 (1.0%)	110 (0.5%)	136 (0.5%)
Above 150	1,296 (73.8%)	1,277 (58.4%)	9,215 (43.4%)	11,788 (46.8%)

Note. The table is based on the SOEP sample used in the main robustness analysis. Source: SOEP. 1997, 1999, 2002, 2009 and 2014 waves. The different variables used in the main robustness analysis are displayed in this table. Grouped by the new WFH frequency variable, which excludes workers that do WFH »rarely, only if necessary«.