Beyond Intergenerational Transmission: Intergenerational Patterns of Family Formation

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ABSTRACT

Research about parent effects on family behavior focuses on intergenerational transmission: whether children adopt the same family behavior as their parents. This potentially overemphasizes similarity and obscures heterogeneity in parent effects on family behavior. In this study we make two contributions. First, instead of focusing on isolated focal events, we conceptualize family formation holistically as the process of union formation and childbearing between age 15 and age 40. We then discuss mechanisms likely to shape these intergenerational patterns. Second, beyond estimating average transmission effects, we innovatively apply multichannel sequence analysis to dyadic sequence data from the Longitudinal Study of Generations (LSOG, N=461 parent-child dyads) and identify three salient intergenerational family formation patterns: a strong transmission, a moderated transmission, and an intergenerational contrast pattern. This enables us examine what determines parent's and children's likelihood to sort into a specific intergenerational pattern. Educational upward mobility is a strong predictor of moderated intergenerational transmission, whereas parent-child conflict increases the likelihood of intergenerational contrast in family formation. We conclude that intergenerational patterns of family formation are generated at the intersection of macro structural shifts and family internal psychological dynamics.

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Introduction

The transition to adulthood and the process of family formation have changed considerably in recent decades. These changes are reflected in new emerging patterns of timing and sequencing of important demographic transitions such as leaving home, getting married, and becoming a parent. Several studies show a postponement of marriage and parenthood, increased divorce rates, and higher levels of nonmarital childbearing (Furstenberg, 2010; Shanahan, 2000; Teachman, Tedrow, & Crowder, 2000). Moreover, new living arrangements like cohabitation are gaining importance (Bumpass & Lu, 2000; Goldscheider, 1997).

In public debate and to a lesser extent also in scholarly work (e.g., Popenoe, 1993) this increasing diversity of family formation and living arrangements sometimes is equated with the demise of the American Family. But despite this pessimistic view, the family still is a primary source of individuals' integration into society and life courses are shaped by the experiences made in the family of origin (Bengtson, Biblarz, & Roberts, 2002; Elder, 1994). Life course theory emphasizes the importance of family relations in the principle of linked lives which states that "lives are lived interdependently and socio-historical influences are expressed through this network of shared relationships" (Elder, Johnson, & Crosnoe, 2003, p. 13). Kinship bonds and among them most prominently parent-child relations are core networks of such shared relationships. Parental influence on children's life courses has been studied across several disciplines with regard to numerous outcomes e.g. values and norms (Acock & Bengtson, 1978; De Vries, Kalmijn, & Liefbroer, 2009), educational and occupational attainment (Blau & Duncan, 1967; Mare & Maralani, 2006), and health (Coneus & Spiess, 2012). More recent accounts also acknowledge the importance of family structure in the family of origin for the reproduction of inequality (McLanahan & Percheski, 2008) as well as for the demographic composition of the filial generation (Murphy & Knudsen, 2002). Consequently, scholars interested in explaining family behavior also increasingly incorporate intergenerational models.

Most research on parental effects on family formation equates parental influence with intergenerational similarity (transmission). These models on intergenerational transmission are usually limited to isolated focal transitions such as fertility (Barber, 2000; Murphy, 1999), divorce (Amato, 1996; Diekmann & Engelhardt, 1999; Wolfinger, 2000) and, to a lesser extent, marriage (Feng, Giarrusso, Bengtson, & Frye, 1999; van Poppel, Monden, & Mandemakers, 2008) (for an exception see Liefbroer & Elzinga, 2012). Generally, when children adopt the same behavior as their parents, this is taken as evidence for intergenerational transmission of family behavior. For instance, if children give birth to their first child at the same age, or if they have the same number of children as their parents, this is seen as an indicator of intergenerational transmission of fertility.

This focus on direct transmission, where children follow the same behavioral patterns as their parents, loses sight of other regularities in parental influence on their children's family formation. Such regularities are empirically stable patterns in which parents' family trajectories are systematically linked to the family behavior of their children, even if the trajectories are not the same for parents and children. In fact, they might be quite the opposite, for example if there was a group of parents who have many children but their children have no or very few children themselves, possibly due to a disharmonious parent-child relationship. Such *contrast patterns* would not indicate direct intergenerational transmission of family behavior, but they would suggest that some mechanisms – operating on an individual, a dyadic or a societal level (Silverstein & Giarrusso, 2011) – link a specific parental family behavior to a different family behavior among their children.

We argue that, by focusing on average effects on focal demographic transitions or certain aspects of family formation (e.g., parity), traditionally applied regression-based methods and their extensions, such as event history and multilevel models, have limitations to study the whole range of parent effects on their children's family behavior. Therefore, traditional approaches tend to overemphasize intergenerational similarities and obscure the heterogeneity of intergenerational patterns of family formation. For example, if the empirical distribution is indeed such, that children of specific parents cluster into *same* or *contrast family formation patterns*, average effects on isolated family formation events give a poor representation for both the *same* and *contrast* parent-child dyads.

This paper addresses two research questions: First, do we find distinct intergenerational patterns of *transmission* and *contrast* in family formation? Second, which mechanisms determine who sorts into specific intergenerational patterns of family formation? Our contribution to the study of intergenerational transmission of family formation is twofold. First, instead of focusing on isolated focal events, we conceptualize family formation holistically as the process of union formation and childbearing between age 15 and age 40. This allows us to theorize about the mechanisms that generate specific intergenerational family formation patterns and about which people would likely sort into them. Second, beyond estimating average transmission effects, we identify salient intergenerational family formation patterns - including *contrast patterns*. This enables us to examine what determines parent's and children's likelihood to sort into a specific intergenerational pattern.

The sequential conceptualization of family formation addresses the problems of the "short-view in analytical scope" (Elder, 1985) caused by exclusively focusing on single events and allows us "to study a complex set of life-course trajectories as they actually take place, providing ideal-types of trajectories that can be interpreted and analysed in a meaningful way" (Aassve, Billari, & Piccarreta, 2007). It thereby recognizes the interdependency of multiple family formation events and acknowledges the diversity of family formation processes (Wu & Li, 2005, p. 112). Based on recent demographic trends and the intergenerational transmission literature we introduce three ideal typical patterns of intergenerational family formation – *strong transmission*, *moderated transmission*, and a *contrast pattern* – and develop hypotheses on micro- and macro-level mechanisms which might bring them about.

Drawing on data from the Longitudinal Study of Generations (LSOG) (Bengtson et al., 2002) we jointly examine family trajectories of parents born around 1920 to 1930 and their children born around 1940 to 1950 using multichannel sequence analysis (Gauthier, Widmer, Bucher, & Notredame, 2010; Pollock, 2007) and cluster analysis. This allows us to identify empirical regularities in family formation of parent-child dyads beyond direct intergenerational transmission and to test our hypotheses on the proposed ideal types in multinomial logistic regression models.

Theoretical Background: Intergenerational Patterns of Family Formation

Current research provides ample evidence for the transmission of family behavior but widely neglects alternative accounts of parental influence. Hence, the picture of intergenerational patterns of family formation remains incomplete. We therefore conceptualize *intergenerational patterns of family formation* as regularities in parent's and children's family formation that include similarity but also comprise *patterns of systematic deviation and contrast*.

Figure 1 presents three ideal-typical intergenerational patterns of family formation. Each panel in figure 1 shows the stylized family formation processes of a parent and his or her child(ren) from age 15 to 40. They differ in terms of the type of process – different family formation states – and the pace at which this process is experienced – the timing and sequencing of family formation states. In the following section we first present each of the three ideal-typical patterns. Then we discuss mechanisms that could bring the respective patterns about. Finally, we consider which people would be likely to sort into each pattern given that certain mechanisms are at work in shaping intergenerational regularities in family formation.

FIGURE 1: Three ideal-typical intergenerational patterns of family formation (view in color)

Strong intergenerational transmission: "same process – same speed". The top panel in figure 1 displays a parent-child dyad in which the child's family trajectory is identical to the sequence of its parent, i.e. the child experiences the same family formation process at the same speed as the parent. The transmission literature proposes several mechanisms that would generate this intergenerational resemblance: value socialization, social control, transmission of family formation as a by-product of status inheritance, and genetic transmission (Barber, 2000; Kohler, Rodgers, & Christensen, 1999; McLanahan & Bumpass, 1988; van Poppel et al., 2008). Moreover, psychological studies emphasize the catalytic impact of transmission belts. Relational transmission belts are concerned with the role of parenting styles and the relationship quality of parents and children whereas socio-developmental transmission belts, among other things, consider the child's developmental phase as well as the child's sibling position (Schönpflug, 2001, p. 175; Sulloway, 1997). Against this background, *strong transmission* of family behavior is most likely to occur if the parent-child relationship is amicable, there is a high level of intergenerational value congruence, the child is firstborn and has a similar social status and the same gender as the parent.

Moderated intergenerational transmission: "similar process – different speed". The second parent-child dyad in figure 1 again shows a pattern of intergenerational similarity. The child experiences a family formation process which is quite similar to the parent's trajectory with regard to the family formation states that occur, but differs in two important respects: First, later onset of family formation in the child's biography, both in terms of a postponement of marital as well as for birth events. Second, the child's family of procreation is smaller than in the family of origin, i.e. the child's parity at age 40 is lower than the parental parity. This corresponds to both a tempo and a quantum effect, i.e. a delay and decline of fertility, among the child generation compared to their parents (Bongaarts & Feeney, 1998). Despite these differences, the family trajectories in the second panel of figure 1 are quite similar. Hence we label this pattern *moderated transmission*.

For driving forces that could bring this pattern about, one can first turn to the mechanisms listed above for *strong transmission*, because essentially, there is similarity in parent's and children's family formation. Reasons for the 'moderation' of this transmission through a shift in timing can be found in the literature that is concerned with wider societal changes in which family formation is embedded. First, structural shifts, including the educational expansion, technological change, changing skill requirements, and a rising labor force participation of women will induce a postponement of family formation among the child generation as they adapt to these changing circumstances (Brückner & Mayer, 2005; McLanahan, 2004; Sennett, 1998; Shanahan, 2000). Second, proponents of the 'Second Demographic Transition' argue that ideational shifts to post-material values of self-realization (Inglehart & Baker, 2000; Lesthaeghe & Neidert, 2006), the broad availability of more effective contraception, and prolonged phases of adolescence (Arnett, 2000) might motivate a pattern of moderated intergenerational transmission among the child generation. Recognizing both structural shifts and ideational changes, Silva (2012) proposes that in times of economic uncertainty traditional markers of adulthood, such as marriage, parenthood or buying a home, become more difficult for young adults to attain. This leads to a postponement of these events in the life course as well as an increasing rejection of these markers as necessary components for constructing an adult identity.

A pattern of moderated transmission is most likely to occur for parent-child dyads in which the children partake strongly in these structural and ideational changes. To what extent they partake in them will among other things be related to social upward mobility. Upward mobility is associated with delayed and decelerated family formation due to longer periods of post-secondary education and re-training to meet higher and more volatile skill requirements on the labor market. Educational and social upward mobility can also be seen as a proxy for more progressive and liberal values of family formation that would additionally favor a pattern of moderated transmission (Inglehart & Baker, 2000; Trent & South, 1992). Further, mother-daughter dyads will be particularly likely to sort into a pattern of moderated transmission, if it is indeed driven by the larger structural shifts mentioned above. The unique closeness often found in the mother-daughter relationship (Silverstein & Bengtson, 1997) creates strong transmission belts that favor similarity in their family formation. Given the greater influx of women into the education system and labor market, especially for our child generation - the baby boomers – daughters are at the same time particularly likely to partake in macro structural shifts that will moderate this transmission of family formation. For our study cohorts, we therefore assume moderated transmission as the most frequent pattern of intergenerational family formation. On the one hand, close parent-child relationships will further transmission. On the other hand profound macro structural shifts between the two generations will induce moderation for many of them by shifting the timing of focal events in the family formation process.

Intergenerational contrast: "different process". This pattern refers to a process where the children not only experience family formation at a different pace than their parents, but go through different family formation states altogether. Stylized examples are given in panel three of figure 1, where the parent follows a family formation process of early marriage and high parities, whereas the children either forego family formation and ultimately remain single and childless, become single parents, or divorce early and remain divorced. Possible mechanisms generating such a *contrast pattern* are suggested in the psychological literature on intergenerational relations and family formation. In terms of family internal dynamics, parent-offspring conflict and marital conflict among parents can interfere with parents' function as role models for children (e.g. Schönpflug, 2001). In the presence of family internal conflict, children might deliberately try to distance themselves from their parents by making opposing life choices also in terms of their family behavior. Another rationale for *intergenerational contrast* in family formation is found in the birth order literature. In a contested debate (Booth & Kee, 2009; Freese, Powell, & Steelman, 1999; Johnson & Stokes, 1976; Murphy & Knudsen, 2002; Sulloway, 1997), several scholars argue that firstborns will adhere most closely to the authority and role model observed in their parents. In contrast, later borns will strive to minimize direct competition with their older siblings by establishing their own 'niches' within the family and follow contrasting paths to their older siblings and parents. This may also be reflected in contrasting family behavior.

Finally, there is an argument in the life course and cohort replacement literature that each generation has a need to establish generation-identifying markers (Bengtson & Troll, 1978; Mannheim, 1952). To assert autonomy and draw boundaries to the parent generation, the child generation could among other things establish generation-specific contrasting family formation behavior. This might be particularly adaptive in times of rapid social change (Bengtson, 1970; Mead, 1970). Nonetheless, we assume that family internal dynamics are the core driving forces of *intergenerational contrast* in family formation. Consequently, children who have a disharmonious relationship to their parents or were exposed to marital conflict among their parents, as well as later born siblings will be most likely to sort into a *contrasting family formation pattern*.

Data and Sample

The data requirements for answering our two research questions on whether the three ideal-typical intergenerational patterns of family formation exist and what determines who sorts into them are high: First, information on family trajectories from age 15 to at least 40 is necessary to assume completed fertility. Censoring in the early 30s is a problem in most potentially suited data sets. Second, we need to identify intergenerational links between parents and children, which is usually not possible at all, or only for very limited case numbers, in surveys that do not explicitly follow a multigenerational design. Third, data on standard socio-demographic variables as well as on family internal dynamics – e.g. the parent-child relationship quality – are necessary to inform the mechanisms discussed above. These are lacking in most large household panel surveys. The Longitudinal Study of Generations (LSOG) meets all three of these requirements (for more details on the data, see Bengtson, Biblarz, & Roberts, 2002).

The LSOG is a four-generation study that was administered in seven waves (1971, 1985, 1988, 1991, 1994, 1997, 2000). The 1971 starting sample consists of 2,044 individuals, aged 16-91, from 328 three-generation families who were drawn randomly from 840,000 members of a California Health Maintenance Organization (HMO) in the greater Los Angeles area. The sampling units were grandparents (generation 1) of three-generation families. The grandparents, their spouses (G1s), their adult children (G2s), and their grandchildren who were aged 16 or older (G3s) were eligible sample members and answered self-administered questionnaires on a wide range of sociological and social psychological topics: social attitudes and values, educational and occupational attainments, family formation, and intergenerational relationships. The sample reflects the membership structure of the HMO and is generally representative of non-Hispanic White, economically stable middle-class families (Bengtson, Copen, Putney, & Silverstein, 2009, p. 330). The LSOG combines prospective measurement with retrospective accounts and offers the advantage to analyze complete family formation sequences of parents and their children between age 15 and age 40. In addition, the LSOG provides “uniquely detailed measurements” (Bengtson et al., 2002, p. 15) of family internal dynamics and at the same time allows to examine the family formation of parents and their children under different socio-historical conditions. The LSOG has been widely used to study intergenerational solidarity (Bengtson & Roberts, 1991), the structure of intergenerational cohesion (Silverstein, Gans, Lowenstein, Giarrusso, & Bengtson, 2010), as well as intergenerational similarities and differences in values, norms and opinions (e.g. Bengtson, 1975; Bengtson et al., 2009; Gans & Silverstein, 2006). To our knowledge, this is the first study to fully exploit the unique intergenerational and longitudinal information on family formation processes in the LSOG.

For the analysis we draw on data for two generations: the parent generation (G2), the ‘silent generation’ born in the 1920s and 1930s, and their children (G2) the ‘baby boomers’ who were born in the late 1940s and 1950s. For the unique linking of parents and children we used the years of birth of the children (G3s) and validated them with information from the birth biographies of their parents (G2s). The resulting starting sample consists of 279 families (434 parents and 305 children). After deleting cases with inconsistent or incomplete information on marital history the sample size is reduced to 226 families with 342 parents and 305 children comprising 461 parent child-dyads. For 156 children we have both the mother-child dyad and the father-child dyad. For the remaining 149 children the data only provide information on one parent-child dyad.

We combine information on marital status and parity to specify nine family formation states: 'single, no child' (SNC), 'single, one or more children' (SC), 'married, no child' (MNC), 'married, one child' (M1C), 'married, two children' (M2C), 'married, three children' (M3C), 'married, four or more children' (M4C), 'divorced, no children' (DNC), 'divorced, one or more children' (DC). Unfortunately, we cannot consistently identify cohabitating and non-cohabiting relationships with the LSOG. They are subsumed under the category 'single'. Nonetheless, the comparison across generations remains valid, since we have the same family formation states for parents and children.

Methods

We use sequence analysis (Abbott, 1995; Abbott & Forrest, 1986; Aisenbrey & Fasang, 2010) to group similar intergenerational family formation processes together. The degree of similarity between sequences is determined by the number and the type of operations – i.e. substitutions, deletions, or insertions – it would take to transform one sequence into another (for an introduction see MacIndoe & Abbott, 2004). Instead of individual sequences, we take the parent-child dyad as the unit of analysis. The parent's and the child's family formation each constitute one dimension of a dyadic intergenerational family formation sequence. We use multiple sequence analysis (MSA) to compare every parent-child dyad to every other parent-child dyad to determine similarity between dyads (on multidimensional sequences see Blair-Loy, 1999; Gauthier et al., 2010; Han & Moen, 1999; Pollock, 2007; Stovel, Savage, & Bearman, 1996).

Pollock (2007) originally proposed MSA to study parallel processes, such as simultaneous employment, family, and housing trajectories. We adopt this approach to dyadic sequences. The main advantage of applying MSA to dyadic sequences is that it enables us to identify *contrasting parent-child patterns*. To this end, MSA creates combined sequence states from the parent and child trajectories (dimensions). For example, if the parent is single and has no children (SNC) at age 20 and the same is true for the child, this is combined to the state [SNC SNC], where first the parent's and then the child's family formation state is displayed. Two hypothetical dyadic intergenerational sequences *A* and *B* from age 16 to 20 can be noted as follows:

Age	16	17	18	19	20
Dyad *A*	[MNC MNC]	[M1C M1C]	[M2C M2C]	[M3C M3C]	[M4C M4C]
Dyad *B*	[MNC SNC]	[M1C SNC]	[M2C SNC]	[M3C SNC]	[M4C SNC]

A shows a parent-child dyad of *strong transmission*, where the parent and child experience the same process at the same pace. *B* shows a parent-child dyad of *intergenerational contrast*, where the child goes through completely different family formation states than the parent in the observation window. With 9 family formation states in each generation there are potentially 81 (9*9) combinations of parent child family formation states, of which 70 occur empirically in our analysis sample. MSA works on the logic of specifying dimension-specific substitution costs. We specify a combination of theory-driven and data-driven substitution costs (see Aisenbrey & Fasang, 2010) to account for the different substantive closeness of family formation states as well as their generation-specific relevance.

First, to account for the substantive closeness of family formation states, we order them hierarchically from 'single no child' = 1 to 'married four children' = 9. The substitution cost matrix is given by the absolute difference between the hierarchically ordered family formation states (appendix table A1). For instance, substituting 'single no child' with 'married four children' costs 8, whereas substituting 'married three children' with 'married four children' comes at a cost of only 1. This reflects that 'married three children' and 'married four children' are much more similar experiences compared to being 'single without a child'.

Second, to account for the generation-specific relevance of different family formation states, we calculate substitution costs based on the generation-specific transition rates between family formation states (probability to transition from one state to another) (Gabadinho, Ritschard, Müller, & Studer, 2011; Rohwer & Trappe, 1997). In regression based analysis of fertility transmission Anderton et al. (1987) followed a similar logic to take into account cohort specific fertility pattern by using relative rather than absolute fertility as the key indicator.

Appendix table A2 shows transition rates between family formation states for each generation. For example, the probability to transition from 'married, 1 child' (M1C) to 'married, 2 children' (M2C) is .34 in the parent generation. It is considerably lower at .18 in the child generation. Based on these transition rates, substitution costs *SC* between state *i* and state *j* are calculated as:

$$SC_{ij} = 2 - p_{ij} - p_{ji}$$

where p_{ij} denotes the transition rate from state *i* to state *j*, and p_{ji} denotes the transition rate from state *j* to state *i*. Substitution costs based on transition rates are bound by 0 and 2. 0 is the lowest possible substitution cost when the probability to transition between two states is 100 percent. 2 is the highest possible substitution cost when the probability to transition from one state to another is zero. Within each generation, substitution of two states will be cheaper if transitions between these states occur frequently. For example, transitioning from M1C to M2C was a more frequent and in that sense a more normative event in the parent generation than in the child generation. Substitution costs based on generation-specific transition rates reflect this in that less distance is generated by substituting these two states in the parent generation than in the child generation.

For the final substitution cost specification (table A4), we weight the theoretical cost specification, which is the same for both generations (table A1) with the generation-specific substitution costs derived from transition frequencies (table A3) by multiplying these two substitution cost matrices. We can thereby simultaneously account for the substantive difference between family formation states as well as their generation-specific relevance. Following MacIndoe and Abbott's (2004) suggestions for a balanced cost setting that will use both indel and substitution operations we set indel costs at half the maximum substitution cost of 8 (16/2=8) to identify similarity in the timing and order of family formation states.

MSA aligns the dyadic intergenerational sequences by combining the substitution costs for each dimension. For example, substituting the combined state [M1C M1C] with [M1C M2C] for two parent-child dyads comes at a cost of 1.82 - the generation-specific substitution costs for M1C and M2C for the child generation (table A4). Substituting [M1C M1C] with [M2C M1C] comes at a cost of 1.66 and substituting [M1C M1C] with [M2C M2C] comes at a cost of 3.54 (1.66+1.82) (table A4). Two intergenerational family formation sequences are most similar, if the two parents follow the same trajectory, and both children follow the same trajectory. They are more distant, when either the parents or the children are similar to one another, and most distant when the pair of parents and the pair of children have very different family formation trajectories. Importantly, similarity *within* the dyad, i.e. between the parent and the child, does not contribute to the distances between parent-child dyads. This enables us to find *contrasting intergenerational patterns*, if they exist.

The output of MSA is a pair wise distance matrix for each pair of parent-child dyads. This distance matrix is used in a ward cluster analysis to group the sequences into salient intergenerational patterns. The Duda-Hart (Duda, Hart, & Stork, 2001) and Calinksi-Harabasz (1974) cluster cut-off criteria support a four clusters solution. We subsequently describe these four intergenerational patterns and analyze determinants of sorting into them in a multinomial logistic regression, where again the parent-child dyad is the unit of analysis. The sequence analysis was conducted using the TraMineR package for sequence analysis in R (Gabadinho et al., 2011).

Results

The four intergenerational patterns identified in the cluster analysis correspond closely to the ideal-typical intergenerational patterns of family formation discussed above (figure 1): we find a pattern of *strong transmission*, two clusters of *moderated transmission*, and a *contrast group*. Figure 2 shows the resulting four clusters as state distribution plots that sum up the frequency of each family formation state at each time point (Gabadinho et al., 2011). Different family formation states are indicated by different colors. We chose a sequential color space with different shades of heat colors that reflects the hierarchical ordering of our sequence states (Zeileis, Hornik, & Murrell, 2009). Figure 3 displays the medoid sequence – the sequence with the smallest sum of distances to all other sequences (Aassve et al., 2007) for the parent and child generation as a representative of each of the four intergenerational family formation patterns.

FIGURE 2: State distribution plot of four intergenerational family formation clusters

FIGURE 3: Medoid sequences as representatives of the four intergenerational family formation clusters

Table 1 shows descriptive information on the four clusters including the average sequence distance between the parent and child generation within each group. This supports relative closeness with an average sequence distance of 62.02 between parents and children in the *strong transmission* group and a much higher average sequence distance of 189.35 in the *contrast group*. Table 2 shows the results of a multinomial logistic regression on cluster membership, including dyadic covariates on gender combination, educational level and differences, birth order, and affectual solidarity to the parents reported by the child as a teenager as a measure of emotional closeness to the parent. We subsequently discuss the four salient intergenerational family formation patterns in connection to the descriptive and regression results. The regression results are discussed as predicted probabilities for specific combinations of characteristics of the parent child dyads calculated from the coefficients presented in table 2.

TABLE 1: Descriptive statistics on 4 intergenerational patterns

TABLE 2: Multinomial logistic regression on intergenerational patterns

The first group maps on closely to the ideal-type of *strong intergenerational transmission* (see figure 1) where children go through the same family formation states as their parents at the same pace. This pattern occurs for 27.7 per cent of the LSOG sample. In this group, parents show relatively late family formation relative to their own generation. They are also the oldest parent cohort with an average year of birth in 1924 compared to 1927 in the total parent generation. The comparatively lower parity among this generation is in line with previous research that showed that the cohorts born between 1914 and 1924 were the hardest hit by the great depression in the transition to adulthood, which suppressed their fertility levels (Wu & Li, 2005). These parents thus already corresponded more closely to the delayed and lower parity family formation processes that became more prevalent among the child generation. Nonetheless, family internal dynamics also play a role in bringing about this pattern of *strong intergenerational transmission*: a first born child who reported high affectual solidarity to their parents as a teenager has a 10 percentage point higher probability to be in this group of *strong transmission* than a first born with low affectual solidarity (29.10 percent versus 18.42 percent). In line with the birth order literature, first borns are more likely to adhere to the family formation pattern observed in their parents with a higher probability to be in this group of *strong transmission than later borns*.

The second and third group of *moderated intergenerational transmission I* and *moderated intergenerational transmission II* show patterns where children experience a similar family formation process as their parents but with later onset and at a slower pace. All focal transitions in the family formation process occur later and they have on average one child less than their parents at age 40. In line with our expectation that the profound macro structural and ideational changes across the parent and child generation would make *moderated transmission* the modal pattern for our study generation, taken together the two *moderated transmission patterns* are the largest group and account for 45.3 per cent of the LSOG sample.

As argued above the likelihood to sort into clusters of moderated transmission is associated with educational upward mobility. In both clusters the difference in years of education between parents and children is higher than the total average in our sample: 1.69 and 2.25 compared to 1.38. The results of the multinomial logistic regression support this descriptive finding: the predicted probability of experiencing a moderated transmission pattern is significantly higher for children who show upward educational mobility. For example the probability to be in the *moderated transmission II* cluster increases from 29.43 percent for children with no upward mobility to 35.23 percent for children who completed two years of schooling more than their parents. This suggests that social upward mobility in the context of changing labor market conditions indeed generates *patterns of moderated intergenerational transmission* of family formation.

In addition to pronounced educational upward mobility, mother-daughter dyads are over-represented in in both *moderated transmission groups*. Daughters part take particularly strongly in the macro structural changes relative to their mothers as women increasingly made inroads to higher education and the labor market and adapted their early life courses and family formation to these new structural requirements. As a result, the share of mother-daughter dyads is particularly high in these groups: around 40 percent compared to 34 percent in the complete sample.

Despite these similarities, there are some remarkable differences between the two clusters of *moderated transmission* both in terms of pattern and determinants. With regard to the shape of the intergenerational pattern, *moderated transmission II* has the highest occurrence of divorce among both parents and children. This corresponds to McLanahan's and Bumpass' (1988) finding of an intergenerational transmission of family disruption, even among the largely white middle class families represented in the LSOG. In contrast to the *strong transmission pattern* of traditional family formation discussed above, the intergenerational transmission of disrupted family formation likely occurs with more temporal shifts – i.e. moderation. Unlike the traditional pattern of family formation, there are no collectively shared normative scripts for disrupted family formation according to which people could model such family formation trajectories.

Furthermore, the two clusters differ with regard to the onset of family formation and parity at age 40. Although, the parents for both groups show a similar pattern of early family formation and the highest parities among the parent generation, the family formation processes of the children are quite different. *Moderated transmission II* displays a pattern of particularly late family formation among the children relative to the total child generation whereas the children in the *moderated transmissions I cluster* enter marriage and parenthood very early. *Moderated transmission I* also shows a closer resemblance between parents and children with regard to parity at age 40.

Taken together, the degree of moderation seems to be weaker for this group than for the *moderated transmission II cluster*, which is also reflected by the considerable difference in the parent-child distance measure (84.27 vs. 105.38) and the regression results. For example, a multinomial model using *strong transmission* as the base outcome (available upon request) reveals no significant differences between *strong transmission* and *moderated transmission I* with regard to the child's affectual solidarity to the parent. The corresponding coefficient for *moderated transmission II,* however, differs significantly indicating a higher chance for children with low levels of affectual solidarity to be in this group.

The fourth group of *intergenerational contrast* shows a pattern where children experience a very different family formation process than their parents that is not only distinct through later timing along the sequence, but also through the absence of most of the parents' family formation states among the child generation. The parents' family formation roughly corresponds to the average of the parent generation in terms of the timing and sequencing of focal transitions and parity at age 40. The children, in contrast, remain childless, many of them do not get married or only in their late 30s. Divorce from childless marriages is fairly common. This form of *intergenerational contrast* accounts for a considerable 26.9 per cent of the sample, and thus cannot be dismissed as a mere outlier or extreme phenomenon against a norm of some form of transmission.

Similar to the two *patterns of moderated intergenerational transmission*, educational upward mobility increases the probability to sort into *intergenerational contrast*. In addition, an important predictor of *intergenerational contrast* in family formation is parent off-spring conflict: a first-born child who reported low affectual solidarity to their parents as a teenager has a 7 percentage point higher probability to be in the *intergenerational contrast cluster* compared to a child with high affectual solidarity (37.51 percent versus 30.17 percent). In addition, later borns have a higher probability to be in the *intergenerational contrast cluster*. For instance, a second born child who reported low affectual solidarity has a 42.68 percent probability to be in this group, for a fourth born child this probability increases to 50.14 percent. Apparently, family internal dynamics that play out in sibling order and emotional closeness between parents and children are strong driving forces for children to show contrasting family formation behavior to their parents.

Discussion

This study draws attention to regularities in intergenerational patterns of family formation beyond direct transmission (similarity). To this end, we conceptualized holistic intergenerational patterns of family formation as regularities where specific parents have specific children but parents and children do not necessarily resemble one another. Based on the discussion of several mechanisms that potentially govern intergenerational continuity and social change in family formation, we specified three ideal-typical intergenerational family formation patterns: *strong transmission*, *moderated transmission* and *intergenerational contrast*.

Indeed, the results of multiple sequence analysis on dyadic parent-child sequences map on closely to these three ideal-types. Additional regression analyses revealed that structural changes in the labor market and education system, indicated by educational upward mobility of the child generation, generate a *pattern of moderated transmission*, where children go through similar family formation states as their parents but at a slower pace. In addition to such structural forces, family internal dynamics are important predictors of *intergenerational contrast* in family formation: children who reported low affectual solidarity to their parents when they were teenagers are more likely to sort into a *pattern of intergenerational contrast*.

Our contribution to the study of intergenerational transmission of family formation is twofold. First, instead of focusing on isolated focal events, we conceptualized family formation holistically as the process of union formation and childbearing between age 15 and age 40. This allowed us to theorize about the mechanisms that generate specific intergenerational family formation patterns and about which people would likely sort into them.

Second, beyond estimating average transmission effects, we innovatively applied multichannel sequence analysis to dyadic parent-child sequences to identify salient intergenerational family formation patterns - including a pattern of intergenerational *contrast*. To date, there is only one other application that used sequence analysis to study dyads. Liefbroer and Elzinga (2012) compared the family formation of parents directly to their children's family formation within dyads, rather than treating the dyads as the units of analysis, as in our approach. To our knowledge this is the first application of multichannel sequence analysis to dyadic sequences to study intergenerational continuities and discontinuities in life course processes. Our findings suggest that the holistic pattern search approach of sequence analysis carries some promise for analyzing intergenerational regularities in life course processes.

Nonetheless, the results have to be interpreted in the context of several limitations. Despite the unique advantages of the LSOG to study intergenerational patterns of family formation, we could not separate cohabiting and non-cohabiting relationships. We therefore might underestimate heterogeneity in the family formation sequences, particularly in the child generation. It is likely that a considerable fraction of the children in the *intergenerational contrast pattern* are in fact in cohabiting relationships and not single. Given the still pronounced legal and normative supremacy of marriage in the United States for both the parent and the child generation, this is still an important difference, especially in conjunction with the childlessness among the child generation.

Further, the LSOG sample only allows insights on the non-Hispanic white middle class population and thus grossly underrepresents the heterogeneity of family formation across American society. In view of this limitation, it is rather surprising that we find as much heterogeneity in intergenerational family formation patterns even in this select group. Nationally representative data would likely reveal additional intergenerational patterns and multiple forms of *transmission* and *intergenerational contrast*. For instance, following the findings of McLanahan and Bumpass (1988) and Wu and Li (2008; 2005), *strong transmission* of disrupted family formation is likely to occur among families that are exposed to concentrated disadvantage and poverty.

Besides analyzing intergenerational patterns of family formation across the entire population, it would be interesting to broaden the specification of the intergenerational sequences. „Familial and nonfamilial transition markers increasingly overlap" (Shanahan, 2000) in the transition to adulthood and it could be fruitful to consider new markers of adulthood (Silva, 2012) and parallel processes of employment and residential mobility to understand intergenerational patterns of early adult life courses. Finally, next to studying additional driving forces and mechanisms that bring intergenerational patterns of family formation about, to enhance our understanding of their implications they should in turn be related to other inequality outcomes and their role in the reproduction of inequality across generations (McLanahan & Percheski, 2008).

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FIGURE 1: Three ideal-typical intergenerational patterns of family formation (view in color)

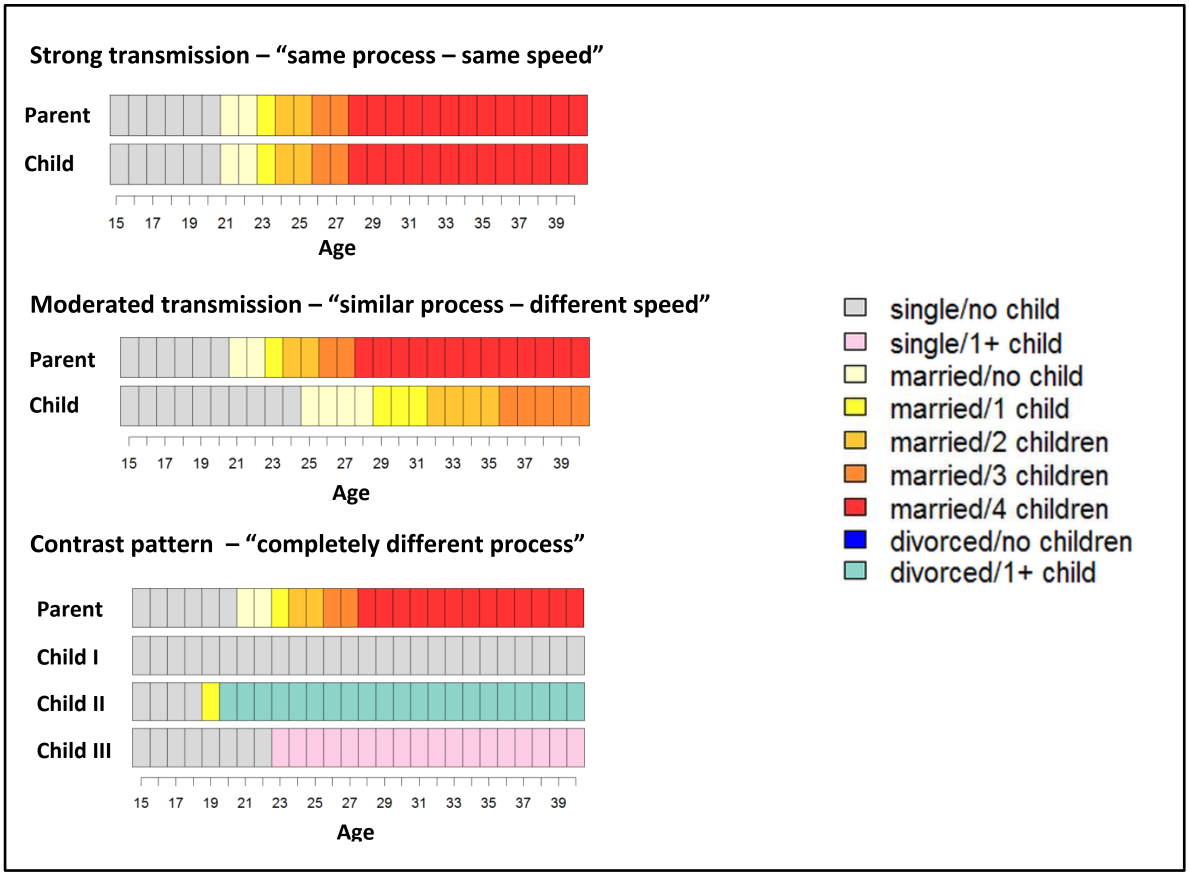

FIGURE 2: State distribution plot of intergenerational family formation clusters (view in color)

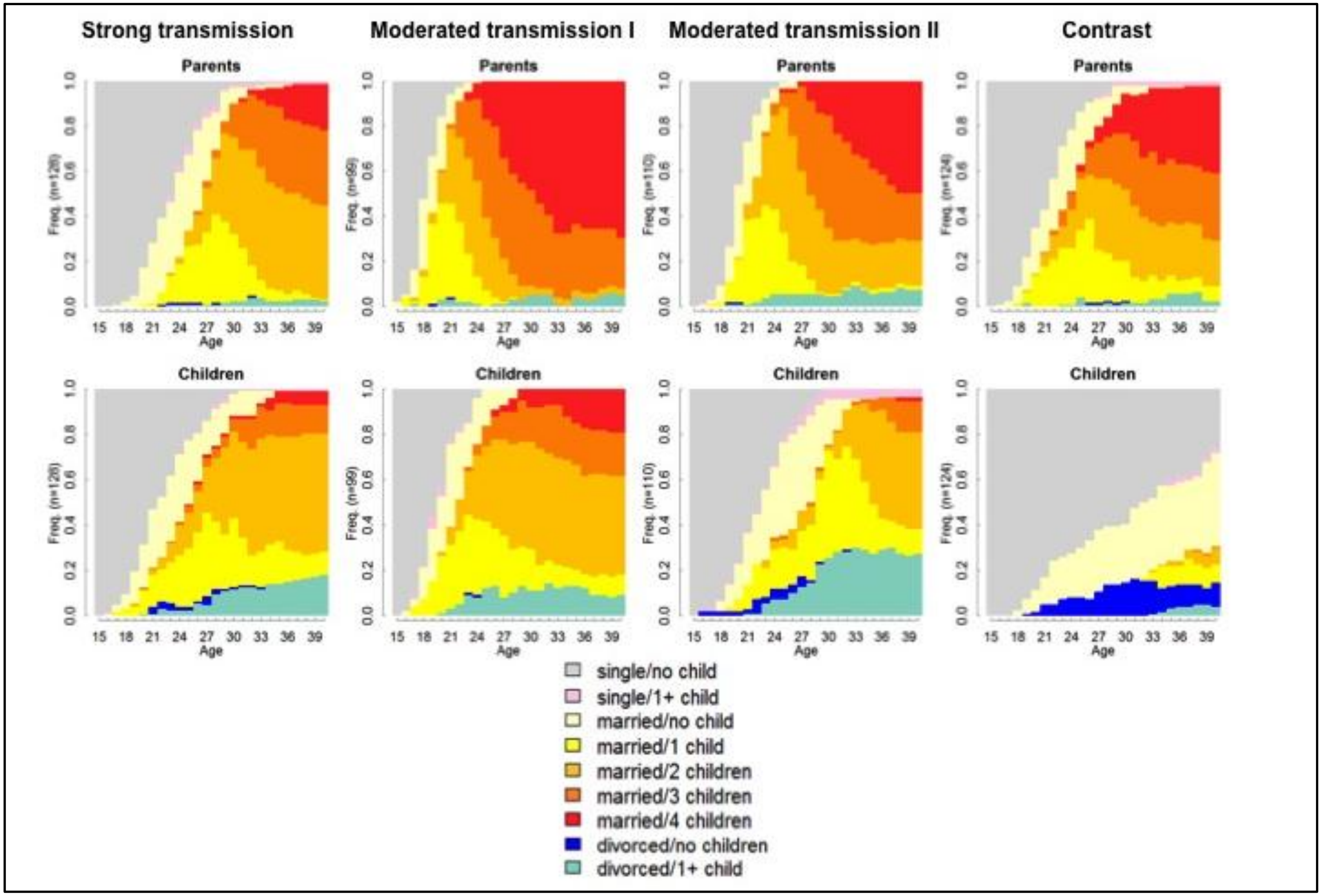

FIGURE 3: Medoid sequences as representatives for the four intergenerational family formation patterns (view in color)

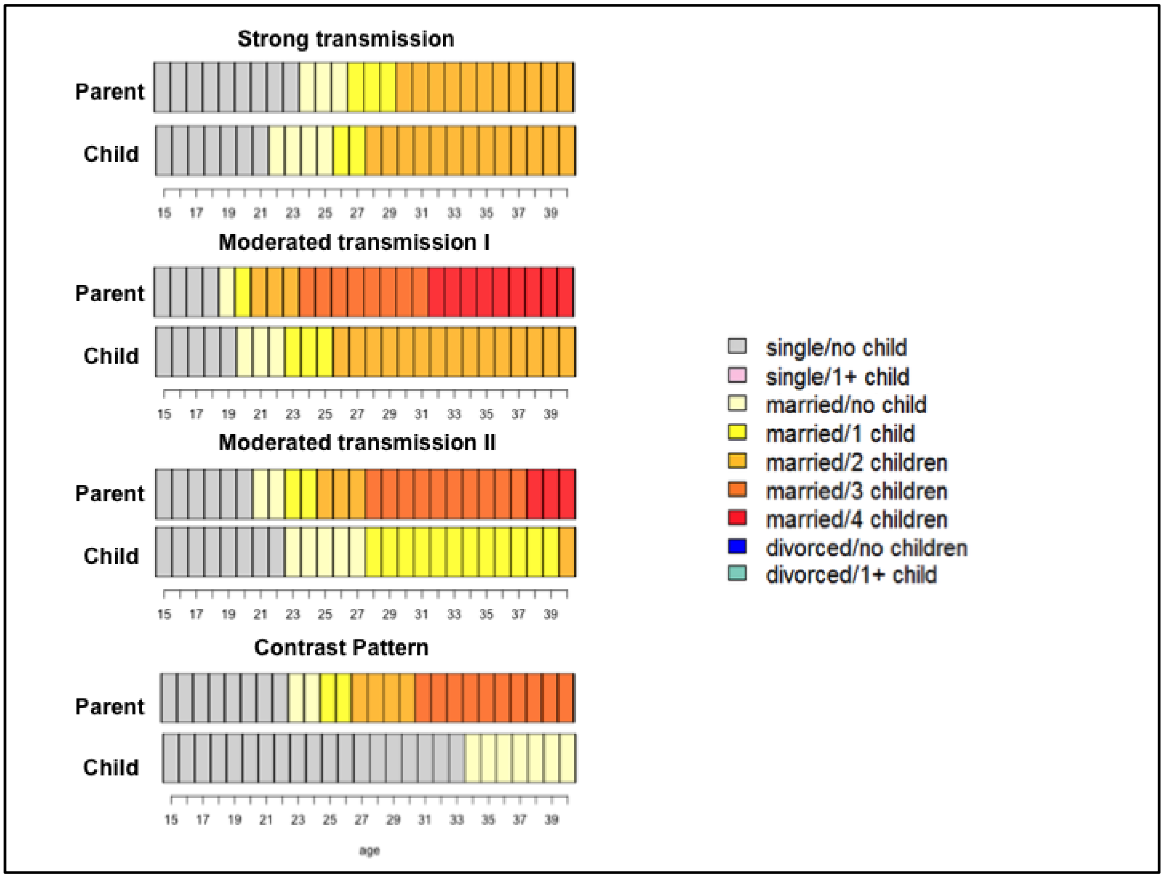

TABLE 1: Descriptive statistics on 4 intergenerational patterns

		Strong transmission	Moderated transmission I	Moderated transmission II	Contrast group	Total
Year of birth (median)	Parent	1924	1931	1928	1926	1927
	Child	1953	1953	1952	1953	1953
Age difference (mean & sd)		28.69	21.72	23.58	26.27	25.32
		(4.07)	(2.99)	(2.83)	(3.99)	(4.42)
Birth order (mean & sd)		1.67	1.71	1.63	1.66	1.67
		(0.81)	(0.84)	(0.78)	(0.85)	(0.82)
Gender constellation (relative frequencies within each column)	mother-daughter	28.13%	39.39%	41.82%	28.23%	33.84%
	father-son	20.31%	12.12%	12.73%	23.39%	17.57%
	mother-son	12.50%	31.31%	19.09%	25.00%	21.48%
	dad-daughter	39.06%	17.17%	26.36%	23.39%	27.11%
years of education (mean & sd)	Parent	14.84	12.55	13.47	14.68	13.98
		(2.83)	(2.17)	(2.54)	(2.90)	(2.80)
	Child	15.46	14.23	15.72	15.81	15.35
		(2.26)	(1.99)	(2.23)	(2.60)	(2.37)
Difference in years of education (mean & sd)		0.63	1.69	2.25	1.13	1.38
		(2.99)	(2.61)	(3.24)	(3.35)	(3.13)
Age first marriage (median)	Parent	24	19	20	22	21
	Child	22	20	23	27[a]	22
Age first birth (median)	Parent	27	20	22	24	23
	Child	26	22	28	-[b]	26
Parity at age 40 (mean & sd)	Parent	2.85	3.71	3.28	3.06	3.19
		(0.83)	(0.52)	(0.87)	(0.92)	(0.87)
	Child	2.19	2.57	2.01	0.34	1.73
		(0.75)	(0.94)	(0.71)	(0.69)	(1.16)
Affectual Solidarity Scale (mean & sd)[c]		4.34	4.37	4.15	3.93	4.19
		(1.01)	(0.97)	(1.11)	(1.02)	(1.04)
Distance (mean & sd)		61.81	84.27	105.38	183.90	109.87
		(35.59)	(40.57)	(35.38)	(62.61)	(65.70)
Total (absolute & relative frequencies)		128	99	110	124	461
		27.77%	21.48%	23.86%	26.90%	100%

Notes: [a] 28.23% of the children in this cluster remain unmarried until age 40; [b] 77.42% of the children in this cluster remain childless until age 40; [c] 15.18% of the children have a missing value for the affectual solidarity scale

TABLE 2: Multinomial Logistic Regression Predicting Pattern of Intergenerational Family Formation (N= 391 parent-child dyads)

	Strong transmission vs. Contrast		Moderated transmission I vs. Contrast		Moderated transmission II vs. Contrast	
Variable	b	OR	b	OR	b	OR
Gender constellation of the dyad (ref.: mother-daughter)						
Father-son	-0.498	0.608	0.914	2.494	0.111	1.118
Mother-son	-0.510	0.601	-0.209	0.811	-0.719	0.487
Father-daughter	-0.0321	0.968	0.633	1.883	0.631+	1.880
Sibling position	-0.826**	0.438	1.532***	4.628	0.680*	1.974
Age difference between parent and child (centered)	0.290***	1.336	-0.703***	0.495	-0.354***	0.702
Dyads years of education (average; centered)	-0.209*	0.811	-0.491***	0.612	-0.0385	0.962
Difference in years of education between parent and child	-0.0886	0.915	0.0484	1.050	0.145*	1.156
Affectual solidarity scale: child's affect to parent (centered)	0.0964**	1.101	0.0491	1.050	0.0119	1.012
Constant	1.279*	3.593	-4.551***	0.0106	-1.624*	0.197
Pseudo-R^2			.276			

Note: LSOG 1971-2000; robust standard errors were used to correct for clustering within families; OR = Odds Ratio;
*** p<0.001, ** p<0.01, * p<0.05, + p<0.10

APPENDIX

TABLES

TABLE A1: Theory-driven substitution cost matrix

	SNC	MNC	DNC	SC	DC	M1C	M2C	M3C	M4C
SNC	0								
MNC	1	0							
DNC	2	1	0						
SC	3	2	1	0					
DC	4	3	2	1	0				
M1C	5	4	3	2	1	0			
M2C	6	5	4	3	2	1	0		
M3C	7	6	5	4	3	2	1	0	
M4C	8	7	6	5	4	3	2	1	0

TABLE A2: Generation-specific transition rates between family formation states

PARENT GENERATION									
	→SNC	→MNC	→DNC	→SC	→DC	→M1C	→M2C	→M3C	→M4C
SNC →	**.85**	**.13**	.00	.00	.00	**.01**	.00	.00	.00
MNC →	.00	**.55**	**.01**	.00	.00	**.43**	.00	.00	.00
DNC →	.00	**.50**	**.44**	.00	.00	**.06**	.00	.00	.00
SC →	.00	.00	.00	**.95**	**.02**	**.02**	**.01**	.00	.00
DC →	.00	.00	.00	.00	**.81**	**.05**	**.02**	**.08**	**.04**
M1C →	.00	.00	.00	.00	**.01**	**.65**	**.34**	.00	.00
M2C →	.00	.00	.00	.00	**.01**	.00	**.84**	**.15**	.00
M3C →	.00	.00	.00	.00	**.01**	.00	.00	**.89**	**.10**
M4C →	.00	.00	.00	.00	**.01**	.00	.00	.00	**.99**
CHILD GENERATION									
	→SNC	→MNC	→DNC	→SC	→DC	→M1C	→M2C	→M3C	→M4C
SNC →	**.90**	**.09**	.00	.00	.00	.00	.00	.00	.00
MNC →	.00	**.78**	**.03**	.00	.00	**.19**	.00	.00	.00
DNC →	.00	**.09**	**.87**	.00	**.03**	**.01**	.00	.00	.00
SC →	.00	.00	.00	**.90**	.00	**.08**	**.02**	.00	.00
DC →	.00	.00	.00	.00	**.91**	**.04**	**.04**	**.01**	.00
M1C →	.00	.00	.00	.00	**.04**	**.77**	**.18**	.00	.00
M2C →	.00	.00	.00	.00	**.03**	.00	**.93**	**.05**	.00
M3C →	.00	.00	.00	.00	**.03**	.00	.00	**.91**	**.06**
M4C →	.00	.00	.00	.00	**.02**	.00	.00	.00	**.98**

TABLE A3: Data-driven generation-specific substitution costs based on transition rates

PARENT GENERATION

	SNC	MNC	DNC	SC	DC	M1C	M2C	M3C	M4C
SNC	0								
MNC	1.87	0							
DNC	2	1.49	0						
SC	2	2	2	0					
DC	2	2	2	1.98	0				
M1C	1.99	1.57	1.94	1.98	1.93	0			
M2C	2	2	2	1.99	1.97	1.66	0		
M3C	2	2	2	2	1.91	2	1.85	0	
M4C	2	2	2	2	1.96	2	2	1.90	0

CHILD GENERATION

	SNC	MNC	DNC	SC	DC	M1C	M2C	M3C	M4C
SNC	0								
MNC	1.91	0							
DNC	2	1.88	0						
SC	2	2	2	0					
DC	2	2	1.97	2	0				
M1C	2	1.81	1.99	1.92	1.92	0			
M2C	2	2	2	1.98	1.94	1.82	0		
M3C	2	2	2	2	1.96	2	1.95	0	
M4C	2	2	2	2	1.97	2	2	1.94	0

TABLE A4: Generation-specific substitution costs: theory driven cost specification (table A1) weighted by generation-specific transition rates costs (table A3)

PARENT GENERATION

	SNC	MNC	DNC	SC	DC	M1C	M2C	M3C	M4C
SNC	0								
MNC	1.87	0							
DNC	4.00	1.49	0						
SC	5.99	4.00	2.00	0					
DC	8.00	5.99	4.00	1.98	0				
M1C	9.93	6.26	5.81	3.96	1.93	0			
M2C	12.00	10.00	8.00	5.97	3.94	1.66	0		
M3C	14.00	12.00	10.00	8.00	5.73	4.00	1.85	0	
M4C	16.00	14.00	12.00	10.00	7.83	6.00	4.00	1.90	0

CHILD GENERATION

	SNC	MNC	DNC	SC	DC	M1C	M2C	M3C	M4C
SNC	0								
MNC	1.91	0							
DNC	4.00	1.88	0						
SC	5.99	4.00	2.00	0					
DC	8.00	6.00	3.93	2.00	0				
M1C	9.98	7.24	5.97	3.83	1.92	0			
M2C	12.00	10.00	8.00	5.95	3.87	1.82	0		
M3C	14.00	12.00	10.00	8.00	5.88	4.00	1.95	0	
M4C	16.00	14.00	12.00	10.00	7.89	6.00	4.00	1.94	0