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Research Article

Childhood left-behind experiences and premarital cohabitation: Evidence from China

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Abstract

BACKGROUND
Premarital cohabitation has risen sharply in China, yet its structural childhood antecedents remain underexplored. Left-behind experiences due to parental migration provide a valuable research lens.

OBJECTIVE
We aim to investigate the association between childhood left-behind experiences and premarital cohabitation within the framework of life course theory and in the Chinese context, examining both the overall relationship and its variation by the timing of parental absence, parental migration type, and gender.

METHODS
We used data from wave 2010 and waves 2014–2022 of the China Family Panel Studies (CFPS), including 5,047 respondents born after 1978. We applied propensity score matching combined with logistic regression to address selection bias and estimate the effects.

RESULTS
Childhood left-behind experience is associated with higher odds of entering premarital cohabitation. The effect is strongest when parental absence occurs before age 3, remains positive for absences during ages 4–12, and is weaker when both periods are involved. By parental migration type, the differences across dual-parent, father-only, and mother-only absence are not pronounced. By contrast, gender heterogeneity is evident: left-behind men exhibit the highest odds of premarital cohabitation, substantially exceeding those of their female counterparts.

CONTRIBUTION
This study draws on institutionally shaped childhood experiences to offer a new lens for understanding entry into premarital cohabitation. In doing so, it advances the application

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of the life course perspective and underscores its relevance to transitional societies. By situating the Chinese case within global family scholarship, it also illustrates how institutional arrangements such as *hukou* and migration regimes generate distinct pathways into cohabitation.

1. Introduction

Living together before marriage has become an increasingly common pathway to family formation in China. Fewer than 5% of adults born before 1970 had cohabited before marriage, but the rate rises sharply among cohorts born in the 1980s and later (Yu and Xie 2021, 2022).

Despite this rapid increase, research on premarital cohabitation in China remains limited, largely confined to describing trends and consequences. As Yu and Xie (2015: 608) observed a decade ago, "even though new research has gradually shifted attention to cohabitation in developing societies such as the Philippines and Taiwan, China has remained outside this line of investigation." Western studies explain the rise of cohabitation mainly through four perspectives: normative change linked to the Second Demographic Transition (SDT) (Lesthaeghe and Neidert 2006), economic rationality (Xie et al. 2003), intergenerational socialization (Hiekel 2021), and adverse childhood experiences (Cherlin, Kiernan, and Chase-Lansdale 1995). While insightful, these frameworks primarily emphasize either early adulthood or individual-level childhood trauma, overlooking structurally embedded early-life contexts and their cumulative consequences across the life course. To address this gap, we examine the large-scale and institutionally produced phenomenon of left-behind childhoods due to parental labor migration, theorizing its enduring impact on premarital cohabitation within the framework of life course theory, which emphasizes how early-life contexts shape subsequent life transitions (Elder 1998).

The phenomenon of left-behind childhoods is particularly salient in China, where parental labor migration has created one of the largest cohorts of left-behind children worldwide. According to National Bureau of Statistics of China (2023), the number of left-behind children in China has reached 66.93 million, 41.77 million in rural areas and 25.16 million in urban areas. Unlike sporadic disruptions, left-behind experiences are often prolonged, institutionalized, and deeply embedded in China's rapid but uneven development and household registration (*hukou*) system (Chan and Buckingham 2008). These features make left-behind childhoods a valuable lens for understanding how structural early-life contexts shape later union behavior.

Building on this perspective, we conceptualize childhood left-behind status as a temporally and institutionally structured exposure and hypothesize that it shapes adult union behavior through two central principles of life course theory: cumulative disadvantage and age-graded timing (Elder, Johnson, and Crosnoe 2003). We further anticipate heterogeneity by parental migration type and by gender, consistent with research on differentiated parental roles in China's caregiving arrangements and gender socialization. Accordingly, this study asks: (1) Do childhood left-behind experiences due to parental labor migration increase the likelihood of premarital cohabitation? (2) Does the timing of parental absence matter? (3) Do the effects vary by which parent migrated and across gender groups?

2 Theoretical framework and hypotheses

Extending the discussion in the introduction, this section develops the theoretical framework through the lens of life course theory. Elder, Johnson, and Crosnoe (2003: 15) define the life course as "an age-graded sequence of socially defined roles and events that are enacted over historical time and place." The framework emphasizes three principles: cumulative disadvantage, timing, and linked lives. In this study we focus on the first two: cumulative disadvantage, highlighting how early disadvantages accumulate across domains, and timing, emphasizing that the impact of events depends on when they occur. Building on these insights, we develop hypotheses regarding the long-term effects of left-behind experiences, while also extending the analysis to heterogeneity by parental migration type and gender, reflecting socially ascribed roles and gendered expectations in the Chinese context.

2.1 Cumulative disadvantage: Pathways linking left-behind experiences to premarital cohabitation

As outlined above, this study focuses first on the principle of cumulative disadvantage (CDA). This mechanism highlights that inequality is not static but accumulates over time. O'Rand (1996) emphasizes that disadvantages emerge from the interaction of life trajectories with institutional opportunity structures such as education, labor markets, and welfare regimes, which function as 'reward structures' that distribute resources unequally. Dannefer (2003) further theorizes CDA as a systemic, group-level process embedded in social institutions. Through resource accumulation, institutional reinforcement, and social labeling, inequalities become self-reinforcing. DiPrete and Eirich (2006) expand this perspective, showing how cumulative processes generate

durable stratification across any temporal domain, such as education, careers, and family formation.

Applied to China, CDA underscores that left-behind experiences are not temporary disruptions but structurally embedded conditions shaped by migration and *hukou* barriers. For rural families, *hukou* restrictions limit access to urban education and welfare, making co-residence with migrant parents difficult (Wei and Gong 2019). Social segregation and social disparities also exist for urban families (Lu et al. 2023), leading many parents to leave children in their registered city of residence under the care of relatives because of hurdles to school enrollment, residency registration, and education costs. Thus, left-behind status reflects institutional constraints that separate children from parents and initiate trajectories of disadvantage.

These disadvantages unfold across multiple and mutually reinforcing domains. First, educational trajectories are often disrupted: left-behind children are less likely to complete higher levels of schooling (Lu 2012). Many also follow their parents into early labor migration, entering the work force prematurely with limited skills and constrained prospects (Huang and Gong 2022). These educational setbacks translate into long-term economic insecurity, as longitudinal studies show reduced employment opportunities and depressed wages in adulthood for those exposed to parental absence (Wang et al. 2021). Economic vulnerability, in turn, raises the barriers to marriage and makes premarital cohabitation appear a more pragmatic, less resource-intensive pathway to partnership (Landaud 2021; Palumbo, Berrington, and Eibich 2025), particularly in China, where marriage is often tied to substantial costs such as bride price, dowry, and housing provision.

Second, psychosocial development is also affected by prolonged parental absence. Left-behind children consistently report higher levels of depression (Liu et al. 2023), lower self-esteem, and less mature coping strategies (Cui et al. 2021). These vulnerabilities are carried into adulthood and shape how individuals approach intimacy (Johnston, Cavanagh, and Crosnoe 2020). Specifically, they may increase the likelihood of seeking earlier or less formalized unions that demand fewer commitments and offer quicker emotional rewards, such as cohabitation.

Third, social capital is also weakened. Although labor migration may raise household income through remittances, parental absence during childhood diminishes sustained parent–child interaction and undermines the intergenerational transmission of marriage-supportive norms (Axinn and Thornton 1992). Prolonged separation is further linked to emotional difficulties and peer relationship problems (Zhao et al. 2017), with these challenges often persisting into adulthood. Weakened peer ties in childhood constrain the formation of trust-based and supportive networks, leaving individuals with reduced access to kinship and peer resources such as financial transfers, housing assistance, or introductions through trusted circles, which typically facilitate marriage.

While potential partners can still be met through the workplace or casual acquaintances, such weak ties are less effective in mobilizing the collective support required for marriage. Under these conditions, cohabitation, less dependent on extended networks and resource transfers, emerges as a more feasible alternative.

Taken together, these educational, economic, psychosocial, and social disadvantages do not operate in isolation but intersect and reinforce one another across the life course. Left-behind childhoods thus represent a cumulative disadvantage process, in which institutional exclusion and family separation jointly channel individuals into more vulnerable and constrained trajectories. Within these trajectories, premarital cohabitation may emerge not as a rejection of marriage but as a more feasible and adaptive step toward union formation, offering intimacy and companionship under conditions of economic insecurity, psychosocial vulnerability, and limited social support.

Based on these observations, we propose the following *Hypothesis 1 (H1): Individuals with childhood left-behind experiences are more likely to enter premarital cohabitation than those without such experiences.*

2.2 Timing matters: Sensitive periods of childhood left-behind experience

Complementing the cumulative disadvantage perspective, life course theory emphasizes the principle of timing. This principle stresses that the consequences of the same event vary depending on when it occurs in the life course (George 1993). Accordingly, not all childhood exposures to parental absence are equivalent. Separations during sensitive developmental periods are likely to have more profound and lasting consequences.

Empirical evidence consistently supports this view. Ryan and Claessens (2013) show that family structure changes during the first three years of life more strongly predict children's behavioral outcomes than later disruptions. Using the British Household Panel Survey, Ermisch and Francesconi (2001) likewise find that early childhood (ages 0–5) family structure has stronger effects on educational and psychosocial outcomes than later changes. Evidence from China echoes this pattern: Lu (2012) demonstrates that parental absence undermines academic performance, with particularly severe consequences when separation occurs at younger ages.

Psychological research further underscores the first years of life as a critical period for attachment formation (Bowlby 1982). During this stage, close and consistent interactions with primary caregivers lay the foundation for a sense of safety, trust, and coping capacity. Prolonged parental absence in these early years disrupts the formation of secure attachment, undermining emotional security and adaptive coping, with effects that are difficult to reverse later in life. Consistent with this, Chinese studies show that children separated from their parents early in life are more prone to emotional and

behavioral problems than those who experience separations later (Fan et al. 2010). By contrast, the negative impact of parental absence in middle childhood or adolescence may be partly buffered by external supports. For instance, school climate and peer networks can strengthen motivation and engagement (Anderson 1982; Wang et al. 2022); school and community social capital can promote resilience among left-behind children (Li, Zhang, and Li 2018).

Building on the previous section's emphasis on cumulative disadvantage, this section applies the timing principle of the life course perspective. We argue that disadvantage associated with parental absence operates most powerfully when exposure occurs in early childhood, while later separations, though still consequential, tend to have less enduring impacts. As a result, individuals who experience parental absence in early life may be especially likely to view premarital cohabitation as a more feasible and emotionally adaptive pathway, offering intimacy and companionship with fewer perceived risks and obligations than marriage.

Based on these observations, we propose the following Hypothesis 2 (H2): Earlier left-behind experiences in childhood are more strongly associated with premarital cohabitation.[3]

2.3 Heterogeneous effects: Parental migration type and gender

While the principles of cumulative disadvantage and timing explain how left-behind experiences generate broad patterns of inequality, life course theory also recognizes that these effects are not uniform across all individuals. Rather, their impact is conditioned by socially ascribed roles and expectations. In the Chinese context this heterogeneity is particularly salient, as differentiated parental roles in caregiving and gendered norms shape both the meaning and the consequences of parental absence.

2.3.1 Parental migration type differences

In Chinese families, fathers have traditionally been regarded as economic providers and disciplinary authorities, playing a central role in decision-making while being less engaged in daily caregiving (Li 2013; Li and Lamb 2015). Although paternal involvement has increased in recent decades, it remains uneven, with fathers more active in educational guidance and household decisions than in routine caregiving (Li 2020).

[3] To test this hypothesis, we divide children's left-behind experiences into two stages: ages 0–3 and ages 4–12, because the CFPS records parental migration separately for these periods. This allows us to directly compare the effects of early versus later childhood separations.

Consequently, paternal migration may weaken paternal supervision and role modeling. Yet, recent evidence indicates that children primarily cared for by fathers do not systematically fare worse in domains such as mental health than those cared for by mothers (Liu and Yu 2024). Moreover, paternal migration typically enhances household financial resources through higher remittances, which can buffer some of the disadvantages of paternal absence (Wu 2020). Grandparents often step in to provide additional daily support, further mitigating the caregiving gap. Taken together, these factors help explain why paternal migration exerts a comparatively limited impact on children's long-term relational behavior.

By contrast, mothers are typically the primary caregivers, responsible for continuous caregiving, emotional responsiveness, and the regulation of daily routines (Li 2013; Li and Lamb 2015). While short-term outcomes such as children's mental health may not differ substantially depending on which parent assumes the primary caregiving role (Liu and Yu 2024), these measures do not capture the long-term formation of attachment. Attachment theory emphasizes that secure attachment depends on consistent emotional availability (Ainsworth et al. 1978), and prolonged maternal absence disrupts these early bonds, increasing the likelihood of insecure attachment and undermining trust, commitment, and relationship satisfaction in adulthood (Simpson 1990). While fathers or grandparents may substitute in daily routines, they are less able to replicate the emotional responsiveness provided by mothers. Moreover, women's migration usually yields lower remittances than men's, meaning maternal absence combines the loss of emotional caregiving with weaker economic compensation (Liu and Yu 2024). This dual deficit magnifies developmental risks, making maternal migration substantially more disruptive than paternal migration.

The most detrimental scenario arises when both parents migrate, creating a compounded loss of instrumental authority and emotional security. In such cases, children are often raised by grandparents or other kin who face age-related limitations, lower educational attainment, and 'generational gaps,' reducing their capacity to provide adequate supervision and emotional support (Zhao et al. 2018). As a result, these children face fragmented attachment, diminished educational opportunities, and constrained economic prospects. This combination of emotional and economic disadvantages strongly predisposes them to view cohabitation as a more feasible and adaptive alternative to marriage, compared with those who experienced single-parental migration.

Based on these observations, we propose the following Hypothesis 3 (H3): *The effect of childhood left-behind experiences on premarital cohabitation is strongest for dual-parental migration, less pronounced for maternal-only migration, and least pronounced for paternal-only migration.*

2.3.2 Gender differences

Gender socialization shapes how boys and girls internalize parental absence and respond to subsequent challenges.

Regarding the economic pathway, Smock, Manning, and Porter (2005), using in-depth interviews with 115 young adults, find that both men and women view marriage as contingent on the male partner's ability to assume the breadwinner role. Landaud (2021) similarly shows with French life-history data that stable jobs have a stronger effect on men's entry into cohabitation and parenthood than on women's. A comparable pattern holds in China: boys are expected to become economic providers, shouldering heavy marriage-market responsibilities such as securing housing (Gao, Pang, and Zhou 2022) and paying bride price, despite official critiques of the practice (Wan 2024). When left-behind experiences limit schooling and depress future labor market prospects, men's marriageability is weakened. In such cases, cohabitation emerges as a more viable alternative, providing intimacy and companionship at lower economic and social cost. Indeed, men often perceive cohabitation as a way to reduce the risk of marital mismatch, whereas women remain more cautious due to reputational concerns and uncertainties around marriage (Zhou 2022).

Beyond economics, gendered pathways also operate in the psychosocial domain. Research on changes in family structure suggests that disruptions are more consequential for boys than girls (Cavanagh and Huston 2008). Boys exhibit greater vulnerability to behavioral problems (Maccoby 1998), while girls typically sustain closer friendships and peer support, which buffer the emotional strain of parental absence. Lacking such support, boys are more exposed to the destabilizing effects of early family disruption. These difficulties often spill over into romantic relationships (Feiring 1999). For left-behind boys, weakened peer ties and fragile social skills undermine pathways to formal marriage, whereas cohabitation, requiring fewer external resources and less social endorsement, becomes more accessible.

Based on these observations, we propose the following hypothesis (H4): *The positive association between childhood left-behind experiences and premarital cohabitation is stronger for men than for women.*

Together, these hypotheses articulate a multi-layered framework. Specifically, left-behind experiences are expected to increase the propensity to cohabit (H1), with stronger effects when occurring earlier in childhood (H2). The association may also vary by parental migration type, being most pronounced in cases of dual-parental absence (H3). Finally, gender differences are anticipated, with men more strongly affected than women (H4). By aligning cumulative disadvantage, timing, and heterogeneity within a unified life course framework, this design has the advantage of capturing multiple dimensions of childhood left-behind experiences in a coherent and systematic way.

3. Data and method

3.1 Data source and sample selection

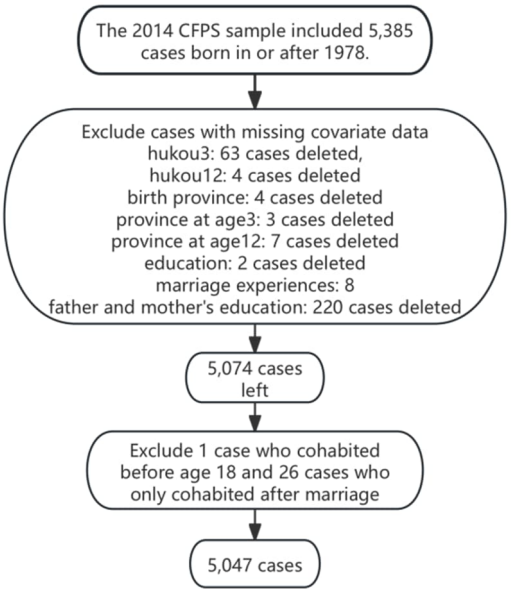
This study draws on data from the China Family Panel Studies (CFPS), a nationally representative longitudinal survey conducted biennially since 2010. Using a multi-stage probability proportional to size sampling design, the CFPS covers 25 provinces, municipalities, and autonomous regions, representing nearly 95% of the Chinese population.

Based on the research objectives, this study draws on data from wave 2010 and waves 2014–2022 of the CFPS. Since information on cohabitation histories was first collected retrospectively in 2014 and prospectively updated in each subsequent wave (2016–2022), the data allows us to reconstruct cohabitation trajectories for respondents. Childhood fixed covariates are taken from the 2010 baseline and merged with the longitudinal cohabitation records.

We restricted the analytic sample to individuals born in 1978 or later to minimize the influence of parental migration due to political factors, resulting in an initial sample of 5,385 respondents. Among them, respondents who reported initiating cohabitation before the age of 18 were excluded to avoid capturing underage cohabitation. Since this study focuses on premarital cohabitation, we further excluded cases where cohabitation occurred only after divorce. In addition, respondents with missing or invalid cohabitation information were removed. After applying these restrictions, the final analytic sample consisted of 5,047 individuals.[4] Figure 1 presents the step-by-step sample selection process.

[4] Detailed results of the comparison between the original and selected samples are provided in Appendix Table A-1, and the estimates suggest that the selected sample is broadly comparable to the original sample.

Figure 1: The sample selection process



3.2 Variable description

3.2.1 Dependent variable: Premarital cohabitation

The dependent variable measures whether respondents ever experienced premarital cohabitation. Cohabitation histories are drawn from CFPS union history items. The 2014 wave collected retrospective reports of episodes within the 2012–2014 window, while subsequent waves (2016–2022) recorded new episodes within the past two years. We constructed a binary indicator coded 1 if the respondent had ever cohabited during adulthood (age 18 or above) and before first marriage (if applicable), and 0 otherwise. For never-married respondents, any reported cohabitation episode up to the latest wave was coded as premarital cohabitation, while for ever-married respondents, only episodes before the first marriage were considered.

A limitation is that cohabitations prior to 2012 may be underreported. To mitigate this truncation problem while retaining statistical power, we conducted robustness checks

restricting the sample to respondents born in 1990 or later, who were at most 22 years old in 2012. In the Chinese context, premarital cohabitation during college years appears to be rare, which could be partly due to dormitory living arrangements and financial dependence on parents. While direct empirical evidence is limited, qualitative and institutional reports suggest that dorm rules and lack of private independence largely constrain cohabitation among students. Thus, limiting to the 1990+ cohort reduces concerns about underreporting while maintaining an adequate sample size.

3.2.2 Independent variable: Childhood left-behind experience

Following the State Council of China's definition (2016) and provincial policy guidelines such as the Fujian Government (2024) requiring at least six months of parental absence for children to be considered 'left behind,' this study adopts the operationalization proposed by Guo et al. (2025). A child is coded as left behind if at least one parent lived apart for more than 24 consecutive weeks before age 12. This upper age bound reflects both policy usage and the design of the CFPS retrospective items, which only record parental non-co-residence for early childhood (0–3) and later childhood (4–12).

Based on these items, we constructed three measures. First, a binary indicator identifies whether the respondent ever experienced parental absence during childhood. Second, to examine sensitive periods, respondents were classified into four groups: (0) never left behind, (1) left behind only in early childhood (0–3), (2) left behind only in later childhood (4–12), and (3) left behind in both stages. Third, to capture parental migration type, we distinguished four categories: (0) neither parent absent, (1) father migration only, (2) mother migration only, and (3) dual parental migration.

3.2.3 Control variables

We included a set of controls at the individual, family, and macro levels, consistent with prior research emphasizing how demographic background, family resources, and regional context shape both children's likelihood of being left behind and their subsequent union behaviors (Yu and Xie 2015; Guo et al. 2025).

At the individual level the controls comprised gender, birth cohort, *hukou* status, migration history, and educational attainment. Gender was coded as 1 for men and 0 for women. Birth cohort was grouped into two categories: those born in the 1970s and 1980s (coded 1) and those born in the 1990s (coded 2). *Hukou* status was distinguished as rural (0) or urban (1), measured separately at ages 3 and 12. *Hukou* and province migration indicators were generated by comparing respondents' *hukou* and residence at ages 3 and

12, coded 1 if a change occurred and 0 otherwise. Educational attainment was classified into four levels: primary school or below (1), junior high school (2), senior high school (3), and college or above (4).

At the family level, we controlled for sibship structure and parental education. The number of older siblings was derived from household roster information, distinguishing older siblings. Parental education was measured as the highest level attained by either parent, using the same four-category scale applied to respondents' own education. At the macro level, controls included region of birth and residence. Provinces were grouped into five broad regions following the China Statistical Yearbook: North China (1), Northeast China (2), East China (3), Central-South China (4), and West China (5).[5]

3.3 Method

Childhood left-behind experience is not randomly assigned but shaped by individual, familial, and contextual factors. This raises the concern that observed associations with premarital cohabitation may be confounded by systematic differences between children who were left behind and those who were not. To address this challenge, we adopt a combined strategy of propensity score matching (PSM) (Rosenbaum and Rubin 1983; Caliendo and Kopeinig 2008; Stuart 2010) and binary logistic regression. PSM reduces selection bias by balancing observed covariates across treatment and control groups, while subsequent regression analysis further adjusts for residual differences, thereby enhancing robustness and statistical efficiency.

In the first step, we estimated each respondent's propensity to experience a childhood left-behind status using a logistic regression model including only pre-treatment, time-invariant, and theoretically grounded covariates. These covariates capture individual characteristics (gender, birth cohort, *hukou* status at ages 3 and 12, *hukou* migration, province migration), family characteristics (number of older siblings, parents' educational attainment), and regional context (birth province and province of residence at age 12). Based on the estimated scores, 1:4 nearest-neighbor matching within a caliper of 0.01 was implemented (Austin 2011; Stuart 2010). Matching quality was assessed using standardized mean differences to ensure covariate balance.

In the second step, we applied a binary logistic regression model to the matched sample to estimate the association between childhood left-behind experiences and the

[5] Variance inflation factor (VIF) diagnostics revealed substantial multicollinearity among the province indicators (VIF > 200) as well as among the *hukou* variables (VIF > 8). To address this issue, we retained only birth province from the province category and *hukou* status at age 3 from the *hukou* category in the final regression models, while including the other related variables as covariates in the propensity score matching procedure. Updated VIF statistics are presented in Appendix Table A-2.

likelihood of premarital cohabitation. Given that the dependent variable is binary, the logistic regression model is an appropriate specification (Hosmer and Lemeshow 2013). The functional form of the model is as follows,

$$ln\left(\frac{P_i}{1-P_i}\right) = \alpha + \beta_0 Leave_i + \sum_{j=1}^{k} \beta_j Z_{ij}$$

where P_i denotes the probability of premarital cohabitation; Leave is the key explanatory variable, measured in three dimensions, including (A) a binary indicator of any left-behind experience, (B) indicators for left-behind status at different developmental stages, and (C) parental migration type (paternal, maternal, or dual migration); and Z_{ij} represents the vector of control variable. β_0 is used to estimate the direction and magnitude of the association.

Finally, to examine gender heterogeneity, we included an interaction term between childhood left-behind experience and gender in the regression models. We also conducted Wald tests, which allowed us to directly test whether the association differed between men and women. As discussed above, we conducted robustness checks by restricting to younger cohorts less affected by truncation bias.

4. Results

4.1 Descriptive results

Table 1 presents the descriptive statistics of all major variables in the analytical sample. Overall, a total of 7.9% of respondents reported a childhood left-behind experience, with 1.1% occurring before age 3, 4.7% between ages 4–12, and 2.1% spanning both periods. The prevalence of left-behind experiences observed in our sample reflects the historical context of the respondents' childhood years. Since our analytic cohorts were born between the late 1970s and 1990s, their childhoods primarily unfolded during the 1980s–2000s, a period when large-scale rural–urban labor migration was still expanding. Consequently, the share of children experiencing parental absence at that time was lower than the peak levels documented in more recent decades.

By migration type, paternal migration (3.7%) is most common, dual-parental migration (3.2%) is non-negligible, and maternal-only migration is comparatively rare (1.0%). This pattern is consistent with prevailing gendered divisions of roles in China during respondents' childhood years. This heterogeneity provides a valuable foundation for the subgroup analyses presented later.

Table 1: Descriptive statistics of relevant variables

Variable		N/Mean	%/Std. dev.
Left-behind experience	Yes = 1	399	7.9
	No = 0	4,648	92.1
Left-behind age	None = 0	4,648	92.1
	Age 0–3 = 1	57	1.1
	Age 4–12 = 2	234	4.7
	Both periods = 3	108	2.1
Left-behind type	None = 0	4,648	92.1
	Father migration only = 1	187	3.7
	Mother migration only = 2	48	1.0
	Dual parental migration = 3	164	3.2
Premarital cohabitation	Yes = 1	202	4.0
	No = 0	4,845	96.0
Gender	Male = 1	2,471	49.0
	Female = 0	2,576	51.0
Birth cohort	1970s and 1980s = 1	3,566	70.7
	1990s = 2	1,481	29.3
Hukou at age 3	Urban = 1	717	14.2
	Rural = 0	4,330	85.8
Hukou at age 12	Urban = 1	776	15.4
	Rural = 0	4,271	84.6
Hukou migration	Yes = 1	81	1.6
	No = 0	4,966	98.4
Birth region	North China = 1	670	13.3
	Northeast China = 2	683	13.5
	East China = 3	912	18.1
	Central-South China = 4	1,328	26.3
	West China = 5	1,454	26.8
Region lived in at age 3	North China = 1	670	13.3
	Northeast China = 2	682	13.5
	East China = 3	913	18.1
	Central-South China = 4	1,330	26.3
	West China = 5	1,452	28.8
Region lived in at age 12	North China = 1	666	13.2
	Northeast China = 2	667	13.4
	East China = 3	922	18.3
	Central–South China = 4	1,333	26.4
	West China = 5	1,449	28.7
Regional Migration at ages 3–12	Yes = 1	56	1.1
	No = 0	4,991	98.9
Educational attainment	Primary school and below = 1	1,353	26.8
	Middle school = 2	2,170	43.0
	High school = 3	954	18.9
	College and above = 4	570	11.3
Parents' educational attainment	Primary school and below = 1	2,143	42.5
	Middle school = 2	1,744	34.6
	High school = 3	956	18.9
	College and above = 4	204	4.0
Number of older siblings		0.56	1.0

Note: For categorical variables, we report frequencies and percentages, whereas for continuous variables (e.g., the number of older siblings), we present means and standard deviations.

Notably, only 4% of respondents reported premarital cohabitation, a figure lower than historical estimates for China. This discrepancy likely reflects truncation in the CFPS measurement window, which makes the robustness check described earlier particularly appropriate and reasonable. When we restricted the sample to those born in 1990 or later, the proportion increased to 9.5%.

About the distribution of control variables, the gender composition is roughly balanced (49% male, 51% female). About 70.7% of respondents were born in the 1970s–1980s, and 29.3% in the 1990s. Most held rural *hukou* status at both age 3 (85.8%) and age 12 (84.6%). Regionally, more respondents were concentrated in Central–South and Western China, compared to East, North, and Northeast China. Other indicators show relatively low levels of mobility: only 1.6% experienced *hukou* migration and only 1.1% experienced regional migration between ages 3 and 12, indicating that our measures primarily capture parental migration/absence rather than child relocation. Among respondents, 26.8% reported primary school or below, 43.0% junior high school, 18.9% senior high school, and 11.3% college or above. By contrast, 42.5% of parents had only primary school or below, indicating that the younger generation experienced substantial educational upgrading relative to their parents (Wu 2010). On average, respondents had 0.56 older siblings.

4.2 Baseline associations between childhood left-behind experience and premarital cohabitation

We combined propensity score matching (PSM) with a binary logistic regression model to estimate the effects.[6] A 1:4 nearest-neighbor matching with a caliper of 0.01 was performed and only one observation was dropped, indicating a high degree of common support between the treatment and control groups.[7] Balance diagnostics show that the standardized mean differences of all covariates were reduced to below 5%, with most reductions exceeding 90%,[8] indicating improved comparability on observed covariates. We then estimated a logistic model on the matched sample.

The results in Table 2 provide strong support for Hypothesis 1. Individuals who experienced parental absence during childhood have higher odds of cohabiting before marriage compared to their non-left-behind peers (OR = 1.845, 95% CI: 1.397, 2.435).

[6] Appendix Table A-3 reports the logistic regression of left-behind status on the covariates used for propensity score estimation. Some covariates contribute more strongly than others to predicting treatment assignment, but propensity score estimation does not rely on the individual contribution of each predictor. The key requirement is that the set of covariates jointly predicts treatment assignment and achieves post-matching balance, which is confirmed in Appendix Figure A-2.

[7] The distribution of the propensity scores before and after matching is provided in Appendix B, Figure A-1.

[8] The standardized mean differences before and after matching are shown in Appendix B, Figure A-2.

Additional analyses restricting the sample to respondents born in 1990 or later produced substantively similar results, mitigating concerns about left truncation in cohabitation histories.[9]

Among the control variables, three patterns stand out. First, men are more likely than women to cohabit before marriage (OR = 2.598, 95% CI: 1.970, 3.426), consistent with prior evidence of a gender gap in cohabitation behavior (Zhou 2022). Second, respondents born in the 1990s display much higher odds of premarital cohabitation than those born in the 1970s–1980s (OR = 5.635, 95% CI: 4.216, 7.533), echoing earlier findings that younger cohorts show greater acceptance of cohabitation (Yu and Xie 2021). Third, regional variation is evident: relative to North China, respondents born in the Northeast, Central-South, and West have higher odds of cohabitation, whereas the estimate for East China produces an interval overlapping 1. In addition, regional migration between ages 3–12 is associated with higher odds of premarital cohabitation (OR = 1.769, 95% CI: 1.106, 2.829), aligning with previous research showing that mobility weakens parental constraints while enhancing individual autonomy in union choices (Rosenfeld and Kim 2005; Mu and Yeung 2023), thereby increasing the likelihood of cohabitation. By contrast, both education-related variables show no clear association with premarital cohabitation. This differs from patterns in many Western societies, where higher education tends to be linked with lower odds of cohabitation.

Table 2: Results of the baseline association between childhood left-behind experience and premarital cohabitation

	OR	95% CI
Left-behind experience	1.845	(1.397, 2.435)
Gender	2.598	(1.970, 3.426)
Birth cohort	5.635	(4.216, 7.533)
Hukou at age 3	1.177	(0.727, 1.906)
Hukou migration	1.855	(0.837, 4.112)
Birth region (reference = North China)		
Northeast China	1.661	(1.504, 1.834)
East China	1.011	(0.973, 1.050)
Central–South China	1.353	(1.326, 1.381)
West China	1.069	(1.009, 1.133)
Regional migration at ages 3–12	1.769	(1.106, 2.829)
Educational attainment (reference = primary school and below)		
Middle school	1.269	(0.948, 1.697)
High school	1.389	(0.887, 2.177)
College and above	1.221	(0.849, 1.757)
Parents' educational attainment (reference = primary school and below)		
Middle school	1.217	(0.859, 1.724)
High school	1.161	(0.897, 1.503)
College and above	1.243	(0.701, 2.206)
Number of older siblings	0.884	(0.692, 1.130)

[9] The robustness check (1990+ cohort) results are provided in Appendix B, Table A-4.

4.3 Associations by timing of left-behind experience

Table 3 presents the results of the timing effect of childhood left-behind experiences on premarital cohabitation. Compared with individuals who were never left behind, those exposed during ages 0–3 have the highest estimated odds of cohabitation before marriage (OR = 2.653, 95% CI: 1.547, 4.552). Although weaker, exposure between ages 4–12 is also associated with elevated odds (OR = 1.807, 95% CI: 1.217, 2.681). Interestingly, individuals who experienced parental absence across both periods show a comparatively lower estimate (OR = 1.518, 95% CI: 1.279, 1.802). Wald tests further show that the differences across the three left-behind age groups are suggestive ($\chi^2 = 4.91$, Prob > chi2 = 0.086).

Table 3: Results of the timing effect: Association between childhood left-behind periods and premarital cohabitation

	OR	95% CI
Left-behind age (reference = no left-behind experience)		
Left behind during ages 0–3	2.653	(1.547, 4.552)
Left behind during ages 4–12	1.807	(1.217, 2.681)
Left behind at both age periods	1.518	(1.279, 1.802)
Gender	2.587	(1.959, 3.417)
Birth cohort	5.646	(4.253, 7.494)
Hukou at age 3	1.177	(0.722, 1.917)
Hukou migration	1.851	(0.816, 4.201)
Birth region (reference = North China)		
Northeast China	1.656	(1.503, 1.824)
East China	1.008	(0.968, 1.049)
Central–South China	1.344	(1.320, 1.369)
West China	1.067	(1.009, 1.130)
Regional migration at ages 3–12	1.795	(1.118, 2.883)
Educational attainment (reference = primary school and below)		
Middle school	1.267	(0.946, 1.698)
High school	1.387	(0.892, 2.156)
College and above	1.211	(0.842, 1.741)
Parents' educational attainment (reference = primary school and below)		
Middle school	1.223	(0.869, 1.721)
High school	1.16	(0.895, 1.505)
College and above	1.236	(0.691, 2.209)
Number of older siblings	0.882	(0.688, 1.131)

These results suggest that the timing of parental absence matters: early childhood disruptions appear particularly consequential, consistent with the notion of sensitive periods in attachment and life course research. At the same time, the comparatively lower odds for those with two-stage experiences indicate that the effect is not simply additive, and the impact of early exposure may dominate subsequent experiences rather than accumulate linearly. A more detailed interpretation of these patterns is provided in the Discussion section.

The effects of control variables remain consistent with those reported in Table 2.[10]

4.4 Associations by parental migration patterns: Father, mother, and both parents

Table 4 examines the association between parental migration type and premarital cohabitation. Dual parental migration is associated with the highest odds of premarital cohabitation (OR = 2.095, 95% CI: 1.422, 3.085). Father-only migration is also linked to elevated odds (OR = 1.847, 95% CI: 1.255, 2.718). By contrast, the estimate for mother-only migration is close to 1, with a wide confidence interval that overlaps unity (OR = 1.010, 95% CI: 0.337, 3.032), suggesting no clear directional pattern in this subgroup. However, Wald tests indicate that the differences between the three migration types are not meaningful ($\chi^2 = 1.66$, Prob > chi2 = 0.436).

Taken together, these results suggest that Hypothesis 3 is not supported. While point estimates suggest somewhat higher odds under dual- and father-only migration, the overall effect does not vary systematically by parental migration type.

Table 4: Results of the association between parental migration type and premarital cohabitation

	OR	95% CI
Left-behind type (reference = no left-behind experience)		
Father migration only	1.847	(1.255, 2.718)
Mother migration only	1.010	(0.337, 3.032)
Dual parental migration	2.095	(1.422, 3.085)
Gender	2.606	(1.977, 3.437)
Birth cohort	5.634	(4.229, 7.505)
Hukou at age 3	1.174	(0.724, 1.904)
Hukou migration	1.854	(0.837, 4.107)
Birth region (reference = North China)		
Northeast China	1.663	(1.504, 1.838)
East China	0.998	(0.965, 1.032)
Central–South China	1.337	(1.312, 1.363)
West China	1.053	(0.981, 1.131)
Regional migration at ages 3–12	1.705	(1.089, 2.672)
Educational attainment (reference = primary school and below)		
Middle school	1.259	(0.941, 1.685)
High school	1.389	(0.875, 2.205)
College and above	1.21	(0.839, 1.744)
Parents' educational attainment (reference = primary school and below)		
Middle school	1.219	(0.861, 1.728)
High school	1.166	(0.905, 1.501)
College and above	1.248	(0.697, 2.234)
Number of older siblings	0.886	(0.694, 1.131)

[10] Results in Table 4 (parental migration type) and Table 5 (gender heterogeneity) also show the same patterns for control variables, further supporting the robustness of the baseline findings.

4.5 Gendered associations of left-behind experiences

The interaction models provide evidence consistent with Hypothesis 4. As shown in Table 5, for men without left-behind experience, the odds of cohabitation are already more than twice those of women without such experience (OR = 2.679, 95% CI: 1.908, 3.761). Left-behind women also have elevated odds compared to non-left-behind women (OR = 2.121, 95% CI: 1.454, 3.093). The largest estimate emerges among left-behind men, whose odds of premarital cohabitation are more than four times those of non-left-behind women (OR = 4.633, 95% CI: 3.097, 6.932). A Wald test confirms that these group differences are pronounced ($\chi^2 = 55.65$, Prob > chi2 = 0.001).

While our data do not directly test these mechanisms, the findings align with prior research suggesting that boys are more exposed to the long-term consequences of parental absence.

Table 5: Heterogeneity analysis results by gender

	OR	95% CI
Left-behind x Gender (reference = non-left-behind women)		
Non-left-behind men	2.679	(1.908, 3.761)
Left-behind women	2.121	(1.454, 3.093)
Left-behind men	4.633	(3.097, 6.932)
Birth cohort	5.630	(4.224, 7.504)
Hukou at age 3	1.178	(0.727, 1.911)
Hukou migration	1.865	(0.841, 4.136)
Birth region (reference = North China)		
Northeast China	1.666	(1.519, 1.827)
East China	1.008	(0.969, 1.049)
Central–South China	1.352	(1.323, 1.382)
West China	1.069	(1.008, 1.133)
Regional migration at ages 3–12	1.720	(1.037, 2.854)
Educational attainment (reference = primary school and below)		
Middle school	1.267	(0.948, 1.694)
High school	1.385	(0.879, 2.184)
College and above	1.221	(0.852, 1.751)
Parents' educational attainment (reference = primary school and below)		
Middle school	1.215	(0.860, 1.719)
High school	1.161	(0.896, 1.505)
College and above	1.239	(0.699, 2.199)
Number of older siblings	0.884	(0.692, 1.129)

5. Conclusion and discussion

Living together before marriage has become an increasingly common pathway to family formation in China. Prior research has mainly interpreted this trend through perspectives such as normative shifts linked to the Second Demographic Transition, economic

rationality, intergenerational socialization, and adverse childhood experiences. While these frameworks identify important drivers of cohabitation, they concentrate on adolescence, early adulthood, or isolated family disruptions, leaving broader structural early-life contexts relatively neglected. By turning to childhood left-behind experiences, an institutionalized and large-scale phenomenon rooted in China's migration and *hukou* regimes, this study demonstrates how early structural disadvantages shape later union behavior.

First, our baseline results show that childhood left-behind experiences are associated with higher odds of premarital cohabitation. Left-behind children face a higher risk of disrupted schooling, premature labor market entry, and limited access to parental and kinship resources, all of which constrain their marriageability while making cohabitation a more feasible pathway. Psychosocial vulnerabilities linked to prolonged parental absence, such as weaker self-esteem and coping skills, may further accelerate the turn to less formalized unions. Taken together, rather than signaling a rejection of marital norms, this pattern should be understood as a pragmatic adjustment to accumulated disadvantages across education, employment, and social support.

Second, our analysis highlights that the timing of parental absence plays a decisive role in shaping later union behavior. Consistent with Hypothesis 2, separations occurring before age 3 have the strongest association with premarital cohabitation, while those between ages 4 and 12 also increase the odds, though to a lesser extent. This aligns with the timing principle of life course theory, which emphasizes that the same event has different consequences depending on when it occurs in the life course (Elder, Johnson, and Crosnoe 2003). Early childhood is a sensitive period for attachment formation (Bowlby 1982; Hazan and Shaver 1987), and disruptions during this stage undermine emotional security in ways that are particularly enduring.

Interestingly, individuals who experienced parental absence across both periods do not exhibit the strongest likelihood of premarital cohabitation, but instead show a comparatively smaller effect. This suggests that cumulative disadvantage may not operate in a strictly linear fashion. According to life course theory, disadvantages in education, economic prospects, and psychosocial development may accumulate across time, but their impacts are also conditioned by timing and social context. Children exposed to parental absence early in life may already face substantial disadvantages, making the additional marginal impact of later separations less pronounced.

This pattern can be further understood through the principle of agency in life course theory. While structural constraints shape opportunities, individuals are not passive recipients of disadvantage. Left-behind children are able to build up resilience through alternative support networks, such as peers, schools, and communities (Li, Zhang, and Li 2018). Over time, these adaptive responses may buffer the incremental harm of additional separations, preventing a simple linear accumulation of disadvantage. If future data

permit, scholars could further examine the moderating role of resilience in shaping how childhood left-behind experiences affect later-life intimate behaviors.

Third, although the point estimates suggest that dual parental and father-only migration are associated with higher odds of premarital cohabitation, while mother-only migration shows little association, Wald tests indicate that the differences across migration types are not distinguishable. This means that Hypothesis 3 is not supported: overall, the effect of parental absence does not vary systematically by whether the father, the mother, or both parents migrate.

We contend that the absence of clear group differences is best understood in relation to the distribution of migration types within the sample. Maternal-only migration is rare (≈1%), and when it does occur the average duration of absence (179.42 weeks) is longer than that of paternal migration (120.36 weeks). This pattern reflects the different roles of fathers and mothers in Chinese families. As prior research shows, fathers have traditionally been positioned as economic providers and decision-makers, whereas mothers are primarily responsible for continuous caregiving and emotional responsiveness (Li 2013; Li and Lamb 2015; Li 2020). This rare-but-long maternal profile leads to small cell sizes and high variance, producing wide confidence intervals around the maternal estimates. As a result, even though the point estimates suggest three contrasting migration types, the statistical tests cannot detect meaningful differences. Future research could address this by drawing on larger-scale samples, pooling across multiple surveys, or incorporating qualitative materials to better capture the distinct emotional and developmental implications of maternal migration.

Fourth, men overall are more likely than women to cohabit prior to marriage, and left-behind men exhibit the highest overall risk of premarital cohabitation, reflecting the combined influence of gender and left-behind status. Left-behind women also show elevated odds relative to non-left-behind women, but the largest contrast emerges for left-behind men, whose odds of premarital cohabitation are more than four times higher than those of non-left-behind women.

These findings resonate with prior research on gendered life course pathways. On the economic side, Chinese men continue to shoulder disproportionate responsibilities in the marriage market, such as housing provision and bride price obligations (Gao, Pang, and Zhou 2022; Wan 2024). Left-behind experiences, which tend to depress educational attainment and weaken labor market prospects, exacerbate these structural disadvantages, undermining men's marriageability and making cohabitation a more feasible, lower-cost alternative to formal marriage. On the psychosocial side, boys are generally more vulnerable than girls to family instability, partly because girls are more likely to sustain supportive peer networks that buffer emotional strain (Cavanagh and Huston 2008; Maccoby 1998). Boys, by contrast, may compensate for diminished closeness through romantic relationships, increasing the likelihood of earlier and less formalized unions.

The findings carry several implications for policy. A priority is to minimize parental absence during the earliest years of life, as our results show that separations before age 3 have the most lasting influence on later cohabitation, consistent with the notion in life course research of sensitive periods. This calls not only for expanding affordable childcare, but also for easing *hukou* barriers so that migrant families can secure public preschool and primary school places in destination cities, enabling co-residence rather than separation. When prolonged or dual-parent absences cannot be avoided, interventions should be more targeted: local governments can establish early development centers in rural sending areas, provide regular psychosocial follow-ups through schools, and strengthen training and financial assistance for substitute caregivers such as grandparents. At the same time, the heightened disadvantages faced by left-behind men highlight the need for gender-sensitive reforms in the marriage market, including affordable rental housing schemes, small-scale housing loans in rural areas, and broader recognition of dual-earner family models. By linking these interventions directly to the timing and type of parental absence revealed in our results, policies can help ensure that young adults enter adulthood with more equal opportunities, rather than having their trajectories constrained by early inequalities.

This study also has several limitations. First, a key concern is that cohabitation histories may be truncated, since the CFPS only began collecting retrospective reports from 2012 onward. As a result, premarital cohabitation episodes that occurred before 2012 are likely underreported in the full sample. To address this concern, we conducted robustness checks restricting the analysis to respondents born in 1990 or later, who were at most 22 years old in 2012 and thus unlikely to have formed unions before systematic data collection began. The results based on this restricted subsample are highly consistent with those from the full sample, lending confidence to the validity of our findings. From a theoretical perspective, if underreporting does occur, it is plausible that such omissions are more concentrated among left-behind individuals. This implies that our estimates should be interpreted as conservative. Second, maternal migration cases are relatively rare in the CFPS sample. To some extent, this scarcity reflects the broader reality in China, where fathers are far more likely than mothers to migrate for work. Nevertheless, the small cell sizes yield wide confidence intervals and imprecise estimates, making it difficult to fully assess the distinct effects of maternal absence. Third, the CFPS does not provide sufficient indicators to test directly the mechanisms proposed here. Future studies should build on pooled datasets or incorporate qualitative materials to validate these pathways.

Beyond these limitations, this study makes several contributions. By bridging life course theory with China's unique institutional context, this study contributes to the literature in three ways. First, it extends the application of life course theory to the study of family formation in transitional societies, explicitly linking early structural

experiences to later union behavior. Second, it advances research on premarital cohabitation by shifting the focus from individual attitudes or short-term family disruptions to the long-term consequences of childhood left-behind experiences, a large-scale and structurally embedded phenomenon that has been largely overlooked. Third, it situates China within comparative scholarship on premarital cohabitation, highlighting how institutional constraints such as *hukou* and migration regimes generate distinctive pathways into cohabitation that diverge from Western patterns. In doing so, this study not only fills a gap in the Chinese literature but also enriches broader theoretical debates on how early-life inequalities shape intimate behaviors across diverse contexts.

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References

Ainsworth, M.D.S., Blehar, M.C., Waters, E., and Wall, S. (1978). *Patterns of attachment: A psychological study of the strange situation*. Hillsdale: Lawrence Erlbaum.

Anderson, C.S. (1982). The search for school climate: A review of the research. *Review of Educational Research* 52(3): 368–420. doi:10.3102/00346543052003368.

Austin, P.C. (2011). Optimal caliper widths for propensity-score matching when estimating differences in means and differences in proportions in observational studies. *Pharmaceutical Statistics* 10(2): 150–161. doi:10.1002/pst.433.

Axinn, W.G. and Thornton, A. (1992). The relationship between cohabitation and divorce: Selectivity or causal influence? *Demography* 29(3): 357–374. doi:10.2307/2061823.

Bowlby, J. (1982). Attachment and loss: Retrospect and prospect. *The American Journal of Orthopsychiatry* 52(4): 664–678. doi:10.1111/j.1939-0025.1982.tb01456.x.

Caliendo, M. and Kopeinig, S. (2008). Some practical guidance for the implementation of propensity score matching. *Journal of Economic Surveys* 22(1): 31–72. doi:10.1111/j.1467-6419.2007.00527.x.

Cavanagh, S.E. and Huston, A.C. (2008). The timing of family instability and children's social development. *Journal of Marriage and Family* 70(5): 1258–1270. doi:10.1111/j.1741-3737.2008.00564.x.

Chan, K.W. and Buckingham, W. (2008). Is China abolishing the hukou system? *The China Quarterly* 195: 582–606. doi:10.1017/S0305741008000787.

Cherlin, A.J., Kiernan, K.E., and Chase-Lansdale, P.L. (1995). Parental divorce in childhood and demographic outcomes in young adulthood. *Demography* 32: 299–318. doi:10.2307/2061682.

Cui, S., Cheng, F., Zhang, L., Zhang, C., Yuan, Q., Huang, C., Zhang, K., and Zhou, X. (2021). Self-esteem, social support and coping strategies of left-behind children in rural China, and the intermediary role of subjective support: A cross-sectional survey. *BMC Psychiatry* 21(1): 158. doi:10.1186/s12888-021-03160-y.

Dannefer, D. (2003). Cumulative advantage/disadvantage and the life course: Cross-fertilizing age and social science theory. *The Journals of Gerontology Series B* 58(6): S327–S337. doi:10.1093/geronb/58.6.S327.

DiPrete, T.A. and Eirich, G.M. (2006). Cumulative advantage as a mechanism for inequality: A review of theoretical and empirical developments. *Annual Review of Sociology* 32(1): 271–297. doi:10.1146/annurev.soc.32.061604.123127.

Elder, G.H., Johnson, M.K., and Crosnoe, R. (2003). The emergence and development of life course theory. In: Mortimer, J.T. and Shanahan, M.J. (eds.). *Handbook of the life course*. Boston: Springer: 3–19. doi:10.1007/978-0-306-48247-2_1.

Elder, G.H., Jr. (1998). The life course as developmental theory. *Child Development* 69(1): 1–12. doi:10.1111/j.1467-8624.1998.tb06128.x.

Ermisch, J. and Francesconi, M. (2001). Family structure and children's achievements. *Journal of Population Economics* 14(2): 249–270. doi:10.1007/s001480000028.

Fan, F., Su, L., Gill, M.K., and Birmaher, B. (2010). Emotional and behavioral problems of Chinese left-behind children: A preliminary study. *Social Psychiatry and Psychiatric Epidemiology* 45(6): 655–664. doi:10.1007/s00127-009-0107-4.

Feiring, C. (1999). Gender identity and the development of romantic relationships in adolescence. In: Furman, W., Brown, B.B. and Feiring, C. (eds.). *The development of romantic relationships in adolescence*. New York: Cambridge University Press: 211–232. doi:10.1017/CBO9781316182185.010.

Fujian Provincial People's Government (2024). What is rural left-behind children? Fuzhou: Fujian Provincial People's Government. https://www.fujian.gov.cn/hdjl/hdjlzsk/mzt/etfl/202408/t20240830_6509079.htm.

Gao, Z., Pang, J., and Zhou, H. (2022). The economics of marriage: Evidence from China. *Humanities and Social Sciences Communications* 9(1): 399. doi:10.1057/s41599-022-01400-4.

George, L.K. (1993). Sociological perspectives on life transitions. *Annual Review of Sociology* 19: 353–373. doi:10.1146/annurev.so.19.080193.002033.

Guo, C., He, X., Du, Y., and Wang, M. (2025). Childhood left-behind experience and marital stability from a life course perspective. *Northwest Population* 46(5): 1–16. Advance online publication. (in Chinese).

Hazan, C. and Shaver, P. (1987). Romantic love conceptualized as an attachment process. *Journal of Personality and Social Psychology* 52(3): 511–524. doi:10.1037/0022-3514.52.3.511.

Hiekel, N. (2021). Understanding the mechanisms of intergenerational social inequality in demographic behavior. In: Liefbroer, A.C. and Zoutewelle-Terovan, M. (eds.). *Social background and the demographic life course: Cross-national comparisons*. Cham: Springer: 141–153. doi:10.1007/978-3-030-67345-1_8.

Hosmer, D.W., Lemeshow, S., and Sturdivant, R. X. (2013). *Applied logistic regression* (3rd ed.). Hoboken: Wiley.

Huang, Y. and Gong, H. (2022). Educational expectations of left-behind children in China: Determinants and gender differences. *Applied Research in Quality of Life* 17(5): 2501–2523. doi:10.1007/s11482-021-09987-7.

Johnston, C.A., Cavanagh, S.E., and Crosnoe, R. (2020). Family structure patterns from childhood through adolescence and the timing of cohabitation among diverse groups of young adult women and men. *Developmental Psychology* 56(1): 165–179. doi:10.1037/dev0000842.

Landaud, F. (2021). From employment to engagement? Stable jobs, temporary jobs, and cohabiting relationships. *Labour Economics* 73(C): 102077. doi:10.1016/j.labeco.2021.102077.

Lesthaeghe, R.J. and Neidert, L. (2006). The second demographic transition in the United States: Exception or textbook example? *Population and Development Review* 32(4): 669–698. doi:10.1111/j.1728-4457.2006.00146.x.

Li, C., Zhang, Q., and Li, N. (2018). Does social capital benefit resilience for left-behind children? An evidence from Mainland China. *Children and Youth Services Review* 93(C): 255–262. doi:10.1016/j.childyouth.2018.06.033.

Li, X. (2013). Fathers in Chinese culture: From stern disciplinarians to involved parents. In: Shwalb, D.W., Shwalb, B.J., and Lamb, M.E. (eds.). *Fathers in cultural context*. New York: Routledge/Taylor and Francis Group: 15–41.

Li, X. (2020). Fathers' involvement in Chinese societies: Increasing presence, uneven progress. *Child Development Perspectives* 14(3): 150–156. doi:10.1111/cdep.12375.

Li, X. and Lamb, M. E. (2015). Fathering in Chinese culture: Traditions and transitions. In: Roopnarine, J.L. (ed.). *Fathers across cultures: The importance, roles, and diverse practices of dads*. Santa Barbara, CA: Praeger/ABC-CLIO: 273–306.

Liu, W. and Yu, J. (2024). Fathering, living arrangements, and child development in China. *Chinese Sociological Review* 56(2): 176–204. doi:10.1080/21620555.2024.2303602.

Liu, W., Wang, Y., Xia, L., Wang, W., Li, Y., and Liang, Y. (2023). Left-behind children's positive and negative social adjustment: A qualitative study in China. *Behavioral Sciences* 13(4): 341. doi:10.3390/bs13040341.

Lu, Y. (2012). Education of children left behind in rural China. *Journal of Marriage and Family* 74(2): 328–341. doi:10.1111/j.1741-3737.2011.00951.x.

Lu, N., Lu, W., Chen, R., and Tang, W. (2023). The causal effects of urban-to-urban migration on left-behind children's well-being in China. *International Journal of Environmental Research and Public Health* 20(5): 4303. doi:10.3390/ijerph20054303.

Maccoby, E.E. (1998). *The two sexes: Growing up apart, coming together*. Cambridge, MA: Harvard University Press.

Mu, Z. and Yeung, W.-J.J. (2023). Internal migration and cohabitation in China: A mixed-method study. *Sociological Perspectives* 66(6): 1125–1145. doi:10.1177/07311214231180559.

National Bureau of Statistics of China (2023). Population status of children in China in 2020: Facts and figures [electronic resource]. Beijing: National Bureau of Statistics of China. https://www.stats.gov.cn/zs/tjwh/tjkw/tjzl/202304/P020230419425666818737.pdf.

O'Rand, A.M. (1996). The precious and the precocious: Understanding cumulative disadvantage and cumulative advantage over the life course. *The Gerontologist* 36(2): 230–238. doi:10.1093/geront/36.2.230.

Palumbo, L., Berrington, A., and Eibich, P. (2025). Living in precarious partnerships: Understanding how young men's and women's economic precariousness contribute to outcomes of first cohabitation. *Population Studies* 79(2): 253–281. doi:10.1080/00324728.2024.2438692.

Rosenbaum, P.R. and Rubin, D.B. (1983). The central role of the propensity score in observational studies for causal effects. *Biometrika* 70(1): 41–55. doi:10.1093/biomet/70.1.41.

Rosenfeld, M.J. and Kim, B.-S. (2005). The independence of young adults and the rise of interracial and same-sex unions. *American Sociological Review* 70(4): 541–562. doi:10.1177/000312240507000401.

Ryan, R.M. and Claessens, A. (2013). Associations between family structure changes and children's behavior problems: The moderating effects of timing and marital birth. *Developmental Psychology* 49(7): 1219–1231. doi:10.1037/a0029397.

Simpson, J.A. (1990). Influence of attachment styles on romantic relationships. *Journal of Personality and Social Psychology* 59(5): 971–980. doi:10.1037/0022-3514.59.5.971.

Smock, P.J., Manning, W.D., and Porter, M. (2005). Everything's there except money: How money shapes decisions to marry among cohabitors. *Journal of Marriage and Family* 67(3): 680–696. doi:10.1111/j.1741-3737.2005.00162.x.

State Council of the People's Republic of China (2016). Opinions on strengthening the care and protection of rural left-behind children. Beijing: State Council of the People's Republic of China. https://www.gov.cn/zhengce/content/2016-02/14/content_5041066.htm.

Stuart, E.A. (2010). Matching methods for causal inference: A review and a look forward. *Statistical Science* 25(1): 1–21. doi:10.1214/09-STS313.

Wan, Y. (2024). Between money and intimacy: Brideprice, marriage, and women's position in contemporary China. *Demographic Research* 50(46): 1353–1386. doi:10.4054/DemRes.2024.50.46.

Wang, H., Cheng, Z., Wang, B.Z., and Chen, Y. (2021). Childhood left-behind experience and labour market outcomes in China. *Journal of Business Research* 132(C): 196–207. doi:10.1016/j.jbusres.2021.04.014.

Wang, M.T., Scanlon, C.L., Del Toro, J., and McKellar, S.E. (2022). Reducing suspension for minor infraction and improving school climate perceptions among Black adolescents via cultural socialization: A multi-informant longitudinal study. *Learning and Instruction* 80: 101621. doi:10.1016/j.learninstruc.2022.101621.

Wei, Y.N. and Gong, Y. (2019). Understanding Chinese rural-to-urban migrant children's education predicament: A dual system perspective. *International Journal of Educational Development* 69(C): 102066. doi:10.1016/j.ijedudev.2019.05.001.

Wu, P. (2020). Study on the effect of rural labor migration on left-behind children's physical and mental health. *South China Journal of Economics* 39(1): 95–111. doi:10.19592/j.cnki.scje.370194. (in Chinese).

Wu, X. (2010). Economic transition, school expansion and educational inequality in China, 1990–2000. *Research in Social Stratification and Mobility* 28(1): 91–108. doi:10.1016/j.rssm.2009.12.003.

Xie, Y., Raymo, J.M., Goyette, K., and Thornton, A. (2003). Economic potential and entry into marriage and cohabitation. *Demography* 40: 351–367. doi:10.1353/dem.2003.0019.

Yu, J. and Xie, Y. (2015). Cohabitation in China: Trends and determinants. *Population and Development Review* 41(4): 607–628. doi:10.1111/j.1728-4457.2015.00087.x.

Yu, J. and Xie, Y. (2021). Recent trends in the Chinese family: National estimates from 1990 to 2010. *Demographic Research* 44(25): 595–608. doi:10.4054/DemRes.2021.44.25.

Yu, J. and Xie, Y. (2022). Is there a Chinese pattern of the second demographic transition? *China Population and Development Studies* 6: 237–266. doi:10.1007/s42379-022-00113-0.

Zhao, C., Wang, F., Li, L., Zhou, X., and Hesketh, T. (2017). Long-term impacts of parental migration on Chinese children's psychosocial well-being: Mitigating and exacerbating factors. *Social Psychiatry and Psychiatric Epidemiology* 52(6): 669–677. doi:10.1007/s00127-017-1386-9.

Zhao, C., Wang, F., Zhou, X., Jiang, M., and Hesketh, T. (2018). Impact of parental migration on psychosocial well-being of children left behind: A qualitative study in rural China. *International Journal for Equity in Health* 17(1): 80. doi:10.1186/s12939-018-0795-z.

Zhou, Y. (2022). Gendering the second demographic transition: gender asymmetry, gendered tension, and cohabitation in contemporary urban China. *China Population and Development Studies* 6: 351–372. doi:10.1007/s42379-022-00114-z.

Appendix A: Descriptive analysis

Table A-1: Baseline characteristics of the original and selected samples

Variable	The original sample (%)/Mean	The selected sample (%)/Mean	P
Gender = 1	48.5	49.0	0.652
Gender = 0	51.5	51.0	
Birth year	1985.89	1985.96	0.442
Education = 1	28.0	26.8	0.609
Education = 2	42.4	43.0	
Education = 3	18.7	18.9	
Education = 4	11.0	11.3	
Hukou 3 = 1	13.9	14.2	0.713
Hukou 3 = 0	86.1	85.8	
Hukou 12 = 1	15.2	15.4	0.870
Hukou 12 = 0	84.8	84.6	
Birth province = 11	0.4	0.5	0.508
Birth province = 12	0.8	0.8	
...			
Birth province = 65	0.1	0.1	
Province lived in at age 3 = 11	0.4	0.4	0.519
Province lived in at age 3 = 12	0.8	0.8	
...			
Province lived in at age 3 = 65	0.1	0.1	
Province lived in at age 12 = 11	0.4	0.4	0.511
Province lived in at age 12 = 12	0.7	0.8	
...			
Province lived in at age 12 = 65	0.0	0.0	
Father's education = 1	49.8	49.3	0.968
Father's education = 2	31.9	32.2	
Father's education = 3	15.1	15.2	
Father's education = 4	3.2	3.3	
Mother's education = 1	67.8	67.5	0.979
Mother's education = 2	22.2	22.4	
Mother's education = 3	8.4	8.6	
Mother's education = 4	1.6	1.5	
Number of older siblings	0.58	0.56	0.358

Table A-2: Variance-inflation Factor (VIF) diagnostic results

Covariate	VIF	1/VIF
Childhood left-behind experience	1.02	0.981
Gender	1.01	0.992
Birth cohort = 2	1.17	0.858
Hukou at age 3	1.38	0.725
Hukou migration	1.02	0.977
Birth region = 2	1.82	0.550
Birth region = 3	1.96	0.510
Birth region = 4	2.22	0.451
Birth region = 5	2.35	0.426
Regional migration 3–12	1.02	0.981
Education = 2	1.65	0.604
Education = 3	1.65	0.606
Education = 4	1.66	0.602
Parents educational attainment = 2	1.35	0.743
Parents educational attainment = 3	1.4	0.714
Parents educational attainment = 4	1.28	0.782
Number of siblings	1.15	0.871
Mean VIF	1.48	

Appendix B: Regression analysis

Table A-3: Logistic regression predicting left-behind experience

Variable	Coefficient	95% CI
Birth cohort	0.300	(0.126, 0.474)
Gender	0.075	(–0.131, 0.282)
Hukou at age 3	–6.548	(–818.382, 805.284)
Hukou at age 12	6.419	(–805.413, 818.253)
Hukou migration	–7.226	(–819.059, 804.606)
Birth region	–0.083	(–0.662, 0.496)
Region at age 12	0.258	(–0.324, 0.841)
Regional migration	1.392	(1.044, 1.739)
Older siblings	–0.066	(–0.188, 0.055)
Father's education	0.126	(–0.011, 0.264)
Mother's education	–0.104	(–0.284, 0.074)

Figure A-1: Distribution of the propensity scores before and after matching

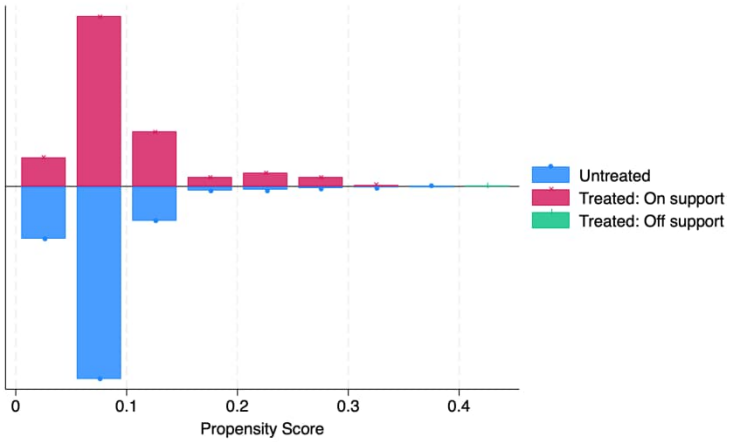

Figure A-2: Standardized mean differences before and after matching

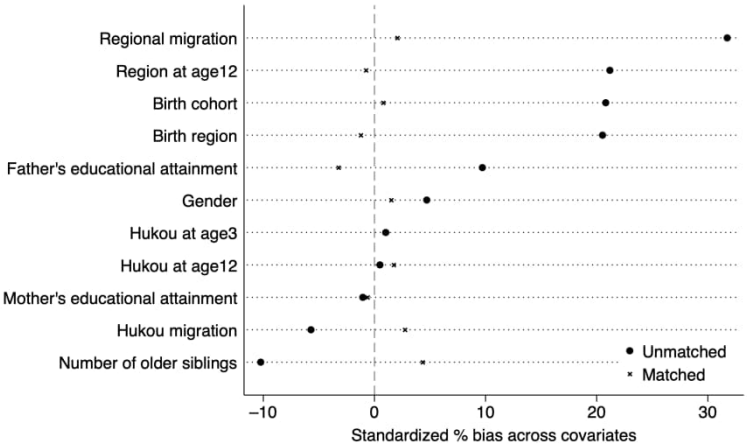

Table A-4: Robustness check (1990+ cohort): association between childhood left-behind experience and premarital cohabitation (N = 1,481)

	OR	95% CI
Left-behind experience	1.676	(1.449, 1.938)
Gender	2.239	(1.361, 3.684)
Birth cohort	1.191	(0.983, 1.444)
Hukou at age 3	1.180	(0.871, 1.600)
Hukou migration	omitted	
Birth region (reference = North China)		
Northeast China	1.275	(1.058, 1.536)
East China	0.861	(0.767, 0.967)
Central–South China	1.042	(1.023, 1.062)
West China	1.047	(0.968, 1.133)
Regional migration 3–12	0.850	(0.058, 12.538)
Educational attainment (reference = primary school and below)		
Middle school	1.533	(1.010, 2.325)
High school	1.865	(1.271, 2.737)
College and above	2.95	(0.477, 18.256)
Parents educational attainment (reference = primary school and below)		
Middle school	1.286	(0.780, 2.119)
High school	1.132	(0.862, 1.487)
College and above	1.160	(0.603, 2.233)
Number of older siblings	1.151	(0.784, 1.691)