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A Cohort Replacement of Household Labour Supply in Germany and the UK

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Abstract: In recent decades, fluctuating unemployment rates and welfare state retrenchment have led to increased levels of economic insecurity in some countries. At the same time, cultural norms and family policies have become more gender-egalitarian. While earlier research related these trends to the decline in the male breadwinner model, little is known about whether recent cohorts who entered adult life against the backdrop of a new socio-economic opportunity structure have established new configurations of household labour supply. Using sequence analysis and cluster analyses across harmonised longitudinal data (GSOEP, BHPS and Understanding Society) for a sample of adults born between 1961 and 1973 in Germany and the United Kingdom (UK), this study introduces an innovative indicator of household labour supply types and new descriptive findings on the cohort replacement of household labour supply in these two countries. Descriptive findings show that recent cohorts in both Germany and the UK are forming more gender-egalitarian households, as reflected by the decline in the male breadwinner model as well as by the rise of 1.5-male breadwinner households in Germany and dual-earner households in the UK. However, the proportion of single and low labour intensity households in recent cohorts has declined in the UK, while there has been no meaningful change in East Germany and a strong increase in West Germany. The evolution of household labour supply types can be attributed to the replacement of cohorts who entered adulthood and established their households under shifting socio-economic contexts and gender ideologies.

Keywords: Household Labour Supply · Cohort replacement · Gender · Welfare state · Life course

1 Background

1.1 Cohort replacement of household labour supply

The process of social change has long been the subject of academic attention in social science (*Firebaugh* 1992; *Alwin/McCammon* 2003; *Lesthaeghe* 2010). A dominant

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theory of social change is cohort replacement, where recent cohorts socialised in new historical conditions with new cultural identities (and thus ideologies) replace older cohorts (*Brooks/Bolzendahl* 2004; *Zoch* 2021). In this paper, I argue that household labour supply has changed as the socio-economic conditions and normative contexts experienced by recent cohorts differed to those of preceding cohorts, implying that social change emerges. Taking *Mayer's* (2004) approach of comparing different life course patterns across societies as a basis, I focus on the role of the broader opportunity structure, which includes the configuration of socio-economic conditions and normative contexts rather than a single policy in shaping cohort replacement in household labour supply.

In recent decades, household types have changed dramatically. The Second Demographic Transition (SDT) since the mid-20th century, which refers to declining trends in fertility and mortality across the globe and the evolution towards more symmetrical gender norms (*Lesthaeghe* 2010), together with educational expansion that provided women with better labour market opportunities, has increased women's economic independence (*Ertl* 2005; *Lesthaeghe* 2010; *Stier/Herzberg-Druker* 2017; *Steiber et al.* 2016). Since the late 1960s, Nordic countries have introduced new family policies aimed at fostering both female labour force participation and birth rates and reducing the trade-off between family and career choices, leading to a better work-life balance (*Ostner/Schmitt* 2008). From the early 2000s, several other countries adopted gender-egalitarian family policies to equalise opportunities for men and women with a view to combining work and family responsibilities more effectively (*Finch* 2008; *Zoch/Schober* 2018). During the SDT and the subsequent shift towards gender-egalitarian family policies, the male breadwinner model has eroded (*Björnberg/Dahlgren* 2008; *Lesthaeghe* 2010; *Hook* 2010; *Bünning* 2015).

At the same time, economic conditions have changed since the mid-1970s, with persistent fluctuations through the early 2000s across various countries. Unemployment rates have fluctuated (*Kalleberg* 2000; *Caldbick et al.* 2014), welfare states have been retrenched, and the labour market has been deregulated, resulting in the proliferation of non-standard precarious employment,[1] including part-time work (*Kalleberg* 2000; *Kemmerling/Oliver* 2006; *Barbieri/Scherer* 2009). This type of employment has reduced the household labour supply, representing the labour available from household members (*Grotti/Scherer* 2014; *Nutz/Gritti* 2022), such as couples or singles.[2] These trends imply that persons in mid-adulthood in recent cohorts established their households in a more gender-egalitarian and less economically secure opportunity structure compared with earlier cohorts. However, little is known to date from the literature about cohort replacement of types of household labour supply, especially in light of the socio-economic changes of recent

[1] Part-time and temporary employment are considered precarious because they are unpredictable and risky (*Kalleberg* 2009).

[2] Households in which couples work full time are considered high work intensity households. In this paper, these households will be referred to as "dual full-time earners".

decades. Therefore, it remains an open question as to *whether a cohort replacement of types of household labour supply has emerged*.

Earlier research has documented different types of household labour supply in liberal societies. Studies have examined the traditional gender division of labour, with a male breadwinner and female homemaker or secondary earner model, in Bulgaria and Germany in 2006 (*Hofäcker et al.* 2013) and in East and West Germany during the period from 1981-2005 for cohorts born between 1919-1971 (*Trappe et al.* 2015). With the rise in women's labour market participation (*Esping-Andersen* 2009) and the corresponding decline in the male breadwinner model (*Lewis* 2001), studies have highlighted new forms of household types, such as dual earner and single households. This trend has been observed in the US, comparing 1970 with 1997 (*Jacobs/Gerson* 2001), in Germany during the years 1991-92, 2001-02 and 2012-13 (*Deuflhard* 2023), and in other European countries, comparing 2006 with 2018, for the cohorts born between 1930 and 1989 (*van den Berg/Verbakel* 2022). However, these studies focused on a static snapshot of household labour supply in a single year or multiple years, thereby underestimating the long-term development of household labour supply. To the best of my knowledge, only *Nutz* and *Gritti* (2022) have examined the different constellations of long-term employment trajectories within coupled households, using cohorts born between 1920 and1960 in Germany and the UK. This study found that traditional gender divisions of labour resulted in greater within-couple wealth inequality in later life in West Germany compared with the UK. However, no study so far has explored cohort replacement of household labour supply trajectories that includes both couples and single individuals.

Therefore, this paper contributes to the literature in two aspects: first, it provides descriptive analyses of cohort replacement in types of household labour supply trajectories. Second, it focuses on both coupled and single households. This study focuses on Germany and the UK as examples of conservative and liberal welfare states, respectively. These countries are particularly interesting cases when it comes to evaluating a cohort replacement in household labour supply because they represent different welfare states that have undergone socio-economic changes in recent decades.

The socio-economic conditions and normative context are especially important for adults' socialisation because, according to the *impressionable years model*, mid-adulthood is a particularly important life stage in which individuals experience dramatic life changes, such as social role formation, which stabilise and persist throughout their life course (*Alwin/McCammon* 2003). Describing the cohort replacement of household labour supply trajectories in mid-adulthood (ages 30-43) in cohorts born between 1961 and 1973 and who entered their early 30s during the period from 1991 to 2016 in various socio-economic contexts in Germany and the UK, can therefore reveal whether a social change emerges.

1.2 Welfare and family policy in Germany and the UK

Esping-Andersen (1999) classified welfare regimes by the degree to which their family policy adopts familialism or de-familialism approaches. While a familialism approach

suggests that the family takes maximum responsibility for the family members, a de-familialism approach aims to reduce individual dependencies on the family by providing services and welfare via the state or the market.

Family policy classification was developed further in later studies (*Daly* 2011; *Lohmann/Zagel* 2016; *Leitner* 2003). *Leitner* (2003) suggested the optional familialism approach, a combination of familialism and de-familialism, as it provides both public childcare and income to support care, which allows families to choose to care for their members. *Daly* (2011) and *Lohmann* and *Zagel* (2016) replaced the term of de-familialism with individualisation, an approach that demonstrates choices, independence, and individualised identity in work and family lives for both genders. For example, the "adult worker model" supports individual rather than joint taxation and facilitates parents' work-life balance by providing public childcare that frees up time in which they can then work. It also encourages active fatherhood and gender equality by incentivising shared parental leave by both spouses. However, *Daly* (2011) argues that European countries that adopted the adult worker model have moved only halfway so far, as the dual-earner, gender-specialised model has been promoted rather than the individualised worker model.

According to the *impressionable years model (Alwin/McCammon* 2003*)*, we can assume that welfare states and gender norms are particularly relevant in mid-adulthood because this period can be critical for socialising and stabilising roles. When making the transition to adulthood, welfare states and gender norms collectively shape social role incentives and, thus, household labour supply (*Geist* 2005; *León* 2005; *Craig/Mullan* 2011). More specifically, in Nordic social democracies where gender equity is actively encouraged (*Geist* 2005) and free, high-quality public childcare, shared parental leave, regulated working hours, and income support for childcare are widely available (*Gornick/Meyers* 2004), the dual-full-time/dual-carer model is more likely to be formed (*Geist* 2005; *Craig/Mullan* 2011). In the conservative welfare state, traditional gender norms are actively supported by social policy; therefore, the unequal gender division of labour tends to be socialised and prominent (*Geist* 2005). The liberal welfare state passively encourages gender equality by treating married women as individuals (*Geist* 2005). However, childcare is provided on a private basis in most cases (*León* 2005); thus, rational choice in the form of cost-benefit considerations leads to either gender specialisation (*Ciccia/Bleijenbergh* 2014) or sole female responsibility for housework (*Geist* 2005).

Germany and the UK represent different types of welfare states with different degrees of famlialisation, de-familialisation or individualisation. Traditionally, Germany represents a conservative welfare state with a strong degree of familialism (*Esping-Andersen* 1999; *Leitner* 2003). Unified Germany had strict labour market regulations and a generous social insurance-based welfare model with strong social protections for the unemployed and lower socio-economic groups (*Esping-Andersen* 1990; *Gebel* 2010). In this context, German households have been relatively secure in economic terms. However, unified German family policy has encouraged *traditional gender norms* and supported the traditional gender division of labour, for example, through the joint tax system, the limited supply of public childcare, and

long and generous parental leave for primary caregivers, mainly women (*Trzcinski* 2000; *Steiner/Wrohlich* 2006).

In contrast, the UK represents a liberal welfare state with a residual (non-interventionist) welfare policy, reflected by limited labour market regulation and modest income support for disadvantaged groups (*Esping-Andersen* 1999; *Gebel* 2010). In this context, family policy is also liberal because parental leave is comparatively modest, and childcare for young children is largely provided by part-time day-care or by family members and relatives (*Esping-Andersen* 1999; *Thévenon* 2011; *Ciccia/Bleijenbergh* 2014; *Banister/Kerrane* 2024). In this context, *a rational choice* in the form of cost-benefit considerations fosters the gendered division of labour. Because part-time childcare receives only modest public financial support, the secondary earners, mainly women, are more likely to be the primary caregivers, leading to the traditional gendered division of labour in the 1.5-earner model (*Ciccia/Bleijenbergh* 2014).

1.3 Socio-economic changes in Germany and the UK

Both Germany and the UK experienced major socio-economic changes during the period under study, namely from 1991 to 2016. In both countries, the Second Demographic Transition that began in the mid-20th century was marked by the adoption of more gender-egalitarian norms and delays in family formation transitions (*Lesthaeghe* 2010). For example, both societies exhibited a notable postponement of parenthood from as early as 1972 in West Germany and the UK, and 1980 in East Germany (*Sobotka* 2004). Moreover, since the 1990s, the expansion in educational options has not only increased women's participation in higher education but also improved their labour market opportunities (*Ertl* 2005; *Boliver* 2011; *Devereux/Fan* 2011; *Becker/Blossfeld* 2021). Furthermore, economic conditions, as well as welfare and family policies, have changed dramatically. Following the reunification of East and West Germany in 1991, the unemployment rate in Germany rose, especially in the former East (*Rosenfeld et al.* 2004). To boost employment, the Hartz Reforms were introduced in 2005 (*Kemmerling/Bruttel* 2006), reducing support for the unemployed while encouraging new types of work arrangements, such as mini jobs, temporary work, and self-employment (*Kemmerling/Bruttel* 2006; *Dingeldey* 2007; *Ehlert* 2012). During this period, persons in mid-adulthood are observed to live in low labour intensity households, where individuals and couples do not have full-time work.

At the same time, while parental leave was highly conservative, with the provision of a generous amount of leave (three years with two years of flat-rate benefits) from 1992 to 2000 (*Ziefle/Gangl* 2014), family policies have fostered optional familialism from 2001 onwards. This is reflected by a more individualised approach with the adoption of the adult-worker model. In 2001, greater benefits were given to parents who took less than one year of parental leave, and parents could choose to take the third year of leave any time between the child's second and eighth birthday (*Ziefle/Gangl* 2014). Moreover, public childcare was expanded in 2005, and since 2013 day-care places have become a legal right for children from the age of

one (*Zoch/Schober* 2018). In addition, parental leave reforms in 2007 introduced earnings-related benefits with a replacement rate of 67 percent (subject to an upper limit of EUR 1,800 per month), which included two months of leave reserved for the partner (*Ziefle/Gangl* 2014). These changes sought to increase women's labour market participation and fathers' involvement in childcare. However, despite the decline in the male breadwinner model, German family policy has remained relatively conservative because it still incentivises a main breadwinner and a part-time secondary earner model (also called the "1.5-earner model"), partly due to the unchanged joint tax system and limited childcare possibilities for young children (*Henninger et al.* 2008; *OECD* 2021a/b).

Historically, East and West Germany had different economic and family conditions. In East Germany, high demand for manual labour required both men and women to work full-time before reunification (*Rosenfeld et al.* 2004; *Zoch* 2021). Although there has been a convergence in adult gender attitudes and work patterns in East and West Germany for people living under similar institutional contexts following reunification (*Rosenfeld et al.* 2004; *Zoch/Schober* 2018), differences in the structural and normative context continue to exist. Public childcare supply and attendance in East Germany is still higher than in West Germany (average childcare attendance is 52 percent in the former and 28 percent in the latter in 2016) (*Zoch* 2020). Moreover, gender ideologies were more egalitarian in the East than in the West before reunification (*Kleinschrot* 2023), and this remained the case following reunification (*Zoch* 2021).

The British welfare state, too, has experienced major socio-economic changes. The unemployment rate rose in the early 1990s and then declined before increasing again sharply after the global financial crisis in 2008 (*OECD* 2020). However, since 1999, two years after the election of a Labour government, welfare policy aimed at employment creation has become more generous. Public expenditure on low-income families and low-wage workers through in-work benefits[3] has grown (*Blundell/Hoynes* 2004; *Finch* 2008; *Gregg et al.* 2009), reflecting greater social protection for households with non-standard, precarious labour market positions. However, welfare policy took a different direction with the reforms between 2010 and 2015. These reforms reduced spending on child and working-age benefits, leading to financial loss, especially among low-income households (*Beatty/Fothergill* 2018).

In addition to these changes in welfare policy, British family policy has become more individualistic and gender-egalitarian, despite very minimal measures to this effect initially. For example, as of 2008, maternity leave was extended to 39 weeks (with paid leave covering 90 percent of employees' wages for the first six weeks, followed by 33 weeks at a low statutory flat-rate payment). Public childcare has also been expanded but remains dominated by part-time childcare provision. Since 2003, fathers have been entitled to two weeks of paid leave, and since 2011, the

[3] In-work benefits are work-dependent types of income supplement (*Blundell/Hoynes* 2004).

possibility of transferring untaken leave between partners has become more flexible (*Finch* 2008; *Daly/Scheiwe* 2010; *Atkinson* 2017; *Banister/Kerrane* 2024; *Gemma* 2023).

The UK social policy model adopted more elements from the "adult-worker model" logic. This approach may have increased the number of dual full-time earner households but, at the same time, partly maintained the 1.5-earner household model because some Working Tax Credits were based on joint earnings. Moreover, public childcare provision, while having been expanded, remained mostly part-time in nature. This policy therefore reduced work incentives for some secondary earners, primarily represented by women (*Lewis* 2001; *Colette/Norman* 2012).

1.4 Cohort replacement of household labour supply in Germany and the UK: empirical expectations

Against this background, cohort replacement in household labour supply for the studied cohorts (1961-1973) is expected. However, different mechanisms might shape household types depending on the socio-economic context. In the liberal context of the UK, gender division of labour stems from mechanisms of *rational choice* of cost-benefit considerations among partners (*Becker* 1981), mainly due to the modest provision of full-time public childcare (*Ciccia/Bleijenbergh* 2014). In the conservative context of Germany, *traditional gender norms* shape policies that incentivise the gender division of labour (*Geist* 2005). However, when economic insecurity rises, such as in cases of unemployment and welfare state retrenchment, a lack of job opportunities and welfare support should translate into *work marginalisation* (*Harsløf* 2003), which drives an increase in households with low labour intensity and involves periods of non-standard employment or non-employment. However, when family policy becomes more gender-egalitarian, a *normative change* towards more equal gender roles is expected to take prominence (*Zoch/Schober* 2018).

Due to the Hartz reforms of 2005, adults in East Germany who were born in the late 1960s and early 1970s began their adulthood with more job opportunities but also with a greater supply of non-standard employment and lower levels of social protection than those born in the early 1960s. However, adults in West Germany in more recent cohorts entered their 30s in a less economically secure context than their counterparts from earlier cohorts. Therefore, due to *work marginalisation*, the proportion of households with low labour intensity is expected to be high and persistent across cohorts in East Germany, and is expected to increase in West Germany. In addition, although the two regions remained different in their gender-egalitarian opportunity structures and gender attitudes following reunification in 1990 (*Zoch* 2021), women's employment patterns converged (*Rosenfeld et al.* 2004). Because family policy in unified Germany has shifted strongly towards optional familialism since the early 2000s, while retaining the joint tax system, a rise in the proportion of 1.5-earner households in both German regions is expected, along with a decline in male breadwinner households in the West and dual full-time earner households in the East. The introduction of adult worker model elements, particularly the expansion of childcare and the earnings-related benefits with paternity quotas,

should lead to a *normative change* in which women and men perceive greater choice in their work and family domains, respectively.

Compared with earlier cohorts, adults born in the late 1960s and early 1970s in the UK established their households during a period of greater welfare support that fostered employment and provided better social protection. Consequently, the mechanism of *work marginalisation* should be less important, and thus the share of adults who live in households with low labour intensity is expected to decline across cohorts. It is important to note that the rise in unemployment rates after the economic crisis in 2008 and the liberalisation reforms between 2010 and 2015 should not have a strong impact on cohort replacement of household labour supply types among the cohorts studied, as these contextual changes occurred when the most recent cohort of adults was already in its late 30s, a stage when people's social roles are more resistant to change (*Alwin/McCammon* 2003). In addition, similar to Germany, British adults in recent cohorts were socialised in a more gender-egalitarian opportunity structure but where the options for combining work and family care remained limited compared with earlier cohorts who were socialised under a liberal policy with gender traditionalism. Therefore, the proportion of male breadwinner households across cohorts should decline, and *a normative change* towards more gender-egalitarian norms may increase the proportion of dual full-time earner households. However, the 1.5-earner household type should remain substantial and particularly prominent in cohorts born between 1964 and 1966, as gender specialisation based on *rational choice* becomes a dominant mechanism. Adults in these cohorts entered their 30s after recovering from the deterioration in economic conditions and before the introduction of more gender-egalitarian family policy reforms.

Country differences in the mechanisms are also expected regarding the pace and patterns of household type changes. The rise in economic insecurity seems to be more continuous in West Germany and remains high and persistent in East Germany, while in the UK, economic insecurity was more dominant for the earliest cohort. Thus, the *work marginalisation* mechanism should more continuously raise the proportion of households with low labour intensity in West Germany compared with East Germany and the UK.

In sum, recent cohorts of adults in Germany and the UK established their households in a different opportunity structure than earlier cohorts, potentially leading to cohort replacement of the types of household labour supply (see Fig. 1 for the historical timeline and the expected cohort replacement of household labour supply for the studied birth cohorts). My hypotheses are as follows:

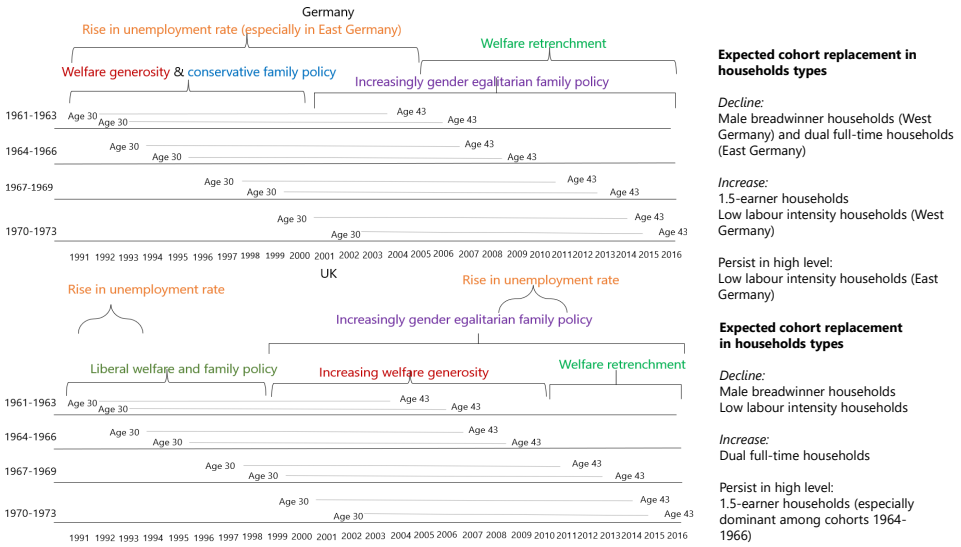
H1*: The male breadwinner household type is expected to decline in West Germany and the UK*

H2*: The 1.5-earner household type is expected to rise across cohorts in both German regions and to remain substantial across cohorts in the UK, with particular prominence among the cohort born between 1964 and 1966*.

H3*: The dual full-time earner household type is expected to decline in East Germany and to increase in the UK*.

H4: *The share of households with low labour intensity is expected to decline in the UK, rise continuously in West Germany, and remain high in East Germany.*

Fig. 1: Historical timeline and the expected cohort replacement of household labour supply for the studied birth cohorts, 1991-2016



Expected cohort replacement in households types

Decline:
Male breadwinner households (West Germany) and dual full-time households (East Germany)

Increase:
1.5-earner households
Low labour intensity households (West Germany)

Persist in high level:
Low labour intensity households (East Germany)

Expected cohort replacement in households types

Decline:
Male breadwinner households
Low labour intensity households

Increase:
Dual full-time households

Persist in high level:
1.5-earner households (especially dominant among cohorts 1964-1966)

Source: own design

2 Data and method

I used panel data from the German Socio-Economic Panel (GSOEP), the British Household Panel Survey (BHPS), and the Understanding Society databases. These annual longitudinal surveys allow us to follow the work histories of household member respondents. The GSOEP survey started in 1984 in West Germany, and since reunification in 1990, it has also included East Germany (*GSOEP* 2020). The BHPS was conducted between 1991 and 2008; from 2009 onwards, part of the BHPS sample has continued to be followed in the Understanding Society survey (*Taylor et al.* 2010). For the current study, I selected respondents who participated in both the BHPS and Understanding Society surveys. I harmonised the datasets from both countries to provide a comparable time frame for the sample population. The analysis is therefore limited to 1991-2016.

The longitudinal data allowed me to track life trajectories on a sample of adults born between 1961 and 1973, from the ages of 30-43. I focused on 13 birth cohorts because the databases provide the maximum amount of information relevant to the study for these adults. Focusing on 13 birth cohorts might show a limited overview of cohort replacement. However, covering the period during mid-adulthood across several birth cohorts, especially when contextual changes have occurred, allows

any new trends in cohort replacement of types of household labour supply to be revealed.

I also limited the analysis to the age range of 30-43 in order to estimate how types of household labour supply are formed in mid-adulthood. I evaluated a cohort replacement of household labour supply types by comparing household types of adults across four groups of birth cohorts. Table 1 shows the distribution of birth cohort groups in the sample. Overall, the sample includes 3521 respondents in Germany and 2663 in the UK.

Tab. 1: Distribution of birth cohort groups

	Germany	UK
1961-1963	20.02	19.79
1964-1966	33.39	27.04
1967-1969	28.89	25.57
1970-1973	16.80	27.60
N	3521	2663

Source: BHPS and Understanding Society, 1991-2016; GSOEP, 1991-2016

To measure types of household labour supply, I utilised several strategies. First, I created a new indicator of household labour supply types by using sequence analysis and cluster analysis (*Abbott* 1995; *Abbott/Tsay* 2000; *Aisenbrey/Fasang* 2010) of the employment status of individuals aged 30-43, and their partners in cases where they lived together.[4] Sequence analysis allows us to understand social processes by estimating several transitions that people make over a long period of time (*Abbott* 1995). It therefore allows us to follow trajectories of statuses over their life course while considering their sequences, duration, and timing. The advantage of using sequence analysis for the study's research question is that it allows us to observe the extent to which household types change or remain stable over time and how they develop and evolve across cohorts. This technique is based on a distance matrix of Optimal Matching Analysis (OMA), which quantifies the number of operations necessary to transform one sequence into another (*Aisenbrey/Fasang* 2017). The minimum operation required is defined as the minimum cost. To prevent arbitrariness in the choice of cost, I set the cost of the deletion and insertion operation equal to 1 and used a data-driven approach that observes the frequency of transitions between operations (*Rohwer/Poetter* 2004; *Piccarreta/Billari* 2007).

Cluster analysis is a technique used to identify distinctive differences in life trajectories. It partitions sequences based on the degree of the similarities of the sequences within the group and the degree of the dissimilarities to sequences in another group (*McVicar/Anyadike-Danes* 2002). I used a combination of the Ward (hierarchical algorithms) and PAM (partitioning around medoids) algorithms (*Studer*

4 For sequence and cluster analysis, I used the R package TraMineR (*Gabadinho et al.* 2011).

2013). This method initialises the PAM algorithm using hierarchical clustering. The main advantage of this combined method over using each algorithm separately is the possibility of maximising global criteria using medoids (as in the case of PAM) but without choosing the starting point of the clusters' number arbitrarily (as in the case of Ward). I have therefore adopted this approach in this study. To have comparable clusters in Germany and the UK across cohorts, I run sequence analysis and cluster analysis for a pooled sample that includes adults from all the studied cohorts in both countries.

Building on the idea of *Lewis, Campbell,* and *Huerta* (2008), I categorised household labour supply using the employment status of individuals and their partners in the same household. However, I did not focus solely on the employment status of couples since contemporary household types include various living arrangements, such as singlehood.

To create an indicator of household labour supply types for the sequence data, I used information on the employment status (part-time, full-time, or non-working) of individuals and partners living in the same household. However, because sequence analysis should include categories with sufficient observations, I minimised the number of categories by considering the gender of partners only when they live in the same household. Table 2 shows the categories of employment constellations and their household types. I first coded the work status of individuals and their partners for each gender (e.g. a male with part-time work whose female partner works full-time).

After creating these categories, I combined them for men and women sharing similar household contexts. I combined the same configuration represented by different respondents, for example, (1) a full-time working female respondent with a part-time working male partner, and (2) a part-time working male respondent with a full-time working female partner. In this way, the employment constellation and the gendered division of labour are captured so as to examine which household types exist. I also combined categories with few observations that shared similar theoretical meanings. For example, the categories in which women or men work part-time and their partner did not work were combined into the single category of "small jobs". Low labour intensity household refers to couples and individuals without full-time work; thus, it is considered for both coupled and single households.

Furthermore, I imputed economic status at the household level for individuals and their partners when observations were missing at some point, using multiple imputations based on demographic variables for the whole survey for a minimum of eight years.[5] I also conducted a sensitivity analysis to check a category of missing values, and the results remained the same (available upon request). Moreover, to account for sample attrition, I weighted the data based on the multiplication of

[5] I imputed 31 percent of the person-year observations in the UK and 19 percent in Germany. Multiple imputations are based on age and include the prediction of missing values by demographic characteristics. A prediction of missing values for 2009 in the UK is also included because the BHPS and the Understanding Society survey skipped this year.

Tab. 2: Categories of employment constellation within households

	Category	Description	Household labour supply types
1	Full-time couple	Couples in which both men and women work full-time	Dual full-time earners
2	Part-time (f) & full-time (m)	Women work part-time and men work fulltime	1.5-male breadwinners
3	Non-working (f) & full-time (m)	Women do not work and men work full-time	Male breadwinners
4	Female breadwinners	Women work full-time and men either do not work or work part-time	Female breadwinners
5	Small jobs	Men or women either do not work or work part-time	Couples with low labour intensity
6	Non-working couple	Neither men nor women work	Couples with low labour intensity
7	Full-time & no partner	Men or women work full-time and do not have a partner	Single and standard careers
8	Part time & no partner	Men or women work part-time and do not have a partner	Single with low labour intensity
9	Non-working & no partner	Men or women do not work and do not have a partner	Single with low labour intensity

Source: own design

the first observation with the cross-sectional weight of a person by the probability of non-participation in the survey during the observed period. This step provided a comparable weight that addressed the potential problem of panel attrition in both countries. Finally, given that the aim of determining types of household labour supply is to focus on individual trajectories within the household context rather than on couples, the indicator captures people's partnering and re-partnering with one or multiple partners.

Presenting descriptive findings on the evolution of household labour supply types in Germany and the UK for cohorts born between 1961 and 1973 based on the new indicator allowed me to evaluate the trend of cohort replacement in household labour supply in light of the socio-economic changes in the two countries. Despite adults in unified Germany living under the same family policy during the period under observation, differences in economic conditions and in normative and institutional context remained following reunification. Cohort replacement data in Germany is therefore divided into East and West.

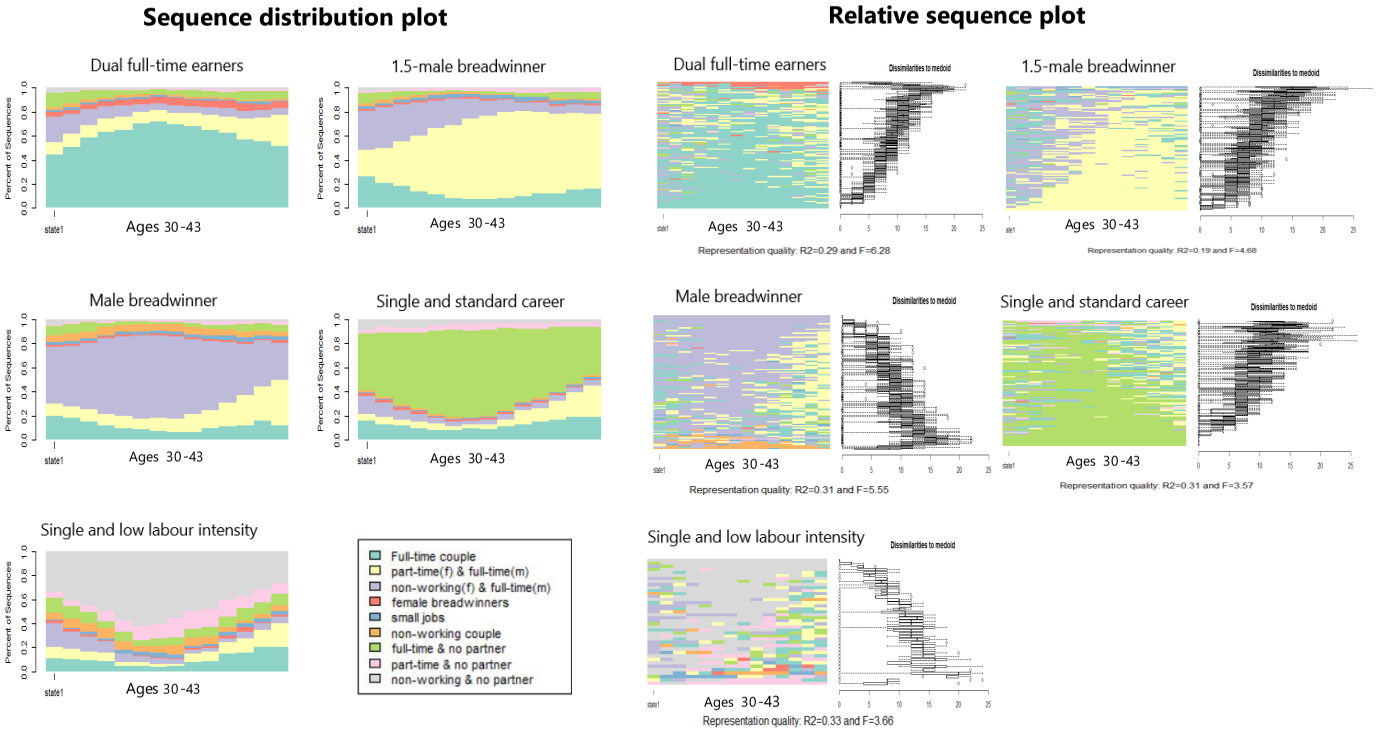
3 Results

Which types of household labour supply have formed in Germany and the UK? The evaluation criteria for the cluster analysis noted that, despite the R-squared measure suggesting solutions with two to three clusters because they demonstrated low levels of reduction in cluster discrepancy, the average silhouette width suggests a solution with five clusters. Based on the combination of the Ward (hierarchical algorithms) and PAM (partitioning around medoids) algorithms, I chose the solution with five clusters because it provided more distinctive and informative clusters. Other evaluation criteria, such as Point Biserial Correlation (PBC), Hubert's Gamma (HG), and Hubert's Somers D (HGSD), also indicated that five clusters provided a suitable solution relative to other solutions (available upon request).[6]

Figure 2 shows the sequence distribution and the relative sequence plots for the pooled datasets of Germany and the UK. The former gives information on the density of each state within the clusters (*Billari/Piccarreta* 2005). The latter emphasises the trend of the sequences within each cluster, including the order and the timing of the states (*Fasang/Liao* 2014). The results indicate five types of household labour supply. The first is the "dual full-time earners" type, during which both partners held full-time work (8.54 out of 14 years of dual full-time earners), with some changes in work status among partners, especially at the beginning and the end of said period. This type of household labour supply presents a work symmetry, as both women and men work full-time.

6 Additional robustness checks found that a solution with five clusters provided the most informative results when testing sequence and cluster analyses for each country separately, as well as for East Germany. For West Germany, a solution with six clusters emerged, splitting two relatively similar clusters which, in the main analysis, are considered as one theoretical cluster. In addition, when including an additional category, "dual part-time couple", the findings remained unaltered (available upon request).

Fig. 2: Patterns of household labour supply types



Notes:

a) The relative sequence plot (*Fasang/Liao* 2014) presents two graphs: the graph on the left presents sequence medoids (k), and the graph on the right presents the dissimilarities in the medoids.

b) Results from the relative sequence plot are based on an LCS (longest common subsequence) distance matrix with substitution costs based on transition rates with k=100. Given that solo standard careers and solo non-standard careers had fewer than 1000 sequences, their analyses included k=80 and k=40, respectively. Results from the relative sequence plot were significant ($p < 0.001$).

Source: BHPS and Understanding Society, 1991-2016; GSOEP, 1991-2016

The second type of household labour supply is the "1.5-male breadwinner" model (also called the 1.5-earner model). People in this cluster form a 1.5-male breadwinner household type in which women work part-time (7.90 out of 14 years of 1.5-male breadwinner). This type of household is switched mostly from the "dual full-time earners" or the "male breadwinner" households and remains so for the rest of the period under observation. The third type is the "male breadwinner" model, in which men work full-time, and women are mainly disconnected from the labour market and, in some cases, switch to part-time work in later stages of life (7.71 out of 14 years of male breadwinner).

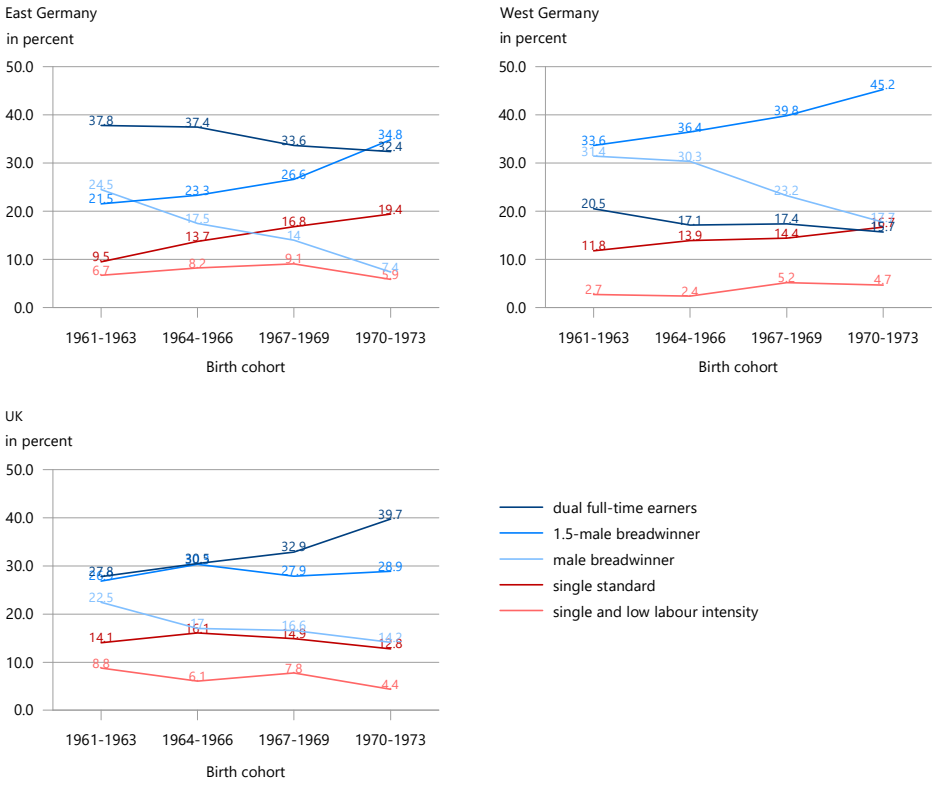
The final two types of households are "singlehood and standard careers" and "singlehood with low labour intensity". In general, single individuals with standard careers have standard full-time jobs and lived without a partner during most of this period (8.38 out of 14 years of singlehood and standard career). Some establish partnerships and go on to have various career trajectories in their households. People in this group exemplify the "individualisation" life course of independent people, who might prefer autonomy in their family lives and are willing to postpone creating partnerships or choose not to be in a partnership.

Finally, those who are "single with low labour intensity" experience marginality in both their careers and co-residential lives, as they spend long periods without partners and in non-standard positions, mainly non-working (6.41 out of 14 years of singlehood with low labour intensity). Although some people in this cluster form "dual full-time earner" or "1.5-male breadwinner" households later in the period under observation, persons in this type of household have the lowest intensity of labour supply, as they mostly do not work and do not share their living arrangements with a partner.

The next question is whether a cohort replacement in types of household labour supply emerges in light of socio-economic changes in Germany and the UK. Figure 3 depicts changes in the distribution of household labour supply types across birth cohorts. As expected from H1, the findings show a decline in the male breadwinner model not only in the UK and West Germany, but also in East Germany. Instead, we see a rise in the 1.5-male breadwinner model in West and East Germany. This household type remained substantial across cohorts in the UK, with a larger proportion in cohorts born between 1964 and 1966. These findings align with H2, which expected that a *1.5-earner household type would emerge in both German regions and remain significant, and particularly dominant for the second group of cohorts in the UK*. Moreover, as expected from H3, the proportion of dual full-time earner households increased in the UK and declined in East Germany. However, it also declined in West Germany, contrary to expectations. In Germany and the UK, more gender-egalitarian family policies were introduced during the period under observation, weakening traditional gender norms in the process. Why, then, did the transition to a more gender-egalitarian normative context in Germany translate into an increase in the 1.5-male breadwinner model rather than a rise in the dual full-time earner model, as happened in the UK?

The increase in the 1.5-male breadwinner model and the decline in the dual full-time earner model in both East and West Germany corroborates the "half-way" shift

Fig. 3: Household type by country and birth cohort, 1991-2016



Source: BHPS and Understanding Society, 1991-2016; GSOEP, 1991-2016

to a more gender-egalitarian family policy, which resulted in a mix of conservative and gender-egalitarian family policy. The decline in the dual full-time earner model in East Germany happened due to East German women's employment patterns converging with those of West German women following reunification. However, this model remained relatively common in East Germany because gender-egalitarian family policy prevailed before reunification (*Rosenfeld et al.* 2004), and the supply of public childcare was relatively high to begin with and has remained higher than in the West (*Zoch* 2020). In West Germany, introducing new elements of the adult worker model led to the decline in the male breadwinner model, presumably due to the better work incentives for mothers (*Zoch/Hondralis* 2017). However, introducing the adult worker model with the existing joint tax system, generous parental leave, and low availability of public childcare[7] (*Trzcinski* 2000; *Steiner/Wrohlich* 2006), led to the rise in 1.5-male breadwinner households in West Germany. In addition, worsening

7 Full-time childcare attendance for under three-year-olds in West Germany in 2016 was 13 percent (*Zoch* 2020).

labour market opportunities for less educated women (*Konietzka/Kreyenfeld* 2010) may have led to a decline in the dual full-time earners model and contributed to the rise in 1.5-male breadwinner households.

The timing also matters. While the rise in the 1.5-male breadwinner model steadily increases across birth cohorts in West Germany, this type of household also increases across cohorts in East Germany, with a particularly sharp increase in cohorts between 1970 and 1973. This trend seems to coincide with the decline in the dual full-time model and thus may represent a convergence with West German employment patterns among these cohorts.

The single, standard-career household type has also grown in Germany but declined slightly in the UK. This finding can be explained by the multiple equilibria theory (*Esping-Andersen/Billari* 2015), which suggests that the transition to more gender egalitarianism involves normative confusion about gender roles with a lower level of commitment to family life, such as partnership. According to the theory, when women gain economic independence in societies that have not yet adopted gender-egalitarian norms, it creates normative confusion about women's roles, which leads to normative uncertainty and translates to a lower level of family commitment, thereby increasing singlehood. In the final phase of the transition, when the population adjusts to gender-egalitarian norms, there is a decrease in normative confusion, a greater level of family commitment, and a decline in singlehood.

Given that the transition to gender egalitarianism in Germany and the UK happened when attitudes regarding gender equity were more prominent in the latter country (81.15 percent) and less so in the former country (65.87 percent) between 2002 and 2014 (*Bellani et al.* 2017), we can assume that the rise in single and standard career households in Germany compared with the UK was a result of the normative confusion in East and West Germany under the mixed conservative and gender-egalitarian family policies. East and West Germany had re-traditionalisation and modernisation trends, respectively. While their gender attitudes converged after reunification, differences regarding maternal employment attitudes remained (*Zoch* 2021), reflecting the ongoing change in gender norms in both regions and, consequently, the possible normative confusion that might lead to the rise in single and standard career households.

In addition, as expected, a growing share of adults in recent cohorts in West Germany live in low labour intensity households. This trend is reflected by an increase in the number of persons without a partner and who are non-working, corroborating the liberalisation of welfare policy in this context. However, the findings for East Germany show a decline in the proportion of single and low labour intensity households from the third to the last cohort, probably due to the Hartz reforms. Nevertheless, there is only a slight decline when comparing the earliest cohorts with more recent cohorts. This proportion remained relatively high and was still higher than in West Germany. In other words, despite the Hartz reforms that aimed to strengthen employment (*Kemmerling/Bruttel* 2006), ultimately there is no meaningful decline in the share of single and low labour intensity households in East Germany across cohorts. In West Germany, however, there has even been a rise in low labour intensity households. This increase, contrary to expectations, was not

fully continuous across cohorts. The rise of this household type is observed from the first to the last cohorts, but it is predominantly visible from the second (1964-1966) to the third cohort (1967-1969). While adults of the first cohorts were exposed to low levels of unemployment in their early 30s, followed by a rise in unemployment, the second and third cohorts were in their 30s when the unemployment rate was already high and continually increasing. This period of high and increasing unemployment occurred before the introduction of the Hartz reforms, which may have only slightly decreased the share of households with low labour intensity in the last cohorts.

In the UK, the share of adults in single and low labour intensity households was high in the earliest cohort before declining substantially. This trend can be explained by the rise in unemployment and the residual welfare policy in the UK in the early 1990s, which translated into few socially protected households among earlier cohorts. However, with the increased generosity of welfare benefits for low-income families and workers since 1999, which also targeted incentivising employment through in-work benefits (*Blundell/Hoynes* 2004), a decline in low labour intensity households in recent cohorts is observed, as expected. Overall, these findings mostly align with H4, which suggests that *a share of households with low labour intensity is expected to decline in the UK, rise in West Germany, and remain high in East Germany.*

4 Discussion

Adults in recent cohorts established their households in an opportunity structure with new forms of working and living arrangements (*Kemmerling/Bruttel* 2006; *Finch* 2008; *Ziefle/Gangl* 2014; *Banister/Kerrane* 2024), reflecting a potential trend of cohort replacement in types of household labour supply. Using longitudinal data with sequence and cluster analyses for samples of birth cohorts of adults in Germany and the UK, this study provides a descriptive analysis of cohort replacement in types of household labour supply. Understanding cohort replacement of living and working arrangements within households is important because it can shed light on the lives of adults in future generations.

The results show a cohort replacement in the types of household labour supply in Germany and the UK. While work and partnership statuses express relative stability during mid-adulthood, cohort change is reflected in the timing of the rise and decline of various household types. As these findings are descriptive results, the analysis did not include variables that explain this trend. However, one possible explanation is offered by the different social contexts across cohorts. In West Germany, earlier cohorts of adults established their households in a more socially protected but also more conservative welfare state. Thus, a low proportion of households with low labour intensity was observed, as reflected by single and low labour intensity households and a high proportion of male breadwinner households.

Those in recent cohorts, however, established their households in more mixed conservative and gender-egalitarian family policies. The results confirmed H1, which expected a decline in the male breadwinner model in West Germany, but we also saw a decline in this model in East Germany. Instead, we see a rise in the share of the 1.5-

male breadwinner household type in both East and West Germany, as expected from H2. This trend can be explained by mechanisms of *normative change* followed by the shift towards more gender-egalitarian family policies. Moreover, as expected from H3, we also see a decline in the dual full-time earner model in East Germany. Adults in these recent cohorts established their households during a period when welfare policies offered less social protection and *work marginalisation* was therefore greater, as reflected by an increasing share of single and low labour intensity households in West Germany. In East Germany, this household type remained relatively prevalent and hardly changed from the first to the last cohorts. These findings are in line with H4. Interestingly, the findings also showed an increasing share of single and standard career households.

In the UK, because adults in earlier cohorts began their early 30s with fewer job opportunities, weaker social protections, stronger traditional gender norms, and a gender-liberal family policy, we see that households with low labour intensity and male breadwinner households prevailed. However, recent cohorts of adults established their households in a context of greater social protection (with less *work marginalisation*) and mixed liberal and gender-egalitarian family policies (with more *gender-egalitarian norms*). This finding could explain why we see a decline in male breadwinner households, as expected from H1, and a decline in single and low labour intensity households, as expected from H4.

Instead, we see an increasing proportion of dual full-time earner households, as expected from H3. This trend might be explained by the mechanism of *normative change* as family policy has become more gender-egalitarian. The 1.5-earner household type remained substantial and particularly dominant in the 1964-1966 cohort, possibly due to *rational choice of gender specialisation*, as expected from H2.

The study has some limitations that should be acknowledged. First, it focused on two types of welfare state that have seen dramatic socio-economic changes in recent decades. It would be fruitful to observe cohort replacement of types of household labour supply in different welfare states, such as the Scandinavian model. Furthermore, in the UK, adults of the cohorts included in the study were exposed to a rise in unemployment in 2008 and welfare state retrenchment reforms from 2010-2015. However, they were in their late 30s at that point and thus more resistant to change. Given that the establishment of roles in mid-adulthood is argued to be the main mechanism explaining the cohort replacement of household labour supply types, the study did not capture how, from 2008 onwards, newer cohorts of adults in this life stage have formed their households in the context of a welfare state offering less social protection. This opens up additional research pathways for future study. Finally, the study provides a descriptive analysis of cohort replacement in household labour supply. It would be fruitful to examine this process in future research using a more extensive longitudinal time framework that examines how life course sequences form after specific policies, including factors as potential explanations.

Despite these limitations, an important question raised by the findings is why there are differences between Germany and the UK in the alternatives to the male breadwinner model, despite both countries establishing households amid more gender-egalitarian family policies. Traditional male breadwinner households

have been replaced by dual full-time earner households in the UK and 1.5-male breadwinner households in Germany. A potential explanation for this difference is that, unlike in the UK, the worsening labour market opportunities for less educated women in West Germany, along with strong gendered institutions, such as limited childcare availability, the joint tax system, and generous parental leave, continue to reinforce traditional gender roles and incentivise main-earner households. Therefore, women in Germany, mainly mothers, still have less opportunity for career mobility than men. Policymakers should foster an individual tax system, increase public childcare, and encourage both spouses to share a moderate term of parental leave in an attempt to incentivise a more equal division of labour within households.

Furthermore, the findings show that the share of single and low labour intensity households increased in West Germany and persisted in East Germany from the first to the last cohorts, despite some decrease due to the Hartz reforms that aimed to strengthen employment (*Kemmerling/Bruttel* 2006). It might be that the liberalisation of welfare policy designed to increase employment through non-standard employment is insufficient when it comes to integrating those who are both single and are persistently unemployed. Policy investment in education and training for this group, as well as efforts to coordinate their skills with labour market demands, could foster better labour market integration.

The findings also have important policy implications for the UK. The cohort change in the UK revealed an increasing proportion of dual full-time earner households while 1.5-male breadwinner households persist and remain substantial. Given that family policy in the UK provides modest support for combining work and family care, dual full-time earner partners might have less choice in caring for their children and tend to have more difficulty juggling responsibilities in work and family spheres, thereby experiencing strong work-family conflict. The 1.5-male breadwinner household type might provide a more flexible alternative for combining work with childcare, but unpaid work in the UK is predominantly undertaken by women (*Ciccia/Bleijenbergh* 2014). To foster a better work-life balance and promote a more equal gender division of labour, a "dual earner/dual care" model, with less than full-time work, might be adopted. This model suggests that both parents share moderate earnings-related parental leave benefits, have access to high-quality early childhood education, reduce working hours, and receive income support during periods of care (*Crompton* 2001*; Gornick/Meyers* 2004; *Morgan* 2008). While dual full-time earner households are more prevalent in the UK than in Germany, it seems that the recent shift in family policy in Germany provides better conditions for adopting the "dual earner/dual care" model.

Interestingly, the male breadwinner model in Germany was also replaced by increasing independence in both work and family life, as reflected by the growing share of single people with standard full-time careers. The transition to more gender egalitarianism in West Germany and the return to traditionalism in East Germany might involve normative confusion and uncertainty about gender roles, leading to a reduced willingness towards commitment and forming a partnership, especially among those with greater economic independence. While I did not include work

and family attitudes in the analysis, I hope that my findings will stimulate further investigation into these issues.

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