From 'home work' to 'home office work'?

Perpetuating discourses and use patterns of tele(home)work since the 1970s: historical and comparative social perspectives.

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ABSTRACT

In contemporary debates, it is regularly overlooked that working from home already has a long history, while the phenomenon of 'tele(home) working' has even gained momentum since the 1970s, being increasingly technologically enabled and socially prepared. This article aims to identify the self-perpetuation of work from home by investigating phases, turning points and diverging temporalities of gender- and parenthood-specific discourses and use patterns of tele(home)work in Germany and the United Kingdom from an interdisciplinary perspective, combining historical and comparative social analysis.

KEY WORDS

flexible working, telework, work at home, historical perspective, comparative perspective, gender inequalities

Introduction

An increase in flexible working, that is, having control over when and where to work (Chung & Van der Lippe, 2020:365), is one scenario of the digital future of work

(Kocka & Offe, 2000; Messenger & Gschwind, 2016; Winkelmann, 2019; Kossek, 2016; Kossek, Perrigino, & Gounden Rock, 2021). Digital information and communication technologies allow interaction with supervisors and colleagues as well as access to work-related data from anywhere at any time, progressively permitting remote and mobile work arrangements. New technological developments, such as cyber-physical systems, algorithms, or digital platforms, further provide new digital ways to regulate and coordinate work performed irrespective of time and place (Brynjolfsson & McAfee, 2014; Hirsch-Kreinsen & Ten Hompel, 2016; Kirchner & Schüßler, 2019; Pongratz, 2018). Consequently, a considerable share of work is no longer restricted to specific work sites and working times (Arntz, Yahmed & Berlingieri, 2020; Dingel & Neiman, 2020; Mergener, 2020). Moreover, during the global COVID-19 crisis, the 'home office' became the order of the day, and this is expected to continue (Pfeiffer, 2021a; Chung, Birkett, Forbes & Seo, 2021).

This suggests a partial disruption of the ideal worker norm, which describes a worker as someone who is present at a regular work site during regular working hours and who prioritises work in line with traditional male life courses (Acker, 1990; Kelly, Ammons, Chermack & Moen, 2010; Williams, Blair-Loy & Berdahl, 2013). Existing research, however, points to gender- and parenthood-specific discourses and use patterns of work from home that reproduce or even reinforce gender inequalities in the labour market (Munsch, Ridgeway & Williams, 2014; Arntz, Yahmed & Berlingieri, 2020; Chung & Van der Lippe, 2020). Furthermore, it suggests that women use work from home to better align work and family demands, whereas men use it to realise high work demands (Lott & Chung, 2016; Lott, 2020). In this context, women, in particular, report that work from home is not allowed or is associated with being less productive (Munsch, Ridgeway & Williams, 2014; Lott & Abendroth, 2020). Men instead seem to have better access to this work arrangement, use it more often and seem to receive wage premiums (Lott & Chung, 2016; Chung, 2020; Lott, 2020).

To better understand current gender- and parenthood-specific discourses *on* and use patterns *of* work from home, this contribution asks whether these public discourses and use patterns have developed over a longer historical time span in the Federal Republic of Germany (FRG) and the United Kingdom (UK) due to changing technical preconditions and political and legal frameworks that progressively touched on the gendered division of labour. Although in Germany and the UK the gendered division of labour is still predominant, the countries differ not only in their welfare state and gender-care regimes but also in how work from home was politically institutionalised (Esping-Andersen, 1990; Lewis, Knijn, Martin, & Ostner, 2008; Bonin et al., 2020). We ask the following: how did gender- and parenthood-specific discourses on and use patterns of work from home develop over historical time? How do they interrelate? Conclusively, do gender-specific developments differ or converge between Germany and the UK?

Hence, in this article, we explore the discourse around telework in its preplanning stage and its early experimental implementation up to the early 1990s and then examine its use and widespread adoption from 1995 onwards to examine the diverging temporalities (Edgerton, 2008) and evaluate whether debates here opened spaces of expectation or drove political measures that conditioned certain use patterns or

whether there were rather ruptures and unpredicted developments (due to new technical possibilities and changing social and labour market policies).

By examining the origins and evolutions of gender- and parenthood-specific discourses and use patterns of work from home and their development over a long time span and in two social settings, our research lends historical depth to the analysis of the present day by reflecting on milestones, leaps and caesuras of the 'digital transformation' (Pfeiffer, 2021b:13; 130). Thus, in analysing long-term trends, persistence patterns and path dependencies, we understand digitalisation as a long-standing, evolutionary process (Bösch, 2017:10; Heßler & Thorade, 2019:167–170), characterised by social and technical changes leading to new political and legal conditions and shaped by discursive negotiations, particularly regarding changing projections of the 'future' of work and society.

In this context, we aim to evaluate how gender- and parenthood-specific discourses and use patterns changed by analysing path dependencies, converging trends and disruptive developments. To this end, we discuss to what extent use patterns and discourses – as acting and thinking spaces – were bound to concrete sociotechnical settings causing path dependencies or, rather, followed new trajectories, promoting possibilities that were both discursively imagined and experimentally enacted and whose dynamic, self-reinforcing tendencies can be described as 'self-perpetuated'.

By zooming in on gender- and parenthood-specific discourses and use patterns of telework, we explore whether these dynamics were driven by sociotechnical changes and how and why, depending on national contexts, the new technically enabled work-from-home started to permeate discourses on the future of work as well as actual work practices. Here the paper speaks to the broader interdisciplinary debate on societal change which is expected in the digital transformation of work, as well as its tendency towards 'self-perpetuation' with path-dependent and accelerated discursive and usage dynamics of sociotechnical work settings in the digital age.

To analyse developments in temporarily and spatially diverging contexts, the historical analysis of discourses is carried out based on selected qualitative case studies and observations of the FRG and the UK, including comparative side glances into the broader Anglo-American context. These are predominantly gained by historicising and re-evaluating popular media accounts as well as social science studies and surveys. Selected archival sources complement the corpus. Contrasting these qualitative, exemplary insights, according to our interdisciplinary approach, we additionally integrate quantitative analyses. Using comprehensive German and UK survey data, we trace trends in use along the lines of gender and parenthood from the mid-1990s onwards. Given the relevance of childbirth for gender inequalities, we expand trend analyses using a life-course perspective, where we analyse how the relevance of transitions to different family-life stages has changed for men's and women's use of telework over time. The analyses centre on data from the Socio-Economic Panel (SOEP) and Understanding Societies Survey (UKHLS). This interdisciplinary approach allows us to explore whether discursive trends and/or use patterns self-perpetuated, decoupled from technical possibilities and political regulations, or whether congruent developments can be observed.

To contextualise the research question and related analyses, this article begins with a description of the background of telework, focusing on its technological enabling and social embeddedness in section two. Section three provides information on our methodological approaches and is followed by the results in section four. Finally, in section five, we synthesise the results on gender- and parenthood-specific discourse and use patterns to determine the implications of the study. The findings of this study indicate that both the discourse on telework and its use patterns show tendencies of self-perpetuation through path dependencies, as they remain gendered and related to parenthood while also detached from technical possibilities and regulative changes. Although in some ways disconnected from institutional settings and technical facilitation, the results indicate that discourse and practice develop simultaneously.

Background

Technically enablement: digital devices and networks

Work from home is increasingly technologically facilitated. The results for Germany and the UK for 2020 indicate that, based on job-specific tasks, at least 40% of jobs could (partly) be performed at home (Arntz, Yahmed & Berlingieri, 2020; Boeri, Caiumi & Paccagnella, 2020). This again has been gradually enabled by the spread of digital computer and network technologies over recent decades. As these technologies developed, workplaces were also reorganised. While in the 1950s and 1960s gigantic 'electronic brains' – in spatially autonomous data centres – served as 'scientific supertools' in academia, the military and administration (Haigh & Ceruzzi, 2021), commercial usage accelerated and by the 1970s computers had conquered major corporations and public administrations with the miniaturisation and evolution of mini and small business (micro)computers and the 'unbundling' of software and hardware solutions. The dawn of the personal computer (and portable laptops) in the early 1980s marked another essential milestone on the way 'from mainframes to smartphones' (Campbell-Kelly & Garcia-Swartz, 2015:3). In this context, experiments to reorganise the workplace and decentralise working worlds using computers were closely linked to advances in computer technologies in general and the newly emerging computer service industries in particular. As an increasing number of commercial users discovered the computer's relevance, computer services quickly became a growing business in the USA and Europe (Abbate, 2012:113–143; Yost, 2017).

As computers developed as data processing devices, digital network technologies also grew. Since the early experiments of the 1960s (Abbate, 2000), new global communication and remote data transmission networks spanned the globe, virtualising communications to the cloud (Hu, 2015). The expansion of digital infrastructures built on (copper and, later on, fibre-optic) cables and wireless technologies supported new customer-to-customer switched networks (such as Telex in Germany) and promoted new agreements on IT standards (Henrich-Franke & Ambrosius, 2015; Henrich-Franke, 2019; Yates & Murphy, 2019:241–268). Since the late 1990s, with the commercial breakthrough of the Worldwide Web and rapid spread of mobile telephony, new mobile and remote work constellations have occurred, globalising data business

process outsourcing and providing – near- *and* offshore – back office services (Homberg, 2018).

For a long time, however, analogue and digital practices were closely linked, since home-based 'computer work' in Europe (and the USA) was usually done by pencil and paper in its beginnings. Freelance programmers since the 1950s only needed access to a telephone to resolve queries with their managers, writing their programs on coding sheets and then sending their handwritten numerical programs by post to an independent data centre whose employees punched the data onto punch cards or paper tape. While the programmers went out to their clients once or twice a week to use computers, they only travelled directly to the data centres, when there were problems (Handy, 1978; Simons, 1981; Huws, 1984b; Kendall, 1993; Shirley, 2020:120;150). Only in the 1970s did this model change slightly as regional satellite offices – equipped with computer terminals – enabled programmers to alternate home- and on-site work. Digital technologies now spread gradually. However, in 1985, only 5% of private households used a home computer in the FRG, France and Italy, while between 13% and 20% did so in the UK. By around 2000, these numbers had increased to 47% (FRG) and 44% (UK), reaching 90% (FRG) and 88% (UK), respectively, in 2018 (Empirica, 1987: 16–17; Huws/Korte/Robinson, 1990: 178–200; Heidtmann, 1992: 126–128; Stöber, 2013: 124–127; Campbell-Kelly, 2015: 116–118; Statista, 2020; 2021). Internet access increased in these countries from approximately 60% in the UK and Germany in 2005 to 97% (UK) and 96% (Germany) in 2020 (OECD, 2022a).

Bearing in mind that computer usage and internet access became widespread only in the 21st century (Statista, 2020; 2021; OECD, 2022a), we hypothetically assume a rather restrained, limited and specialised argument that, nevertheless, in line with the larger discourses on computerisation, such trends were heavily polarised and conveyed increasingly high expectations. Similarly, continuous, limited growth of work from home over time is expected.

Socially prepared: political directives and legal frameworks of tele(home)work

In line with the increasing technological possibilities to work from home, its growing use[1] was also socially prepared; stimulated by corporate, trade union and workers' interests; regulated by political directives and embedded in legal frameworks. Since 1945, in all European countries, initially a male breadwinner model was prevalent; according to this, until the 1960s, women predominantly stayed at home and undertook domestic and care work (Kuller, 2007:201). This pattern was in line with established gender and generational regimes. For a long time, social concepts, norms and values replicated in tax, labour, family and marriage law became instrumental in establishing the male breadwinner model as a guiding principle. Technology companies such as IBM's West German subsidiary in these days accordingly even used a conservative

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1   The long history of 'work from home' clearly predated the digital age (FES 2020). Thus, despite all popular assumptions vis-à-vis a steady decline in homeworking in the 20th century, its renewed growth in numerous economic sectors in Europe (as well as in North America and Australia) had already been recognised in 1983 (Lipsig-Mummé 1983:546–550).

rhetoric in gendered communication presenting IBM's head, Thomas J. Watson, as *pater familias* in the 'IBM family' to pursue welfare capitalist measures in the 1950s and thus effectively holding up labour organisation attempts (Schlombs, 2017). Despite women's work becoming widely accepted in both countries by the mid-1960s – the quota of women working part-time rapidly increased in the FRG from 7% in the early 1960s to 19.3% in the early 1970s and in the UK from 12% in the early 1950s to 26% in the 1960s and 35% in the 1970s (Von Oertzen, 1999:210–232; Kuller, 2010:74–77) –, it was only in the last third of the 20th century that gender regimes slowly changed when state policies were less bound to the traditional breadwinner paradigm with the *pater familias* as the nucleus. In Western Germany, through the 1960s, part-time work was credited in the country's social security systems, while in the UK, the 'Social Security Pensions Act' of 1975 served as a major step towards equalising pension rights. The German plans to pursue a 'caregiver-parity-strategy' (Sainsbury, 1999:263f.), which also included parental leaves and allowances and credited baby years as well as care services in pension insurance, proved to be more impervious to neoliberal approaches to dismantling the welfare state in the 1980s and 1990s. In Western Germany, elaborate political concepts shaped the changing gender politics, whereas in the UK, representing the 'liberal' state model, a social security system centred on the male breadwinner was less pronounced. However, this model also generated specific gender inequalities, less caused by unequal social services than by tax and labour policy. In addition to such attempts to equalise social benefits, state programmes also began to politically support family work from the 1970s. Hence, in both countries, new initiatives to expand the networks of public childcare facilities (crèches, all-day nurseries and schools) were launched and were widely realised in the 1990s, although the supply of daycare centres both in Germany and in the UK remained below average. However, as much as such new gender regimes reflected the pluralisation of female life and career plans, the male model, with its uninterrupted, career-oriented, full-time standard employment relationship, was hardly shaken. Rather, despite all regional divergencies, across Europe, social patterns in household and care work distribution proved quite 'change-resistant' (Kolbe, 2002:167–170; Kuller, 2007:233–234; Mattes, 2012:197–199). Therefore, while by the 1970s the *breadwinner/housewife* paradigm was replaced by a *breadwinner/additional income-earner* model, which also created segregated labour markets for women with significantly poorer opportunities for earnings and career advancements, even deepening the gender gap, only in the 1990s was a new *adult-worker-model* increasingly politically supported. Yet, the gendered division of labour challenged women to harmonise their laborious (and sometimes unpaid) care and household work with their jobs. Beyond all differences, both countries showed strong similarities (Kocka, 2001:8–13; Woods, 2004:208–213; Lewis, 2006: 40; Kuller, 2007:232–236; Kuller, 2010:65–67; Summers, 2012:175–178; Lenger & Süß, 2014:3; Neumaier, 2019:435–442). These changing family policies were accompanied by a higher number of dual-earner families in the late 20th (Lenk, 1989:42) and early 21st centuries. In line with this, maternal employment rates (child < 14 years) rose to 74% in Germany and 73% in UK in 2019. Yet, full-time rates among mothers in UK (40%) and Germany (36%) remain substantially below the EU average (OECD, 2022b), suggesting increasing interest in working from home, especially for mothers.

As a 'Homeworkers Protection Bill' was still being controversially discussed in the UK, a 1930s and (newly amended in 1975) 'Homework Act' already existed in Germany (Karpf, 1980:104–128; Kilian, 1985:152; Tate, 1995:83–85). Nevertheless, even in Germany the regulation of 'homework' was debated. In the late 1980s and early 1990s, thus, teleworkers (unlike homeworkers in general) were generally categorised as employees with regular labour and social rights claims (Gitter, 1985; Kilian, Borsum & Hoffmeister, 1987; Lenk, 1989:158–207; IG Metall, 1993:46–73). Today, in Germany, telework and home-based work follow regular labour and social rights when workers are employed by an organisation, while mobile work is still less strictly regulated (see Backhaus, Tisch & Beermann, 2020).

However, since 2002, an EU agreement on telework has been in place, referring to telework as any activity that could be done from employer premises but also done away from these premises (for example, at home), and the agreement holds that teleworkers enjoy the same rights as workers who do their job from the employer's premises (European Framework Agreement on Telework, 2002).

This was particularly important, as early model experiments in implementing new work arrangements were quite diverse (see Appendix 1, Figure A1; cf. also Godehardt, 1994: 295–313; Büssing, 2003:18–20). Thus, alongside model experiments with secretaries and data typists in the UK and FRG (Ballerstedt et al., 1982; Huws, 1984b; Dostal, 1985; Kern & Wawrzinek, 1985; Bullinger, Fröschle & Klein, 1987), which mainly addressed women, there were also attempts to establish new computer-based home-working practices among managers. These highly paid, better educated (male) experts and 'elites' of digitalisation – contemporarily described as 'time pioneers' (Hörning, Gerhardt & Michailow, 1990) – gained new autonomy, both temporally and spatially, from remote working. In the early 21st century in the UK, the expansion of teleworking practices was mirrored in the extension of the right to request telework by employees with caregiving responsibilities (this right was passed in 2002) to *all* employees under the 'Children and Families Act' in 2014 (Bonin et al., 2020). However, employers could still reject the request when it posed risks to the organisation's functioning. Although the right to claim telework is politically discussed in Germany, it has not yet been implemented (Picker, 2019). In line with these different regulations, recent research has shown that the use of home-based work is higher in the UK than in Germany (Chung & Van der Lippe, 2020).

Developments in family policy were also accompanied by an overarching trend towards flexibilisation in labour market policies in the FRG and UK from the 1970s (Süß & Süß, 2011; Süß, 2012; Süß, 2016); politicians, corporate representatives, and employers' and employees' associations accordingly struggled over new ways to reorganise the workplace, discussing with a sense of urgency new, flexible forms of home-based work. Work from home can also be used in the interest of employers to flexibly respond to work demands irrespective of time and space (Chung, 2017).

In general, the development of 'tele(home)work' in the USA and Europe can be divided into three phases. Firstly, in the late 1970s, early experiments aimed at transferring ICTs into the world of office workers. In these years, implementing teleworking models was predominantly a means to outsource routine desk work. Secondly, from the mid-1980s onwards and, above all, in the early 1990s, big

companies – largely driven by governmental research and subsidy policies – identified executive employees, managers and programmers as target groups, authorising teleworking for more complex tasks. Since the late 1990s, in the dawning online era, digital technologies, thus, enabled new home-based and mobile work constellations. Thirdly, with the rapidly growing dispersion of the World Wide Web and the rise of small, smart mobile devices in the 21st century, mobile work left its stationary character, allowing work to be done almost anywhere. Recently, the development of 'telework' has been described as involving a three-generation evolution from home to mobile offices and, most recently, virtual office work (Messenger & Gschwind, 2016:197).

Given the societal changes outlined above, and especially the changing gender relations, we hypothesise that a new and growing public attention economy for work-family balance issues is emerging and expect the issue of tele(home)work to be increasingly discussed along the lines of gender and family politics, sharply reframing the discourse on computerised 'flexibilisation' as a gender issue. In the same vein, we hypothesise a general increase in telework use in both countries over time with gender- and parenthood-specific use patterns that only slowly diminish. In Germany, in particular where requesting telework is not a legal right provided to all employees, as is the case in the UK, alignments of trends for men and women should be less pronounced.

To conclude, the social and legal preconditions in Germany and the UK shaped the dissemination of technically enabled work from home, while perpetuating over time, in line with distinctive path dependencies. The concept of path dependence acknowledges that this dissemination was (and is) a process informed by the past, indicating an evolutionary rather than a disruptive pattern of dissemination (Araujo & Harrison, 2002; Vergne & Durand, 2010; Fraunholz & Hänseroth, 2012:23f.). Describing such work patterns, we suggest that both the discourse on telework and its use patterns show tendencies of self-perpetuation through path dependencies – as remaining gendered and related to parenthood – over historical time and space. However, exogenous shocks can also disrupt established patterns and alter, expand and accelerate self-perpetuating tendencies (Vergne & Durand, 2010), as it was the case during the COVID-19 pandemic (Abendroth et al., 2022).

Method

In line with our interdisciplinary approach to analysing gender- and parenthood-specific developments in temporally and spatially diverging contexts, we combine historical analyses of the discourses along selected qualitative case studies and observations with quantitative analyses of the use of telework from the 1990s onwards. Our historical and sociological analyses of the FRG and the UK are expanded by comparative side glances into the Anglo-American contexts.

Discourse

In tracing the origins of 'telework' in its international discourses, we encounter contradictory visions of the 'future of work' (Kocka, 2000). These visions paradigmatically expose the contested 'past futures' (Pias, 2005; Bösch, 2017;

Hölscher, 2019; Rehlinghaus & Teichmann, 2019) of the digital age. From a cultural history perspective, such visionary concepts are particularly remarkable, as they came along with certain discursive and visual narratives to stage both computer work and workers. Thus, we exemplarily use a discourse analytical approach (Landwehr, 2007) incorporating linguistic and visual sources to examine how computer work has been perceived and symbolically charged since the late 1950s. The sources exemplarily demonstrate how public discourses and private expectations popularised and perpetuated technological plans, visions and utopias (Fraunholz & Woschech, 2012), bundling sky-high hopes and deep fears concerning the machinations of the machine age in the emerging 'digital society' (Bösch, 2017; Gugerli, 2018; Gugerli & Zetti, 2018).

By investigating the shifting discourses from a broad historical perspective and accentuating the interactions between digital technologies and social changes, we link up with debates in contemporary history on the history of work and the welfare state, science and technology policies, and family and gender relations in Europe since 1945. While primarily focusing on the perceptions and interpretations of the practice of computer usage and its social consequences, we analyse the discourses in their social contexts. As such, the history of digitalisation can be seen as a new integrative paradigm of writing a people's history ('Gesellschaftsgeschichte') of the late 20th and early 21st centuries (Danyel & Schuhmann, 2015; Rankin, 2018).

Dissemination and use patterns

Applying quantitative methods to large-scale data from Germany and the UK, the sociological part of this study provides a trend analysis of the use of home-based work among mothers, fathers and childless men and women in both countries over time. Based on a life-course perspective, the importance of transitions to parenthood for the use of home-based work among men and women is additionally investigated, considering whether these transitions gained importance over time while applying individual fixed-effects models. Hence, we estimate increases/decreases in the likelihood of working from home related to the birth of a child or the increasing age of a child over time.

Trend analyses are conducted using yearly linear regressions based on five waves (1997, 1999, 2002, 2009 and 2014) of the *German-Socioeoconomic Panel* (SOEP) and five waves (2010/2011, 2013/2014, 2016/2017, and 2018/2019; Siegers et al., 2020) of the British *Understanding Society Panel* (UKHLS; Fumagalli, Knies, & Buck, 2017) while controlling for occupation, age and tenure for each year. The data contain information about the respondents' individual and household characteristics and on the respondents' employment. Because telework activities were not included in all waves, data were restricted to years including this information. We only included respondents who were questioned in two or more waves, who were in gainful employment within the last seven days and who were between the ages of 15 and 64. Longitudinal analyses only included individuals who either had children younger than 16 living in their home or who experienced childbirth within the observation period.

The variables indicating *working from home* are coded as 0 when employees either did not work from home or their organisation provided no opportunities to work from

home. Variables are coded as 1 for respondents working from home regularly (the UK) or weekly/monthly/occasionally (the FRG).[2] Descriptive analyses are differentiated, based on gender and parenthood, between fathers (1), childless men (2), childless women (3) and mothers (4) we herein follow the prior work of Arntz et al. (2022) on the development of work from home in Germany. Longitudinal analyses are separated by gender. The age of the youngest child is the main control variable and is coded for children aged 0–1 (1), 2–5 (2), 6–11 (3), and 12 and older (4). For children not born yet, the variable is coded as 0.

Results

Historical discourse

Telework-futurism: wired societies and electronic cottages
In the late 1950s, in the formative years of the digital age, the image of the 'electronic homeworker' was shaped by early experiments (Abbate, 2012:128–140) and popularised in the literature on automation (Jones, 1957; Goodman, 1958). Here, pioneering attempts, largely by women programmers and entrepreneurs in the USA and UK, aimed to promote computer work to combine career and care work. Most prominently, US-American mathematician Elsie Shutt, for example, started her company, Computations Inc. in Harvard, Massachusetts in 1957, while British programmer Stephanie Shirley established Freelance Programmers (later to become F International) in Chesham near London in the early 1960s (Shirley, 2001; Shirley, 2020), empowering women to work. Yet, introducing the new home workers, many media reports, stereotypically, patronised the 'women entrepreneur' and her 'girls' as 'pregnant programmers'. The *Business Week* in 1963 even staged photos to show what a 'typical scene' of working from home looked like and thus promoted a new iconography which overshadowed the well-established, traditional image of the woman as the 'good wife and mother' with the image of the 'working professional'. From there on, similar pictures portraying the new computer piecework in the living room (Buckinghamshire Examiner, 1977; Bahl-Benker, 1984; 1985 a/b; Schöll & Küller, 1988), spurred the public and academic 'attention economy'.

However, the phenomenon received broader attention slightly later. Futurists, from the early 1970s, read the growth in the cottage industry as evidence of computers and IT playing a decentralising role in society. In accordance with prophetic and excited accounts of global villages (McLuhan, 1962) and virtual cities (David, 1969:80f.), the 'wired society' with its growing rural economy became a popular trope in discourse (Martin, 1978). In 1970, James Martin, known as the 'guru of the information age' (Röhr, 2021:60), and Adrian R. Norman claimed 'we may see a return to cottage industry with

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2   In the German SOEP, respondents stated whether they occasionally worked from home and if so, whether they did so on a weekly or monthly basis or less than once a month. In the British UKHLS, respondents state whether their organisations provide opportunities for flexible employment and if so, whether employees 'work from home on a regular basis'. Based on the wording of the questions, we do not know the exact frequency of homeworking activities in the UK. To us, it seems that the British wording of 'regular work from home' combines the categories working from home weekly/monthly contained in the German survey.

the spinning wheel replaced by the computer terminal [...]. Indeed, in the future, [...] some companies may have almost no offices' (Martin & Norman, 1970:155–156).

A decade later, still mesmerised by the new technology's potential and a possibly computer-networked world, US writer and businessman Alvin Toffler devoted an entire chapter of his bestseller *The Third Wave* (1980:194–207) to this postspatial, postindustrial future with his idea of 'electronic cottages'. Toffler's' revolutionary 'techno-sphere' quickly fired utopian visions. Hence, architects and writers Roy Mason and Lane Jennings enthusiastically advocated for a 'computer home' – a 'home-centred life of the future' – which would be 'exhilarating and mind-expanding' (Mason, 1983). Similar (positive) diagnoses were shared by industrialists such as Mike Aldrich (1982), feminists such as Barbara Gutek (1983), and academics such as Frederick Williams (1983), who proclaimed the dawn of an 'electronic renaissance'.

The idea of *working* at home, here, was incorporated into a wider, popular discourse on using IT gadgetry to bank, shop for and access computer-based news services 'from your own living room' (Forester, 1988:232; Miles, 1988; Huws, 2003:91–93). Such computer home scenarios – imagining home places as 'domestic machine-utopia[s] cocooned from the outside world' (Robins & Hepworth, 1988: 158; 170f.) – promoted a modern technology-savvy, consumer-oriented lifestyle while they, at the same time, curiously appeared conservative with their invocation of familial unity and rural setting. By no coincidence, Rowan A. Wakefield, editor of the *American Family Newsletter*, thus evoked such electronic 'neo-familialism' (Godard, 1985: 327; 335) in nostalgic words: 'family empowerment means ... using home computers to bring back into the home many functions that were there before the industrial revolution ... Its coming is inevitable, a direct result of the marriage of the computer with the family in our information age' (Wakefield, 1986:18–19). The *New York* magazine featured a cover story ('Home Is Where the Office Is') and romanticised the 'husband-at-home-families' as 'best of both worlds', characterised by professional success and expanded family time (Pettus, 1982:28–34). Publicly, male telecommuters were now staged as New Men and New Fathers (in opposition to the 'Company Men'), as telework allegedly created the opportunity to share domestic responsibilities, while telework and tele-education were said to particularly enable women to equally master career, care work and household duties (Patton, 2020:145–157). This imagery, however, was by no means restricted to the USA.

In general, in the USA and Europe, optimistic views conveyed the idea that all social activities and transactions would become electronically mediated (Robins/ Hepworth, 1988: 157). However, these views were contrasted by alternative visions according to which the new digital technologies caused isolation, atomisation and exploitation (Gregory, 1983; Huws, 1984a; Huws, 1984b; Siegel & Markoff, 1985; Mehlmann, 1988; Huws, Korte & Robinson, 1990:XIII). From this perspective, a new Fordism was seen as being expanded to home-based working regimes.

Family and gender relations: home-based scenarios of living and working in the digital age

Regarding gender relations, critics declared that, although telework created the opportunity to share domestic responsibilities and tele-education particularly enabled women to equally master career, domestic work and child-rearing, it created new

low-paid, low-quality labour and thus reproduced and even strengthened the traditional division of labour between the sexes. Moreover, digitalisation gendered communication patterns (Mettler-Meibom, 1988) and created a new political economy. This pessimistic image was perpetuated in the rhetoric of the 'electronic cage':

> *women isolated at home, trapped in electronic cages, using cable tv, computers and touch-tone phones for video shopping and telephone banking. Women reading Family Circle Magazine on the tv-screen to see which recipes they should pull from their home computer file, while daughter Jane plays with her voice-synthesised doll and son Dick plays computer chess. Women forced to data entry or circuit board assembly from home for piecework pay, so they can work and care for children at the same time.* (Zimmerman, 1983:4; cf. generally: Frissen, 1992:36–43)

Alluding to 'trapped housewife syndrome' (Friedan, 1963), contemporaries started to analyse the idea of 'home informatics' from a feminist perspective, labelling the domestic sphere a sphere of female 'oppression' and even 'enslavement' (Huws, 1984a; 2003).

Here, 1973 marked a milestone in the long and chequered international discourse on telework. At the time, an interdisciplinary team of researchers at the Center for Futures Research at the University of Southern California, Los Angeles started a programme to develop and critically investigate new ways to digitise working worlds. The group, led by Jack Nilles, a former NASA engineer, discussed possibilities to substitute telecommunications for transportation. Their report 'The Telecommunications-Transportation Tradeoff' quickly became a founding document of the rapidly growing discourse on 'telework' in the following years (Nilles, 1974; 2007). Promoting new, flexible working worlds, Nilles and his team proposed 'telecommuting' as an 'alternative to transportation' – and an innovative answer to traffic gridlocks (as well as its environmental consequences such as air pollution), urban sprawl and the scarcity of non-renewable resources (Gan, 2015; see Figure 1). Thus, they envisioned a decentralised working system dispersing companies into 'satellite offices' where employees could work remotely instead of being physically present at headquarters or commuting to a central location downtown.

The study promised rosy prospects, while the vision of computer-based home work particularly gained in charm vis-à-vis the increasingly pressing energy and environmental crisis and the overarching diagnoses in an 'Age of Uncertainty' (Galbraith, 1977). Awaiting the worldwide web and the personal computer to transform the workplace, Nilles' team predicted that 'communications and computer technologies have the potential for acting as catalysts that could radically change the structure of American society in much the same way' as 'the automobile [...] during the first half of this century' (Nilles, 1974:130–132). The new digital data highways and communication networks were expected to change work *and* family relations.

However, although the team quite thoroughly anticipated potentially problematic, negative consequences – such as new pressures towards 'flexibility' and 'part-time job mobility' or a tendency to 'monitor [the workers'] output and productivity'– the study, in general, predicted 'a favorable change in the quality of life for the individual; a change predicated on a healthier environment and a heightened feeling of identity with his or her community, family and co-workers' (Nilles, 1976: 11–15; 154–165; Nilles, 1985:204–207).

Figures 1 – 3:   Telework

Sources: (1) (left) 'It's 8:45 – Do you know where your employees are?'. *Forbes Magazine*, September 12, 1983; (2) (centre, above) 'Had a hard day in the study, dear?'. *Newcastle Journal*, April 16, 1993; (3) (centre, below and right) 'Akkord im Wohnzimmer', in Schöll/Küller (eds): Micro Sisters, Berlin 1988:31; 33.
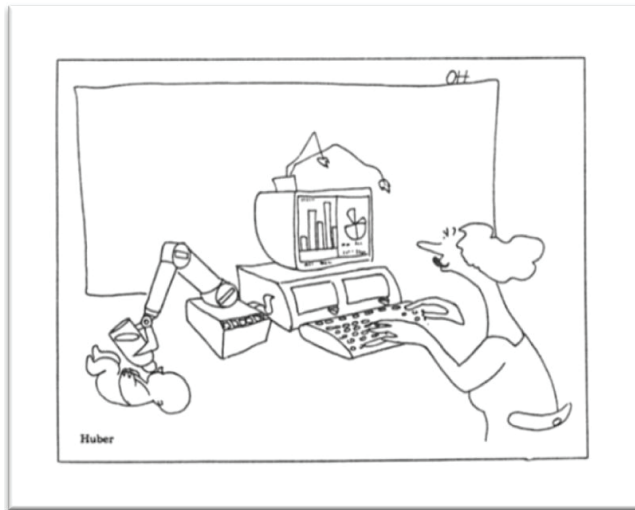
Figure 4: Combining career and family?

Source: Angelika Bahl-Benker (IG Metall): Telearbeit. Ein Beitrag zur Humanisierung der Arbeits- und Lebensbedingungen der Arbeitnehmer/innen? in H. ans R. Hansen (ed): *GI/OCG/ÖGI-Jahrestagung 1985*, Berlin:1021.

Discursively, the image of the remote worker was (re)shaped in the 1970s by Nilles' study. From there on, in the USA, studies adopted the neologism of 'telecommuting' implicitly alluding to the typical 'commuter', who was widely imagined as being 'male, working in a managerial or professional capacity, conforming to a corporate ethos and

living in the outer suburbs' (Huws, 2003:90),[3] although newspaper images depicting the new telecommuters were less gendered (Reinhold, 1977; Macrae, 1978; Pollack, 1981; Salmans, 1982; Wiegner & Paris, 1983; Kroll, 1984; Raimondi, 1985) in this period.[4] Furthermore, popular imagery was superimposed by ideas whose origins lay in the countercultural, libertarian movements of the 1960s and 1970s, which radically criticised – with their hippy-like hostility to bureaucracy and large-scale organisations – a corporate industrial society and evoked a new 'creative worker' (notably: a white middle-class male worker) in a decentralised 'post-industrial society' built on small workplaces networked by 'convivial' and 'appropriate' technologies (Reich, 1970; Bell, 1973; Illich, 1973; Schumacher, 1973). Around 1980, when the discourse spilled over to Europe, the debate on 'telework', 'Telearbeit' or 'télétravail', however, was quickly led by the imagery of the *female* worker (Wilson, 1982; Monod, 1983:677–678; Huws, 1984b; Farthmann, 1984:548; Craipeau, 1985) while critical positions increasingly gained a voice.

Gender@work: discourse economies in the FRG and UK

Since telework was first discussed controversially in the 1970s, several weighty policy reports and technology assessments, international studies and symposia have covered the topic. From its outset, however, the debate was not detached from party politics. In Europe, as in Western Germany, France and the UK, establishing electronic highways and innovating 'telecommunication [was] becoming the centrepiece of national industrial policies' in the 1980s (quoted in: Melody, 1986:80; see also Nora & Minc, 1978; Lange & Wichards, 1982; Craipeau, 1984; Grande, 1989; cf. generally Röhr, 2021:202–232).[5] Optical fibre cables were planned to modernise the 'countries' infrastructure, while in Germany and the UK, the ill-planned cable policy rapidly provoked critique.

In this context, in the UK, computer and social politics were connected. Notably, Labour (and later Social Democrat) MP, Shirley Williams, stated that 'microelectronics offer the opportunity of reuniting the family' (Williams, 1981:69). However, it was mostly conservative agents – Prime Minister Thatcher and her Minister for Information Technology, Kenneth Baker, industrialists and even bishops – who supported the plans to create telework opportunities. Industrialists such as Mike Aldrich, ROCC Computers

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3   This was in line with early social studies assuming 53% of the telecommuters in the USA to be male (US DOT, 1993: 20f-21). However, while in the USA white middle-class men predominantly owned PCs and home computers (Edwards & Edwards, 1983:20–22; Holden, 1984:296; Baer, 1985:137), read newspapers such as Cottage Connection or Telecommuting Review, and overwhelmingly subscribed to tele-networks such as the online-group 'Working from Home' (close to 97%) established on the CompuServe network, here, large numbers of teleworkers were female, too (Huber 1987: 118119; Calabrese, 1988:3–5).

4   By 1985, the US press printed various articles on new telework arrangements, showing both sex white-collar workers (clearly mirroring hierarchies by mainly portraying male managers and female secretaries/data-typists), while later images predominantly staged the female teleworker (cf. for example Goncharoff, 1985; Rothmann, 1985; Perez-Peña, 1992; Calem, 1993; Shields, 1995).

5   By no coincidence, hence, in Europe and the USA, the rise of 'teleworking' by the 1990s was closely linked to the experiments by computer service companies. In the UK, early experiments by ICL and Rank Xerox (Ramsower, 1985; Christensen, 1987; Coulson-Thomas, 1990) at their London branches and in Germany by Siemens, Deutsche Telekom or IBM Germany (Wegener, 1983; Glaser, 1995; Sommer & Schertel, 2001; Büssing, 2003) show how computer and telecommunication companies pioneered new teleworking models in the 1980s and 1990s. In both countries, these companies primarily capitalised on such evolution by producing terminal equipment and operating networks.

Managing Director, who was the lead author on UK policy reports such as the Cabinet's IT Advisory Panel, *Cable Systems*, thus promoted a computer policy that supported his plans to sell data entry systems, investing in viewdata (videotex) systems and home computers. In his book, he claimed, 'the burden of change must be towards home-centring our lives' (Aldrich, 1982: 100). Lamenting the changing 'anti-family' practices and 'attitudes to work', and their social implications, his program clearly centred on women who were beginning to transcend the traditional roles (care work and household) assigned to them.

In the FRG, the outgoing social-liberal coalition and especially, later, the conservative administration under Christian Democratic chancellor Kohl (CDU) emphatically embraced the new technologies and propagated the expansion of digital communications by cable and a computer-compatible expansion of the telephone network (BT, 1984b; Mettler-Meibom, 1986; Mettler-Meibom, 1988). Here, too, male protagonists largely commented on new opportunities where 'technical progress can help to abolish the old division of labour, so that the rhythms of life and work, family and career can be reconciled again'. From this perspective, Heiner Geißler, Christian-Democratic Federal Minister for Youth, Family and Health, attacked the trade unions as impeding progress in these words:

'Those who work five hours at a computer screen at home in the morning and help at a social centre or work as exercise instructors in the afternoon, those who assemble switchgear in the afternoon and farm in the morning, or those who divide their labour in the morning and bring up their children in the afternoon, are simply evading the conflict between capital and labour that is supposed to dominate everything. Such people are no longer available for the class struggle' (Tagesprotokoll, 1984:127).

Liberal MP and FDP secretary-general Helmut Haussmann seconded 'Jobs at home, more flexible working hours and more part-time work would also offer greater protection against unemployment and against career decline caused by new technologies' (SZ, 1984:1). With these words, conservative governments and employee associations (such as the Christian Democratic Workers Association) in the early 1980s aimed to reorganise social and family policies while legitimising new labour market dynamics and thus praised the 'soft power of the family' and a 'new motherliness', as critics remarked (Bahl-Benker, 1985a; Huber, 1987).[6] Euphorically, Hans-Ulrich Wegener, the leading Siemens manager who directed the company's pioneering experiments with 'IT-based home workstations' in 1982–83 (Wegener, 1983; Verein Sozialwissenschaftliche Forschung und Praxis für Frauen, 1983:58; Jäckel & Rövekamp, 2001), in his 'vision of the future' even explicitly addressed these critics, claiming to raise the women's issue since 'the unity of home and workplace' would mean both 'rationalisation' and 'humanisation': 'as women can build up their own existence, not only offer their work to a company, and they can dispose of their work themselves, they

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6   On the association's position see CDA-Bundestagung. 'Die sanfte Macht der Familie/Schritte zu einer familiären Gesellschaft' 1/These 1: 'Neue Informationssysteme und Technologien bieten die Möglichkeiten, wieder zu kleineren Produktionseinheiten zurückzukehren und Erwerbsarbeitsplätze in die Nähe des Wohnbereichs und eventuell ins Heim zu verlagern. Das sind Chancen, die erprobt und genutzt werden sollten' (quoted in Bahl-Benker 1985a:96, Fn 23).

become freer. This will certainly promote emancipation more than certain Sunday speeches' (Wegener, 1982:82−86).

While opposition representatives, particularly Green party politicians, attacked the new digital technologies, Social Democrats took on an ambivalent role, welcoming the new 'time sovereignty' attributed to new, flexible work arrangements and acknowledging political privatism and isolation (Glotz, 1984; Farthmann, 1984). Hence, in the German parliament, the issue was heatedly debated, and the administration conceded to closely evaluate the downsides (BT, 1984a:21; BT, 1985:8852-8855; BT, 1988:15−17). Since 1983, large research programmes have been implemented to explore the social consequences and establish legal structures (Kilian et al., 1987).[7] Nevertheless, while employer associations supported telework plans, trade unions remained strictly opposed until the 1990s, turning the topic into an ongoing political issue (Farthmann, 1984:550−552; Tippmann, 1985:105−106; and more generally: Huber, 1987:141−155).

In this heated debate, unionists in Germany insistently pointed to the new challenges and perils associated with 'telework': a strengthening trend towards deskilling and downgrading, social isolation, mental health problems, the blurring border between work and leisure time (with its tendency to permanent control), a degradation of average incomes, and a loss of collective labour agreements. Field reports partially supported this criticism. While some workers positively mentioned the chance to work highly flexibly and part time, particularly in so-called 'community bureaus' ('Nachbarschaftsbüros') as co-working spaces, others, especially women, evoked the problems that came with multiple roles and responsibilities – meeting household and family responsibilities while at the same time working (Harms, 1983; Bahl-Benker, 1983; 1984; 1985a/b; Brandes & Buttler, 1987; Richter, 1988; Giesert, 1989; Goldmann & Richter 1991; Godehardt, 1994; Stiegler, 1998). In the UK, as in the FRG, where the business slowly prospered and marked a lucrative niche, above all, a widening gender pay gap, narrowed career prospects and precarious working conditions remained usual (Olson & Primps, 1984; Syrett, 1985; Mettler-Meibom, 1988; Shirley, 1988; Huws, Korte & Robinson, 1990).

Both in Germany and the UK, the unions, which were stuck in a legitimacy crisis in the early 1980s due to political turmoil, stagnating membership and low-level white-colour worker organisation (Howell, 1999; Schneider, 2000; Hachtmann, 2011; 2015; Raphael, 2021:170−192), hence organised aggressive campaigns against 'telework'. In Germany, the unions stylised the debate as bringing the country to a crossroads. Thus, the German Trade Union Confederation published a brochure entitled 'Telework – electronic hermitage or a new form of personal development?' (DGB, 1988). Here, the unions strategically narrowed the semantic corridors and spoke of 'electronic home work' ('elektronische Heimarbeit') (Winkelmann, 2019; 2020). With this particular historical connotation, the unions alarmingly claimed to see new 'Silesian conditions' alluding to the Silesian weavers' precarious destiny in 19th-century cottage industries. As such, they even demanded – as IG Metall did in 1983 – a 'legal ban on electronic home work' (DGB, 1985; Bahl-Benker, 1983:575; Bahl-Benker, 1984; Bahl-Benker,

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7   In 1983, a research program on 'Computer-based Telework and Labour Law' was conceptualised in the FRG. See on this Forschungsvorhaben 'Computergestützte Telearbeit und Arbeitsrecht', B 149/159579; B 149/159580; B 149/159584, German Federal Archives (Bundesarchiv) Koblenz.

1985a; 1985b; DGB, 1988:7).[8] From a comparative European perspective, however, this was a disputed practice, as workers' representatives in other countries, such as the Trades Union Congress in the UK, proposed stronger regulations rather than bans (Huws, Korte & Robinson, 1990:50; 55).

In general, in the 1980s and 1990s, it was remarked that 'the role of telework has been transformed', as Ursula Huws in her pioneering study in the early 1990s concluded:

> *Instead of being a solution to the problem of commuting, or the problem of the cumbersome and alien nature of large bureaucracies, it has now become a solution to the problem of the breakdown of the family. With the change in role, the image of the teleworker has also been transformed. There has been a change both of sex and of status. No longer the male ex-commuter or autonomous artist, the teleworker is now a woman who, by implication 'puts her family first', the corollary of which is that her work is relatively unimportant, something to be fitted in between emptying granny's bedpan and washing the baby's nappies.* (Huws, 2003:95)[9]

Huws noted a crucial political point; nevertheless, the debate was more complex than this conclusion suggests. From early on, the discourse on remote and home-based work was embedded in a broader debate on 'flexibility'. Here, teleworking was a media event reported in guidebooks and magazines, even inspiring design magazines to launch a series on how to furnish a 'home office' (Breathnach, 1985; Richter, 1988; Jones, 1989; Schreiber, 1990; Holden, 1993). Newspaper articles and scholarly studies equally pointed to the diverging realities in the much-lauded 'electronic cottages' and thus especially described the dissimilarities between part- and full-time teleworkers as well as between those who only did home-based work and others who mostly alternated between the office and home office (Ramsower, 1985; Kinsman, 1987; Sennett, 1999). Over decades, several myths grew up around the new digital (home) work (Monod, 1985; Allen & Wolkowitz, 1987; Klebe & Roth, 1987; Forester, 1988; Huws, 2003). Finally, this was particularly true from a global perspective. Despite symbolising a 'weightless' economy, the new work, done either as home work or by 'digital nomads' (Makimoto & Manners, 1997), who – as 'electronic immigrants'– occasionally even appeared as a 'threat' in national(istic) discourses (*Times of India*, 1989; Blake, 1990), produced particular hardships and so some scholars postulated the rise of a new 'cybertariat' (Huws, 2003). A new, technology-induced division of labour globally entangled the working realities between the Global North and Global South (Aneesh, 2006; Xiang, 2007; Patel, 2010).

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8   The US-American AFL-CIO also suggested a complete 'ban' in 1983, possibly inspiring the German Unions (Huws, 2003:96–98; Huber, 1987: 142). On trade union policy in the FRG, see the records of the DGB- and IG Metall-Archives in the Archives of Social Democracy, particularly: 'Elektronisch gestützte Heimarbeit', 1984–1985, 5/DGAT000771; 'Teleheimarbeit von Frauen: Heimarbeit', 1984-1988, 5/DGAT000871; 'Elektronisch gestützte Heimarbeit: Arbeitsgruppe', 1984-1985, 5/DGAT000532; 'Elektronische Heimarbeit', 1981–1984, 5/IGMA230633, Archiv der sozialen Demokratie (AdsD) Bonn.
9   Notably, in this highly moralistic political discourse, myriad articles on (electronic) homeworking were written based on personal experiences. As Huws, who knew the topic as a single-working mother, being a freelance writer, Tom Forester, author and computer specialist, also wrote as an experienced home-based worker (Forester, 1985; Forester, 1988: 232).

Summing up, popular imagery on tele(home)work developed a very specific discursive economy, peaking in the late 1970s and early 1980s with a high focus on gender and family-related issues. Being embedded in larger debates on societal changes, such as an ongoing individualisation and a progressing bias towards individual 'self-realisation' (as a 'change in values') from the 1970s and new tendencies to combine career and care work, it addressed larger debates on what a 'future' society should look like. Surprisingly, the phenomenon thus attracted greater interest, although real usage remained comparatively low by the late 1990s.

## Dissemination and use-patterns

Trends

Germany

For Germany, trend analyses indicate an increase in the use of home-based work starting in the 1990s. Probabilities for home-based work increased for all different arrangements of home-based work: weekly, monthly and occasional work from home. Probabilities vary by gender, which is evident when comparing the different forms of home-based work. Although men more often seem to have had access to home-based work (see occasional home-based work, Figure 5), women are more likely than men to work from home on a regular basis (see weekly home-based work, Figure 7). In 2014, up to 20% of fathers occasionally worked from home compared to less than 15% of childless women. With regard to occasional telework, gendered patterns became slightly more pronounced and changed over time, while during the 1990s, mothers were more likely to work from home in all groups (Figures 5, 6 and 7). Men, especially fathers, surpassed mothers and showed higher tendencies to work occasionally/monthly from home during the 2000s. Only in the weekly telework group do mothers remain the main user group.
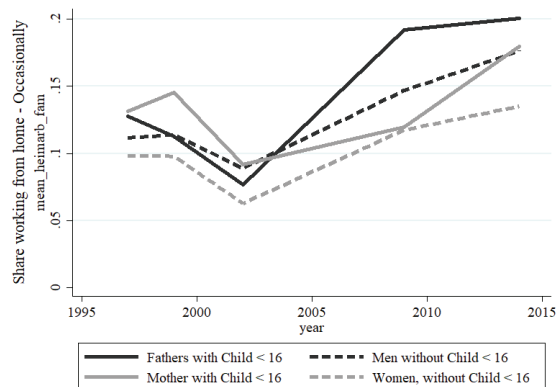
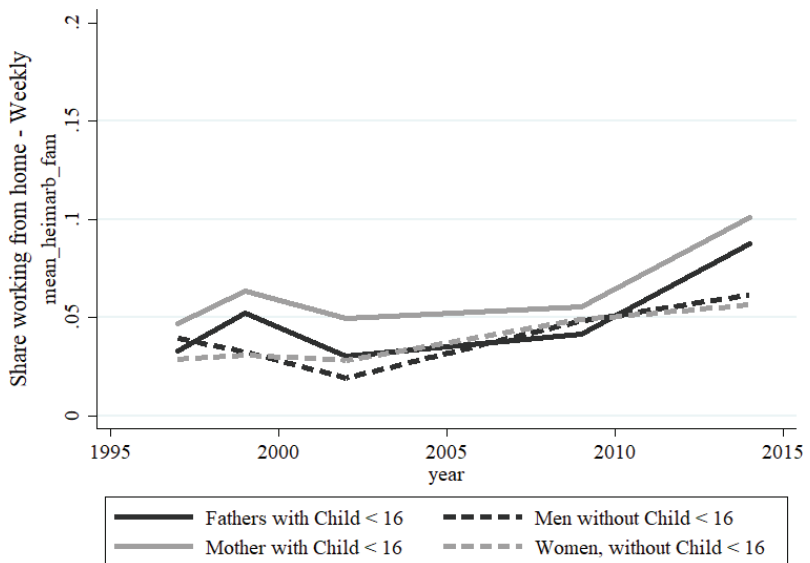**Figure 5:   Share of employees within groups who work from home occasionally**

Source: authors' calculations based on SOEP (1997–2014).
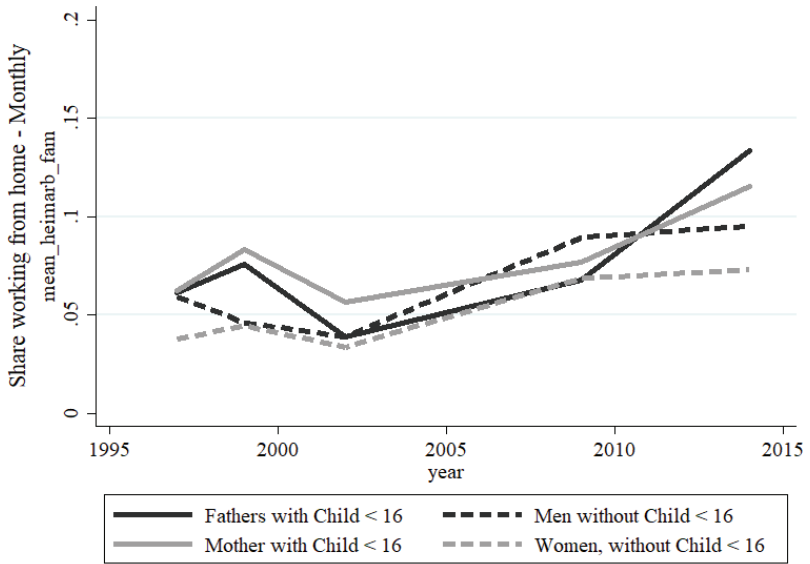
Figure 6:   Share of employees within groups who work from home monthly

Source: authors' calculations based on SOEP (1997–2014).

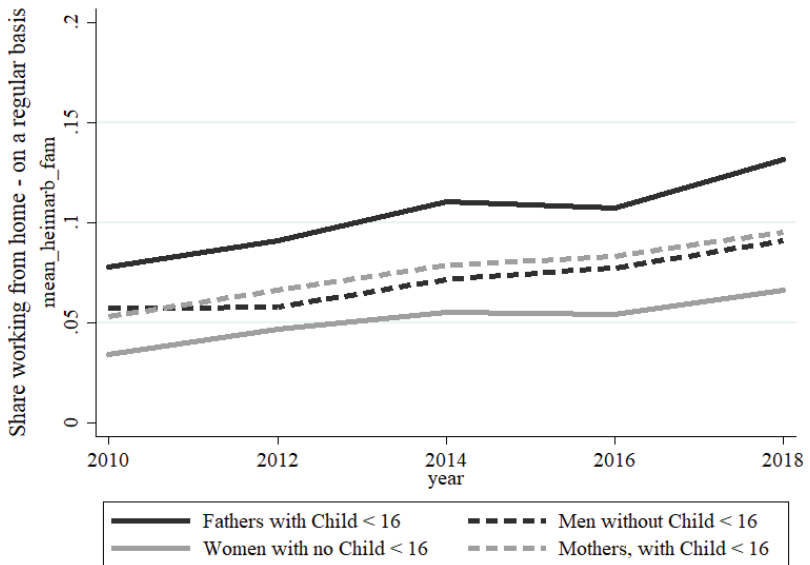**Figure 7:   Share of employees within groups who work from home weekly**

Source: authors' calculations based on SOEP (1997–2014).

UK

Analyses of British data (Understanding Societies Panel) reveal, comparable to the German context, an increase in the probability of working from home for all employee groups (see Figure 8). In contrast to Germany, in the UK, fathers are more likely to work from home on a regular basis than working mothers.[10] For fathers, the likelihood increased from approximately 9% in 2010 to 14% in 2018. For mothers, the increase was from 5% to 9.6% in 2018. Between 2010 and 2018, the gender patterns remained largely constant.

Life course perspective

Turning to the life-course perspective, we analysed how men's and women's probability of working from home changed in relation to the birth of a child or the age of their children (comparing having no children to having children aged zero to one year, two to five years, six to eleven years or twelve years and older). To investigate how effects of the birth and age of the child might have changed over time, we additionally consider the year the child was born. For the German analyses, birth cohorts range from 1985 to 2014; for the British analyses, the time ranges from 1997 to 2018.

Figure 8: Share of employees within groups who work from home regularly

Source: authors' calculations based on UKHLS (2010–2018).

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10   We consider this operationalisation to be a combined version of the results of weekly or monthly home-based work from the German survey.

Germany

For Germany, we find gender differences in how having children affects parents' likelihood of working from home. Mothers' probability of occasionally working from home increases by approximately 7% when their children are between the ages of two and five years old compared to not having children (see Table A1, Model 2). With increases of approximately 6%, the effects are similar for arrangements allowing for monthly or weekly home-based work (see Table A1 and Models 4 and 6). For men, the likelihood of occasionally working from home increases when children are six years and older. However, the effect is significant only at the 10% level and does not apply to monthly or weekly home-based work (see Table A1 and Models 1, 3, and 5). Hence, analyses indicate that the likelihood of working from home is more closely related to parental status and children's age among mothers than among fathers.

The year in which children are born is again more strongly related to women's working arrangements. Mothers whose youngest child is born later are more likely to work from home when they have children, especially considering monthly/weekly homeworking arrangements (see Table A2; Models 4,6). When their child is born later, mothers' period of increased homeworking activities expands until their children are up to 11 years old. Thus, motherhood has gained importance over time for work from home. The importance of parenthood for men's likelihood of working from home slightly increased over historical time, as indicated by the year their child was born.

UK

In the UK, both men's and women's likelihood of working from home increases due to having children at home. While women respond earlier in the life of the child (when the child is between zero and one year and two to five years old; see Table A3), men increase their home-based work activities later in the child's life (when the child is older than two years) but afterwards do not seem to readapt their activity. The year the child is born seems less relevant in the UK than in Germany. There, only a slight effect is found for fathers further increasing their likelihood of working from home when their children are between six and six and are born later. The lesser effects for the year the child is born might be driven by the fact that home-based work arrangements were adopted earlier within the UK than in Germany. Additionally, the UK data (2010–2018) provide information for a later period than the German data (1997–2014).

Summing up the analyses, we observe general increases in home-based work for all user groups and in both countries. The use is, however, not as high as expected based on technological facilities to work from home. Gendered patterns changed over time and by telework arrangement, mainly in Germany. Here, the observed pattern, according to which women were the main users of work from home, clearly decreased over time, and remained stable only for weekly work from home, but not for occasional and monthly work from home. In the UK, men, instead, were and remained the dominant users. Differences between parents and nonparents seem to be increasing, indicating that the use of telework to some degree follows reconciliation purposes. The general relevance of parenthood for work from home is also shown by longitudinal analyses showing a higher likelihood of working from home when children are born and younger in age in the German context. Interestingly, the relevance of children

neither increases nor decreases in relation to the child's birth cohort in the UK. These findings indicate 'self-perpetuative' tendencies, especially in the UK, as use patterns seem to largely persist despite changing policies and a legal institutionalisation of work from home first for parents and, later, irrespective of parenthood. In contrast, in Germany, patterns of regular work from home seem to respond to political agendas with a slow convergence of gendered use patterns among parents.

Conclusion

Today, digital technologies enable workers to connect with colleagues and supervisors anywhere at any time. However, despite optimistic scenarios regarding the future of work driven by technological change, debates about flexibility potentials and possibilities for greater gender equality in the labour market remain. In the same vein, imaginations, interpretations and negotiations of telework are ever recurring, most recently during the current pandemic, which made work from home more widespread than ever and a necessity to restrict the spread of the virus. Against this backdrop, the aim of this research was to identify self-perpetuation of work from home by investigating phases, turning points and diverging temporalities of gender- and parenthood-specific discourses and use patterns of tele(home)work in Germany and the UK from an interdisciplinary perspective, combining historical and comparative social analysis. This article analysed the discourse around telework in its preplanning stage and early implementation phase until the early 1990s and then considered the broader dissemination of telework and its use patterns from 1997 onwards. It evaluated how gender- and parenthood-specific discourses as well as actual use patterns of telework developed, converged or diverged over time and how this is related to general technical preconditions, institutional settings, and the embeddedness of telework into broader social contexts. In doing so, the study sought evidence for discursive developments as well as developments in usage that show signs of path dependency progressing increasingly disentangled from political or regulatory frameworks. For this reason, we considered whether discourse and practice developed simultaneously or became decoupled over time.

Conclusively, we can state that, since its early debates in the USA, the idea to digitise work by computers rapidly spilled over the Atlantic and was controversially perceived in many European countries (Dangelmaier, Förster, Horsthemke & Kress, 1999:85). Discursively, the 1970s marked an early climax in the public's attention economy. Then and again, the phenomenon was forecast to become a common practice around the globe. However, its practical relevance remained rather marginal in the USA as well as in England – while in Germany, during the early 1980s, a widely received study even proclaimed that there were literally no IT-based home workstations by then (Ballerstedt et al., 1982:90; Dostal, 1985). In general, it was not until the late 1990s that telework was utilised more widely.

However, historically, the progressing dissemination and developing use patterns in the USA and Europe hardly correspond to the discursive dynamics. New literature on 'telework' in the FRG, therefore, has proposed the argument that until the early 21st century, 'the extent of public debate on telework' was 'far greater than its actual spread' and, hence, there was a remarkable shift from a 'discourse without practice' in the 1970s

and 1980s to a 'practice without discourse' in the 1990s (Winkelmann, 2019:151; 2020). According to our analysis, this wording seems highly pointed, but, especially with regard to the early days, certainly accurate.[11] Fittingly, while the press was already writing about the 'new wave' of home workers, a study from 1987 could still mockingly remark that 'for every teleworker there were three accompanying researchers' (Huber, 1987:58–59).

Selected topics dominated the discourse. For example, the debate in the 1980s and 1990s on new computer-based working (time) models in Europe quickly centred on combining career and family. This rhetoric was gendered, primarily centering on women's role in working, and thus appeared to some, in the promise of combining career and family, as a vehicle of emancipation while to others, with its tendency to make work more 'flexible', rather as a means of new digital performance control, which entailed social and economic risks and forced legal regulations.

Despite this general trend, there were substantial national disparities. In a large-scale comparative survey conducted by the European Commission in 1984/85, more than 10,000 households in the FRG, France, Italy and Great Britain were asked about their attitudes about 'teleworking'. According to the results of the study, approximately 14.5% of the 90 million employees in the countries would accept 'teleworking at home'. The lowest rate was recorded in the FRG, with approximately 8% of the employees having the greatest interest; in contrast, in Great Britain, nearly 23% of the employees would consider decentralised telework models (Empirica, 1987:VII; 3;16–18). In line with these statistics on PC and home computer distribution in Europe in the 1980s and 1990s, a connection between the supposedly higher rate of home computer use in the UK, which enabled private and work-related computer usage, and the more positive attitudes towards 'teleworking' here, compared to in the FRG, where scepticism prevailed for decades, seems highly plausible. However, upcoming studies need to investigate this correlation in greater detail.

Upon analysing the discourses, their protagonists and underlying strategies, we find more particularities. Across Europe, the introduction of telework was a highly political issue, while the rhetoric of the 'brave new working worlds' causing an unlimited worker's control reached an early climax in the Orwell year. In Germany, however, even from its early days, the public debate has been particularly polarised and emotive. Therefore, in 1983, a TV series even spoke of a 'secret coup d'état' with regard to new media in the working world (Prokop, 1984; Grimm, 1985; Hönicke, 1985; Stiglmair, 1987; Hoffmann, 1987). While employers' associations and companies mainly neglected the new digital working worlds as an unrealistic scenario, the trade unions spurred the controversy. Alongside politicians and experts, they actively engaged in the debate, even demanding a 'legal ban on electronic home work'.

Beyond all dissimilarities that may explain the delays in implementing 'telework' in the FRG and the varied dynamics and temporalities in the discourse, there was nevertheless a very common, substantial change in semantics. This overarching trend concerns the image of 'home work' ('Heimarbeit') in general, which has above all changed massively due to

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11   In later years, however, discourses remained nonetheless intense, as German Parliamentary Papers since the early 1990s exemplarily show. Tele(home)work, here, was increasingly addressed in numerous policy debates.

digitalisation in the UK and FRG. In the early 20th century, this work was seen as a contradiction to modern, industrial society, which had to be overcome. Thus, for a long time, the term conveyed the 'character of the backward' annotating work that was 'poorly paid and technically not up to date', as Andrea Komlosy states (Kramer, 2020:16). Precisely, this dimension was explicitly echoed in the discourse on 'electronic home work' in the early years; especially in the 1980s and 1990s, with the debate on a 'crisis of the labour society' (Dahrendorf, 1980; Méda, 1995; Rifkin, 1995), it was therefore highly controversial and, in the FRG in particular, viewed sceptically for a long time. Thus, 'teleworking' appeared above all as highly risky. However, the tenor subsequently changed fundamentally, and the computer-supported 'home office' increasingly advanced to a model for the future as a technologically advanced activity for well-paid knowledge workers. This positive image was quite long lasting until the COVID-19 pandemic.

Measured against the great expectations regarding the spread of telework, actual use in both countries has long lagged behind discursive attention and, interestingly, behind the technical feasibility of telework. In line with its promotion and discussion as a resource to foster work-family integration (Ashforth et al., 2000; Kossek et al., 2006), use patterns show a greater prevalence of telework among parents throughout the observation period in both countries. The gendered discourse is mirrored by German use patterns – especially considering regular work from home, which was over time mostly realised among mothers. Indeed, findings show that having a child is more influential to mothers' homeworking activities, which points towards women's greater need to use telework for their everyday integration of work and familial demands in line with their role as primary caregivers (Bianchi, 2000; Lott, 2020; Ishizuka & Musick, 2021).

Contrastingly, in the UK discourse and practice in general revealed greater incoherencies due to fathers' constantly higher telework activities (despite the fact that telework, here, was quickly discussed as a mothers' work, too). Although we need to keep in mind that the British data relate to a late point in time, earlier studies provide further evidence of men's higher likelihood of working from home (Felstead & Henseke, 2017). Moreover, use-patterns in the UK contrast with those in Germany, as life-course analyses show that the likelihood of British fathers to work from home increased more strongly with the birth of a child. The current analyses even suggest that in the UK, the gendered discussion of the phenomenon might be countered by women's greater necessity to reduce working hours when becoming mothers due to insufficient and expensive childcare (which is even more pronounced than in Germany), which decreases the likelihood of working from home (Chung, 2020). Hence, in the UK, women might be more likely to use flexible work schedules rather than teleworking.

These results further indicate that gender-and parenthood-specific patterns have perpetuated over time pointing to a *path-dependent perpetuation* which distinctively characterised both Germany and the UK. The parenthood-specific use patterns in particular have perpetuated over time. Yet, for Germany this mainly applies for mothers, as having children became even more influential to mothers' homeworking activities over time. These findings correspond to the 2007 reorganisation of parental leave policies, restricting mothers' eligibility for parental leave to one year, as their earlier return to work potentially increased mothers' flexibility needs. Although fathers' likelihood to work from home also increased over time, up to the point where fathers'

use exceeded that of mothers, this only applies for less regular (monthly) telework. By contrast, in the UK, the relevance of children rose especially for fathers. This pattern might have especially been driven by the 2003 regulation granting parents the right to request telework in the UK, which may have especially encouraged fathers to request work from home. Alternatively, men might use telework more often to signal commitment and realise overwork (Lott, 2016; Chung, 2020).

Interestingly, recent developments during the COVID-19 pandemic shifted the narrative of telework away from one of family friendliness to that of a necessary strategy to control the spread of the virus. To the same degree as gender- and parenthood-specific rationales for using opportunities to work from home, actual homeworking activities aligned for the UK (Chung, 2021) and Germany (Abendroth et al., 2022). These recent observations further strengthen the idea that exogenous shocks can disrupt established patterns as well as path dependencies and, thus, trigger new perpetuative dynamics (Vergne & Durand, 2010).

Addressing the diverging dynamics, temporalities and turning points of the digital transformation of working worlds, the combined analysis of discourses and use patterns of tele(home)work since the 1970s reveals how polarised perceptions and radical expectations vis-à-vis digital technologies overshadowed its – rather slowly progressing – dissemination and usage. While attempts to combine work and family were bound to concrete sociotechnical settings and showed path dependencies, wider possible scenarios were discursively imagined and experimentally enacted over decades, equally showing dynamic, self-reinforcing tendencies. Industry federations, private enterprises, unions, governmental actors and research institutions thus publicly negotiated whether the emerging digital technologies were a promising means to combine career and family and appeared as a vehicle of emancipation or whether telework, with its tendency to make work more 'flexible', rather paved the way for a new digital performance control, which entailed social and economic risks and possibly eluded legal regulation. Semantically, the meaning was heavily loaded, as telework was expected to change (for better or worse) traditional 'home work' to modern 'home office work'. In this context, the publicly discussed, intended usage was nevertheless unequal to practical – gender- and parenthood-specific – use patterns which were evolving tacitly. Furthermore, telework arrangements were technically enabled (with PCs as well as connections to the worldwide web), however, the mere existence of these technical tools marked no turning point;[12] rather, it took several decades for digital technologies to spread, and even longer to be socially mastered. Thus, evolving use patterns – which are hidden behind popular revolution metaphors (Neeley, 2021; Warzel & Petersen, 2021; Cook, 2020) – were largely socially shaped, even in times when technological progress limited the actors' formative capacities. Also, the

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12 Technically, telework based on virtual communication and digital computational technologies has been possible since the late 1970s. Innovations such as minicomputers, videotelephony (Friebel et al., 2003; Held, 2020) or 'teletex' (Bullinger, Fröschle & Klein, 1987) – a customer-to-customer switched network – demonstrated how long these technologies existed prior to their widespread adoption. Videotelephony thus only became widely distributed in the early 21st century and its application reached its peak during the 2020 pandemic. In 2000, however, researchers still claimed: 'The stigma of videoconferencing is that, throughout its history, next year has always been the year it was going to really take off' (Wilcox, 2000:17).

trajectories varied as seen in a comparative perspective. Hence, the history of telework is a good example to study how imagined concepts and real changes in technological logics determined the labour process and stimulated diverging dynamics and temporalities of 'self-perpetuation'. Overall, we conclude that the historical and comparative social perspective is a promising way to analyse the dynamics, pluri-temporal phases and turning points in long-term developments.

To conclude, in this study, we have contributed to existing research in two central ways: firstly, this article contributes to larger theoretical debates on 'digitalisation' as a systemic 'transformation' driven by 'technological developments, economic logics and social dynamics' (Pfeiffer, 2021b:13f.). Our findings, here, particularly emphasise societal conditions as relevant factors that shape the use of technical possibilities to work remotely. Thereby, we draw attention to the ongoing imaginations *of* and interactions *in* socio-technical constellations. Secondly, we contribute to a larger debate on gender inequalities in the labour markets, as both discourse and use patterns in the analyses point towards the reproduction of gender and parenthood specific work patterns in digitalised working worlds. Thus, according to our results, especially in Germany, mothers increasingly started working from home. By contrast, fathers in the UK were the most likely to work from home, which contrasts with conventional gender patterns. However, as was previously shown, differences also persisted in the UK with regard to the time invested in care work and wages, which pointed to the longevity of traditional gender roles (Chung & Van der Lippe, 2018; Chung, 2020). These findings question the hopes of dissolving inequality structures due to technical developments, and challenge theories which address high rising expectations of greater control over working time and place. Our results, hence, rather provide evidence to support to theories which draw a more complex picture, indicating a polarisation in the digital working worlds according to gender and parenthood patterns: despite new digital tools that, here, mobilised the networked working worlds and created new leeway, especially with regard to knowledge-based work. The reliance on new technologies also carried the potential to digitally taylorise routinised, non-cognitive skills, and thus has been shown in existing research to paradoxically both increase and diminish autonomy (Mazmanian, Orlikowski & Yates, 2013:1337f.). In line with this, our results could even be linked to current debates on class distinctions being reinforced in the digital working world (Kirchner, Meyer & Tisch, 2020; Gensler & Abendroth, 2021).

In the context of the interdisciplinary research programme (SPP 2267), this study aimed to explore the gains of applying an interdisciplinary approach to combine historical and sociological perspectives on the 'digital transformation'. Contrasting discourses and use patterns it shed light on the ideas and preconceptions tied to telework and helped to identify the self-perpetuation of gender- and parenthood-specific use patterns of work from home. Thus, this explorative, collaborative work may create room for further interpretations and future research questions.

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ACKNOWLEDGEMENTS

APPENDIX

Figure A1: Examples of realised forms of telework (and similar work) arrangements (1985)

Country	Company/Task	Type*)	Persons	Job	Notes	Source **)
FRG	Integrata Tübingen Software House	TS	20	Data Processing Specialists		1
FRG	ICR Neustadt	TH	2	Data Collection and Data Entry		2
FRG	Pilot Project Baden-Württemberg	TM	[21]		[Kilian 1987, S. 40; Bullinger et al. 1987][A]	3
FRG	Pilot Project Siemens AG	TH	[3]	Clerical Work	[Kilian 1987, S. 41-42][B]	4
FRG	Pfennigparade (Company)	TN	70	Programmer	Handicapped People	2
FRANCE	Telephone Services	TH	37	Telephone Exchange (Operators)		5
FRANCE	Telephone Boutique/ Sales Agency	TS	?	Salesperson, Clerks		5
FRANCE	Research Institute	TH	1	Researcher	Pilot Project for Handicapped Person	5
FRANCE	Insurances	TS	700	Insurance Agents		5
FRANCE	Insurances	TH	1	Typist		5
FRANCE	Bank	TH	2	Clerk		5
FRANCE	Telefon-Marketing	TM	84	Salesperson		5
FRANCE	Sporting Goods Company	TM	15	Agents	Introduction of Portable Computers	5
FRANCE	EDP-Services	TM	3	Programmer		5

Country	Company/Task	Type*)	Persons	Job	Notes	Source **)
FRANCE	Teleworking Center (Marne la vallée)	TN	15	Miscellaneous Professions		5
GB	F. (Freelance) International	M	630	Programmer	Freelancers, 95% Women	5,6
GB	Rank Xerox	TH	22	Miscellaneous Professions	'Networking-Program'	2
GB	ICL	TH	200	Programmer		5
GB	Department of Industry	TH	6	Clerk	Pilot Project	5
GB	ICL	H	100	Technical Authors (Writers)	Freelancers	5
ITALY	Olivetti Software	TM	1 000 (?)	Programmer	Proportion of Home Work unclear	5
ITALY	ENI (Industrial Chemistry)	TM	50	Managers & Specialists		5
ITALY	University Mailand	TM	5	Miscellaneous Professions	Model Character	5
SWEDEN	Service-Zentralen (North Sweden)	TN	40	Typists	Model for Labor Market Policy Reasons	5
USA	Heights Information Inc. (Software House)	TH	180	Data Processing Specialists		6
USA	Lift Inc. (Software Hourse)	TH	?	Data Processing Specialists	Handicapped People only	6
USA	IBM (Computer Manufacturer)	TM	800	Manager / Data Processing Specialists	Additional Terminals at Home	2
USA	Tymshare Cupertino	TM	40	Manager, Data Processing Specialists		2
USA	Interactive Systems	TM	100	Data Processing Specialists		6
USA	AWS-Programm (CDC)	TM	50	Miscellaneous Professions	"Homework-Programm"	2
USA	Continental Illinois Bank	TH	4	Word Processing		6
USA	Blue Cross/ Blue Shield (Insurance)	TH (H)	200	Programmer		6

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Country	Company/Task	Type*)	Persons	Job	Notes	Source **)
USA	American Airlines Inc.	TS	200	Data Collection and Data Entry	Use of Low Labor Costs in Barbados	6
USA	Satellite Date Corp.	TS	?	Data Collection and Data Entry	Use of Low Labor Costs in Barbados	6

*) T Tele- (Work/Offices)

S Satellite Office

M Mixed Form (partly at home, partly in the company)

H Home Work

N Neighborhood Office

**) 1 Heilmann, W./B. Krcmar: Freiberufliche Softwareentwicklung zu Hause – ein Beispiel für neue Formen der Büroarbeit, *HMD* 112/1983, S. 71–76; Heilmann, W./I. de Vitorelli, Teleprogrammierung in der Bundesrepublik Deutschland, in *Office Management* 5/1984, S. 442–444; Ballerstedt, E. et al. (Batelle Institut, Frankfurt a.M.)/W. Heilmann/B. Krcmar (Integrata GmbH, Tübingen): Studie über Auswahl, Eignung und Auswirkungen von informationstechnisch ausgestalteten Heimarbeitsplätzen, Forschungsbericht DV 82-002 „Datenverarbeitung" des Bundesministeriums für Forschung und Technologie, FIZ Eggenstein-Leopoldshafen 1982.

2 Hönicke, I.: Kinder, Küche und Computer. Teleheimarbeit: Traumjob oder Schlesische Verhältnisse, in: CW-Extra 1985, S. 4-7.

3 Wawrzinek, S./H.-P. Fröschle (Frauenhofer Institut für Arbeitswissenschaft und Organisation): Schaffung dezentraler Arbeitsplätze unter Einsatz von Teletex. Zwischenbericht, Stuttgart 1985.

4 Wegener, H. U.: 'Telearbeit für das Büro. Bericht über einen Modellversuch der Siemens AG, in: Data Report 1/1983, S. 4-7.

5 European Foundation for the Improvement of Living and Working Conditions, Telework – Impact on Living and working Conditions, Dublin 1984.

6 Ballerstedt, E. et al. (Batelle Institut, Frankfurt a.M.)/W. Heilmann/B. Krcmar (Integrata GmbH, Tübingen): Studie über Auswahl, Eignung und Auswirkungen von informationstechnisch ausgestalteten Heimarbeitsplätzen, Forschungsbericht DV 82-002 „Datenverarbeitung"des Bundesministeriums für Forschung und Technologie, FIZ Eggenstein-Leopoldshafen 1982.

A Additional references added by the authors.

B Additional references added by the authors.

Source: Dostal 1985, p. 478.

Table A1: Models of parents' likelihood to work from home - Germany

	Occasional home- based work		Monthly home-based work		Weekly home-based work	
	(1)	(2)	(3)	(4)	(5)	(6)
	Men	Women	Men	Women	Men	Women
Age Youngest Child						
0–1	0.038	0.020	0.019	0.019	0.012	0.031
2–5	0.044	0.073*	0.007	0.061*	0.011	0.056*
6–11	0.066+	0.052	0.027	0.046	0.014	0.031
12 and older	0.069+	0.040	0.018	0.029	0.013	0.012

	Occasional home- based work		Monthly home-based work		Weekly home-based work	
	(1)	(2)	(3)	(4)	(5)	(6)
	Men	Women	Men	Women	Men	Women
Control Variables						
First Birth (ref=no first birth)	0.002	0.039	0.009	0.025	0.021	−0.011
Additional Birth (ref=no additional birth)	0.036*	0.018	0.003	−0.016	−0.007	−0.008
Occupational Status (ISEI)	0.002***	0.002***	0.000	0.001**	−0.000	0.001
Age	−0.009	0.019	0.004	0.005	0.005	−0.008
Age sq.	0.000	0.000	−0.000	0.000+	−0.000+	0.000
Married or with partner, living together (ref=not married/living w. partner)	−0.009	0.014	−0.022	0.016	−0.024*	0.007
No. of hours normally worked per week	0.001	−0.002*	0.002+	−0.002*	0.003**	−0.001*
Contract Type (ref=fixed/seasonal)						
Regular Contract	−0.001	−0.003	−0.024	−0.011	−0.022	−0.011
No Contract	0.044	−0.044	−0.013	−0.025	−0.015	−0.019
Tenure	−0.002+	0.003**	−0.002**	0.001	−0.001+	0.001
Survey Year (ref=2010)	0.000	0.000	0.000	0.000	0.000	0.000
2012	−0.002	−0.029	0.011	−0.002	0.000	0.028
2014	−0.013	−0.135	0.003	−0.049	−0.004	0.030
2016	0.070	−0.295	0.048	−0.138	0.009	0.059
2018	0.114	−0.395	0.082	−0.196	0.022	0.080
Constant	0.212	−0.614	−0.073	−0.281	−0.121	0.203
Observations	6319	5189	6319	5189	6319	5189
R^2 $_{within}$	0.021	0.024	0.013	0.026	0.009	0.022
R^2 $_{between}$	0.083	0.010	0.003	0.016	0.003	0.020
R^2 $_{overall}$	0.060	0.008	0.005	0.014	0.000	0.021

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Source: authors' calculations based on Socio-economic Panel (1997–2014; with gaps); linear probabilities for home-based work, 1 = *occasionally/monthly/weekly work from home*; 0 = *no home based work used/no home based work available.*

Table A2:   Models of parents' likelihood to work from home—including interaction with child's birth cohort - Germany

	Occasional-home based work		Monthly home- based work		Weekly home- based work	
	(1)	(2)	(3)	(4)	(5)	(6)
	Men	Women	Men	Women	Men	Women
Age Youngest Child	0.000	0.000	0.000	0.000	0.000	0.000
0–1	0.057	–0.029	0.021	–0.007	0.005	0.005
2–5	0.061	0.026	0.007	0.008	0.007	–0.003
6–11	0.075+	0.014	0.027	–0.005	0.011	–0.021
12 and older	0.080+	–0.003	0.014	–0.028	0.010	–0.048
Age youngest child X Year of birth Youngest Child	0.000	0.000	0.000	0.000	0.000	0.000
0–1 X Year of birth	–0.002	0.007	–0.000	0.003	0.001	0.003
2–5 X Year of birth	–0.003	0.007	–0.000	**0.007+**	0.000	**0.008***
6–11 X Year of birth	–0.001	0.007	0.001	**0.009***	0.001	**0.010***
12 and older X Year of	–0.000	0.004	–0.001	0.006	0.000	0.006
First Birth (ref=no first birth)						
Additional Birth (ref=no additional birth)	0.005	0.023	0.010	0.012	0.020	–0.026
First Birth (ref=no first birth)	0.034+	0.021	0.003	–0.014	-0.007	–0.006
Occupational Status (ISEI)	0.002***	0.002***	0.000	0.001**	-0.000	0.001
Age	–0.009	0.016	0.004	0.002	0.005	–0.011
Age sq.	0.000	0.000	–0.000	0.000+	-0.000+	0.000
Married or with partner, living together=1	–0.007	0.012	–0.022	0.014	-0.025*	0.005
No. of hours normally worked per week	0.001	–0.002*	0.002+	–0.002*	0.003**	–0.001*
Contract Type (ref=fixed/seasonal)						
Regular Contract	–0.001	–0.003	–0.025	–0.012	-0.022	–0.012
No employment contract	0.043	–0.044	–0.014	–0.025	–0.015	–0.019
Tenure	–0.002+	0.003**	–0.002**	0.001	–0.001+	0.001

	Occasional-home based work		Monthly home- based work		Weekly home- based work	
	(1)	(2)	(3)	(4)	(5)	(6)
	Men	Women	Men	Women	Men	Women
Survey Year (ref=1997)						
1999	−0.001	−0.027	0.010	0.001	0.000	0.031
2002	−0.010	−0.129	0.002	−0.040	−0.005	0.040
2009	0.075	−0.278	0.048	−0.116	0.008	0.084
2014	0.119	−0.371	0.085	−0.165	0.020	0.116
Constant	0.192	−0.479	−0.074	−0.130	−0.113	0.371
Observations	6319	5189	6319	5189	6319	5189
R^2_{within}	0.022	0.026	0.013	0.029	0.009	0.027
$R^2_{between}$	0.090	0.020	0.003	0.045	0.002	0.002
$R^2_{overall}$	0.064	0.017	0.005	0.038	0.000	0.004

$^+ p < 0.10$, $^* p < 0.05$, $^{**} p < 0.01$, $^{***} p < 0.001$;

Source: authors' calculations based on Socio-economic Panel (1997-2014; with gaps); linear probabilities for home-based work, 1 = *occasionally/monthly/weekly work from home*; 0 = *no home-based work used/no home-based work available*.

Table A3 :   Models of parents` likelihood to 'work from home on a regular basis' – United Kingdom

	Basic Models		Models incl. Birth Cohort Children	
	(1)	(2)	(3)	(4)
	Men	Women	Men	Women
Age Youngest Child (ref=not applicable/no child)				
Between 0–1	0.016	0.031**	0.036	0.027
Between 2 and 5	0.032**	0.025*	0.033*	0.033*
Between 6 and 11	0.026*	0.013	0.029*	0.017+
12 and older	0.030**	0.011	0.029+	0.017
Age Youngest Child X Year of birth youngest Child (ref=0 X Year of Birth Youngest Child)				
0–1 X Year of Birth Youngest Child			−0.002	0.001
6–11 X Year of Birth Youngest Child			0.003+	0.000

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	Basic Models		Models incl. Birth Cohort Children	
	(1)	(2)	(3)	(4)
	Men	Women	Men	Women
12 and older X Year of Birth Youngest Child			0.001	0.001
Control Variables				
First Birth (ref=no first birth)	−0.002	−0.030*	−0.003	−0.030*
Additional Birth (ref=no additional birth)	−0.001	0.012	0.002	0.011
Age	0.002	0.008	0.002	0.008
Age sq.	−0.000	−0.000**	−0.000	−0.000**
Occupation (ref=employers/ higher management)	0.000	0.000	0.000	0.000
Higher professional	−0.008	−0.011	−0.007	−0.011
Lower management & professional	−0.013	−0.078***	−0.013	−0.078***
Intermediate	−0.037*	−0.075***	−0.036*	−0.075***
Lower supervisory & technical	−0.036+	−0.093***	−0.036+	−0.093***
Semi-routine	−0.033+	−0.097***	−0.033+	−0.097***
Routine	−0.026	−0.102***	−0.025	−0.102***
No. of hours normally worked per week	−0.001	0.000	−0.001	0.000
Tenure	0.009	0.054	0.009	0.055+
Contract Type (ref=fixed/ seasonal)	0.000	0.000	0.000	0.000
Regular Contract	0.001	−0.014	0.001	−0.014
Survey Year (ref=2010)				
2012	−0.010	−0.095	−0.011	−0.096
2014	−0.013	−0.188	−0.014	−0.190
2016	−0.023	−0.287	−0.025	−0.292
2018	−0.020	−0.386	−0.024	−0.392
Constant	0.186	0.483**	0.194	0.485**
Observations	16699	17827	16699	17827
R^2_{within}	0.007	0.010	0.008	0.010
$R^2_{between}$	0.006	0.002	0.005	0.002
$R^2_{overall}$	0.002	0.001	0.002	0.001

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; Source: authors' calculations based on Understanding Societies Panel (2010–2018; with two year intervals); linear probabilities for home based work, 1 = regularly work from home; 0 = no home based work used/no home based work available.