

**Childhood Family Structure and  
Complexity in Partnership Life Courses**

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## ABSTRACT

This study investigated the associations between childhood living arrangements and *complex* adult partnership trajectories. The authors defined first union dissolution as the event initiating a complex partnership life course, and measured the level of complexity using a weighted cumulative index of subsequent partnership episodes. The analyses were based on a representative sample of the German population born in 1971-73 from the German Family Panel and used multivariate hurdle models to estimate the probability of experiencing the initiation of a complex partnership trajectory, as well as the level of complexity. Results showed that respondents who did not grow up with both biological parents (i.e. those who experienced an *alternative* family structure) had both a greater likelihood of experiencing the dissolution of their own first union, and followed more complex subsequent partnership trajectories. These associations varied across types of (alternative) family structures experienced during childhood and according to the level of parental partnership (in)stability. This study contributes to our understanding of contemporary partnership complexity and its precursors using a long term life course theoretical and methodological frame. We acknowledge that continuities and disruptions in the development of adult (complex) partnership trajectories can be linked to a growing diversity of family structure in childhood. Thereby, we expand knowledge on intergenerational interdependencies of family instability and complexity beyond the reproduction of the event of union dissolution.

Keywords: childhood family structure, partnership behavior, linked lives, union dissolution, complexity index

## INTRODUCTION

For the past four decades, contemporary societies have experienced increased rates of marital union instability, leading to larger shares of children growing up without both biological parents. Social science research has postulated that part of the present-day adult population is reproducing the *alternative* (non-nuclear) family structures that they were exposed to as children, often reinforcing cycles of socio-economic (dis)advantage (McLanahan, 2004, McLanahan and Percheski, 2008). Empirical research has confirmed that partnership behavior runs through

generations of families. This literature has clearly established that parental separation increases an individual's own union dissolution risk (Amato, 1996, Amato and DeBoer, 2001, Diekmann and Engelhardt, 1999, Diekmann and Schmidheiny, 2013, Dronkers and Härkönen, 2008, Lyngstad and Engelhardt, 2009). At the same time, the research suggests an ever-growing number of additional transitions in and out of partnerships following the dissolution of a first union, leading contemporary young adults to accumulate greater *complexity* in their partnership life courses than previous generations (Hiekel and Fulda, 2018, Lichter and Qian, 2008). Research on this subject has been less comprehensive with respect to deciphering the long-term impacts of the childhood family context for complex partnership life courses in adulthood, considering their emergence (e.g. an initial union dissolution) together with their further developments (e.g. further partnership spells). Understanding such lifelong interdependencies is important to shed more light on the precursors of growing family complexity, and potential contributors to cycles of disadvantage.

Adopting a long term life course perspective, we contribute new knowledge by proposing and examining paths of continuity and disruption in adult's partnership trajectories as a by-product of exposures to alternative family structures during childhood. We might expect that such exposure sets an individual on the path towards a complex partnership trajectory through known mechanisms of reproduction of partnership behavior. In line with the prominent notion of *path dependency* in life course research, we further argue that growing up in an alternative family structure can trigger a self-perpetuating process by which the complexity of the adult partnership trajectory amplifies over the individual life course. Such continuities in the sequence of partnership choices in adulthood can be understood as a "shadow of the past", reflecting that past decisions can limit future opportunities and that early life (dis-)advantages accumulate over time (Bernardi, et al., 2018, Dannefer, 2003, DiPrete and Eirich, 2006).

Alternatively, in line with the notion of a *turning point* (Abott, 1997), exposures to alternative family structures during childhood can trigger discontinuities in an expected path of complexity accumulation over the adult partnership life course. This view emphasizes the interactions between opportunity structures and individual agency, and acknowledges that biographical experiences may also redirect life paths (Elder, 1985). Although the turning point argument would suggest biographical breaks between childhood exposures and the emergence of and the accumulation of greater complexity in the partnership trajectory, it may however not necessarily

apply to both. For example, experiencing parental separation in childhood might be linked to the replication of such behavior as adults, but young adults also might take steps to minimize the possibility of experiencing (further) complexity in their own partnership trajectories, in order to avoid the consequences, for themselves or for their children, of following in their own parents' footsteps.

Hence, we argue that different scenarios may link childhood family structure with adult children's partnership behavior over the life course. We thus formulate the following research question:

*How does the experience of an alternative family structure during childhood contribute to the accumulation of complexity in the sphere of intimate relationships over the adult life course?*

Our study thus contributes to recent research that has extended the focus of adult child outcomes from parental separation alone, to study the effects of the diverse exposures to and changes in the childhood family structure. Scholars have recently argued that, to achieve a better understanding of the effects of childhood family instability on the lives of adult children, researchers should address heterogeneous outcomes in adulthood in relation to specific childhood exposures to single parent, stepparent and other alternative family structures; and in relation to the associated transitions across family structures in childhood (Härkönen, et al., 2017). Claims that types of and transitions across childhood family structures affect adult children's outcomes are sustained by scattered evidence, which suggests heterogeneity in the strength of these associations and, potentially, diverse mechanisms linking the behavioral patterns of parents and their offspring (Amato, 1996, Amato and DeBoer, 2001, Fomby and Cherlin, 2007, Wolfinger, 2003). We thus formulated a second research question:

*Does the studied association vary according to type of and transitions across alternative family structures during childhood?*

To understand the relationship between family background and partnership life course complexity, it is particularly important to consider holistic partnership trajectories, i.e. the complete and structured set of partnership episodes in (early) adulthood. Studying long-term partnership trajectories contributes to the existing literature as it addresses the intergenerational transmission of partnership behavior beyond exactly matched events (i.e. the dissolution of parents' and children's first union), and thereby acknowledges breaks in the patterns of

partnership behavior across generations. Following the research on life course trajectories, we propose that the *complexity* of an individual's partnership trajectory results from a combination of the number, duration and sequencing of partnership episodes over time. In addition, we account for the social meaning attributed to complex trajectories in each specific context (i.e. whether the associated partnership transitions are deemed advantageous or disadvantageous in a given society). To this end, we propose a weighted complexity index that combines empirical and theoretical facets of partnership complexity in one measure. In this study, we take the dissolution of the first union (marital or not) as the defining event for setting an individual on a *complex* partnership trajectory. Further episodes of relationship instability or entry into arguably less stable relationship types contribute to the accumulation of additional complexity in the partnership trajectory.

The existing research regarding the complexity of partnership trajectories and their associations with families background has primarily been conducted in the United States (e.g. Hofferth and Goldscheider, 2010, Ryan, et al., 2009, Valle and Harker Tillman, 2014, Wolfinger, 2003). The US context is often argued to exhibit partnership and family patterns that differ from other national contexts with comparable levels of material wellbeing, and thus, findings from the US are not generalizable to other countries (Cherlin, 2009). In this research, we contribute to the literature by addressing the German case, where partnership life courses differ from the US in a number of key ways. For the German cohort studied here, the vast majority of first unions started with unmarried cohabitation rather than direct marriage (Hiekel and Fulda, 2018). Additionally, in Germany, cohabiting unions at any order are more likely to be transformed into a marriage than to end in separation, unlike in the US (Lichter, et al., 2010, Lichter and Qian, 2008).

For the empirical analyses, we use data from nine annual waves of the German Family Panel *Pairfam*, collected between 2008 and 2016, and a sample of 1,398 women and men from three cohorts born between 1971-73, who reached age 40 before the end of the observation period. Drawing on Ritschard *et al.* (2018), we construct a time-varying, continuous measure of complexity for the individual partnership life course. We use hurdle regression models to examine the links between childhood family structure and the complexity of adult partnership life courses. These models allow us to sequentially address the determinants of experiencing a complex partnership trajectory—in our study this is initiated by the dissolution of the first union—and the accumulation of complexity thereafter (i.e. with further partnership episodes).

Our results show that, among other things, exposure to alternative family structures during childhood is linked to the accumulation of greater partnership complexity in adulthood. These and further related findings of this research support our understanding of the reproduction of family life courses.

## COMPLEXITY IN PARTNERSHIP TRAJECTORIES

The wide array of changes to people's partnership and family behavior in recent decades have been viewed as a manifestation of the so-called *Second Demographic Transition* (Lesthaeghe and van de Kaa, 1986, van de Kaa, 1987): (1) the decreasing popularity of marriage and the rise of unmarried cohabitation, exemplified by declining marriage rates and the postponement of marriage (European Commission, 2015), (2) increases in non-marital fertility (Perelli-Harris, et al., 2012), and (3) increasing relationship instability demonstrated by rising divorce (and separation) rates (e.g. Sobotka and Toulemon, 2008).

The life course approach has been key to improving our knowledge of increasingly complex partnership trajectories. Family scholars predominantly applied methodologies for examining the timing, duration or repetition of *single events* or point-in-time outcomes of partnership trajectories, such as the time to first marriage or divorce, the transition from cohabitation to marriage and determinants of repartnering. Gathering evidence on complex partnership trajectories only using such methodologies can be problematic because of the underlying assumption of no or little difference in the components of the process (or prior behavior) leading to the same partnership outcomes. Only recently have improved sources of longitudinal data and methodological innovations in life course analysis enabled researchers to adopt a holistic perspective on individual partnership trajectories. That is, rather than studying the components or specific behaviors that compose a partnership trajectory separately, these studies consider the set of behavioral choices as well as their timing and sequencing jointly, to study partnership trajectories as individual behavioral *processes* ((Elzinga and Liefbroer, 2007, Fasang and Raab, 2014, Perelli-Harris and Lyons-Amos, 2015, Van Winkle, 2018).

Research using such a holistic perspective has shown that partnership life courses have *de-standardized*, that is, differences in the structure of individual life courses have increased among recent birth cohorts. Life events occur—if at all—at more dispersed ages for younger cohorts.

When life courses become less normatively, organizationally and legally regulated, individuals start acting in more autonomous ways. As a consequence, an increasingly smaller share of contemporaneous birth cohorts follow the “standard” partnership trajectory consisting of an early and stable marriage (Brückner and Meyer, 2005). The fact that partnership life courses have also become more *differentiated* has been less studied (Elzinga and Liefbroer, 2007). While de-standardization reflects increasing differences between cohorts, differentiation refers to increasing differences within cohorts and reflects individual life course development is unequal and less predictable. Indeed, life states in individual life courses have increased in number and their type and durations are more diverse among contemporaneous cohorts (Brückner and Meyer, 2005). Increasing life course differentiation is also supported by evidence that the number of transitions in and out of unions and the variability in the duration and order of partnership spells increases in contemporaneous populations.

In common with previous work, the present study addresses individual partnership behavior in terms of distinct *trajectories* that evolve over the life course. We incorporate the notion of life course differentiation by acknowledging that individuals accumulate complexity over the course of their partnership trajectory, (1) by entering a greater number of distinct partnership-related states (single, cohabiting, married, separated) and (2) by exhibiting less predictability in terms of the duration and the sequencing of these states. We will elaborate on the conceptualization and application of the complexity measure in the method section of this paper.

## LINKING CHILDHOOD FAMILY STRUCTURE TO COMPLEX PARTNERSHIP TRAJECTORIES

Parental separation has become an increasingly salient part of children’s lives in many individualized societies. Beyond this initial separation, children may also experience further changes to the structure of their family and household. For example, a parent’s new partner may move in (and then out again), and parental re-marriage often brings step- and half-siblings along. Alternatively, co-residence with grand-parents or other relatives may be used as temporary solutions, while (separated) parents get their lives back on track. In brief, children with separated parents are growing up in a variety of *alternative family structures*—living arrangements other than with both biological parents—and some will experience changes to their family structures more often than others during their childhood.

The life course research paradigm of *linked lives* (Elder, 1994) emphasizes the role of the family of origin in shaping early, as well as subsequent, partnership behavior during adulthood. Thus, it is possible that not growing up with two biological parents contributes to differentiation or unequal development in adult partnership trajectories. Prior research has predominantly studied how family structure during childhood—with a focus on the event of parental separation—is associated with single components of partnership trajectories in adulthood: (1) timing and (2) type of union formation, (3) relationship instability, and (4) repartnering. The associated research evidence primarily comes from the United States and shows that the experience of an *alternative family structure* is associated with earlier home leaving, which is a key predictor of earlier entry into a first union (Fomby and Bosick, 2013, Goldscheider and Goldscheider, 1998, Hofferth and Goldscheider, 2010, McLanahan, et al., 2013, Raab, 2017), and is associated with choosing cohabitation rather than marriage as the mode of entry into a relationship (Amato and Kane, 2011, Thorsen, 2017). It follows that earlier union formation is a good predictor of union dissolution (Heaton, 1991, Teachman, 2002). However, most research on the intergenerational associations of family behaviors has focused on the reproduction of union dissolution within families, and the key finding is a substantial association between parental separation and the dissolution of a union, *ceteris paribus* (Amato, 1996, Amato and DeBoer, 2001, Diekmann and Engelhardt, 1995, Diekmann and Schmidheiny, 2013, Dronkers and Härkönen, 2008, Lyngstad and Engelhardt, 2009, Wolfinger, 2003). Only recently has the examination of these intergenerational associations been extended to the instability of unions outside marriage (Amato and Patterson, 2017), as well as to life courses characterized by repeated episodes of unmarried cohabitation (Lichter and Qian, 2008). This provides some initial evidence for an association between childhood family structure and the development of complexity in adult partnership trajectories, also beyond the dissolution of the first union.

Why would we expect that individuals' exposure to alternative family structures during childhood is associated with the accumulation of greater complexity in their own adult partnership biographies? Existing theoretical perspectives address three types of mechanisms for the intergenerational transmission of partnership behavior: value socialization, SES transmission, and stress caused by family instability.

First, sociological perspectives draw on theories of value socialization, social control and deviance and focuses on *parental role modeling and parental supervision*. As part of their



socialization efforts, parents transmit values to their children that refer to specific desirable life goals and serve as standards or criteria guiding young adults' partnership behavior (Bengtson, et al., 2002). Through means of social control, parents also limit their children's opportunities to engage in undesired behavior (McLanahan and Bumpass, 1988, Nye, 1958, Thomson, et al., 1994). Children's behavioral outcomes may be similar to their parents' behavior because the child-parent relationship encourages conformity in values, attitudes and beliefs. Family structures other than those consisting of two married parents may indicate that the parents involved hold less traditional value orientations regarding family pathways, which are then transmitted to their children, and serve as behavioral guidelines for the children's own future partnership behavior (Barber, 2000, Barber, et al., 2002). Parents may also transmit such behaviors via less deliberate pathways, by illustrating a possible course of action for solving relationship problems that children may (unintentionally) imitate later in life (Cunningham and Skillingstead, 2015). In light of empirical evidence that parenting skills are stratified by family structure, family scholars have explained the intergenerational transmission of union instability by arguing that the children of separated parents miss out on the benefit of being exposed to models of effective dyadic functioning during childhood and then lack these skills in their own adult relationships (Amato, 1996). Applying the evidence of socialization as a mechanism linking parents' and adult children's behavior, we would expect that children growing up in any alternative family structure would be more likely to experience the initiation of a complex partnership trajectory (i.e. a first union dissolution) than children *not* growing up in any alternative family structure. Some of the arguments presented here support the notion that adults exposed to alternative family structures in childhood will accumulate greater partnership complexity thereafter, either because of the normative flexibility regarding family pathways or because of a lack of capabilities or intention to commit to a stable partnership.

Second, the economic perspectives focus on the availability of resources, like income and time investments in children, and hence on the *socio-economic standing of the family of origin and its transmission across generations*. Parental resources are beneficial for children's outcomes as they determine the accumulation of financial and human capital (Coleman, 1988). More resources imply more income to satisfy basic needs as well as providing opportunities for cognitive and social development, on the one hand, and more parental time devoted to supporting and monitoring children, on the other hand (Thomson, et al., 1994). Not growing up with two

biological parents implies a loss of resources available to support children and potentially disrupts the transmission of socio-economic status, as the absence of at least one biological parent reduces access to additional income and parental time (McLanahan and Percheski, 2008, McLanahan and Sandefur, 1994, Uunk, 2004). It is noteworthy that re-partnering of the co-resident parent has been found to compensate for some of the economic strain caused by parental union dissolution and the transition to single parenthood (Magnuson and Berger, 2009). However, stepparents tend to invest less in their stepchildren (Uunk, 2004) and the stepparent-child relationship may remain less close than the taken-for-granted biological parent-child relationship, limiting a full compensation of parental “social” resource transmission through re-partnering (Thomson, et al., 1994). Such processes may also be fueled by the family dynamics created by the presence of stepsiblings or the birth of half-siblings in the child’s stepfamily (Lappegård and Thomson, 2018). Drawing on evidence of socio-economic status transmission as a mechanism for intergenerational partnership patterns, we would expect continuities or that alternative childhood family structures predispose individuals to complex partnership trajectories in adulthood by facilitating the conditions that trigger relationship instability (e.g. early parental home leaving, early union formation, economic stress). The economic arguments presented here also suggest heterogeneity by exposures to different types of alternative family structure. The implications of economic adversity among children from single-parent background for adult life courses can be partly compensated through parental re-partnering. From evidence on the dynamics of stepfamilies, we can expect disruptions with paths of complexity due to stepparent-induced compensation of initially lost parental resources. However, we also expect heterogeneity in the extent to which children benefit from the stepparent effect.

Finally, the stress perspective focuses on the detrimental effects of instability on children’s development, which may explain the persistence of partnership behavior across generations (Fomby and Cherlin 2007, Waldvogel et al. 2010). Proponents of the *instability hypothesis* suggest that children are at least as affected by disruptions and the frequency of changes to family structure as by the exposure to an alternative family structure itself. Thus, exposure to multiple changes in family structure during childhood may have a greater impact on subsequent partnership behavior than a single change (e.g. from a stable family structure to an alternative one). Thereby, we can expect that a path of continuity is more likely with increasing number of changes in the family structure during childhood.

## METHOD

### *Data and Sample*

Analyses were based on data from nine annual waves of the German Panel of Intimate Relationships and Family Dynamics (pairfam), release 9.0 (Huinink, et al., 2011). Data were collected between 2008/2009 and 2016/2017 and comprise detailed information on childhood family structure and change as well as own partnership and fertility biographies of individuals from three birth cohorts: 1971-73, 1981-83 and 1991-93.<sup>1</sup>

For this analysis, we select respondents from the oldest pairfam birth cohort (1971-73) as this allows us to study partnership trajectories up to age 40. The original sample of this birth cohort consists of 4,054 individuals. We exclude respondents who identify themselves as other than heterosexual (n=55), those not born in Germany or whose parents were not German-born (n=713), and those who only participated in wave 1 (n=1,161), since information on childhood living arrangements was not collected until wave 2. These baseline sample criteria were met by n=2,125 respondents. We additionally excluded those living in an alternative family structure already at birth (n=85) because of the small group size. The fact that this small group never lived with both biological parents precludes us from merging them with those who experienced the transition into an alternative family structure in childhood. We also excluded respondents who did not enter a partnership before the end of the observation window (n=169) because of the small group size, and because of their arguably different rationale for following a trajectory of no/low partnership complexity.<sup>2</sup> Lastly, we excluded observations from individuals with missing information on any model variables in the regression analyses. The analytical sample for our primary analysis amounts to 1,402 respondents contributing n=10,357 observations. In additional analyses that test alternative main predictors, the analytical sample is further reduced to 1,386

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<sup>1</sup> Though a supplementary Eastern German oversample exists (*Demographic Differences in Life Course Dynamics in Eastern and Western Germany Demodiff*) these data did not provide information on the type of family structure transitions or on the age at which these transitions occurred. We therefore based our analysis on the original pairfam sample, comprised of 20% Eastern Germans, which is representative for the population ratio at the national level.

<sup>2</sup> In our analysis we generate a partnership complexity measure that takes the value 0 for respondents who do not experience episodes of partnership instability. This includes respondents who entered a stable marriage eventually, after cohabiting first with their spouse, but also respondents who never entered a partnership. We excluded the latter from the analyses because their trajectories are qualitatively different from those who entered a partnership. Our results however are identical when including never partnered respondents in our sample.

respondents contributing  $n=9,950$  observations to analytical models. All analyses were replicated using the most restrictive analytical sample, and results from these replications did not change the conclusions drawn from the analyses presented here.

## ***Measures***

### *Partnership complexity*

We deploy sequence-based methods to generate our outcome measure, which is a continuous measure of the complexity of an individual's partnership life course. We use available information on the dates (i.e. month and year) and types of union (i.e. cohabiting and married) that were formed or dissolved between age 16 and age 40. This enables us to build sequences of ordered monthly states that consist of the following relevant partnership situations: "Never partnered", "Cohabiting", "Married" and "Previously partnered". The "Never partnered" state includes episodes of single living before entering a first union (either a cohabitation or marriage). "Cohabiting" or "Married" states refer to relationship episodes of any order, though most of them are first order. Although the data are ordered in partner episodes, we cannot identify temporal separations that pre-date the panel. Thus, our study understates complexity in partnership life courses derived from temporal partnership instability. The data allow us to assert that any "Cohabiting" state in our sample followed by a "Married" state in the following month refers to respondents marrying their cohabiting partner. The "Previously partnered" consist mostly of separated people—from a cohabitation or a marriage—and a few widowers (less than 3 percent). Most applications of sequence analysis compare individuals' sequence characteristics, such as the occurrence, order and timing of role transitions, using algorithmic techniques. Such comparisons allow the clustering of individual sequences in groups that are useful to assess continuity with or departures from the standard life course sequence in a population. In this research, we are additionally interested in assessing within-individual sequence qualities, or, put differently, the accumulation of partnership experience and instability within the sequence at time  $t$  (i.e. at a given age). Previous researchers have proposed measures such as the *complexity index* (Gabadinho, et al., 2010) or the *turbulence index* (Elzinga, 2010, Elzinga and Liefbroer, 2007) that quantify the degree of *differentiation* within individual life courses. Individual sequences with many episodes, odd sequencing and high variability in episode duration get higher index scores, as they are more unstable or complex. Such measures have already found an application

in studies of employment trajectories (Biemann and Wolf, 2009, Manzoni and Mooi-Reci, 2011) and family trajectories (Elzinga and Liefbroer, 2007, Van Winkle, 2018).

Building on the *complexity index* (Gabadinho, et al., 2010), we define index  $C(s)$  for partnership sequences as follows:

$$c(s) = \sqrt{\frac{h(s)}{\log(n_a)} * \frac{nt_s}{(l_s - 1)}}$$

where  $C(s)$  is the geometric mean of two components of complexity in sequences: (i) the partnership state distribution in the sequence measured by the longitudinal sequence (or Shannon) entropy  $h(s)$ —interpreted as the ‘uncertainty’ in predicting the states in a given sequence, where uncertainty is higher with more states and uniform durations of states in a sequence—normalized by the logarithm of the number of possible states  $n_a$  (in our application this is 4); and (ii) the order of partnership episodes in the sequence measured by the number of transitions  $nt_s$  normalized by the length of the sequence minus 1:  $l_s - 1$ . The  $C(s)$  index ranges from 0 to 1.<sup>3</sup>

One shortcoming of this complexity index,  $C(s)$ , proposed by the above-referenced literature is that it grasps the degree of volatility of (e.g., employment or partnership) episodes in a sequence rather than the quality or substantive meaning of any sequence. That is, two sequences with a similar episode structure can obtain the same index value despite one being considered advantageous, such as continued upward transitions to better paid jobs in an occupational career, and the other being negative or disadvantageous, such as continued moves in and out of employment. Two recent studies therefore suggested the use of correction factors to the complexity index that penalize or reward the score depending on theoretically-based qualities of (e.g., employment) transitions (Manzoni and Mooi-Reci, 2018, Ritschard, et al., 2018). We extend this to the study of partnership trajectories, and develop a weighted complexity index that addresses deviations from traditional, socially desirable partnership paths, particularly if deviations are associated with social disadvantage. Research indicates that stable partnerships, particularly marriages, are normatively desirable and result in better economic, social and health outcomes than remaining unpartnered, separating or being in many relationships over the life

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<sup>3</sup> The value 0 of  $C(s)$  can be obtained for a sequence that contains no partnership transitions. The value 1 of  $C(s)$  can be obtained for a sequence that either (i) contains all partnership states with uniform durations, or (ii) where the number of transitions across states is equal to the length of the state sequence minus 1.

course (Dush and Amato, 2005). Therefore, we consider entering a first partnership (cohabitation or marriage) as a potentially advantageous transition that does not add complexity to the partnership trajectory. In addition, premarital cohabitation has become the normative standard union formation behavior in many European societies, and was practiced by the vast majority of the birth cohort of German men and women studied here (Hiekel and Fulda, 2018). In line with this, we consider marrying (a cohabiting partner), thereby institutionalizing a union, as a potentially advantageous transition that does not add or alleviate partnership trajectory complexity. In contrast, we consider that the first episode of union instability marks the onset of a complex partnership trajectory. Accordingly, higher order partnerships followed by further separations are regarded as potentially disadvantageous transitions that add complexity in the partnership trajectory. Table 1 shows which partnership state transitions add complexity or not to the partnership trajectory, based on existing knowledge of their potentially advantageous and potentially disadvantageous consequences.

[Table 1 about here]

Building on a weighted complexity index proposed by Ritschard et al. (2018), we propose a weighted partnership complexity index  $wC(s)$  that considers the above adjustments and can be written as:

$$wC(s) = c(s)^\alpha (1 + q(s))^\beta$$

where  $c(s)$  is the complexity index of the sequence and  $(1 + q(s))$  is a non-negative correction factor.<sup>4</sup> The element  $q(s)$  of the correction factor is defined as the difference between proportion of potentially disadvantageous transitions and the proportion of potentially advantageous transitions in the sequence. When potentially disadvantageous transitions outweigh potentially advantageous transitions in a sequence, the value of the correction factor is over 1 and the  $wC(s)$  score increases. When potentially advantageous transitions outweigh potentially disadvantageous

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<sup>4</sup> The original weighted complexity index by Ritschard et al. (2018) also corrects for the positive or negative meaning attached to the initial state of the sequence. In our research, the initial state is “never partnered”, as relationships in a cohabitation before age 16 are generally very rare and non-existent in our sample. Thus, no correction for the initial state was required. However, depending on the definition of relationships and the datasets used, where respondents might begin in other initial states, such a correction might be considered.

transitions, the value of the correction factor is below 1 and the  $wC(s)$  score decreases. Lastly, when potentially advantageous transitions equal potentially disadvantageous transitions, the value of the correction factor is 1 and the  $wC(s)$  score is not affected by the correction factor. The non-negative tuning parameters  $\alpha$  and  $\beta$  are weights for the unweighted  $C(s)$  index and the correction factor, respectively. We set  $\alpha$  equal to 1, and  $\beta$  larger than 1 to strengthen the correction given that the proportion of partnership transitions is rather low in a sequence based on monthly states. Results are presented using a  $\beta$  equal to 1.5, but analyses using smaller or larger  $\beta$  rendered similar results. In our sample, the index  $wC(s)$  ranges between 0 and 0.38, with a mean of 0.04 and a standard deviation of 0.07. Disregarding sequences with zero score, the  $wC(s)$  average is 0.12 and the standard deviation is 0.06. Overall, our empirically valid and sensitive, as well as theoretically grounded index,  $wC(s)$ : (1) scores zero for sequences that follow a standard ordering of partnership episodes (i.e. do not experience partnership instability); (2) scores higher with an increasing number of partnership states for sequences that feature non-standard partnership episodes; and (3) scores higher with equal durations across partnership states.

[Figure 1 here]

As an illustration, Figure 1 shows four artificial trajectories and the associated values for the weighted partnership complexity index  $wC(s)$  at age 40. The first sequence, composed of a “Never partnered” episode, a “Cohabiting” episode, and a “Married” episode, has a zero  $wC(s)$  score because we consider it a standard partnership sequence in the study context. We note that the traditional (unweighted partnership) complexity index  $C(s)$  renders a non-zero score (of 0.071), because the transitions, first, from never partnered to cohabitation and, second, from cohabitation to marriage adds additional states in the partnership trajectory. Sequence 2 and 3 have an additional episode of “Previously partnered”, and thus, the  $wC(s)$  is non-zero because of the potentially disadvantageous transition of separation. The score of Sequence 3 is lower than the score of Sequence 2 because most time is spent in the state “previously partnered”, which makes the sequence more predictable in empirical terms. In substantive terms, a separation after a long partnership (Sequence 2) may strongly affect individuals at age 40, while the negative effect of (an earlier) union dissolution may have dissipated over time (Sequence 3). Finally, Sequence 4 features two separations and three partnership episodes. Due to the large number of transitions in and out of partnerships, the  $wC(s)$  is much larger than the unweighted index  $C(s)$  in Sequence 4

and than the wC(s) in any other sequence, even though the last partnership transition concerns the institutionalization of a cohabitating partnership through marriage.

### *Childhood family structure*

Based on retrospective accounts of childhood living arrangements collected in the second panel wave of the survey, we obtained information on all transitions in childhood family structure from birth up to age 16. To estimate the average effect of alternative family structure on partnership complexity in adulthood, we distinguish respondents who lived with both biological parents throughout all childhood years (i.e. the reference group) from respondents who experienced any transition away from living with both biological parents. In our sample, n=230 respondents (16%) stopped living with both biological parents before turning 16 years old.

To test the moderating effect of *type of alternative family structure*, we categorize those ever living in an alternative family structure into three groups: (1) living with a single parent, (2) living in a stepfamily, and (3) any other alternative family structure. The latter group comprises individuals who ever lived in family structures without their biological parents, such as living with other family members, in an institution, independently, or with a partner. We could not disaggregate the latter group any further because of the low prevalence of each subgroup. Single-parent families were the most common type of alternative family structure (more than two thirds were assigned to this type), stepparent family structures were less common (about one third), and *other alternative family structures* were uncommon (only one in five).<sup>5</sup>

To address the instability hypothesis—in which the adult partnership trajectory might be affected by frequent changes in the childhood family structure—we use the information on the number of transitions in the childhood family structure. We created a categorical variable that distinguishes respondents who spent their whole childhood with both biological parents (i.e. the reference group) from those with one transition to an alternative family structure, and those with two or more transitions across alternative family structures.<sup>6</sup>

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<sup>5</sup> For the few respondents who experienced multiple types of alternative family structure during childhood, we prioritized assignment to alternative family structures and then to stepparent families over single-parent families. Using an alternative operationalization where a respondent can be assigned to multiple alternative childhood family structures rendered similar results.

<sup>6</sup> We note that despite significant correlation, there is no perfect correlation of the measure for the type of family structure with the number of transitions. We find that the majority of individuals with one family structure transition



### *Model covariates*

We use two sets of control variables in our models that capture individual socio-demographic characteristics correlating with general life course patterns (i.e. age and age squared, sex, regional context), and parental economic and cultural resources correlating with the intergenerational behavior transmission (i.e. parental education and mother's age at birth). We do not control for other established predictors of partnership instability or higher order partnership behavior such as individual's resources and attitudes because these are known outcomes of childhood family structure and including them in the analyses may potentially bias our results. In the following, we elaborate on the control variables used in our models.

*Respondent's socio-demographic characteristics.* First, partnership choices are regulated by social norms around appropriate age at first union, for example (Billari, et al., 2003, Madkour, et al., 2014), which shape people's opportunities to find partners and decisions regarding whether and when to institutionalize their unions. We therefore include *respondent's age in years* (centered at age 18, as well as its squared term) as a time-varying covariate in order to account for potentially non-linear age effects on increasing complexity over the partnership life course.

Second, *women and men* exhibit different partnership behavior, with men more likely than women to postpone union formation and marriage, in particular, thus increasing women's opportunities to build more complex partnership trajectories.

Third, and particular to the context studied, *East-West differences* are taken into account. Alternative family structures were more prevalent in the former German Democratic Republic than in the Federal Republic of Germany due to earlier age at childbearing, higher non-marital fertility, higher marital instability, lower religiosity and higher female labor force attachment—differences that persist more than 25 years after German reunification (Huinink, et al., 2012, Klüsener and Goldstein, 2016, Kreyenfeld, et al., 2011).

*Parents' cultural and economic resources.* Childhood family structure may affect the accumulation of partnership complexity in adulthood via other possible pathways related to

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in childhood lived in a single parent household (58%), followed by stepparent household (24%) and other alternative family structure (18%). We also find that among those who experienced more than one transition, the majority moved from a single or other alternative family structure to a stepparent family structure (63.8%), however a non-trivial proportion (36.2%) experienced a different order of family type transitions.

parental characteristics. First, we included the *years of education of the respondent's parent*, for the parent with the highest level of education. From an economic perspective, the transmission of the socio-economic status of the family of origin relates to demographic behavior because parents with higher socio-economic standing invest more in their children's human capital, which in turn affects the children's earning potential and actual income. At the same time, they tend to encourage their children to postpone costly and hard to reverse family transitions (Barber, 2000, Billari, et al., 2015). Higher parental social standing has also been linked to greater efficiency in fostering children's life course agency, and hence, their ability to achieve behavioral intentions (Elder, 1994, Elder, et al., 2003, Hitlin, 2007, Hitlin and Elder, 2006, Macmillan, 2006). Finally, wealthier parents have more financial resources to support their children to make costly life transitions.

Second, *mother's age at birth of respondent* relates to the timing of the onset of the mother's reproductive career. Just like unions formed at earlier ages, respondents with a younger mother may be more prone to experience parental instability during childhood. Earlier age at parenthood has also been associated with fewer socio-emotional skills to support the child (Shapiro and Mangelsdorf, 1994). Using the same data and a similar analytical sample, Raab (2017) found that having a younger mother was positively associated with earlier transition to parenthood, and with earlier experience of events typically preceding childbirth, such as leaving the parental home, and entering a first union.

### ***Analytical strategy***

The empirical analyses proceed in two steps. First, we present sample summary statistics of the weighted complexity index for adult partnership trajectories as well as their bivariate associations with indicators of family structure during childhood. Second, we conduct a multivariate regression analysis of the predictors of the weighted partnership complexity index.

To examine complexity in partnership trajectories, an initial key distinction between zero score values (i.e. non-complex trajectories) and positive values (i.e. complex trajectories) of the partnership complexity index  $wC(s)$  is necessary. Not accounting for this distinction is empirically and substantively problematic for two reasons. A partnership complexity index  $wC(s)$  of zero is structurally different from non-zero positive values and thus not adequately captured in

a linear model specification. Additionally, a linear model does not account for the potentially skewed distribution of the measure, given that a large fraction of the sample might not be following a complex partnership trajectory. The different structural source for complex and non-complex trajectories is evidenced by research on relevant antecedents of and individual selection into union dissolution (Lyngstad and Jalovaara, 2010).

To address the issues mentioned above, for the multivariate analysis of the complexity index we apply double hurdle models (Cragg, 1971, Wooldridge, 2010). These models are extensions of bounded dependent variable models where some observations are categorically excluded from passing a hurdle, in our case this hurdle is a non-zero score of the  $wC(s)$  index equivalent to experiencing a first union dissolution as a precondition to potentially build a complex partnership trajectory. Two equations are estimated. In the first equation, a probit model predicts the probability of a non-zero score of the  $wC(s)$  index and determines if a partnership trajectory is complex or not. In the second equation, a tobit model estimates linear predictions for the level of  $wC(s)$  given that the observation has a non-zero score, and determines the level of complexity of the partnership trajectory after the dissolution of the first union. Despite its similarity with Heckman selection models (Heckman, 1979), double hurdle models are advantageous because first, they do not require an exclusion criterion for the first equation; and second, those who do not build a complex partnership trajectory are not disregarded in the second equation that predicts the degree of partnership complexity for everybody who *potentially* dissolves a first union. For the analysis we use repeated observations from each individual over time, and thus, our complexity index is a time-varying measure that is updated each survey wave. To account for the nested structure of repeated observations over time, we estimate cluster bootstrap standard errors using the *bootdhtreg* command in Stata 14.0 (Engel and Moffatt, 2014).

Results from the multivariate analyses are used as initial evidence of the determinants, in particular the family structure during childhood predictors, of complexity in partnership trajectories. Our main interest lies in the estimated coefficients for childhood family structure of the second equation of the hurdle model, as these refer to predictions of the accumulation of partnership complexity overtime. However, results from the first equation are also relevant, as these offer additional evidence of the role of childhood family structure for experiencing a first union dissolution. We separately predicted the association between the four measures of childhood family structure (i.e. alternative family structure up to age 16, type of family structure

up to age 16, parental separation by age 16, number of transitions across alternative family structures by age 16) to assess what features add to the accumulation of complexity in partnership trajectories.

## RESULTS

### *Descriptive findings*

In our analytical sample, 59 percent of the respondents have a zero score in the continuous measure of partnership complexity:  $wC(s)$ . That is, the majority of our analytical sample did not follow a complex partnership trajectory, but entered a stable relationship, still intact at the end of observation. Among the sample minority with a non-zero score in  $wC(s)$  the mean value is 0.11, which is equivalent to having entered at least two partnerships before age 40. The distribution of non-zero score values of  $wC(s)$  is slightly right-skewed, with more respondents scoring under than over the mean score (see Figure A1 in the appendices).

Bivariate associations show that complexity in partnership trajectories is higher among respondents who did not live continuously with both parents from birth to age 16 (*Alternative family structure*) than among respondents who did (*Traditional family structure*). We find that 52 percent of respondents from an alternative family structure in childhood had a non-0 score in the  $wC(s)$  index, while the percentage only amounts to 39 percent for respondents from a traditional family structure in childhood. Among those with non-zero scores, a mean score in  $wC(s)$  of 0.13 is higher for respondents from an alternative family structure than for respondents from a traditional family structure who scored, on average, 0.10. The difference is statistically significant, and is equivalent to an additional partnership break-up among respondents from alternative family structures during childhood. The bivariate associations between other model variables and our measure of complexity in family trajectories can be consulted in Table A1 in the appendices.

### *Multivariate findings*

For the multivariate analysis, we deploy hurdle regression models and examine whether living in an alternative family structure during childhood is associated with complexity in adult

partnership trajectories in sequential steps, with the estimation of two equations. In the first step, we examine whether living in an alternative family structure during childhood is associated with the initiation of a complex adult partnership trajectory—i.e. the dissolution of a first union. Results are presented in Table 2 as predicted probabilities of a non-zero score in the wC(s) index. Conditional on passing the hurdle of initiating a complex partnership trajectory, we examine in a second step whether living in an alternative family structure during childhood is associated with a greater level of complexity in the adult partnership trajectory. Results are presented in Table 3 as linear predictions of the wC(s) index with zero censoring. Three sets of model specifications examine associations between the complexity measure and family structure during childhood using different strategies to operationalize the latter. All models include the set of relevant respondents' and parental characteristics that affect the study associations. The effects are presented as average marginal effects that reflect the increase (or decrease) in the probability of occurrence of a complexity episode (Table 2) or in the level of complexity (Table 3) when the predictor increases by one unit (when continuous) or from the reference category to another (when categorical) while all other predictors in the model are fixed at their mean.

In Model 1 in Tables 2 and 3 we distinguish respondents who lived with both biological parents until age 16 (i.e. the reference group) from respondents who entered an alternative family structure at some point during childhood. Results from Model 1 in Table 2 show a higher probability of initiating a complex trajectory when experiencing an alternative family structure in childhood. The predicted probability is 0.30 greater ( $p < 0.001$ ) for a respondent who experienced an alternative family structure in childhood than for a respondent who did not. Results from Model 1 in Table 3 show a significant association of alternative family structure in childhood with the accumulation of greater partnership trajectory complexity in adulthood. Conditional on initiating a complex trajectory, the level of partnership complexity according to the wC(s) index is 0.03 units higher ( $p < 0.001$ ) for a respondent who experienced an alternative family structure in childhood than for a respondent who did not. These associations are robust to controlling for relevant variables such as respondent's socio-demographic characteristics as well as parental resources. The associations of these variables with partnership complexity are also interesting,

and in some cases these are relevant for predicting the dissolution of the first union but not for accumulating further complexity in the partnership trajectory.<sup>7</sup>

[Table 2 about here]

[Table 3 about here]

In two sets of further models, we answer our second research question regarding whether types of alternative family structure and the number of transitions across alternative family structures moderates the association between living in an alternative family structure during childhood and greater partnership complexity in adulthood. Acknowledging diversity in family structure and examining whether some types of alternative family structure are associated with more (or less) complexity in the adult partnership trajectory than others, we next included a categorical predictor in Model 2, addressing four types of family structure and their associations with our complexity measure. We distinguish (1) respondents who lived with both biological parents until age 16 (i.e. the reference group) from (2) respondents who lived with one biological parent only, (3) respondents who lived with a biological parent and a stepparent, and (4) respondents in other alternative family structures. We find that the experience of the most prevalent alternative family structures, single parent family and stepfamily, were associated with greater partnership complexity in adulthood compared to a two biological parent-family. Results from Model 2 in Table 2 show that growing up in a single-parent family was associated with initiating a complex trajectory (0.50;  $p < 0.001$ ) while living in a stepfamily was not significantly associated with initiating a complex trajectory (-0.06;  $p > 0.05$ ). We thus find evidence that the biological parent's re-partnering and a stepparent moving in would mitigate, in part, the effect of growing up in an alternative family structure, since children growing up in a stepfamily are not more likely to initiate a complex trajectory than those growing up with both biological parents. This conclusion is nuanced by the associations with the accumulation of greater complexity. Indeed,

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<sup>7</sup> Additional models available under request also include age-categories of first transition to an alternative family structure. The inclusion of these variables did not substantively change any results presented in Table 2 and Table 3.

results from Model 2 in Table 3 show that growing up in a stepfamily as well as in a single-parent family was associated with a greater accumulation of partnership complexity over the adult life course. However, the linear prediction is four times higher for respondents who (partly) grew up in a stepfamily (0.05;  $p < 0.001$ ) compared to those who grew up in a single-parent family (0.02;  $p < 0.001$ ). A Wald test for the comparison of coefficients confirms that the difference in the linear predictions is statistically significant. Finally, growing up in another alternative family form was associated with a higher probability of first union dissolution (0.87;  $p < 0.001$ ), and moderately associated with more complexity in the partnership trajectory (0.01;  $p < 0.05$ ). However, it is difficult to interpret the results of other alternative family structures, as it is possible that the family structure types mingled here may have different effects that cancel each other out.

In Model 3, we examined whether the effect of childhood family structure on adult partnership complexity differed by the number of transitions in (alternative) family structures by age 16. Results from Model 3 in Table 2 show that the predicted probabilities of initiating a complex trajectory are lower among respondents experiencing two or more transitions (0.26;  $p < 0.001$ ) than among respondents experiencing only one transition (0.32;  $p < 0.001$ ). We run a Wald test for the equality of the two coefficients, and the associated results lead us to conclude that the difference is not statistically significant, and, thus, initiating a complex trajectory is not related to the number of household transitions during childhood. Results from Model 3 in Table 3 lead to similar conclusions with regard to the accumulation of greater complexity. In this case, the linear prediction for one transition (0.02;  $p < 0.001$ ) is lower than for two or more transitions across childhood family structures (0.04;  $p < 0.001$ ). Although a Wald test suggests statistically different probabilities for the two groups, the difference is small and does not substantively affect the pattern of partnership complexity. Overall these results suggest that, *ceteris paribus*, there are no substantial differences in the complexity of adult partnership trajectories between individuals who experienced lower and higher levels of household structure instability in childhood.

### ***Sensitivity analysis***

The reader will recall that the complexity index used in our analyses is not purely empirical, but also theoretically grounded: it “penalizes” potentially disadvantageous transitions and “neutralizes” socially desirable and potentially advantageous partnership transitions. We

therefore also test our expectations against an unweighted, thus purely empirical complexity index, using a linear regression model with clustered standard errors. The purpose of this analysis is to see how sensitive our findings are to the corrections we impose based on the existing knowledge of the long-term consequences of different types of partnership behavior. The estimated linear predictions of partnership complexity according to alternative family structures in childhood, resulting from this sensitivity analysis (see Table A2 in the appendix of the paper) display some similarities to and some differences from those in Table 3 using the weighted partnership complexity index  $wC(s)$ , but the associations are weaker. Among other things, growing up in a stepparent family or other alternative family structure is not significantly associated with the unweighted partnership complexity index, using conventional statistical levels. Experiencing two or more transitions across alternative family structures is positively associated with the unweighted partnership complexity index, while only transitioning once into an alternative family structure is not. Despite the differences in these results, the main conclusion that exposure to alternative family structures in childhood matters still stands.

## CONCLUSIONS AND DISCUSSION

In recent decades, increased rates of union dissolution, the declining centrality of marriage and the emergence of alternative, less stable union types have dramatically undermined the time people spend in their first (marital) union. At the same time, individual partnership trajectories have become inherently more complex, with increasing numbers of transitions across diverse partnership situations and time spent with several partners (and between partners) over the life course. This study adds to our understanding of how complexity in contemporary partnership life courses develops, by investigating the long-term impacts of childhood family background and its relevant diversity. With the onset of societal changes dating back to the late 1960s, increasing shares of the contemporary adult population grew up in family structures other than the traditional nuclear family consisting of two biological parents and their children. Given this background, we asked to what extent individuals' childhood exposure to alternative family structures was associated with building up greater complexity in their own adult partnership trajectory, and whether this association was moderated by the type and stability of these alternative childhood family structures.



To answer these questions, we used rich prospective and retrospective longitudinal data from the German Family Panel (pairfam) to reconstruct family structure trajectories from birth to age 16 and adult partnership trajectories from age 16 to age 40. We innovated by proposing a holistic measure of complexity that accounts for accumulated experiences over the partnership life course. To this end, we built a time-varying, continuous index that takes into account empirical (i.e. number of transitions in and out or across partnerships, and the duration of each partnership) as well as theoretical aspects of complexity in an individual's partnership life course (i.e. whether partnership transitions are deemed advantageous or disadvantageous in a given society). Drawing on the life course perspective, we suggested that complexity in an individual's partnership trajectory starts with the dissolution of a first union, and builds up with higher-order instances of partnership formation and dissolution. We formulated hypotheses regarding the links between relevant dimensions of childhood family structure and the accumulation of complexity across the adult partnership life course. Using hurdle regression models, we simultaneously examined whether childhood family structure is associated with starting a complex trajectory, on the one hand, and with accumulating greater complexity thereafter, on the other.

Our key findings provide further evidence that the long arm of childhood shapes adult life courses. First, we find that, compared to growing up with both biological parents, exposure to an alternative family structure in childhood is associated with a higher probability of experiencing the dissolution of the first union in adulthood. This result resonates with an overwhelming body of evidence on the intergenerational reproduction of union dissolution (Amato, 1996, Amato and DeBoer, 2001, Diekmann and Engelhardt, 1999, Diekmann and Schmidheiny, 2013, Dronkers and Härkönen, 2008, Lyngstad and Engelhardt, 2009). Second, we find that, conditional on a first union dissolution, exposure to alternative family structures in childhood was associated with a greater accumulation of complexity in the adult partnership trajectory, up to age 40. In fact, in our models, exposure to an alternative family structure in childhood was the best predictor of greater complexity in adult partnership trajectories. It is worth noting that these associations are not trivial, given that the numbers of second-order union dissolutions in our sample are relatively low. Together, these two key findings support our underlying hypothesis that not growing up with two biological parents contributes to differentiation processes in adult partnership life courses. We extend previous studies by showing that the potential impacts of childhood family

structure on union instability in adulthood persist beyond first union dissolution and affect subsequent higher-order partnership behavior in contemporary Germany.

Our study furthermore questions the continuity or path dependency between childhood exposures and outcomes in adulthood, by revealing heterogeneity in the study associations that are due to differential exposures to childhood family structures. Exploring differential partnership outcomes in adulthood by type of exposure to childhood family structure has the potential to hint at relevant interactions between opportunity structures and individual agency, which affect the likelihood that individuals will continue or break with the intergenerational reproduction of partnership behavior. In our sample, the most prevalent type of alternative family structure in childhood was growing up with a single parent, which we found to be strongly associated with experiencing a first union dissolution and moderately associated with accumulating greater complexity over the partnership life course thereafter. This finding suggests that single-parent family structures in childhood contribute to the intergenerational reproduction of partnership behavior, which could be viewed as a self-perpetuating process with few opportunities for individual agency to redirect an individual's life path. In contrast, we find that individuals growing up in stepfamilies were as likely as those living in continuously intact families during childhood to experience a (first) union dissolution as adults. This finding suggests that, for the German cohort studied here, co-residence with a stepparent may alleviate the negative effect that exposure to alternative family structures has on adult partnership behavior. Compensation mechanisms seem one plausible explanation for the lack of association. A more agent-based explanation is that the exposure to a stepparent family structure as a child may lead individuals to purposively avoid a similar experience for their own children. However, looking beyond the first relationship, at the full picture, debunks this optimism as over-hasty. Among those who experienced a first union dissolution, the number of subsequent partnership episodes is much greater for those adults who grew up with a stepparent compared to any other type of (alternative) family structure. We thus conclude that a large minority of young adults with stepfamily experience may lack the individual agency to escape the strong pull of the cumulative disadvantage set up by the initiation of a complex partnership trajectory. This finding extends prior research on what we know about the intergenerational transmission of partnership behavior.

Finally, we find no substantive differences in the complexity of adult partnership trajectories if there was only one transition from living with both biological parents into an alternative family

structure, or if there were additional transitions. This result does not support the instability hypothesis (Fomby and Cherlin 2007, Waldvogel et al. 2010) which led us to expect that children are at least as affected by disruptions and the frequency of changes in the family structure as by the type of family structure itself. We believe that part of the absence of an effect can be due to the limited number of respondents who reported several transitions in childhood, while many of them may have ended in a stepparent family structure that alleviates part of the potential *instability effect*.

We should note some caveats and potential limitations of our study. While using theory-based weights enabled us to acknowledge deviations from socially desirable partnership paths in our complexity measure, we should remind the reader that these weights are specific to the study context. For instance, the transition to an initial cohabitation is normative in the German context but might be a deviant social behavior in others. In other words, this measure is not readily applicable to data from other contexts. Despite this, it is relatively simple to adjust these correction factors to the specific features of other social settings. We also note that our results with a theory-based complexity index do not differ substantively from those using an unweighted, empirical complexity index. It is also worth stating that testing the underlying mechanisms of the study associations was not our focus, and future research should test the cultural and economic explanations we introduced in the theoretical framework. In the multivariate models, we used a number of controls relating to respondents' socio-demographic characteristics and resources as well as to parental resources. Our results were robust to the inclusion of these controls in the models, which indicates that the associations we find are probably due less to the lower socio-economic standing of the individual and the family of origin than to exposures to alternative family structures in childhood. However, further research should use more exhaustive measures than those that were available here.

Our study has implications for future, theoretically-grounded research aimed at advancing our understanding of *linked lives*—more concretely the intergenerational associations—in partnership life courses. The results presented here support the popular notion of life-long development, where early life events set the stage for later experiences and outcomes (Settersten, 2018). However, we also suggested that early experiences are not necessarily constraining the life paths of individuals in such a way that they cannot re-direct them, even if these individuals were initially exposed to conditions and experiences that were deemed disadvantageous. Furthermore,

we proposed to address *turning points* in partnership trajectories through which individuals break with the patterns of their parents' life paths. Adopting a holistic life course perspective—in which partnership life courses are conceptualized as processes instead of single events or point-in-time outcomes—proved fruitful for empirically addressing continuity and change in life paths across generations. Although there is a growing body of work using similar research designs, we advocate for research that integrates strong conceptual underpinnings and theoretical developments alongside empirical considerations, in order to deepen our understanding of the complexity of partnership trajectories over the life course.

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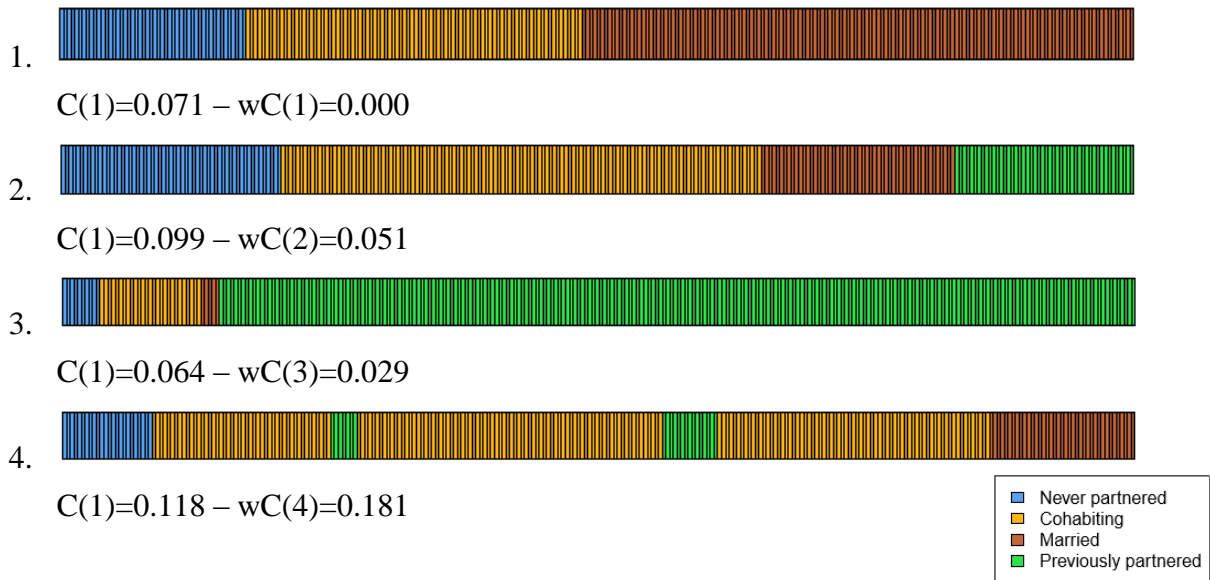
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## TABLES & FIGURES

Figure 1. Example sequences of monthly partnership states (age 16 to 40) and values of the (weighted) partnership complexity indices at age 40.



Notes:  $C(s)$  is a complexity index as proposed by Gabadinho, et al (2010);  $wC(s)$  is a weighted complexity index using corrections proposed by Ritschard et al (2018).

Table 1. Partnership state transitions that contribute (or not) to the accumulation of partnership trajectory complexity in the study context

<u>Potentially advantageous / do not add or alleviate complexity</u>	<u>Potentially disadvantageous / add complexity</u>
Never partnered → Cohabiting	Cohabiting → Previously partnered
Never partnered → Married	Married → Previously partnered
Cohabiting → Married	Married → Cohabiting
Previously partnered → Married	Previously partnered → Cohabiting

Notes: The transition Cohabiting → Married is with the same partner. The transition Married → Cohabiting is with a different partner.



Table 2. Predicted probability for the occurrence of a complexity episode in the partnership trajectory (*average marginal effects*)

	Model 1 AME	Model 2 AME	Model 3 AME
<i>Family Structure during childhood</i>			
Both biological parents	Ref.		
Alternative family structure	0.299*** (0.035)		
<i>Type of Family Structure during childhood</i>			
Both biological parents		Ref.	
Single parent		0.502*** (0.054)	
With stepparent(s)		-0.059 (0.060)	
Another alternative structure		0.870*** (0.108)	
<i>Number of transitions across alternative family structures during childhood</i>			
0 (living with both biological parents)			Ref.
1			0.315*** (0.039)
2 or more			0.256*** (0.061)
Age	0.115 (0.082)	0.137 (0.084)	0.116 (0.082)
Age squared	-0.002 (0.002)	-0.002 (0.002)	-0.002 (0.002)
Women (ref. men)	0.109*** (0.027)	0.118*** (0.028)	0.109*** (0.027)

Eastern Germany (ref. Western Germany)	0.098** (0.035)	0.132*** (0.036)	0.096** (0.035)
Parents' years of education	-0.009 (0.005)	-0.011 (0.005)	-0.008 (0.005)
Age of mother at birth of respondent	-0.023*** (0.002)	-0.025*** (0.003)	-0.023*** (0.002)
Constant	-1.360 (0.891)	-1.525 (0.913)	-1.372 (0.891)
LL	-937.12	-855.80	-933.48
Number of observations	10357	9950	10357
Number of respondents	1402	1386	1402

Probit regression for non-zero scores in the W(c) index. First-stage equation of hurdle models. Data: Pairfam (2009-2016, unweighted). Note: Cluster bootstrap standard errors in parentheses. A complexity episode is defined by the dissolution of the first union.

\*p < .05; \*\*p < .01; \*\*\*p < .001

Table 3. Linear predictions of the level of complexity in the partnership trajectory (*average marginal effects*)

	Model 1 AME	Model 2 AME	Model 3 AME
<i>Family Structure during childhood</i>			
Both biological parents	Ref.		
Alternative family structure	0.026*** (0.003)		
<i>Detailed Family Structure during childhood</i>			
Both biological parents		Ref.	
Single parent		0.019*** (0.004)	
With stepparent(s)		0.048*** (0.005)	
Another alternative structure		0.014* (0.006)	
<i>Number of transitions across alternative family structures during childhood</i>			
0 (living with both biological parents)			Ref.
1			0.022*** (0.003)
2 or more			0.036*** (0.005)
Age	-0.011 (0.007)	-0.012 (0.007)	-0.012 (0.007)
Age squared	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Women (ref. men)	0.001 (0.002)	0.000 (0.002)	0.001 (0.002)

Eastern Germany (ref. Western Germany)	0.004 (0.003)	0.005 (0.003)	0.004 (0.003)
Parents' years of education	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Age of mother at birth of respondent	0.001** (0.000)	0.001** (0.000)	0.001** (0.000)
Constant	0.231** (0.078)	0.239** (0.079)	0.235** (0.078)
LL	-937.12	-855.80	-933.48
Number of observations	10380	9950	10380
Number of respondents	1398	1386	1398

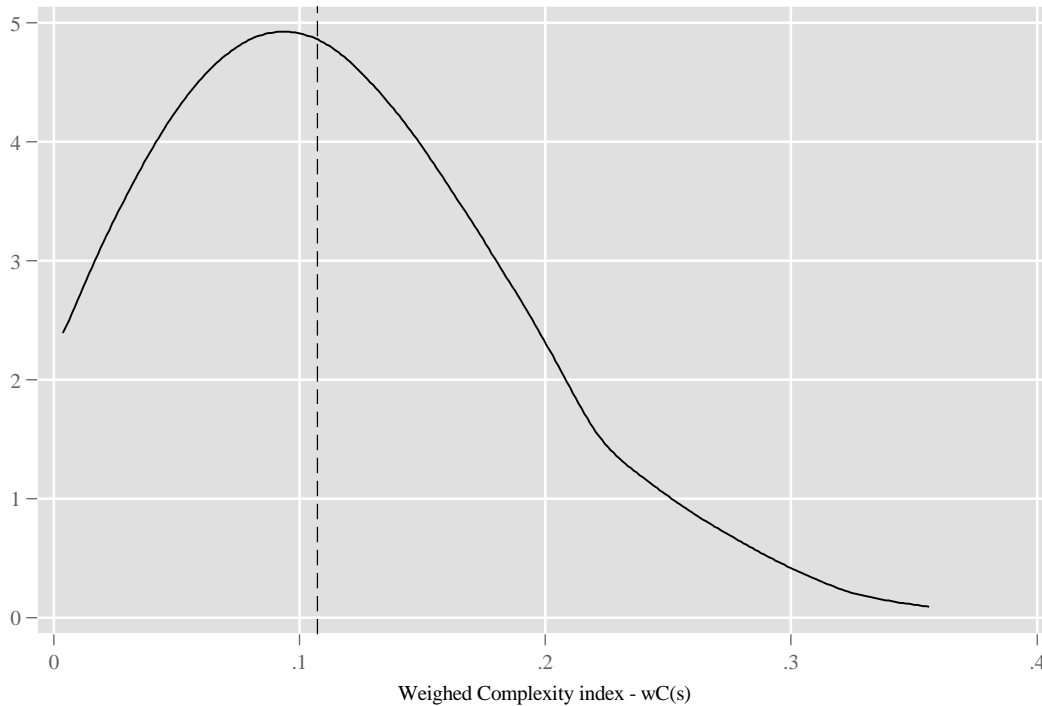
Tobit regression of scores of the W(c) index with zero censoring. Second-stage equation of hurdle models. Outcome is a non-zero score in the W(c) index. Data: Pairfam (2009-2016, unweighted). Note: Cluster bootstrap standard errors in parentheses.

\*p < .05; \*\*p < .01; \*\*\*p < .001



## APPENDICES

**Fig A1.** Distribution of the weighted partnership complexity index.



**Notes:** Pairfam 2009-2016. Density function of the weighed Complexity  $wC(s)$  index. Respondent averaged  $wC(s)$  index scores across observation were used for calculations. Respondents with averaged 0 scores were omitted. Higher values of the index denote more complexity in partnership trajectories. The density functions have been smoothed using a Kernel estimator. The horizontal line is the mean coefficient of the  $wC(s)$  index.

Table A1. Means and proportions of model variables and associations with complexity in partnership trajectories - wC(s) index.

	Proportion	Complex trajectories % of non-0 wC(s)	Complexity score for non-0 wC(s)
Types of family structure before age 16			
Two biological parents (only)	0.86	36.23	0.112
Single parent	0.06	49.76	0.132
One stepparent	0.05	44.04	0.145
Other structures	0.03	58.66	0.115
Transitions across family structures before age 16			
One	0.12	46.17	0.134
Two or more	0.05	54.26	0.136
Gender			
Men	0.43	37.36	0.117
Women	0.57	38.94	0.116
Region			
Eastern Germany	0.21	41.18	0.116
Western Germany	0.79	37.46	0.116
	Mean (st. Dev)	Correlation with non-0 wC(s) indicator	Correlation with wC(s) for non-0 wC(s)
Age (years)	39.74 (2.66)	0.05	-0.09
Parental education (years)	12.23 (2.54)	-0.02	0.01
Age of mother at birth (years)	26.39 (5.72)	-0.10	0.02

Data: Pairfam (2009-2016, unweighted).

Table A2. Linear predictions of the level of the unweighted complexity index (*average marginal effects*)

	Model 1 AME	Model 2 AME	Model 3 AME
<i>Family Structure during childhood</i>			
Both biological parents	Ref.		
Alternative family structure	0.006** (0.002)		
<i>Type of Family Structure during childhood</i>			
Both biological parents		Ref.	
Single parent		0.008** (0.003)	
With stepparent(s)		0.007 (0.004)	
Another alternative structure		0.007 (0.004)	
<i>Number of transitions across alternative family structures during childhood</i>			
0 (living with both biological parents)			Ref.
1			0.004 (0.002)
2 or more			0.011** (0.004)
Age	-0.002 (0.001)	-0.002 (0.001)	-0.002* (0.001)
Age squared	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Women (ref. men)	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)
Eastern Germany (ref. Western Germany)	-0.001	0.000	-0.001

	(0.002)	(0.002)	(0.002)
Parents' years of education	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)
Age of mother at birth of respondent	-0.000**	-0.000**	-0.000**
	(0.000)	(0.000)	(0.000)
Constant	0.120***	0.118***	0.120***
	(0.013)	(0.013)	(0.013)
<hr/>			
Number of observations	10357	9998	10357
Number of respondents	1402	1386	1402

Linear regression of scores of the unweighted complexity index. Data: Pairfam (2009-2016, unweighted). Note: Cluster standard errors in parentheses.

\*p < .05; \*\*p < .01; \*\*\*p < .001