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Housework over the course of relationships: Gender ideology, resources, and the division of housework from a growth curve perspective

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ABSTRACT

In the 21st century, the division of housework remains gendered, with women on average still spending more time doing chores than their male partners. While research has studied why this phenomenon is so persistent, few studies have yet been able to assess the effect of gender ideology and socio-economic resources at the same time, usually due to data restrictions. We use data from the *pairfam*, a new and innovative German panel study, in order to test the effect of absolute and relative resources as well as his and her gender ideology on the division of housework. We employ a life course perspective and analyze trajectories of couples' housework division over time, using multi-level random effects growth curve models. We find that an egalitarian gender ideology of both him and her significantly predicts more egalitarian division-trajectories, while neither absolute nor relative resources appear to have an effect on the division of housework over time. Furthermore, our results expand the literature by investigating how these processes differ among childless couples and couples who experience the first birth.
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1. Introduction

The way in which gender structures the life course has undergone pronounced changes in the late 20th and early 21st century (Brückner & Mayer, 2005; Huinink & Mayer, 1995). Educational expansion and the influx of women into the labor market have led to both a marked rise of dual-earner couples and an increase in educational homogamy (Blossfeld & Timm, 2003). Today, younger cohorts of women are on par with their partners with respect to earning college degrees, and have caught up in terms of labor force participation (Domański & Przybysz, 2007; Kollmeyer, 2012). Yet, the need for chores done around the house and the care of children and the elderly remains largely unchanged, leading to tensions in the compatibility of gainful employment and the family (McGinnity, 2014; Stier, Lewin-Epstein, & Braun, 2012). Hand in hand with these changes, traditional gender roles in the family are being challenged. Gender role changes are occurring across various domains such as the realm of domestic work, paid work, or child care (Bühlmann, Elcheroth, & Tettamanti, 2009; Davis & Greenstein, 2009). Nonetheless, the majority of housework and childcare is still carried out by women today (Treas & Lui, 2013). How couples split the housework has great implications for the time and energy each of the partners can invest in paid employment, sleep, and leisure activities. Consequently, unequal divisions of housework have been tied to various aspects of gender and class stratification (Cooke, 2011; Moen, 1992). Scholars interested in the interplay between the gendered division of housework and gender stratification have been trying to understand which factors drive the gendered division of domestic work in couples, and why the traditional division of labor is so persistent, despite women's entry into tertiary education and paid work in large numbers (Treas & Drobnic, 2010). The current paper seeks to contribute to this literature by employing a life course perspective and conceptualizing the division of housework in couples as a trajectory over time. Specifically, we are interested in understanding how this trajectory unfolds over the course of a relationship, and how changes in the division of housework relate to major life course events, or 'turning points' (Clausen, 1995; Elder, 1998; Rönkä, Oravala, & Pulkkinen, 2003), such as the transition to parenthood. In addition, we assess the impact of stable and changing characteristics of the couple or each partner.

Analytically, we separate couples who experience the transition to parenthood and couples who remain childless during the period of observation. We use data from the German Family Panel

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(*pairfam*) and a growth curve modeling approach, based on multilevel models to examine how the main factors, which have been shown to affect the division of housework in previous studies, relate to the division of housework among young couples in Germany. In particular, we are interested in understanding how and why change occurs in the division of housework as a function of both partners' socio-economic resources and gender ideology in the course of the relationship, and how the experience of parenthood as a turning point interacts with these processes. We hence have two main research questions: (1) How do gender ideology and partners' relative economic resources affect housework trajectories in Germany? Do we find different effects for couples who experience the transition to parenthood and for those who remain childless? (2) Does the empirical focus on trajectories rather than single transitions lead to similar results, compared to earlier studies?

The first question is motivated by ongoing theory-driven debates on the main reasons for persistence of gender separate spheres. The dominant theoretical strands can be divided into two main groups: economic resources and social psychological aspects of gender ideology (Davis & Greenstein, 2013; Lewin-Epstein, Stier, & Braun, 2006). Until the mid-2000s, this debate was dominated by economic reasoning, and arguing that couples divide housework unequally on the basis of the male partner's higher earnings (for a summary see Gupta, 2006). However, more recently studies drawing on longitudinal earnings information and housework data find little support for this view (Dechant, Rost, & Schulz, 2014; Kühhirt, 2012). These latter studies conclude that norms and gender ideology may influence the meaning of gendered economic resources. However, direct measures of these aspects are rarely provided due to a lack of data on gender attitudes of both partners in most panel studies. In addition, a growing body of research has provided evidence that both gender ideology and gendered assessments of economic resources are context dependent (Bühlmann et al., 2009; Gupta, Evertsson, Grunow, Nermo, & Sayer, 2010). Context dependence implies that focusing on micro-level mechanisms alone neglects the direct and indirect effects of welfare states and family policies in framing gendered housework trajectories and individual agency (Elder, 1998). While there is one study which focuses on examining housework division trajectories over several measurements in time among US couples (Lam, McHale, & Crouter, 2012), and a few recent studies which investigate the effect of relative resources versus gender ideology on the gendered division of housework (Schober, 2013; Evertsson, 2014) both approaches have not yet been tested using data on Germany. Our analysis thus investigates these micro-level theoretical mechanisms, which are supposedly at work in all developed market economies (e.g. Baxter, Hewitt, & Haynes, 2008; Gupta et al., 2010) in the German context, thereby providing a test of external validity.

The second question draws on the same debate but is motivated, in addition, by concerns of life course theory and methodology. Elder (1998: 1) considered life trajectories "as modes of behavioral continuity and change" in the domains of family, work and education. He considered individual life transitions in these domains as parts of larger social trajectories, providing them with distinctive meaning and form. As both relative resources and normative frames appear to change over the course of couple-relationships, we argue it matters crucially how both processes unfold over time. Furthermore, following Elder (1998), both processes potentially influence – or are influenced by – subjective experiences of turning points over the life course, which potentially disrupt established developmental paths. Previous research found mothers to be more likely considering the transition to parenthood as a turning point in their life course, as compared to fathers. Men, in contrast, considered occupational events as turning points more often than women did (Rönkä et al., 2003). We argue that previous studies fall short in disentangling the complex causal relationships existing between economic resources, gender ideology, family formation and housework. In order to overcome this problem we assess housework trajectories rather than single changes towards more or less egalitarian divisions and apply time-varying covariates. The findings of our study point at an empirical validation of earlier findings on the (in)-significance of relative resources and the potential impact of gender norms.

Our focus on housework trajectories is innovative and adds to the literature in various ways. First, we know that the division of housework changes frequently over the course of relationships (Grunow, Schulz, & Blossfeld, 2012). Hence, we apply longitudinal multi-wave panel data from the pairfam data to capture these changes over time. Second, it is not clear what drives these changes as few data sets exist which allow for (a) testing various competing forces of change or (b) investigating how these forces come into play over the life course. Our data enable us to assess these processes over extended courses of couple relationships. Going beyond earlier studies, we are able to include time-varying measures of family formation and changes in partners' absolute and relative resources, while controlling for gender ideology. Third, our assessment of the interplay between gender ideology, economic resources and housework takes up Mayer's (2009: 426) assessment that "the interaction of psychological dispositions and processes and socially constructed life courses still awaits a systematic investigation with adequate data and research designs". Our study seeks to contribute novel insights on this interaction. We argue that our analytic strategy may be closer to the life course paradigm as compared to previous research because we are able to assess multiple changes over a longer stretch of couple-life time (Mayer, 2009: 414).

2. Life course perspective on studies of housework

Across the world, women still carry out the majority of routine housework and childcare in most families (Treas & Drobnic, 2010; Treas & Lui, 2013). In line with other scholars, we argue that applying a life course perspective to the phenomenon of largely persistent gendered housework patterns is illuminating and indispensable, if we want to investigate the mechanisms that contribute to the gendering of housework over time (Baxter, Haynes, Western, & Hewitt, 2013). We apply a life course perspective on the study of housework by, first, considering the social context in which couples divide paid and unpaid work in the German welfare state setting. Second, we highlight the interrelatedness of these divisions by conceptualizing the gendering interplay between the family as the realm of unpaid work and employment as the realm of paid work, employing the concept of linked lives. Third, drawing on the concepts of life course trajectories and turning points, we argue that individual and coupled pathways in these life domains are likely path-dependent, unless disrupted by major life course events. Drawing on previous research, we highlight the transition to parenthood as a phase in which individuals are especially susceptible to change.

2.1. Social context

"Historical forces shape the social trajectories of family, education, and work, and they in turn influence behavior and particular lines of development" (Elder 1998: 2). Individuals' trajectories across these various domains of life and their implications for further development have been considered basic elements of life course theory and research (Elder, 1998). While some individuals may be able to choose the trajectories they

follow, thus practicing human agency, all choices are considered to be context-bound and thus, constrained by the wider social context (Elder, 1998). Even though men's and women's trajectories in the educational and employment realms have become more equal over the past decades, structural and cultural path dependencies still play a key role in determining how effectively a shift from gender separate spheres to gender equity translates into a couple's everyday life (Moen, 2003). In line with this perspective, gender inequality in housework hours has been found to be conditioned by economic inequalities, implying that the amount of housework performed by women is lower in advanced economies (Heisig, 2011). Among the advanced economies, gender inequality in housework hours has been shown to be related to national levels of gender equity (Breen & Cooke, 2005; Fuwa, 2004; Hummelsheim & Hirschle, 2010; Stier & Lewin-Epstein, 2007). According to the gender inequality index (GII), estimated by the United Nations Development Programme (which considers reproductive health, gender empowerment and women's labor force participation), Germany has recently been ranked the sixth most gender equal country in the world (UNDP, 2013). At the same time, the unadjusted gender pay gap is with 23.1% way above the EU-27 average of 16.4% (European Commission, 2012). Against this background, German couples perform on average a rather traditional division of housework, with couples living in the western part of Germany performing a more traditional division of housework as compared to couples in the east (Dechant et al., 2014; Grunow, 2013).

Germany has long been known as a prime example of a male breadwinner and female homemaker state with family policies fostering a stay-at-home parent through extended phases of paid parental leave and thus, gender separate spheres (Sainsbury, 1999). The joint taxation system rewards single-earner couples and one-and-a-half earner families over dual full-time earners (Hofmeister, Blossfeld, & Mills, 2006). Consequently, women's economic dependency on their spouses is comparatively high (Mandel, 2009). This policy model has been altered in recent decades, while women's labor force participation increased and couples adopted more egalitarian gender norms (Lück, 2006). In addition, the former communist eastern part and the conservative western part of Germany reunited in 1989, thereby joining a dual-earner culture, established in the East with a developing one-an-a-half-earner culture in the West under a mostly conservative family policy framework (Grunow & Müller, 2012). These developments make Germany an ideal context in which to test the impact of couples' relative and absolute resources against believes in gender separate spheres and emerging ideologies of equity as affecting the gender division of housework (Cooke, 2007).

2.2. Linked lives, trajectories and turning points

Within the German social context, work and family trajectories of men and women are institutionally linked to one another in gendered ways. The concept of linked lives has been used to describe how couples synchronize their life planning and action by coordinating paid and unpaid work as well as family formation (Elder, 1978, 1998). Life synchronization among couples implies adaptations by both partners. These adaptations, we argue, drawing on Elder's (1998) ideas of life trajectories, resemble path-dependent processes rather than one-point-in-time decisions about the gender division of paid and unpaid work. Hence, we assess and contextualize micro-level dynamics and focus empirically on processes of change rather than snap shots of couples' social reality. The concept of life course trajectories is closely linked with the concept of turning points. Turning points have been described as experiences leading to a disruption of individuals' developmental pathways (Rönkä et al., 2003). The transition to parenthood has been identified as a turning point and a life phase in which individuals and couples are especially susceptible to change their division of paid and unpaid work (Evertsson & Nermo, 2007; Grunow et al., 2012; Kühhirt, 2012; Schober, 2013; Schulz & Blossfeld, 2006). Given the social context of Germany, couples' should be inclined to adapt towards more traditional divisions of housework over time upon entering parenthood, thus adjusting their employment strategies increasingly towards gender separate spheres. For instance, working mothers take up the vast majority of parental leave that couples are entitled to (a maximum of 14 months if the leave is shared and 12 months when the leave is taken by only one person) and thus spend extended phases away from their jobs. In contrast, couples strongly believing in gender equity should attempt to follow trajectories of sharing paid and unpaid work equally, largely independent of their relative earnings or changes therein. In line with the concept of trajectories, housework patterns established upon entering parenthood have been found to persist during later stages of the couple relationship (Deutsch, 1999; Gershuny, Bittman, & Brice, 2005; Grunow et al., 2012). In order to understand these dynamics in the gender division of housework it is essential to study these phenomena "across life domains, such as work and family" (Mayer, 2009: 414) and as linked to the lives of others, in this case the partner and family (Moen, 2003).

3. Previous research

Few scholars have investigated change in the gender division of housework with an explicit reference to the life course paradigm. Those who did point to frequent changes and their entanglement with other life domains, most importantly parenthood. In this vein, Yu and Moen (1997) report in a US study that the intensity of housework and care demands shifts over the life course. Working couples' time in domestic work appears to peak when children are young and time demands appear to be lowest for childless couples. Baxter et al. (2008) use two waves of Australian panel data and examine the impact of family transitions (i.e. transitions from cohabitation to marriage, transitions to first and higher-order births) on men's and women's housework hours. Men's housework time appears remarkably stable across transitions while women increase housework hours, in particular upon entering parenthood. Coltrane and Ishii-Kuntz (1992) investigate how the timing of transitions to parenthood affects the subsequent division of labor among couples in the US. They find clear timing effects and interactions between timing of parenthood and gender ideology. Cunningham (2005) assesses the impact of gender ideology on later divisions of housework among young US couples. His findings suggest that men's gender ideology has a greater impact on the later divisions of housework than women's gender ideology. In a later study, Cunningham (2007) analyses the influence of women's employment on the gendered division of household labor. His findings indicate that men married to women who accumulate more employment experience perform a larger share of housework than men married to women with a history of weaker labor force attachment. For Germany, evidence is less straightforward when it comes to the impact of labor market related processes. Schulz and Blossfeld (2006) investigate the division of housework among married couples during 14 years of marriage. They use event-history techniques and find that men's likelihood to perform more housework declines over the course of marriage. This process appears to be independent of couples' relative resources. In line with the longitudinal findings from the US and Australia, the transition to parenthood appears to foster a more traditional division of labor among married couples in Germany. Longitudinal analyses from Great Britain investigate the impact of prenatal characteristics (gender ideology and wages) among couples on the

gender division of housework after child birth (Schober, 2013). Women's higher absolute wages and egalitarian gender ideology reduce the shift towards a more traditional division of labor. Whether women's wages are higher than their partner's does not impact the division of labor upon entering parenthood.

In sum, life course studies of the gender division of labor differ in their focus of investigation and in their specific findings. Studies agree that the transition to parenthood intensifies gender separate spheres and a more traditional division of housework. These studies have little to offer, though, when it comes to the gender division of labor among childless couples. The role played by relative resources and gender ideology is still unclear, as mixed evidence exists. In Europe (Germany and Great Britain) and Australia, relative resources and labor market behavior appear to be less relevant as compared to the US. Gender ideology appears to be relevant but is rarely studied explicitly in the European life course literature on housework, due to lack of available data. We therefore broaden the discussion of potential mechanisms in a next step by including evidence from cross-sectional studies.

3.1. Relative resources, gender ideology, and the division of housework

Two major micro level processes have been argued to affect the division of housework and other chores among couples. One is the economic development of partners' absolute and relative socio-economic resources, the second is gender ideology, pointing at an effect of gender socialization on gender beliefs and attitudes which in turn affect gendered behavior in the family and elsewhere. Empirical evidence concerning the different potential mechanisms is mixed and varies across countries and samples, yet studies supporting each of these arguments exist.

3.1.1. Economic resources

Investigating couples' division of housework from an economic perspective implies studying how couples utilize material resources as a means to decide about their gender division of housework. Empirically, resource-based arguments have long been supported (Davis & Greenstein, 2013). More recently, though, evidence is increasingly suggesting that a Euro earned by a female partner is worth less in negotiations over housework than a Euro earned by a male partner (Killewald & Gough, 2010). Lewin-Epstein et al. (2006) have found evidence for relative resources. They show that "greater sharing is positively associated with time constraints of the wife, as measured by spouses' market work, and negatively associated with those of the husband. It is also related to the education of the wife (when the wife is better educated the couple tend to share more) and to spouses' gender attitude and age" (Lewin-Epstein et al., 2006: 1158). Other research indicates that in Australia, women's relative earnings affect their time spent in housework more strongly than their absolute earnings (Baxter & Hewitt, 2013). Using longitudinal analyses and fixed effects regression models, two recent studies on Germany have found that the occurrence of the first birth is the main predictor for a shift towards a more traditional division of housework among couples (Kühhirt, 2012; Dechant et al., 2014; Grunow, Schulz, & Blossfeld, 2007). Kühhirt's study found no additional effect of absolute earnings on the division of housework once controlling for child birth, and found that relative earnings had a minor effect only on the magnitude of housework performed by parents (Kühhirt, 2012: 575). Conversely, Dechant et al. (2014) found a positive association between relative earnings and housework. A more egalitarian division of housework was performed when the female partner earned more than the male partner, at least in some of their model specifications.

3.1.2. Gender ideology

Social psychological approaches and theories of symbolic interaction emphasize the ways in which norms, values, beliefs, and attitudes influence the gendered performance of housework. Following Davis and Greenstein (2009) we refer to these aspects as gender ideology. Against the background that housework has been and still is gendered, theories of gender ideology view gendered divisions of housework either as gender performance or as resulting from beliefs in gender separate spheres (Davis & Greenstein, 2009; Cunningham, 2001). There is accumulating and strong empirical evidence that a gender egalitarian ideology of the partners is related to a more egalitarian share of housework among couples: almost all studies who have tested for this effect have found support for it (e.g. Aassve, Fuoci, & Mencarini, 2014, Evertsson, 2014; Lewin-Epstein et al., 2006), (for a review see Lachance-Grzela & Bouchard, 2010). Some studies point at differing effects of her and his ideology. For example, using data from Sweden, Evertsson (2014) finds that women whose male partners embrace an egalitarian gender ideology spend less time on housework than those partnered with less egalitarian men. Women's egalitarian gender ideology, conversely, was not found to have a similar effect on increasing their male partners time spent on housework. With regard to Germany, Lewin-Epstein et al. (2006) have shown that gender ideology seems to affect the division, but that men's and women's time spent in housework are affected only by their own gender ideology, and not those of their spouses. Their study, as most of those who test for gender ideology, however, is based on a cross sectional snapshot. Yet, recent research points out that gender ideology itself may not be stable among individuals over time (Carlson & Lynch, 2013; Davis, 2007). Carlson and Lynch (2013) find in their analysis based on US panel data a reciprocal relationship between an individual's gender ideology and their share of housework over time, suggesting that while gender ideology affects behavior, behavior is also re-shaping gender ideology, even among adult individuals within the same relationship over the time span of just a few years. Davis (2007) shows that gender ideology changes with young adults' own experiences and that these experiences become more important than the ideologies held in their family of origin. Studies testing the effect of gender ideology on the subsequent division of housework as measured at later points using panel data are rare, and are still missing in the German context.

4. The current study: framing and contribution

Previous longitudinal studies show that housework-divisions change over the course of couple-relationships and that the transition to parenthood leads to less egalitarian divisions of housework. We know little, though, about how prominent the trend toward less egalitarian divisions is among couples who remain childless. In addition, causal relationships between housework, paid employment and gender ideology remain contested. Our theoretical framework of linked life trajectories and turning points, applied to the German social context, suggests that housework trajectories should be rather stable or path-dependent over time, unless interrupted by turning points, such as the transition to parenthood. Our theoretical framework further suggests that processes of adaptation in the realm of housework should be interdependent with coordinated changes among couples in other life domains, such as the labor market. Gender ideologies are understood in this framework as psychological dispositions that may influence the trajectories themselves and thus the direction of coordinated changes in the realms of both housework and employment.

Most previous studies are not suited to assess the theoretically suggested dynamics and causal relationships as they either draw

on cross-sectional data or two-point-in-time comparisons. Cross sectional data represent snapshots of one-point-in time and thus provide neither reliable information on the dynamics of couples' trajectories nor on the causal relationships between potential predictors and dependent processes (Blossfeld & Drobnic, 2001). Two-point in time comparisons provide some information on the direction of changes but only if the processes studied are truly path dependent and if changes occur at the same rate over the entire course of a relationship. Assuming that changes that occur between t0 and t1 are representative of the greater trajectory of the couples division of domestic work may be misleading though, as previous longitudinal research suggests (Grunow et al., 2012). Another weakness of two-point in time comparisons is their limited capacity to draw causal inferences about the order and timing of changes in the dependent and competing independent processes. For instance, if gender ideology (or economic resources) and housework are measured at the same point in time, the directionality of the effects cannot be assessed. The interrelated path-dependencies suggested by life course theory would in addition result in spurious effects of the independent variable. We suggest that it is necessary to look at the trajectories of the division of housework and changes therein over a longer course of time, measuring the couple at multiple time points. In order to make causal inferences about competing time-varying predictors, these variables need to be lagged in order to reflect the theoretically suggested causal order. As mentioned, research indicates that gender ideology is not stable, but can change and adapt to actual behavior. We therefore argue that it is necessary to measure gender ideology before the division of housework is assessed, in order to disentangle the temporal ordering and to break a possible feedback loop from the actual division of housework on gender ideology. Previous studies have measured gender ideology and the division of housework at the same point in time (Evertsson, 2014; Aassve et al., 2014) and hence are not well suited to evaluate the directionality of the effects. Other studies have used fixed effects panel regression to estimate the effect of relative resources on changes in the division of housework but had no direct measure of gender ideology (Kühhirt, 2012; Grunow et al., 2007). While these studies are well suited to control for all stable characteristics within and across couples over time, they cannot easily offer estimates on time-invariant measures, such as a measurement of gender ideology that is held constant at a value measured prior to the assessment of the gendered division of housework. We therefore use multi-level random-effects models that enable us to approach the study of the division of housework by modeling trajectories of housework within couples over time. Additionally, these models allow us to incorporate time-invariant measures of his and her gender ideology, assessed before subsequent housework trajectories are measured. These models cannot control for all stable characteristics in the same way fixed effects models can. Yet, random effect models allow for the estimation of parameters for the unexplained variance between clusters both with respect to the intercept as well as the slope parameters, thus allow for controlling for at least some unobserved heterogeneity (Snijders & Bosker, 2012).

5. Data & measurements

5.1. Data

The data for our study come from the Panel Analysis of Intimate Relationship and Family Dynamics (*pairfam*), an ongoing German panel study launched in 2008. The focus of the pairfam is on partnership and family processes. It offers rich measures of current and retrospective partnership-, fertility-, educational-, and labor market histories. It also includes many variables on dynamics between partners such as the division of domestic work, partnership conflict, and gender ideology. Waves one to five (2008/09–2012/13) are included in our analyses. The pairfam has a multi-cohort and multi-actor design. This means that main respondents (anchor persons) were exclusively drawn from three specific birth cohorts: 1971–1973, 1981–1983, or 1991–1993. In addition, the (residential) partners, parents, and children of anchor persons are included in the survey; they have been interviewed via separate questionnaires.[1] The panel included 12,402 main respondents in wave one, and yearly follow-up interviews have been conducted. The sample shrunk over time due to attrition; in wave five 53% of anchors were still present. The pairfam is a unique data source well suited to advance our knowledge on the question of why couples split the housework the way they do. It has several advantages compared to other panel studies. First, it features many 'young' couples, i.e. couples who have been together for a rather short amount of time. This is theoretically important because divisions of housework and paid work are to some extent path dependent (Grunow et al., 2012). Thus, the initial point in the couples' division of housework needs to be considered carefully. In our data, the relationship duration, referring to the first begin of the relationship, not the time since moving in together, indicates that in wave one, one third of the couples have been together for a maximum of 36 months, and 50% of the couples for 72 months or less. The sample hence enables us to look at the division of labor among couples who are at the early stages of living together. This is an advantage since we know that the division of housework changes as couples age and move through life together, specifically after the birth of children (Schulz & Blossfeld, 2006). Second, yearly measures of how couples divide the housework are available, enabling us to understand in greater detail than available in most other panels how the housework trajectories evolve. Third, the pairfam features yearly measurements on both partners' education, labor force participation, and income, as well as bi-annual measurements of both partners' gender ideology. We are not aware of any other panel study that includes several measures on the division of domestic work over time, as well as gender ideology variables for both partners.

5.2. Analytic sample

We have limited the analytic sample to heterosexual couples who are childless at the first interview, in order to homogenize the sample by focusing on couples who are at similar stages in their relationship and life course. Furthermore, we estimate separate models for couples who (a) remain childless throughout the observation period, and (b) experience the transition to parenthood during the panel. As more than 20% of German women remain childless (Konietzka & Kreyenfeld, 2013), we believe that it

[1] Partner interviews were voluntary and not all partners have opted into being surveyed. Only ca. 50% of partners have participated in the survey, more detailed information on response rates can be found here: http://www.pairfam.de/fileadmin/user_upload/redakteur/publis/Dokumentation/TechnicalPapers/TP01_Field-Report_pairfam5.0.pdf. To be more explicit, the pairfam includes both: variables on partners that have been provided by the anchor person, as well as measures that have been directly collected via separate partner-interviews from the partners themselves. Many variables on the partners, such as measures on socio-economic characteristics, are therefore available twice: provided by the anchor and provided by the partner. Theoretically, a possible selection bias introduced by the selectivity of partner participation can be circumvented, when no information that has been collected from partners *only* is needed. Since the gender ideology variables for partners are only available directly from the partner-interviews, we however had to limit the sample to those waves and couples for which the partner interview is available. When coding the socio-economic variables on the partner, we also used those measures provided by partners themselves, and only complemented with information provided by anchors on the partner if the partner measures were missing.

is essential to study whether the mechanisms affecting their gender division of labor are similar to those affecting their peers. It is not uncommon for anchor persons to experience more than one co-residential relationship during the panel. We only include one relationship per anchor, choosing the longest co-residential relationship recorded in the data. If a first birth occurs during the panel, we prioritize the corresponding relationship over the longest one, in case of conflict. Overall, 5324 of the respondents who are childless at the time of the first interview report having a partner – including non-residential relationships – at some point during panel waves 1–5. However, our analytical sample is much smaller for several reasons, which are documented in Table A1 (Appendix A). Couples who do not live in the same household and co-residential couples in which the partner did not participate in the voluntary partner-survey are excluded, as the partner's gender ideology measurements come from the partner questionnaires. Also, we only include couples which have been surveyed at least twice, as we lag the co-variates and hence lose the first observation in time. Missing values, specifically on partners' income information, further reduces the sample size. The large majority of cases are lost due to missing partner questionnaires and the exclusion of couples with information for one wave only, not due to missing values on the covariates. The final analytical sample used for the model estimations consists of 285 couples who experience the transition to parenthood during the observation period, and 489 couples who remain childless throughout.

5.3. Dependent process: housework trajectories

The depended process of interest is the division of housework, referred to as housework trajectory.[2] This item is measured on a scale from 1 '(Almost) completely my partner' to 5 '(Almost) completely me'. The value of 3 stands for an egalitarian division of housework. Responses indicating 'I don't know', 'Only another person', or 'This doesn't apply to us' were coded as missing. Both the anchor and the partner answered this question separately. For our analyses, we only use the answers provided by the anchors as representative for the couple. Therefore, we have recoded the dependent variable such that 1 stands for '(Almost) entirely him' to 5 "(Almost) entirely her'. There are some discrepancies between the answers of partners within couples in the data. Men, for example, are, on average, reporting a more egalitarian division of labor, which fits to what is known from the literature (Kan, 2006; Press & Townsley, 1998). We therefore control for the gender of the responding anchor in the models. In addition, we estimated separate models for male and female anchors and added interaction effects between independent variables and sex of the anchor where appropriate (separate models not shown).

Figs. 1 and 2 give a descriptive overview of the average reported division of housework over the course of time in the full sample,[3] among childless couples who remain childless (Fig. 1), and couples that start out childless but become parents during the panel (Fig. 2). Fig. 1 indicates that, among childless couples, on average, the division of housework remains stable over time, halfway between an egalitarian division and her doing slightly more than him (value of 3.5). We produced the same graph for various categories of relationship duration at first observation (e.g. new couples having been together for up to 3 years, longer term couples etc.), and did not find differences in the flat average trajectories by previous relationship duration (not shown). Fig. 2 depicts the trajectory of the division of housework among couples who experience the first birth during the panel. Here, the time axis of observed couple time is centered at the time of the birth, represented at time 0. Negative time represents the years before the birth, and positive time the consecutive years after the birth. Obviously, these couples begin their trajectories similar to other childless couples, halfway between an egalitarian division and her doing more than him. A marked change toward a more traditional division of housework takes place during the year after the birth, though. The trajectory stabilizes again thereafter.

During the modeling process using the multi-level models, we tested various parametrizations of time, including linear trends, polynomials, and splines. The correct parametrization is important to allow for the best fitting time trend of the division of housework. In the sample that remains childless none of the slope parameters expressing a time trend was found to be significant. Here, time is expressed counting forward from wave one over consecutive waves, regardless of the duration of the relationship at the first wave (we control for previous relationship duration in the models incorporating covariates). The linear trend on the time variable is insignificant, as are various polynomials we have tested. There are, however, significant variance components for both the random intercept as well as the random slope on the linear time trend. We therefore keep the (insignificant) linear time parameter in the model, so that we are able to include the random slope on this parameter in the model. The significant random intercept and slope parameters suggest that there is not only significant variation in the level of how childless couples split the housework (random intercept), but also that the trajectories of the housework differ significantly across couples over time (random slope of time trend). Both observations hold even though there is no systematic linear or polynomial trend of the housework trajectory among couples over time.

Turning to the sample of couples who experience a first birth during the observation period, we settled on a spline function to model the housework trajectories. As suggested by the descriptive Fig. 2, there is no significant time trend in the observed years before the birth, which are summarized in the first spline piece (−4 years before the first birth up to the year of birth). Subsequently, each year after the birth has been modeled using one separate spline piece, in order to understand the trajectory for the period after the transition to parenthood. The spline piece representing the year after the first birth has a positive coefficient and is highly significant throughout specifications, whereas the coefficients of the spline pieces of years 1+ after the birth are insignificant in most models. This suggest that the division of housework shifts significantly towards more traditional gender roles in the year after the birth, and remains at that new traditional level thereafter without significant further change.

5.4. Covariates

We apply three type of covariates: control measures, and time varying as well as time invariant covariates of interest. Table 1 provides an overview of the covariates and their mean sample values, separately for each of the two analytical samples (remaining childless versus experiencing the transition to parenthood). It is important to note that both samples are virtually equal with respect to the sex and cohort composition of the anchor person, the relationship duration at the opening of our observation window, the age difference between partners as well as educational levels. This suggests that we are not capturing couples at different stages of their life courses when separating those who remain childless during our window of observation from those

[2] The division of labor in other domains of domestic work has also been surveyed (shopping, repairs, financial and administrative matters, and childcare), but we are focusing solely on the division of housework, as this is the domain which is most clearly gendered, devalued, and time consuming (Davis and Greenstein, 2013).

[3] This includes all couples in the pairfam in their longest relationship in each category, also those with missing values on the model covariates.

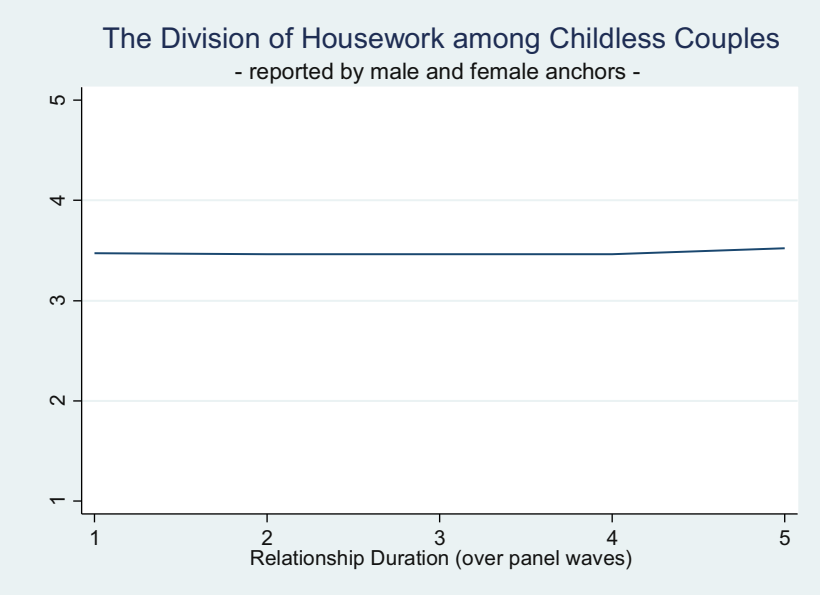


Fig. 1. Division of housework: 1 = (Almost) entirely him, 5 = (Almost) entirely her.

who become parents. Rather, we separate two groups which live parallel and different life styles, signified for instance by higher incidences of cohabitation among those remaining childless. The descriptive values have been computed based on one single wave for each couple, namely the first observation, in order to facilitate interpretation. Hence, they depict means only at the first point of observation for each couple.

Sex and *birth cohort* of the anchor person, the pre-panel relationship duration, relative age of the partners and marital status serve as control variables. The *relationship duration* has been measured in months and expresses the time since the couple first started their relationship, not the co-residency. Relationship duration is time-invariant and represents the previous relationship duration at the first wave of observation. We also entered a squared term for the relationship duration to the models to allow for non-linear effects. *Relative age* is coded as her age subtracted from his age. *Cohabitation status* is time varying. Table 1 shows that 64% of the couples who remain childless during the panel cohabit during the first wave of observation, while this applies only to 33% of couples who become parents over the observation period.

Absolute education is measured in four categories based on the ISCED 1997 classification, separately for him and her. Our educational variable is time varying and has been surveyed in every wave. Being enrolled in full-time education is coded as one distinct educational category, and is mutually exclusive with the three other categories. Having no degree or a lower secondary degree is coded as low education, upper secondary and non-tertiary post-secondary education are summarized as medium education, and all types of tertiary education are coded as high education. In the models, medium education serves as the reference group for both him and her. Couples who do not enter parenthood during our window of observation are enrolled more

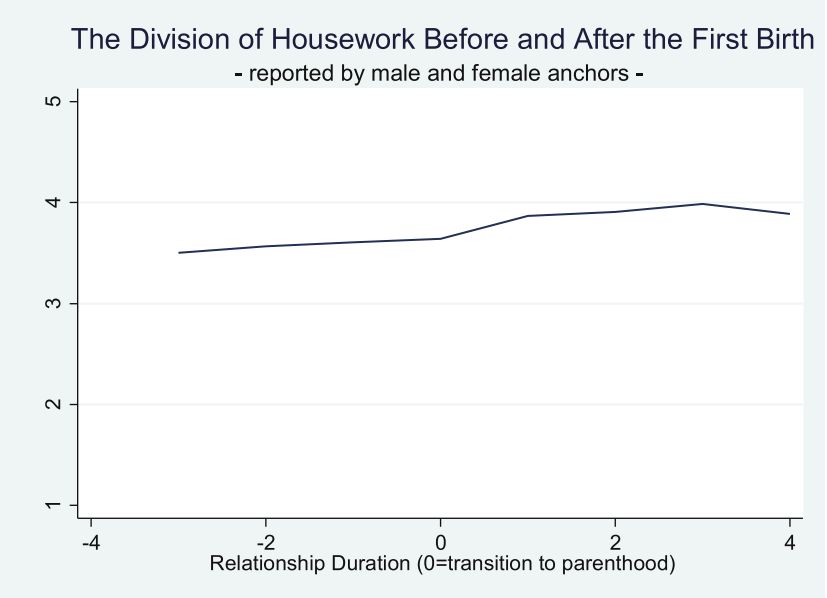


Fig. 2. Division of housework: 1 = (Almost) entirely him, 5 = (Almost) entirely her.

Table 1
Descriptive sample statistics.

Variable	Childless sample Mean	First birth sample Mean
Male anchor	0.52	0.53
Cohort 1991–1993	0.04	0.01
Cohort 1981–1983	0.68	0.68
Cohort 1971–1973	0.28	0.31
Relationship duration (months)	68.33	69.88
Age difference	2.85	2.92
Cohabiting	0.64	0.33
His enrollment	0.08	0.02
His low education	0.04	0.03
His medium education	0.51	0.51
His high education	0.38	0.44
Her enrollment	0.10	0.02
Her low education	0.03	0.04
Her medium education	0.54	0.61
Her high education	0.33	0.32
She more education	0.13	0.09
He more education	0.17	0.22
His net income (log)	5.62	6.02
Income ratio	0.45	0.35
His HW attitude	4.34	4.24
Her HW attitude	4.50	4.40
N	537	329

often in education as compared to those who do make the transition to parenthood. For instance, more of those remaining childless are enrolled in education at first observation, namely 8% of male and 10% of female partners. Among those who experience the transition to parenthood only 2% of both male and female partners are enrolled at first observation.

Relative education is expressed by two dummy variables. The first dummy indicates that she has more education than him (hypogamous couple). The second dummy variable marks couples in which he has more education than her (hypergamous couple). The reference group is comprised of couples with similar educational levels, and includes couples in which one or both partners are enrolled in education. There are more hypogamous couples among those who remain childless with 13% as compared to 9% in the subsample experiencing a first birth. The contrary applies to hypergamous couples with 17% versus 22% respectively. We conceptualize relative resources as having an effect of the division of housework via bargaining power. Therefore, in the models, all socio-economic resources, including the absolute and relative educational measures, have been lagged by one period, in order to allow for time for the effect to unfold.

We measure *relative income* as the ratio of her monthly net income over the combined net income of both partners. In the childless sample, her contribution to the combined monthly incomes is on average 45%, but only 35% among couples who experience the birth during the panel, in the first wave of observation. With regard to *absolute income*, it is not feasible to add both her and his net income to the model due to the linear combination with the relative income. Our analyses have shown that her net income does never reach statistical significance (not shown), we have therefore settled on a specification including *his logged net income* only. The income measures are also lagged by one wave and have been measured yearly. The information on net income is missing for about 9.5% of anchors and 25.4% of partners.

The pairfam features eight questions on *gender ideology*, and both partners have been surveyed separately. Those attitudinal questions have only been included in the questionnaire bi-yearly, in waves one, three, and five. Three of those questions concern the value of marriage, four questions address the compatibility of childrearing and labor market work or the parent-child relationship, and only one question asks directly for attitudes on the division of labor between partners. We base our gender ideology measure only on this latter question, since it is the most relevant in the context of our research question. These items have been worded as statements which have then been rated on a scale from 1 (completely disagree) to 5 (completely agree). The wording of the relevant statement is: '*Men should engage in housework to the same degree as women*'. Male and female partners of both analytical samples, on average, agree with this statement. Women have a slightly more gender egalitarian attitude than men, and individuals of both sexes are slightly more gender egalitarian in the sample which remains childless than individuals who will have a first birth during the panel. For the analyses, we have fixed the gender ideology measure at the value that has been observed in the first wave the couple first appears in the data (or the second wave if the first couple-observation was during waves two or four). Gender ideology is thus a time invariant covariate. Even though the gender ideology measure is available in a time varying fashion, we settled on this strategy in order to avoid *endogeneity*. Research has shown that attitudes can be influenced by behavior and changes in the environment (Davis, 2007). For our main set of models, we therefore decided to avoid measuring attitudes at a later time in point than the absolute and relative socio-economic resources, since it may be the case that those attitudes are adjusted to reflect the actual behavioral situation the respondent experiences. Since we assess gender ideology for most couples at wave 1, and since we lose this first observation for each couple due to lagging of the relative resources for the model analyses, we basically measure gender ideology in the year before we assess the division of housework for the first time, thus modeling a clear temporal order. In the same vein, we do not add measures of labor force participation patterns to the main models, since gender ideology and employment situation may be interrelated. In addition, we have estimated models which allow the gender ideology measures to vary over time, as well as models which hold both gender ideology and the resources variables constant at their first measured value. These specifications serve as robustness checks for our main models.

6. Methodological strategy

In order to model the trajectory of the division of housework for couples and to test whether absolute or relative resources and gender ideology predict changes in the division of housework over time, we estimate growth curve models within a multi-level framework. Our data are nested and represent two levels, multiple observations over time that are nested within couples. The MLM approach is appropriate as it allows adjusting for within cluster dependence, and hence extends multiple regression models to accommodate clustered data, which includes repeated observations on the same units over time as one way of clustering (Rabe-Hesketh & Skrondal, 2012: 2). Growth curve modeling is well suited to model longitudinal change, as it "explicitly models the shape of trajectories of individual subjects over time . . . " (Rabe-Hesketh & Skrondal, 2012: 343).

Our dependent process is the trajectory of the division of housework over consecutive panel years, measured in five categories, which express the partners' relative contributions. Since the scale represents subjective perceptions and we cannot assume that the distances between the outcome-categories are identically spaced, an ordered logit MLM models would be most appropriate and to be preferred over the linear model. We have, however, tested both model options and settled on estimating linear MLM growth curve models, due to various reasons. First, the linear model is much easier interpretable, as it does not require a log transformation. Second, the linear models estimate fewer parameters and are computationally less costly. They therefore

allow more readily incorporating a random slope on the time trend in the model. We have found such a random slope to be significantly increasing the fit of the model. When we estimated the corresponding MLM growth curve models using ordered logit specifications, we were not able to obtain standard error estimates on the random slopes in the more complex models with a larger number of covariates. Third, as we have estimated all models using both the linear MLM and the ordered logit MLM, we know that substantive results did not vary between model types (not shown). We estimated separate models for our two samples of interest: childless couples who remain childless over the course of the panel, and childless couples who experience the first birth during the panel. All models have been estimated in STATA 13 using the mixed (or meologit) command. We specified an unstructured variance–covariance matrix in all models, in order to allow the variance and covariances to be freely estimated from the data.

The level 1 model captures within-couple changes in the division of housework over time, using a linear time variable (childless sample) as well as a spline function of time (transition to first birth sample).

At level 2, the couple level, we have both time-varying and time invariant predictors. Time invariant covariates such as gender ideology and most control variables such as birth cohort and sex of the anchor speak to between couple variance, whereas time varying covariates such as relative income or education speak to both the variance within and between couples. We also tested for cross level interactions, namely for interactions of the covariates of interest (relative resources or gender ideology) and the significant spline piece in the model of couples who experience the first birth during the panel. We did this in order to test whether the significant spline piece of the trajectory differed as a function of couples relative resources or partners' gender ideology. None of these interactions was found to be significant, though. We estimated separate models for (1) absolute and relative education, (2) absolute and relative income, (3) gender ideology, and (4) a full model with all covariates of interest.

7. Findings

7.1. Absolute & relative education

Tables 2 and 3 show the model results for the childless sample and the sample which experiences the first birth. In a first step, we test whether and how each partner's absolute and the partners' relative educational attainment predict changes in the division of housework in both samples. In the childless sample (Table 2), her lagged enrollment in education significantly predicts a more egalitarian division of housework. The size of the effect is −0.32, hence the division of housework is more egalitarian by about one third of a category in the dependent variable when she is enrolled, which is coded from 1 (housework performed almost entirely by him) to 5 (almost entirely by her). All other absolute or relative educational categories appear not to be significantly related to the housework trajectories in the joint model. We found, however, a significant interaction between his high education and sex of the reporting anchor person.[4] Among female respondents, his high education predicts a more traditional division of housework, while the reverse is true among male respondents ($p = 0.021$). This finding may be related to data quality or hint at differing perceptions of the division of housework of men and women, when they are themselves highly educated or their partner is. Relative education has no significant effect on the housework trajectories. The same finding applies to the model based on the sample of couples who experience the first birth (Table 3). Here, neither absolute nor relative education significantly predict changes in the division of housework. Also, in both models, interactions of the education variables and the time variables (e.g. the significant spline piece in model 3) remain insignificant.

7.2. Absolute and relative income

As a next step, we estimated models including only the control variables and the income variables to investigate how absolute and relative income predict the housework trajectories. Among childless couples, neither his log net income, nor her income ratio are significantly related to the housework trajectories of couples. Among couples who experience the first birth, his log net income is also no significant predictor of the division of housework. Yet an increase in her income ratio significantly predicts a more egalitarian housework trajectory. The relative income variable measures her contribution to the household income and is expressed in percentage points, coded from 0 to 1. Hence, increases in her relative income are expressed in the digits following the decimal point, and 0 stands for her relative income contribution of 0%, while 1 means that she contributes 100% to the joint net income. The model expresses the effect of a 1-unit increase in the covariate on the dependent variable, hence, a 1 percent increase in her relative income relates to a more egalitarian division by 0.0025 units on the 1–5 scale of the dependent housework variable.

7.3. Gender ideology

As a next step, we estimate models, which include the control variables and his and her gender ideology. Both gender ideology variables are highly significant in predicting the housework trajectories across couples. A more egalitarian ideology is associated with a more egalitarian division of housework. This holds for her and his ideology in both samples. Among couples who experience a first birth, a one unit increase in her ideology toward egalitarianism is related to a 0.14 unit decrease in the division of labor measure (higher values in the dependent variable signify a more traditional division), a 1 unit increase in his ideology toward egalitarism relates to a 0.16 decrease. Among childless couples, the coefficient sizes are −0.09 for her gender ideology and −0.19 for an increase in his gender ideology towards egalitarism. Gender ideology hence emerges as an important predictor for the division of housework trajectories in both samples of couples.

7.4. Full models

In the final step, we estimate the full model incorporating all covariates at the same time. As in the previous model, gender ideology emerges as a highly significant predictor for couples' housework trajectories. Among childless couples (Table 2), the coefficient for her enrollment is still highly significant and predicting a more egalitarian trajectory. In the sample of couples who experience a first birth, her income ratio is no longer significant after controlling for gender ideology. We interacted all covariates of interest separately with the significant spline piece in a cross level interaction in the model using the sample which experienced the first birth. None of these interactions turned out to be significant, and hence we dropped them from the models. Thus,

[4] Recall that the models include both female and male anchor respondents. We conducted separate models for male and female anchor persons, and found significant effects of his high education on the division of housework in the separate models for male and female respondents which differed in the direction of the effect. We therefore interact the dummy for his high education with the sex of the anchor (Table 2). While both coefficients are not significantly different from the reference category, a chi-square test reveals that they significantly differ from each other ($p = 0.021$).

Table 2
Childless couples: Coefficients from growth curve models predicting changes in the division of housework as a function of relative resources and gender ideology.

Fixed Effects		Education only		Income only		Ideology only		Full model	
		Est	SE	Est	SE	Est	SE	Est	SE
Intercept		3.495***	0.204	3.129***	0.188	4.458***	0.264	4.66***	0.3
Level 1									
	Relationship duration (linear)	0.004	0.019	−0.005	0.019	0.009	0.018	−0.001	0.018
Level 2									
Time-varying									
	Her enrollment	−0.322**	0.119					−0.296**	0.119
	Her low education	−0.190	0.189					−0.201	0.183
	Her high education	−0.122	0.135					−0.070	0.131
	His enrollment	0.000	0.123					0.016	0.121
	His low education	−0.025	0.188					0.046	0.181
	His high education FR	0.112	0.150					0.069	0.146
	His high education MR	−0.160	0.146					−0.164	0.141
	She more education	0.022	0.146					0.001	0.142
	He more education	0.027	0.148					0.046	0.144
	His log-income			0.017	0.012			0.014	0.011
	Her income ratio			0.028	0.107			−0.001	0.109
Time-invariant									
	Her HW-Ideology					−0.092**	0.035	−0.095**	0.035
	His HW-Ideology					−0.196***	0.034	−0.188***	0.034

Random effects	Education only		Income only		Ideology only		Full model	
	Est	SE	Est	SE	Est	SE	Est	SE
Random intercept	0.228	0.037	0.231	0.037	0.206	0.035	0.191	0.034
Random slope duration	0.005	0.002	0.005	0.003	0.004	0.003	0.005	0.003

***p < .001 **p < .01 *p < .05 †p < .1.

Table 3
Couples with a first birth during the panel: Coefficients from growth curve models predicting changes in the division of housework as a function of relative resources and gender ideology.

Fixed effects		Education only		Income only		Ideology only		Full model	
		Est	SE	Est	SE	Est	SE	Est	SE
Intercept		3.713***	0.364	3.991***	0.383	5.075***	0.410	4.931***	0.419
Level 1									
Relationship duration									
	Spline −4–0	−0.019	0.063	−0.027	0.064	−0.051	0.062	−0.022	0.064
	Spline 0–1	0.347***	0.077	0.352***	0.078	0.364***	0.076	0.326***	0.078
	Spline 1–2	0.037	0.058	0.009	0.061	0.051	0.058	0.020	0.061
	Spline 2–3	0.051	0.075	0.071	0.077	0.038	0.075	0.057	0.076
	Spline 3–4	−0.047	0.094	−0.059	0.094	−0.053	0.093	−0.047	0.094
Level 2									
Time-varying									
	Her Enrollment	−0.262	0.220					−0.252	0.215
	Her low education	0.400	0.266					0.440†	0.258
	Her high education	−0.297	0.219					−0.305	0.215
	His enrollment	0.199	0.217					0.243	0.213
	His low education	0.157	0.275					0.052	0.266
	His high education	0.339	0.222					0.353	0.216
	She more education	−0.053	0.235					0.011	0.229
	He more education	−0.075	0.230					−0.158	0.225
	His log-income			−0.013	0.015			0.00	0.01
	Her income ratio			−0.251*	0.125			−0.15	0.12
Time-invariant									
	Her HW-ideology					−0.143***	0.044	−0.130**	0.043
	His HW-ideology					−0.161***	0.037	−0.146***	0.036

Random effects	Education only		Income only		Ideology only		Full model	
	Est	SE	Est	SE	Est	SE	Est	SE
Random intercept	0.344	0.068	0.342	0.068	0.287	0.060	0.296	0.062
Random slope spl. 0–1	0.311	0.089	0.312	0.089	0.335	0.090	0.313	0.088
Covariance	−0.178	0.064	−0.164	0.063	−0.164	0.061	−0.177	0.061

***p < .001 **p < .01 *p < .05 †p < .1.

there appears to be no significant effect of relative resources or gender ideology on the direction or steepness of the shift in the division of housework in the first year after the transition to parenthood. This findings is robust to alternative specifications of the covariates. We have estimated additional sets of models (a) which allow the gender ideology variable to vary over time, (b) which hold not only the gender ideology- but also the resource variables constant at their first measured value, and (c) which use time-constant resources variables and time-varying ideology variables (Tables A2 and A3 in Appendix). Regardless of the specification, a more egalitarian gender ideology of either partner significantly predicts a more egalitarian division trajectory. Only the standard errors of the coefficients for her ideology in the childless sample increase somewhat in the models that allow the ideology variables to vary over time, decreasing the significance of this covariate to the 10% level. When relative resources are held constant at the first observation, there emerges also a significant effect of the partners' relative education on the division of housework trajectory. This, however, only applies to the sample that experiences the childbirth. Here, couples in which she has more education than him a have a significantly more egalitarian division trajectory. We interpret these findings as evidence for the strong and consistent predictive power of partners' gender ideology for their division of domestic work. The decreased significance of her ideology in the time-varying model version may indeed be due to a feedback loop, such that she adjusts her preferences to the prevailing division of housework over time. Further research is needed to understand why the time-constant relative education variable predicts the division of domestic work in the first birth sample while the time-varying version has no such effect. Theoretically speaking, we have a strong preference for using the time-varying lagged predictor. Also, the time-constant measures speak to the between-couple variance. We, however, are interested in predicting both the between and within-couples variances, which is why we focus on the main models with the time-varying predictor for resources and the time-invariant predictors for the ideology measures in discussing our findings.

8. Discussion and conclusions

Few studies have to date been able to assess the effect of relative resources and gender ideology simultaneously on couples' housework division over a longer time span by modeling time lags to assess the directionality of the effects. This gap in the literature is due to the lack of longitudinal data that includes several measures on the division of housework over time, gender ideology, and changes in the partners' resources. In addition, little is known about changes in the division of housework among couples who remain childless. As childlessness is increasing in modern societies, it is important to assess how housework trajectories unfold among these couples and what drives their division of labor. We contribute to closing these gaps by using data from the pairfam panel, an innovative and ongoing new family panel from Germany. Data from this panel allow us to assess the effect of gender ideology and absolute and relative socio-economic resources on the housework trajectories among younger couples. Instead of looking at one or two arbitrary time points in a couples' relationship or at single housework transitions we follow couples over up to five years of their relationship. Our approach implements Elder's (1998) concept of life course trajectories, turning points, and linked lives. Due to the richness of the data, we are able to use lagged versions of the absolute and relative resources in order to allow for a bargaining effect of resources on housework to unfold over time. Additionally, we are able to obtain measures of gender ideology before couples actually make further decisions about their division of paid work and housework. This enables us to break a possible feedback loop of the actual gendered behavior prevalent among the couples on changes in the partners' ideology. We thus eliminate an important source of bias for estimates of gender ideology on the (subsequent) division of housework. In the following we summarize our specific contributions to the literature.

First, our results corroborate previous cross-sectional findings, which suggest that gender ideology has a significant effect on the actual division of housework. We find that a more gender egalitarian ideology expressed by either her or him in the first wave predicts a more gender egalitarian trajectory of the division of housework in subsequent years. This finding is largely robust to using a time-varying measurement of gender ideology. It has been argued that in order to assess the effect of gender ideology on behavior "single-equation models based on cross-sectional data provide no information on causality and are therefore severely limited in their ability to test explanatory hypothesis." (Carlson & Lynch, 2013: 1516). Yet, most studies testing how gender ideology may affect the division of housework have been based on cross sectional data. To the best of our knowledge, the only available study on the case of Germany in that respect has been conducted by Lewin-Epstein et al. (2006), also based on a cross sectional survey. They have found that each partner's ideology affects their own time spent in housework, but not that of their spouse. Since our measure of housework is relative and only assesses the relative but not each partner's absolute share of housework we cannot speak to this difference. Nonetheless, we can confirm a significant effect of both partners' egalitarian gender ideology on a more egalitarian division of housework by using our refined temporal ordering. Our models furthermore show that this effect is quite robust and persists when we control for absolute or relative resources, or the labor force statuses of both partners. Questions of how gender ideology comes about, why and how it changes over the life course, and what it really expresses are ongoing in social science research. Our findings suggest that it is worthwhile to keep these discussions going and to use longitudinal data to assess the change of gender ideology over time. Our findings underscore the argument that gender ideology is an important driver of gendered behavior. We therefore think that it will be fruitful for future research to explore the mechanisms through which gender ideology operates and affects gendered behavior in general and the division of housework in particular, more deeply. For example, it may well be the case that relative resources play a role in the bargaining process over housework only when the gender ideologies of the partners are conflicting.

Second, our findings show that absolute and relative socio-economic resources seem to play only a minor role in how housework trajectories unfold among couples. We have not found any indication for an effect of relative education on housework trajectories. Increases in her relative income predicted a more egalitarian division of housework among couples who experience the transition to parenthood, but only in a separate model that is not controlling for gender ideology. Once we control for gender ideology, this effect becomes insignificant. Two out of three previous studies using German longitudinal data have presented some evidence that increases in her relative income do affect the division of housework toward a more egalitarian share among couples, either in general (Dechant et al., 2014) or with respect to the steepness of the shift towards a more traditional share after childbirth (Kühhirt, 2012). Our findings suggest that this effect may be spurious, in the sense that relative income is in itself affected by both partners' gender ideologies and couples' adaptations within the context of linked lives and associated trajectories. We did not find any indication for significant effects of absolute resources on the gendered division of housework, other than a significant effect of her educational enrollment on a more

gender egalitarian division among the sample that remains childless.

Third, our paper adds to the literature by presenting separate models for couples who become parents and couples who remain childless over the course of the panel. Of course, couples in the childless sample may experience the transition to parenthood at a later point time. Yet, the sample differs only slightly from their fertile peers with respect to the distribution of the birth cohort of the anchor, relative age of the partners, or previous relationship duration. We therefore argue that it makes sense to test for the possibility of differing mechanisms and the role of turning points in shaping the division of housework trajectories between those two groups. Our findings suggest that there is no indication for the presence of fundamentally different mechanisms between the two groups. The main difference between the results is that her but not his enrollment in education is significantly related to a more egalitarian division trajectory in the childless sample but not in the fertile one. While we confirm a previous finding on female partners' enrolment on a more egalitarian division of housework (Bianchi, Sayer, Milkie, & Robinson, 2012), it remains unclear why this effect is not present in the sample that makes the transition to parenthood. Fewer male and female partners are enrolled in this sample to begin with, yet it is a question for further research to explore whether women who are enrolled in education but will have a baby within a few years may be different from women who won't become mothers within the same time frame, with regard to gender ideology and measurable behavior, even before the pregnancy. Stange's research (2011) suggests that the educational pathways of eventual mothers and matched non-mothers differ already post-pregnancy, and this differential behavior may be applicable to other behavioral outcomes such as gender roles behavior in partnerships, too. We have however not tested for an interaction effect between enrollment and gender ideology. In line with the theoretical concept of life trajectories, we find no significant time trend in the housework trajectories among childless couples, but considerable random variation both, in the intercept and the slope estimate on the time trend. We therefore conclude that couples' division of housework does change over time while couples remain childless, but that there is no systematic development towards a more traditional or egalitarian division of labor across couples. Only the birth of a first child leads to a unidirectional shift towards a more gender-traditional division of housework. This finding clearly supports previous research and confirms that major life transitions constitute turning points in gendered family processes.

Finally, we would like to point out that our study is not without shortcomings. First, the couples stem from three different birth cohorts (1991–1993, 1981–1983, 1971–1973). All three cohorts have been at most in their early 40s while the panel was collected, yet there may well be cohort differences in gendered behavior present, which we could not assess since the cohort sub-samples are too small to be analyzed separately. Second, and more fundamentally, we are not fully able to distinguish between within- and between-couple variance in our models. The level 1 model regarding change over time in the division trajectories clearly speaks to within-couple changes, while the time-invariant covariates only speak to between-couple differences. The time-varying covariates within couples, however, speak to both the between and the within couple variance. We need to point out that our main covariates of interest, gender ideology and relative resources, hence are not fully located at the same level, which may affect the interpretation of our results. Yet, allowing gender ideology to be time-varying may have introduced feedback bias. We have estimated models with time-varying measures of the ideology variables and shown that the results are robust. Third, our maximum window of observation has been limited to five years, due to the current window of availability. Follow-up studies, using future waves of pairfam would be needed to validate our findings on housework trajectories. Fourth, case numbers of couples who live together and are childless at first, and have been surveyed for at least two waves are rather small, compared to the overall sample size. One obstacle is that answering the partner questionnaire is voluntary, and many partners chose not to do so. This may introduce some bias with respect to differences between couples who participated in the partner interview versus couples who did not. The percentage of partners who participated in the interview is larger among couples who had a child during the panel, as compared to those who did not. This may point to the strength of the commitment of the partners towards the union as one possible selection criteria. Fifth, we have not examined whether there are systematic differences between couples who have a child versus couples who have not, beyond the descriptive comparison of the covariates provided above. There may be selection based on gender ideology and other preference structures into both union formation and selection into parenthood. However, the respondents are still in their childbearing years, so that couples who have so far not have had a child may still become parents at later points of the survey. Also, the trajectories of the division of housework seem comparable between the childless couples and the years of 'childless time' among couples who will have a child eventually. Sixth, while the multi-level random effects models with the random slopes can account at least partly for unobserved heterogeneity, we are not able to control for all stable characteristics on the couple level in the way fixed-effects model can. Hence, there remains the possibility of spurious findings due to omitted variable bias. That being said, our findings are supported by previous research, using fixed-effects regressions. Finally, the life course approach we have taken in this study clearly has been fruitful in informing our thinking about couple-level changes over time. Still, more systematic research is needed to understand how psychological dispositions – in this case gender ideologies – and their change over the life course, relate to the decisions made and actions performed by men and womenin the early 21st century (Mayer, 2009).

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Appendix A.

Table A1–A3

Table A1
Full survey sample versus analytical sample: number of couples who are childless at first observation in the pairfam, waves 1–5.

	Childless throughout	First birth observed
All couples	4730	594
Partner questionnaire filled	2219	336
Remain after lagging/losing couples with one observation only	1040	317
Remain after excluding missing covariates	489	285

Table A2
Childless couples: Coefficients from multi level models predicting changes in the division of housework as a function of time-varying and time-constant relative resources and gender ideology.

Fixed effects		TV-resources, TC-ideology		TV-resources & ideology		TC-resources & ideology		TC-resources, TV-ideology	
		Est	SE	Est	SE	Est	SE	Est	SE
Intercept		4.66***	0.3	3.943	0.257	4.637	0.286	3.884	0.249
Level 1									
	Relationship Duration (linear)	−0.001	0.018	−0.009	0.019	0.012	0.018	0.002	0.018
Level 2									
Resources									
	Her enrollment	−0.296**	0.119	−0.319**	0.120	−0.230†	0.137	−0.247†	0.141
	Her low education	−0.201	0.183	−0.210	0.186	−0.130	0.155	−0.148	0.159
	Her high education	−0.07	0.131	−0.100	0.133	0.073	0.154	0.048	0.157
	His enrollment	0.016	0.121	0.031	0.122	−0.052	0.136	−0.054	0.139
	His low education	0.046	0.181	−0.021	0.184	−0.022	0.160	−0.085	0.164
	His high education FR	0.069	0.146	0.094	0.148	−0.256	0.156	−0.259	0.161
	His high education MR	−0.164	0.141	−0.159	0.144	0.232	0.120	0.244	0.123
	She more education	0.001	0.142	0.025	0.144	−0.077	0.176	−0.078	0.180
	He more education	0.046	0.144	0.038	0.146	0.175	0.170	0.178	0.174
	His log-income	0.014	0.011	0.012	0.012	0.027	0.009	0.023	0.009
	Her income ratio	−0.001	0.109	−0.024	0.110	0.097	0.116	0.083	0.118
Ideoloy									
	His HW-ideology	−0.188***	0.034	−0.073***	0.019	−0.197***	0.034	−0.073***	0.019
	Her HW-ideology	−0.095**	0.035	−0.042†	0.023	−0.093**	0.035	−0.039†	0.023

Random effects	TV-resources, TC-ideology		TV-resources & ideology		TC-resources & ideology		TC-resources, TV-ideology	
	Est	SE	Est	SE	Est	SE	Est	SE
Random intercept	0.191	0.034	0.200	0.036	0.190	0.034	0.197	0.036
Random slope duration	0.005	0.003	0.006	0.003	0.004	0.003	0.005	0.003

Table A3
Couples with a first birth during the panel: Coefficients from Multi level models predicting changes in the division of housework as a function of relative resources and gender ideology.

Fixed effects		TV-resources, TC-ideology		TV-resources & ideology		TC-resources & ideology		TC-resources, TV-ideology	
		Est	SE	Est	SE	Est	SE	Est	SE
Intercept		4.931***	0.419	4.521***	0.386	4.705***	0.409	4.354***	0.373
Level 1									
Relationship duration									
	Spline −4–0	−0.022	0.064	−0.042	0.065	−0.053	0.062	−0.077	0.063
	Spline 0–1	0.326***	0.078	0.346***	0.078	0.342***	0.078	0.359***	0.078
	Spline 1–2	0.020	0.061	−0.008	0.062	0.043	0.058	0.011	0.059
	Spline 2–3	0.057	0.076	0.054	0.077	0.040	0.075	0.037	0.075
	Spline 3–4	−0.047	0.094	−0.050	0.095	−0.046	0.093	−0.051	0.094
Level 2									
Resources									
	Her enrollment	−0.252	0.215	−0.175	0.215	−0.211	0.254	−0.242	0.247
	Her low education	0.440†	0.258	0.409	0.258	0.333†	0.180	0.391*	0.176
	Her high education	−0.305	0.215	−0.239	0.214	0.231	0.252	0.276	0.246
	His enrollment	0.243	0.213	0.217	0.212	0.332	0.244	0.300	0.237
	His low education	0.052	0.266	0.085	0.264	0.046	0.213	0.026	0.208
	His high education	0.353	0.216	0.297	0.216	−0.187	0.250	−0.217	0.244
	She more education	0.011	0.229	−0.041	0.229	−0.601*	0.280	−0.638*	0.274
	He more education	−0.158	0.225	−0.077	0.225	0.347	0.264	0.393	0.257
	His log-income	−0.005	0.015	−0.008	0.015	0.020†	0.011	0.016	0.011
	Her income ratio	−0.150	0.125	−0.139	0.126	−0.180	0.169	−0.152	0.166

Table A3 (*Continued*)

Fixed effects		TV-resources, TC-ideology		TV-resources & ideology		TC-resources & ideology		TC-resources, TV-ideology	
		Est	SE	Est	SE	Est	SE	Est	SE
Ideology									
	Her HW-ideology	−0.130**	0.043	−0.090**	0.030	−0.121**	0.043	−0.093**	0.030
	His HW-ideology	−0.146***	0.036	−0.115***	0.028	−0.144***	0.036	−0.114***	0.028

Random effects	TV-resources, TC-ideology		TV-resources & ideology		TC-resources & ideology		TC-resources, TV-ideology	
	Est	SE	Est	SE	Est	SE	Est	SE
Random intercept	0.296	0.062	0.272	0.060	0.289	0.062	0.265	0.060
Random slope spline 0–1	0.313	0.088	0.304	0.088	0.371	0.097	0.367	0.097
Covariance	−0.177	0.061	−0.165	0.060	−0.204	0.065	−0.196	0.064

***p < .001 **p < .01 *p < .05 †p < .1.

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