

Sibling similarity in education and employment trajectories at ages 16–19 in the UK: The role of parental influence and individual experiences in early adolescence

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ABSTRACT

Young people's early education and employment trajectories (EET) hold profound implications for either perpetuating or alleviating social inequalities across the life course. Family background plays an instrumental role in shaping these trajectories, but we have little understanding of how similar or different these trajectories are between siblings and which early adolescent experiences are associated with individual trajectories. Using the UK Household Longitudinal Study, this paper explored how individual early adolescent experiences (ages 10–15) influence siblings' EET in late adolescence (ages 16–19). We used a combination of sequence and cluster analysis to create a typology of trajectories, compare these outcomes on three analytic samples – the related siblings, conditionally assigned unrelated peers and randomly matched unrelated peers – and then used a multivariable regression approach to determine the extent to which trajectories among siblings are shaped by individual early adolescent experiences. Siblings exhibited a greater tendency to follow similar post-16 EET compared to unrelated peers, including those coming from similar backgrounds, highlighting persistent effects of the family of origin. However, siblings often diverge onto different trajectories, pointing to the role of individual experiences in the process of status attainment within the family. Thus, adolescents' positive educational aspirations and feeling of family support emerged as significant predictors of favourable EET outcomes. Overall, this study highlights that early life course trajectories and the process of status attainment within the family are shaped by a complex interaction of family circumstances and individual experiences.

1. Introduction

What young people do after finishing compulsory education can affect their lifetime earnings and employment careers. Early experiences of precarious employment, unemployment, and inactivity, in particular, could have a harmful effect on young people's careers and lead to starkening of social inequalities throughout the life course (Dorsett & Lucchino, 2014; Schoon & Lyons-Amos, 2016; Anders & Dorsett, 2017; Pelikh & Rowe, 2024). There is considerable evidence that early education and employment trajectories are influenced by family background (e.g., social class and family type). To disaggregate family background effects, previous studies have examined differences in life course transitions between siblings (Lyngstad & Prskawetz, 2010; Raab et al., 2014; Karhula et al., 2019; Buyukkececi & Leopold, 2021; Grätz et al., 2021; Her et al., 2023; Anderson et al., 2024). Evidence suggests that, on average, siblings tend to exhibit greater similarity in their

educational pursuits and employment trajectories compared to individuals coming from similar socio-economic backgrounds (Karhula et al., 2019). However, even after accounting for family background, disparities in outcomes between siblings persist, including differences in educational achievements (e.g., Grätz et al., 2021; Sieben & De Graaf, 2001; Sieben & Huinink, & De Graaf, 2001). Yet, our understanding remains limited regarding the factors responsible for driving these disparities, particularly in the context of early adolescent experiences. Additionally, the outcomes in these studies are usually measured as one-event-at-a-time (i.e., educational attainment or income at a specific age; with exception of Karhula et al., 2019) which can mask substantial differences in the processes leading to the outcomes.

The family of origin may affect early education and employment trajectories (EET) among siblings in various ways. It is argued that young people's life choices, educational and career success are influenced by their parental background through the mechanisms of social

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stratification and intergenerational transmission of social class (*origin-destination* framework) (Blau & Duncan, 1967; Erikson & Goldthorpe, 1992; Breen and Jonsson, 2005; Chetty et al., 2018; Bukodi et al., 2020). This influence encompasses both the material aspects, such as parental wealth and resources, and the intangible aspects, such as genetic endowment, values and attitudes, parenting style and expectations instilled by parents (Lareau, 2003; Henderson, 2013; Mooyaart & Liefbroer, 2016; Keijer et al., 2018, Billari et al., 2019; Berrington et al., 2016; Brons et al., 2017; Berrington, 2020; Erola et al., 2022). However, the process of status attainment may not be constant within the family. Previous research has demonstrated that factors like family size, birth order, sex composition, and age differences between siblings contribute to shaping their early life course paths (Conger & Little, 2010; Lyngstad & Prskawetz, 2010; Raab et al., 2014; Bu, 2016; Karhula et al., 2019; Buyukkececi & Leopold, 2021; Her et al., 2022). Furthermore, the quality of relationships between siblings could also explain similarity in their behaviours (McHale et al., 2012; Yucel & Yuan, 2015, 2016; Her et al., 2021). Nevertheless, what remains less well explored is the impact of individual agency, personality traits, and other unique factors that may apply to one sibling but not necessarily to another sibling in the context of their educational and career journeys (Her et al., 2021; 2023). For example, one sibling might opt not to pursue a university education, while another chooses to continue education due to differences in aspiration. Similarly, one of the siblings might experience lower mental health and wellbeing compared to the other resulting in different EET. These examples demonstrate that by focusing exclusively on the family-level characteristics, we might be overlooking the importance of individual factors (non-shared environment) that shape early life course trajectories among siblings.

This paper seeks to further unpack the status attainment processes by exploring the influence of individual early adolescent experiences (10–15) on education and employment trajectories of siblings in late adolescence (16–19). We used data from Understanding Society (UK Household Longitudinal Study) which allows to follow siblings longitudinally from early adolescent years into their transition to adulthood and explore which factors influence similarities and differences in their EET. Specifically, UKHLS uniquely collects data from each of the siblings before they reach age 16, including questions on educational aspirations, perceived family support, relationships with siblings, health and wellbeing. Collectively those characteristics could further expand our understanding of the predictors of post-16 EET additional to that of the role of family characteristics captured on the parental level, including socio-economic background and family type. Using a longitudinal life course perspective, this paper will address the following three research questions:

RQ1 Are education and employment trajectories (EET) at ages 16–19 more similar between siblings compared to unrelated peer dyads?

RQ2 What is the contribution of compositional factors and parental background characteristics in shaping the EET at ages 16–19 among siblings?

RQ3 How are the EET at ages 16–19 among siblings shaped by individual early adolescent experiences?

We applied a combination of sequence and cluster analyses to create a typology of EET between the ages of 16 and 19. We compared the outcomes between siblings to those of randomly matched unrelated peers and conditionally assigned unrelated dyads from similar parental backgrounds drawn from the general population to put siblings' EET into a wider context and assess the family of origin effects by measuring the gaps between siblings and unrelated dyads (RQ1). We then examined the contributions of compositional factors and parental characteristics in shaping the EET and establishing whether they are more pronounced in the family context (RQ2). Finally, we performed regression analyses on an individual level using the sample of siblings to explore the extent to which trajectories among siblings are shaped by

individual early adolescent experiences (RQ3).

2. Theoretical background

2.1. Family characteristics

Parental education and resources are traditionally seen as the strongest predictors of children's educational and occupational outcomes. High-SES parents possess essential financial, social (i.e., networks) and cultural (i.e., parenting styles and involvement in children's education) capital which enable them to provide comprehensive support for their children's educational and developmental needs (Blau & Duncan, 1967; Lareau, 2003; Björklund et al., 2010; Henderson, 2013; Sironi et al., 2015; Mooyaart & Liefbroer, 2016, Keijer et al., 2018, Billari et al., 2019). Additionally, high-SES parents are more likely to pass on elevated educational aspirations, often as a means of preserving family wealth, in contrast to low-SES families (Goldthorpe, 1996, Wiik, 2009). Consequently, children from high-SES and low-SES backgrounds tend to cultivate different intentions about their future life course decisions. For example, children of high-SES parents are likely to prioritise continuing education over early labour market entry (Ermish & Francesconi, 2001a; Berrington et al., 2016; Mooyaart & Liefbroer, 2016, Brons et al., 2017, Keijer et al., 2018). This path is associated with subsequent benefits, including smoother transition into the labour market, ultimately contributing to greater financial stability in the future. Conversely, the lack of comparable support for young individuals from less privileged backgrounds may result in lower educational and career ambitions, potentially leading to an earlier and more turbulent entry into the labour market.

Another factor that might affect how siblings fare in their transitions to adulthood is family type. With the increasing prevalence of divorce in developed nations, there is a growing argument that parental separation not only leads to a reduction in financial resources but is, in itself, a distressing event that can adversely impact children's wellbeing and future life chances (Amato, 2000; Ermish & Francesconi, 2001b; McLanahan, 2004; Kiernan & Mensah, 2010; Waldfogel et al., 2010; Härkönen et al., 2017; Solaz et al., 2024). According to the "diverging destinies" argument (McLanahan, 2004), children of highly-educated mothers are more likely to grow up in two-parent households with greater available resources, including both parental time and financial support. In contrast, children of mothers with lower levels of education, who often face challenges in accessing the job market, are more inclined to be raised in single-parent households characterised by financial constraints, thereby exacerbating the potentially detrimental effects on children's outcomes. For example, early exposure to adverse life events, such as family disruption and financial hardship can increase an adolescent's risk of developing mental health issues or engaging in risky behaviours, which may derail their educational and career paths (Schilling et al., 2007; Mersky et al., 2013; Hunt et al., 2017; Nelson et al., 2020).

Family characteristics might also play a role in shaping EET between siblings through the mechanisms of genetic endowment. As siblings share a large proportion of their parents' genes, it has been debated whether genetic influences on socio-economic outcomes (education, occupation, income) are stronger among children from advantaged families or disadvantaged backgrounds. In high-SES families, the advantaged rearing environments may amplify positive genetic influences ("enhancement mechanism"; Bronfenbrenner & Ceci, 1994; Shanahan & Hofer, 2005), while in low-SES families, uncertainties and instability may necessitate greater reliance on genetic potential to overcome challenges ("challenging mechanism"; Nielsen, 2016; Lin, 2020). Additionally, the literature has discussed the role of non-shared environments (factors that make siblings different from one another) as one of the potential drivers of the intergenerational transmission of social inequalities (Erola et al., 2022). While testing these mechanisms is beyond the scope of this paper, it is important to acknowledge their role

in the process of status attainment within the family and the fact that these effects may vary depending on the institutional context and levels of social inequalities (Baier & Lang, 2019; Herd et al., 2019; Baier et al., 2022; Isungset et al., 2022a).

2.2. Sibling factors

Research on sibling similarity in various behaviours has extensively discussed the roles of the birth order and family size, especially in relation to the educational outcomes. It has been shown empirically that first-borns are more likely to achieve higher educational achievements compared to later-born siblings (Behrman & Taubman, 1986; Black et al., 2005; Conley & Glauber, 2006; Kalmijn & van de Werfhorst, 2016; Lehmann et al., 2018; Isungset et al., 2022b). One of the most common explanations for this phenomenon is related to the “resource dilution” model (Blake, 1981; Downey, 2001), according to which a higher number of siblings limits the amount of parental resources to be distributed among siblings, resulting in less favourable outcomes for later-born children.

Age gap and sex composition could also define siblings’ similarities when they are growing up, with siblings born closer to each other and being of the same sex more likely to follow each other’s behaviour during the transition to adulthood (Bu, 2016; Raab et al., 2014; Her et al., 2022, 2023). Apart from these quantifiable sibling characteristics, the quality of the relationship between siblings could also shed light on the observed similarities or differences between them (McHale et al., 2012; Yucel & Yuan, 2015, 2016; Her et al., 2021). Intuitively, we can expect that siblings with higher quality/warmer relationships might be more prone to affect each other’s life decisions and be more similar, whereas those with lower quality and higher prevalence of conflict and aggression towards each other, on the contrary, might have divergent experiences, especially during the transition to adulthood (McHale et al., 2012; Her et al., 2021).

2.3. Individual early adolescent experiences

Besides shared family experiences and sibling factors, individual early adolescent experiences may also play a role in explaining young people’s education and employment trajectories. Thus, siblings may have different expectations and aspirations in life despite coming from the same family background (e.g., Bu, 2016). For example, siblings characterised by a conscientious personality style, denoting a high degree of careful planning and competence, may navigate life transitions in a more structured and organised manner (Conger & Little, 2010; Her et al., 2023). They might prefer to continue education or get a professional qualification straight after compulsory school. In contrast, individuals with a less playful disposition might embark on more turbulent trajectories.

Siblings may also have varying degrees of closeness with their parents and could experience differing levels of familial support, potentially influencing their life choices and career paths (Desforges & Abouchar, 2003; Boonk et al., 2018). Parental involvement and support might encompass multiple aspects, such as fostering a nurturing and stable home environment, providing intellectual stimulation through enriching activities, and engaging in meaningful parent-child conversations (Ibid.). Individuals’ peer relationships and social experiences during early adolescence can also shape their educational and occupational trajectories (Gini & Pozzoli, 2009; Bowers et al., 2014; Wolke & Lereya, 2015; Moore et al., 2017). For example, adolescents who develop strong peer support networks and engage in extracurricular activities may gain important social and interpersonal skills that facilitate successful transitions to higher education or stable employment (e.g., Bowers et al., 2014). In contrast, adolescents who experience peer rejection, bullying, or social isolation may struggle with confidence and social competence, potentially hindering their ability to navigate key life decisions (Gini & Pozzoli, 2009; Wolke & Lereya, 2015; Moore et al., 2017). Furthermore,

individual mental health and wellbeing may vary among siblings and can have significant impacts on their future educational and occupational trajectories. Therefore, while there is some evidence linking adolescent mental health and wellbeing to educational attainment and adverse early labour market outcomes (Rodwell et al., 2018; von Simson et al., 2022), there exists a gap in understanding the longitudinal educational and employment routes leading to these outcomes and how they interact within different family environments.

2.4. Transition to adulthood in the UK

Compared to other European countries, the British pattern of the transition to adulthood has been traditionally described as ‘accelerated’ with an early transition from school to work and diverging career paths heavily influenced by parental socio-economic background (Cavalli & Galland, 1995; Bynner, 2001, 2005). Less privileged youth often experienced rapid school-to-work transitions (“fast-track”), while young people from more advantaged backgrounds typically pursued higher education (“slow-track”). The existence of rapid school-to-work pathways can be traced back to the historical demand for unskilled youth in labour-intensive industries in Britain, allowing young people to enter the labour market directly after school (Ashton et al., 2016; Maguire & Maguire, 1997). Economic shifts toward technological industries have made direct school-to-work transitions challenging without acquiring additional qualifications. Consequently, the rate of participation in education in Britain has gradually increased since the early 1980s,¹ yet the share of students from more advantaged backgrounds entering higher education has remained almost double that of students from lower socio-economic groups (Murphy et al., 2019).

Although institutional contexts shaping youth transitions have historically varied among developed countries (Cavalli & Galland, 1995; Quintini & Manfredi, 2009; Billari & Liefbroer, 2010), the economic uncertainties of the past two decades have led to widespread increases in youth unemployment, NEET rates, and temporary work contracts across nations (Jongbloed & Giret, 2022; Bosmans et al., 2023; Rouvroye & Liefbroer, 2023). Despite these shared challenges, the UK retains distinctive features in the accelerated school-to-work transition and the significance placed on full-time employment as a marker of adult status (Spéder et al., 2014; Pelikh & Rowe, 2024). Thus, compared to other European countries, the UK has a lower average age for completing education and a higher proportion of 16–19 year-olds in employment (Eurostat, 2015).

Previous literature has discussed the growing complexity and turbulence in early educational and employment pathways among recent cohorts in the UK and how observed inequalities relate to parental socio-economic background (Dorsett & Lucchino, 2014; Schoon & Lyons-Amos, 2016; Anders & Dorsett, 2017; Pelikh & Rowe, 2024). However, there is a limited understanding of which factors influence these trajectories within family and how they differ between siblings. In this paper, we specifically investigate how the interplay of family and sibling characteristics as well as individual adolescent experiences shape siblings’ EET in early adulthood.

3. Data and analytical strategy

3.1. Data

We used data from the UK Household Longitudinal Study (UKHLS, also known as Understanding Society; University of Essex, Institute for Social and Economic Research, 2023a). UKHLS is a nationally representative household survey which started in 2009 and sampled approximately 40,000 households in the United Kingdom at Wave 1,

¹ For more information on the institutional context and school-to-work transitions in the UK see Pelikh and Rowe (2024).

including a boosted ethnic minority sample. The study contains detailed information on a wide range of socio-demographic and health characteristics, including partnership histories, changes in education and employment, and attitudinal data. In the subsequent waves, the sample includes all adults who were part of the households recruited in Wave 1. This includes individuals who may have moved out of their original households but who were followed to a new household. Therefore, the study allows us to follow siblings from the same household longitudinally and create their EET between age 16 and 19, even after they leave the parental home. In UKHLS, all economic activity states could be reported retrospectively since the last interview (up to 9 spells in some waves), providing the opportunity to create employment and education histories for individuals who might have missed some waves. Only spells reported as primary economic activity were taken into consideration. Members of households between the ages of 10 and 15 are invited to fill out a youth questionnaire ('Youth Panel'), covering topics like personal values and attitudes, wellbeing, family relationships, and future expectations. When individuals reach the age of 16, they become eligible for their first adult interview ('rising 16s').² By linking the Youth Panel and the adult main dataset, the study uses a range of unique variables available in UKHLS (e.g., own educational aspirations and household characteristics), as well as the ethnic-minority boost, to understand multiple predictors driving differences in EET between siblings. 12 waves of data were available at the time the analyses were conducted.

3.2. Analytical strategy

To assess the similarity in EET at ages 16–19 between siblings (RQ1) and examine the contribution of compositional factors and parental background characteristics in shaping the trajectories (RQ2), we constructed three analytical samples. The first sample consists of sibling dyads. The second sample consisted of 'randomly matched unrelated dyads', created by randomly pairing each sibling with an unrelated individual. The third sample, 'conditionally matched unrelated dyads', was formed by pairing each sibling with an unrelated individual who shared three key socio-demographic characteristics: maternal education (low, medium, and high), family type (parents separated or together at age 15), and ethnicity (White British; Mixed; Indian/Pakistani/Bangladeshi; Black).³

We then employed a combination of sequence and cluster analysis to create a typology of EET at ages 16–19. We used the trajectory types as an outcome in a set of regression models using the three samples described above to establish the extent to which the siblings' trajectories are similar or different, and in which ways. As the conditional assignment effectively balances out the potential variability in observed parental background traits between sibling dyads and unrelated dyads, we then examined the contribution of compositional factors (i.e., age difference and sex composition) and parental characteristics to differences in trajectories among sibling dyads in comparison to conditionally matched unrelated dyads.

Finally, to explore the extent to which EET among siblings are shaped by individual early adolescent experiences (RQ3), we employed a series of regression models on an individual level using a sample

² On average, a significant proportion of 15-year-olds in the UKHLS, ranging from 75 % to 89 %, transition into the adult sample after reaching 16, as documented by Pelikh (2019). Notably, the vast majority (98 %) of these individuals have participated in the Youth Panel at least once (Ibid.).

³ Through matching each sibling can be paired to either someone unrelated to them in the sibling sample or to one of the individuals born in 1993–2002, who were interviewed in YP and for whom information on economic activity status was available for ages 16–19, but who had no siblings matching eligibility criteria for the study (or no siblings at all). Table A3 in the Appendix contains information on socio-demographic characteristics of this sample in comparison to the sibling sample.

containing only siblings. In the following sections, we explain in detail how we created the analytical samples and describe the methods used.

3.3. Sample selection

We began with identifying all sibling dyads enumerated in Understanding Society using the Family Matrix ($n = 44,461$). We then excluded dyads in which one or both siblings did not fill out the Youth Panel questionnaire completed at ages 10–15 ($n = 38,136$).⁴ Next, we excluded dyads in which we did not have the complete information on both siblings' economic activity status between ages 16 and 19 ($n = 5087$), leaving 1238 sibling dyad pairs in which both siblings were interviewed as adolescents and for whom we had available information on their economic activity status between ages 16 and 19. To be able to link early family circumstances shared between siblings we additionally excluded step, adopted and foster siblings ($n = 24$) as well as those with missing parents' IDs ($n = 5$). Finally, we also excluded three pairs in which one of the siblings was born in 2003 as this birth cohort mostly has not reached the age 19 by the end of the observation period in wave 12. The final analytical sample comprised of 1983 individuals born 1993–2002 from 926 families. Two to four siblings in these families met the sample selection criteria, corresponding to 1206 sibling dyads. Tables A1 and A2 in the Appendix contain detailed information on the reasons why some sibling dyads were not included in the main analyses ($N = 2583$) and how their main socio-demographic characteristics compare to dyads included in the sample.⁵

The matching generated a total number of 647,847 unrelated conditionally matched dyads and 5980,116 randomly matched dyads, duplicates excluded. Each sibling in the sibling dyads is matched at least six times to an unrelated young person sharing the same socio-demographic background characteristics. Hence, six iterations of a sample ($N = 3189$ dyads) containing sibling dyads ($N = 1206$) and conditionally assigned unrelated dyads can be possible ($N = 1983$). We pooled these samples together for the analyses. To ensure comparability, we also selected six random matches for each sibling from the randomly matched dyads, resulting in a similar number of observations to the conditionally matched dyads.

4. Methods

4.1. Sequence analysis

We employed sequence analysis to describe the EET at ages 16–19 among young people who were born in 1993–2002, who were interviewed in YP and for whom information on economic activity status is available for ages 16–19. In essence, sequence analysis considers individual life course as a chronologically ordered string of states. In our case, these are economic activity states experienced by young people between ages 16 and 19. The method aims to find comparable sequences of transitions between different states (such as, for example, transitioning from being a student to being employed full-time or transitioning from part-time employment to full-time employment) by measuring their dissimilarity and identifying a minimal cost through which the two sequences can be made more similar, based on optimal matching techniques. These techniques utilise insertion/deletion (indel)

⁴ One of both siblings in the excluded pairs were not eligible for the interview in the Youth Panel when first joined the study (i.e., aged 16 and above).

⁵ Due to the data availability, siblings included in the sample were more closely spaced (mean age gap of 2.6 years) compared to those who were not eligible for the analysis (mean age gap 7.0 years). Parents of siblings included in the analysis were more likely to be living together, with a higher proportion of mothers who achieved a high educational level. The sample included in the analysis was less ethnically diverse, with over 70 % of sibling dyads from White British origin.

or substitution operations to determine the level of dissimilarity between sequences (Abbott, 1995). Subsequently, the dissimilarity between each individual's trajectory is computed and utilised within a clustering algorithm to define representative trajectory categories.

Our study focused on individuals aged 16 who were in full-time education (completing secondary school) at the beginning of the observation period. Over time, we distinguished between seven economic activity states that young people could transition through: full-time employment (≥ 30 hours), part-time employment (< 30 hours), full-time student (including a small portion involved in governmental training), unemployment, economic inactivity (comprising those engaged in family care, sick, or disabled), parental leave, and self-employment (including cases from the UKHLS where working hours were unspecified).

To calculate the dissimilarity between individual trajectories, we applied the Dynamic Hamming Distance (DHD) measure. DHD accounts for the timing of transitions and produces a pairwise dissimilarity matrix among individuals (Lesnard, 2010). It achieves this by using time-varying substitution operations, which are derived from the transition rates between states in each month obtained from the real data. These substitution costs are then employed to estimate a dissimilarity matrix encompassing all individuals in our sample.⁶

In the next stage, the resulting dissimilarity matrix is employed in a clustering algorithm to generate representative trajectories. To determine an appropriate number of clusters, we adopted a two-stage approach. First, we scrutinised dendrograms generated through the application of Ward's hierarchical clustering algorithm to identify natural breakpoints in the data. Second, we computed the Studer et al. (2011) discrepancy measures for a range of sequences, namely pseudo F and pseudo R², to compare the quality of different cluster solutions.⁷ Based on the distance, size, and discrepancy parameters of these cluster solutions, we chose a four-cluster solution presented in the results section. A five-cluster solution suggested splitting the cluster which groups together individuals who spent a considerable amount of time out of the labour force from those who were mostly unemployed. Although these groups are substantively different, they signal the least favourable outcome associated with turbulent economic activity after finishing compulsory education, and for the purposes of our analysis were grouped together.

4.2. Regression analysis

Having categorised individual EET at ages 16–19, we employed a combination of binary and multinomial logistic regression techniques for two primary objectives. First, we employed binary regression to examine whether siblings belonged to the same cluster (outcome variable takes values "same" or "different"). To explore in which way the trajectories are similar or different and how they are associated with parental characteristics and siblings' composition, we utilised the combination of EET clusters within a dyad as an outcome variable in the multinomial regression analysis.⁸ Second, we utilised multinomial logistic regression to explore how various individual adolescent experiences, such as educational aspirations and family environment, were linked to the likelihood of following specific EET. To isolate individual

⁶ Given our study's three-year observation window for sequence analysis and the clear differentiation between final clusters, the results of the sequence and cluster analyses are robust across various distance measure specifications (results available upon request).

⁷ See Pelikh and Henderson (2024) for more detail.

⁸ We specified standard errors to be clustered on a family level. For unrelated dyads, a parental identifier for the member of a sibling sample served as a family identifier. Mother's ID was used as parental/family identifier in most cases as 21 % of the sample had a missing father's ID. In single father's families (~1 %), father's ID was used as parental/family identifier.

experiences from the influence of shared parental background, we additionally performed a regression analysis with family fixed effects. Each pathway served as an independent single outcome in these models.

4.3. Independent variables

4.3.1. Parental socio-demographic background

We used three characteristics to capture the parental socio-demographic background, which we employed to answer all three research questions. We used maternal education as a measure of the family's socio-economic context.⁹ We categorised maternal education into three groups: low (comprising compulsory school education, GCSE, or equivalent), medium (A-levels or equivalent), and high (degree or other higher). During the modelling phase, we merged the medium and low categories into a single category – less than higher – since the results for children with mothers falling into these two educational groups were comparable. To determine family type, we utilised the Marital and Cohabitation Histories dataset provided by Understanding Society (University of Essex, Institute for Social and Economic Research, 2023b). When parents had separated before both siblings in a dyad reached the age of 15, we coded the family type as "separated". To capture the experiences of children of mixed backgrounds more accurately, we employed ethnicity information collected directly from the children. We grouped these categories into four broader categories: White British, Mixed and Other, Black, Indian/Pakistani/Bangladeshi.¹⁰

4.3.2. Sibling factors

In order to examine how the composition of siblings contributes to explaining the similarities in EET at ages 16–19, we used information on sibling sex composition (whether they are of the same sex or mixed), age gap (less than two years, two to three years, or more than four years), sibship size¹¹ (two, three, four or more sibling in a family) and birth order (first, second, third or higher). These characteristics were found to play a crucial role in explaining sibling similarities across various life course trajectories, including educational aspirations and outcomes (e.g., Bu, 2016; Grätz et al., 2021). Additionally, we considered the composition of the cohort (1993–1997 and 1998–2002) in which siblings belonged, in order to address potential variations caused by

⁹ Around 21 % of our sample lacked paternal identification, and an additional 10 % of parents had separated before their children reached the age of 15. In almost all cases (99 %), children resided with their mothers. Therefore, incorporating information on the father's educational level would only be applicable to approximately two-thirds of our sample and may not significantly enhance the accuracy of capturing the parental background. We acknowledge that having a highly educated stepfather could influence children's outcomes, however, investigating the influence of stepparents' socio-demographic characteristics on children's educational outcomes is beyond the scope of this paper. Furthermore, there are compelling reasons to believe that maternal education and her involvement in her children's education exert a more substantial influence on their educational outcomes than paternal education (for examples and mechanisms see Dollaghan et al., 1999; Magnuson et al., 2009; Harding et al., 2015).

¹⁰ While we acknowledge that such grouping might obscure significant differences within these categories, the study's design constraints prevented us from further disaggregating these groups. However, our additional sensitivity analysis, which explored subgroups within the "Indian/Pakistani/Bangladeshi" category, provided similar results for these subgroups (results available upon request). Due to limitations in sample sizes, we also had to merge the "Mixed and Other" and "Black" groups in our regression analysis. We did not attempt to interpret findings for this combined group as it represents a diverse array of ethnicities without a clear and coherent identity. Therefore, our primary focus was on the larger and more distinct ethnic groups.

¹¹ To create the sibship size and birth order variables, we used information from mothers' fertility histories (and fathers' in case of single father households) collected in Waves 1 and 6 of Understanding Society to capture information on older siblings who were not enumerated in the study.

changes over time that might have affected some siblings but not others, such as fluctuations in the labour market. We also controlled for the twin status in the sibling dyad (71 pairs, 5.9 % of the sample).

Additionally, we used information on the quality of sibling relationships collected in the Youth Panel. Children were asked a series of questions that began with: "How often do any of your brothers or sisters do any of the following to you at home?". These behaviours included "hit, kick, or push you", "take your belongings", "call you nasty names" and "make fun of you". Respondents could select between four response categories: "never", "not much (1–3 times in the last 6 months)", "quite a lot (more than 4 times in the last 6 months)", "a lot (a few times every week)". Following these questions, children were also asked whether they themselves engaged in bullying behaviour towards their siblings. The same set of behaviours and response categories was used for these questions. We used a binary variable to identify siblings who responded "a lot" to any of these questions as potentially experiencing sibling conflict. Additional sensitivity analyses, including separate variables for sibling victimisation and sibling bullying, as well as using a continuous scale variable instead of categorical ones, did not yield further insights into our research questions (results available upon request).

4.3.3. Family environment

Family environment was captured through a range of questions asked in both children and parents. Children were asked about the quality of their relationship with their parents and the level of parental interest and support in their education. For the family support question, we categorised responses into two groups: "feeling supported in most or all aspects" and "feeling supported in some areas" or "not feeling supported" (combining the latter two due to the low occurrence of the "not feeling supported" answer). We also utilised information on the frequency of conflicts with either the mother or father and how often they engaged in conversations with their parents about significant matters. These variables were coded as occurring at least once per week or less than once per week. Additionally, we used information on how often parents expressed interest in their children's school performance and how frequently they attended parent's evenings at school. We categorised these responses into two groups: "always or nearly always" and "less than always."

For parents, we used information on the frequency with which they helped their children with homework and coded it into two groups: helped on at least a weekly basis or less than weekly. We also explored including a question on how important they thought it is that their children complete A-levels (or Highers, in the case of Scotland). However, due to our study's design and the data collection pattern for this question (which was asked in odd waves only for parents of children under 15), nearly 30 % of parents were not asked this question. Furthermore, the group of parents who expressed a lack of belief in the significance of continued education (at least one parent) comprised less than 4 % of the total sample preventing us from including it in the analysis. Instead, we looked how the interaction effect between maternal education and adolescents' own educational aspiration is associated with young people's EET.

4.3.4. Educational aspirations, mental health and wellbeing

To measure adolescent educational aspirations, we used data on whether adolescents expressed a desire to pursue further full-time education at a college or university after completing their current level of schooling. If their response was "yes," we categorised it as "intends to continue education", while all other responses were categorised as "no intention to continue education".

To capture adolescent mental health, we used the Strengths and Difficulties Questionnaire (SDQ) (Goodman et al., 1998). We used scores from four dimensions of SDQ: emotional symptoms, conduct problems, hyperactivity, and peer relationship problems. Each dimension was scored on a scale from 1 to 10. To identify individuals potentially experiencing issues in each of these domains, we used a cut-off at the

90th percentile of the scale scores, a method established by Goodman et al. (1998) and previously employed by various studies including He et al. (2013) and Smith et al. (2021). To capture adolescent wellbeing, we used data on life satisfaction, measured on a 7-point scale ranging from 1 (indicating very satisfied) to 7 (indicating very dissatisfied). To represent low wellbeing, we reverse-coded the scale and created a binary outcome, identifying individuals with scores below 4.

Since some of the individual variables were repeatedly measured for those aged 10–14 in Wave 1 of the Youth Panel, we selected data collected at age 15 (approximately for 80 % of the sample) or the closest available age. In line with findings from Croll (2010) and Berrington et al. (2016), we observed that the percentage of individuals expressing an intention to continue their education increased with age, while the proportion of adolescents reporting low wellbeing also rose with age, consistent with the findings reported by Knies (2022). To account for these age-related effects, we introduced an additional variable capturing the age at the time of the last interview.

Additionally, in our individual-level analyses, we included the country of residence (England, Wales, Scotland, Northern Ireland) to account for potential structural factors that could influence EET of young people. Table A4 in the Appendix contains details on descriptive statistics for each variable used in the individual-level analyses.

5. Results

5.1. Are education and employment trajectories (EET) at ages 16–19 more similar between siblings compared to unrelated peer dyads? (RQ1)

Fig. 1 presents index plots for four-cluster solution describing distinctive educational and employment trajectories at ages 16–19. Index plots represent individual sequences over time (i.e., each line represents one individual trajectory). All individuals start at age 16 being enrolled in full-time education (still at school; grey colour) and are followed for 36 months until they turn 19. Panel a) presents index plots and distribution of trajectories among individuals in the sibling sample. Panel b) presents index plots and distribution of trajectories among individuals who did not have a sibling for comparison but met the criteria to be considered for matching sample (described in Section 3.3). Percentages in brackets refer to the proportion of the overall sample following a particular trajectory.¹² The distribution of trajectories by cluster was relatively similar among two samples, with a slightly higher proportion of individuals in the sibling sample staying in education between ages 16 and 19.

Table 1 provides a summary of the average number of months spent in each state in four distinctive clusters. The largest cluster "in education" (44.7 %) refers to young people continuously in education between ages 16 and 19. "Turbulent" cluster describes the trajectories among young people who struggled to establish themselves in the labour market after finishing education, experiencing short spells of employment (less than four months, on average; Table 1), but largely being unemployed (around 6 months in total; Table 1) or out of labour force ("OLF"; around 3 months in total; Table 1). Despite the heterogeneity in the age at which young people have left education, this cluster signals a precarious pattern of not being able to make a stable transition to labour market which could have long-term negative effect on young people's careers. The two remaining clusters refer to young people who transitioned into the labour market either via a full-time employment (12.1 %) or part-time employment (20.2 %) route. These clusters could be different as transition to part-time employment might be masking a more turbulent transition into the labour market, as shown by Pelikh and Rowe (2024). However, as these trajectories cumulatively describe a pathway of getting labour market experience straight after school,

¹² The results were very similar if sequence analysis was performed separately on subsamples (results available upon request).

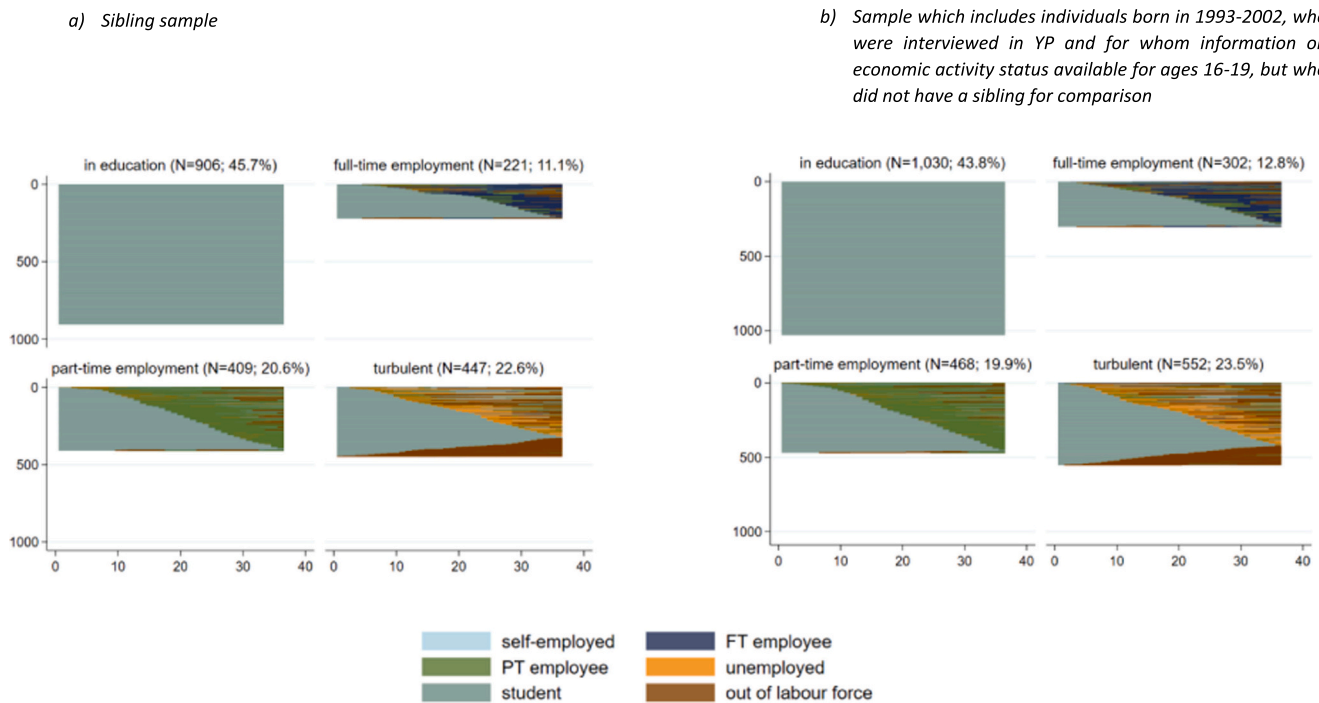


Fig. 1. Index plots for typology of education and employment trajectories, a) in the sibling sample; b) in the matching sample, individual level.

Table 1
Mean time spent in each economic activity state, by cluster (in months).

Cluster	Self-employed	FT	PT	Unemployed	Student	OLF	Total N (%)
1) In education	0	0	0	0	36	0	44.7
2) FT employment	0.34	11.06	0.58	0.89	22.79	0.35	12.1
3) PT employment	0.23	0.54	12.17	0.65	22.15	0.26	20.2
4) Turbulent	1.88	0.68	1.3	6.29	22.45	3.39	23.0
Total	0.52	1.6	2.83	1.69	28.48	0.88	4335 (100 %)

Source: UKHLS, Waves 1–12; own calculations.

Note: ‘FT’ stands for full-time employment; ‘PT’ stands for part-time employment; ‘OLF’ stands for ‘out of labour force’.

which is very different from continuously staying in education or experiencing more turbulent entry into labour market, to avoid small sample sizes, we grouped these clusters together in the analysis.

Next, we estimated the probability of both individuals to follow a similar EET at ages 16–19, i.e., belong to the same cluster identified by sequence analysis distinguishing between sibling dyads, randomly matched and conditionally matched unrelated dyads (Fig. 2). The probability of following the same trajectory was higher among the sibling pairs (0.48; 95 % CI (0.45–0.51) compared to both conditionally matched unrelated dyads (0.38; 95 % CI (0.37–0.39) and randomly matched unrelated dyads (0.35; 95 % CI 0.34–0.36), suggesting that particular patterns of economic activity behaviour at ages 16–19 tend to cluster within families. From the perspective of the intergenerational inequalities, the 13 percentage point difference between the siblings and the unrelated randomly matched dyads indicates a substantial familial influence on EET.

Next, we investigate in which way the trajectories are similar or different (Fig. 3). On average, siblings were more likely to follow a similar trajectory regardless of the type of the trajectory compared to unrelated dyads. For example, siblings were more likely to both stay in education or transition into labour market. However, they were also more likely to follow the turbulent pathway, highlighting the role of shared family background in perpetuating disadvantage.

5.2. What is the contribution of compositional factors and parental background characteristics in shaping the education and employment trajectories at ages 16–19 among siblings? (RQ2)

Next, to estimate the contribution of compositional factors and parental background characteristics in shaping the trajectories, we included an interaction effect in the multinomial logistic regression models between maternal education, family type, ethnicity, sex composition and age gap (one by one) and the variable indicating sibling or conditionally matched unrelated dyad. A full table with estimates from multinomial logistic regression models is presented in the Appendix Table A5.

Fig. 4 presents the results of the multinomial regression analyses on the role of parental background characteristics in shaping EET at ages 16–19. Overall, siblings from families where mothers were highly educated (panel a) and parents were living together (panel b) had higher probability of staying in education compared to the unrelated dyads from similar backgrounds. The differences in chances of staying in education by maternal education and family type were starker between the individuals in the sibling sample compared to unrelated dyads. Additionally, the differences in the probability of following a turbulent pathway were more pronounced by maternal education in the sibling

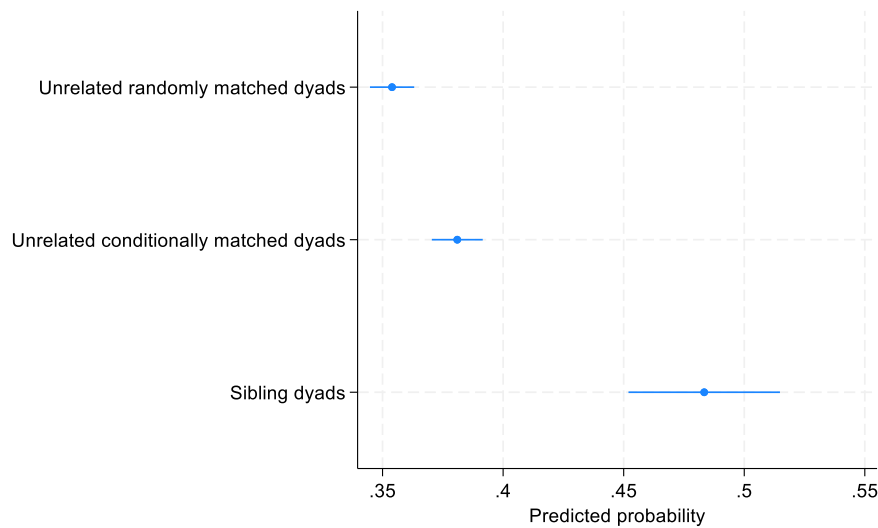


Fig. 2. Predicted probability of following a similar education and employment trajectory at ages 16–19, among sibling dyads, randomly and conditionally matched unrelated dyads. *Note:* The figure presents estimates with 95 % confidence intervals. The models are controlled for sex and cohort composition, and age gap. Standard errors are clustered on a family level. *Source:* UKHLS, Waves 1–12; own calculations.

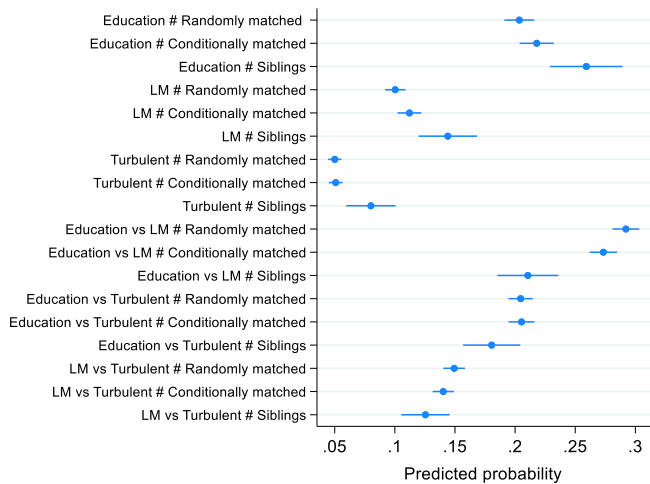


Fig. 3. Predicted probability of following a similar education and employment trajectory at ages 16–19, by type, among sibling dyads, randomly and conditionally matched unrelated dyads. *Note:* “Education” refers to those continuously staying in education at ages 16–19. “LM” stands for “Labour Market” and includes those who transitioned into full- and part-time employment. “Turbulent” refers to the cluster describing the trajectories of young people who struggled to establish themselves in the labour market after finishing education. The figure presents estimates with 95 % confidence intervals. The models are controlled for dyad’s sex and cohort composition, and age gap. Standard errors are clustered on a family level. *Source:* UKHLS, Waves 1–12; own calculations.

dyads compared to unrelated dyads.¹³ Collectively, the results presented in Fig. 4 suggest that it is not only the observed family characteristics that play an important role in shaping EET at ages 16–19, but also the unobserved family characteristics (i.e., values and practices) which affect all siblings’ trajectories in a family.

Overall, siblings of the same sex had higher probability of staying in education compared to the unrelated dyads from similar backgrounds. The result was true for both brothers and sisters dyads (not shown, available upon request). With regards to the age gap, the results were less conclusive with large overlapping confidence intervals which could be related to the fact that siblings in the sample are quite closely spaced (mean age gap of 2.6 years; Table A2 in the Appendix).

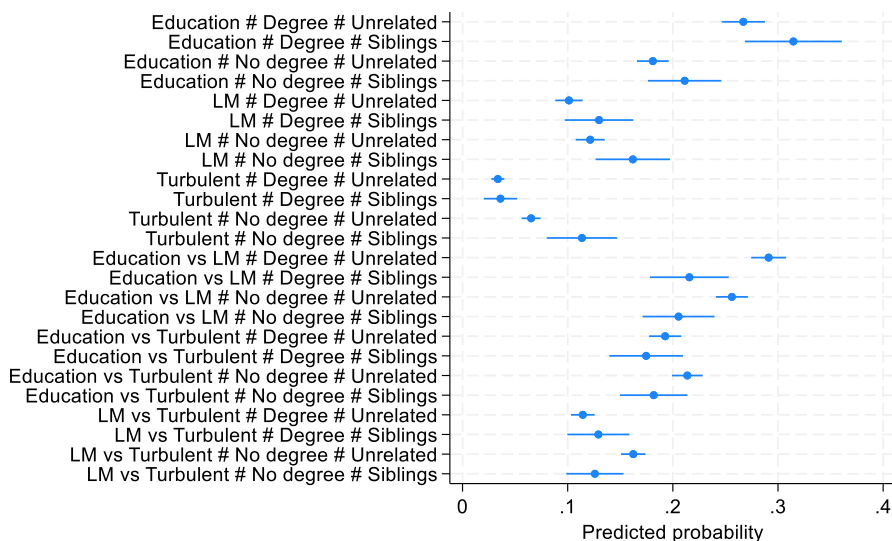
5.3. How are the education and employment trajectories at ages 16–19 among siblings shaped by individual early adolescent experiences? (RQ3)

In this section, we present the results of the individual-level analyses which investigated the role of individual early adolescent experiences in shaping education and employment trajectories at ages 16–19 among siblings. Table 2 presents estimates from multinomial logistic regression models.

With regards to the sibling factors, first-borns exhibited a greater likelihood of staying in education and were less likely to embark on the “Turbulent” trajectory. Siblings coming from larger families, characterised by four or more children, displayed a heightened probability to follow the “Turbulent” path. These trends held true for both male and female siblings in our dataset. In our examination of the quality of sibling relationships, we explored variables related to sibling bullying and victimisation. Surprisingly, these variables failed to explain any variations in EET between the ages of 16 and 19. We discuss the implications of these findings and measurement issues in the discussion section.

¹³ With regards to ethnicity, there was more variation among outcomes for the White British group among unrelated dyads compared to the sibling sample, which can be largely explained by the size of this group and related to it unobserved heterogeneity between individuals (for results refer to Pelikh and Henderson (2024)). Young people from Indian, Pakistani, and Bangladeshi origins were more likely to stay in education, with the results being similar between sibling and unrelated dyads. This result is in line with the recent trends of further and higher education participation among various ethnic groups reported by Lympopolou and Parameshwaran (2015).

a) Maternal education



b) Family type

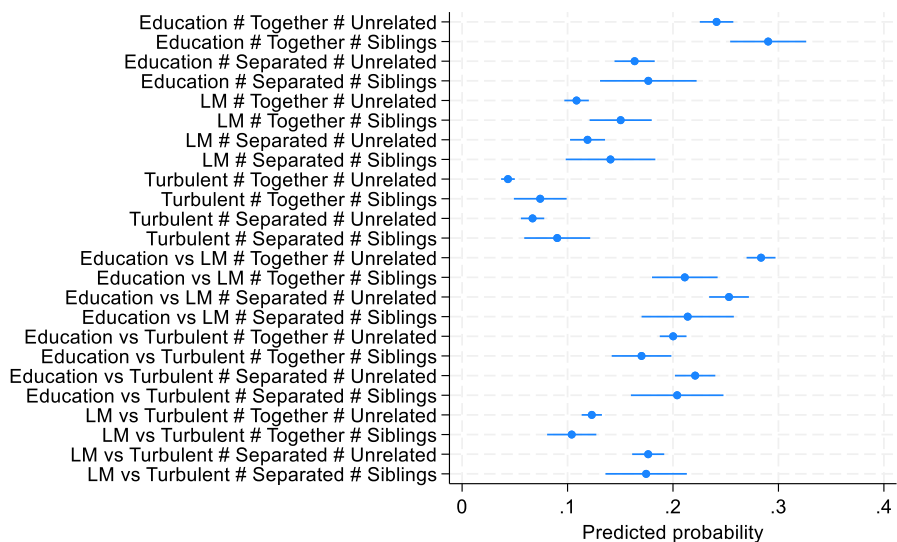


Fig. 4. Predicted probability of following a similar education and employment trajectory at ages 16–19, by type, among siblings and conditionally matched unrelated dyads in the Matched sample #1; a) by maternal education and b) family type. Note: “Education” refers to those continuously staying in education at ages 16–19. “LM” stands for “Labour Market” and includes those who transitioned into full- and part-time employment. “Turbulent” refers to the cluster describing the trajectories of young people who struggled to establish themselves in the labour market after finishing education. “Unrelated” refers to conditionally matched unrelated dyads. The figure presents estimates with 95 % confidence intervals. The models are controlled for siblings’ sex and cohort composition, and age gap. Standard errors are clustered on a family level.

Source: UKHLS, Waves 1–12; own calculations.

The family environment is among the key factors that played a significant role in explaining the 16–19 EET. Siblings who reported receiving substantial family support, as well as those whose parents consistently attended school evenings, exhibited the highest likelihood of remaining in education and the lowest likelihood of pursuing the “Turbulent” trajectory (as depicted in Fig. 5, panels a and b). Notably, these effects were magnified when each of these variables was analysed independently (results available upon request), emphasising the paramount importance of family relationships and parental engagement in influencing the educational outcomes of children. Surprisingly, we did not find any effects associated with variables related to the frequency of quarrels or communication with parents. Furthermore, parental interest in their children’s schooling, as reported by the children themselves, and the frequency of parental assistance with homework, as reported by

parents, also did not explain any differences in EET at ages 16–19 between siblings. We discuss the implications of these findings and measurement issues in the discussion section.

Positive educational aspirations (Fig. 6, panel a) predicted a higher probability of staying in education and have a protective effect against following the “Turbulent” pathway.¹⁴ The interaction effect between adolescent’s educational aspirations and maternal education (Fig. 6, panel b) additionally highlights the importance of young people’s own

¹⁴ The results are robust to various model specifications. We additionally tested whether excluding mental health and wellbeing variables would make a difference as they could be associated with educational aspirations, but found no differences in the results.

Table 2
Multinomial logit models of education and employment pathways at ages 16–19 among siblings, by type of pathway (ref – Staying in education).

Covariates	Labour market		Turbulent	
	RRR	p > Z	RRR	p > Z
<i>Sex (ref - male)</i>				
female	1.14	0.291	0.82	0.138
<i>Birth order (ref - first born)</i>				
second	0.99	0.918	1.45	0.027
third and higher	0.93	0.693	1.19	0.407
<i>Ethnicity (ref - White British)</i>				
mixed	0.48	0.005	1.12	0.695
Ind/Pak/Bang	0.22	< 0.001	0.45	< 0.001
Black	0.34	0.001	0.49	0.051
<i>Maternal education (ref - high)</i>				
medium/A-level etc	1.80	0.001	1.56	0.014
GCSE/School	1.04	0.787	1.22	0.233
Twins	1.15	0.567	1.58	0.106
<i>Family type (ref - together)</i>				
separated	1.22	0.164	1.54	0.006
<i>Sibship size (ref - two)</i>				
three	1.15	0.383	1.06	0.763
four+	1.05	0.803	1.86	0.003
<i>Country</i>				
Wales	0.81	0.463	0.83	0.565
Scotland	0.81	0.386	1.33	0.335
Northern Ireland	0.41	< 0.001	0.67	0.131
<i>Educational aspirations: (ref - no intention to intends to continue)</i>				
intends to continue	0.58	< 0.001	0.49	< 0.001
<i>Quarrelling with parents (ref - less than once per week)</i>				
at least once per week	0.98	0.890	1.04	0.815
<i>Talking to parents (ref - less than once per week)</i>				
at least once per week	1.08	0.553	1.26	0.108
<i>Family support (ref - supported in some things/not supported)</i>				
supported in most things	0.83	0.221	0.90	0.565
<i>Parents expressed interest in school performance (ref - less than once per week)</i>				
at least once per week	0.87	0.375	1.02	0.935
<i>Parental help with homework (ref - less than once per week)</i>				
at least once per week	0.95	0.759	0.88	0.488
not known	1.19	0.295	1.43	0.057
<i>Frequency of parental attendance of school evenings: (ref - less than always)</i>				
always	0.72	0.089	0.59	0.004
<i>Sibling relationships (ref - frequent conflict)</i>	0.89	0.332	1.00	0.984
<i>Low wellbeing (ref - good wellbeing)</i>	1.58	0.102	1.61	0.110
<i>SDQ emotional symptoms (ref - none)</i>	0.97	0.917	1.42	0.156
<i>SDQ conduct problems (ref - none)</i>	1.18	0.427	1.35	0.168
<i>SDQ hyperactivity/inattention (ref - none)</i>	1.36	0.099	1.35	0.119
<i>SDQ peer relationships (ref - no problems)</i>	0.69	0.047	1.13	0.488
<i>Age at interview < 15 (ref - 15)</i>	0.89	0.432	0.81	0.245
<i>Birth cohort 1998–2002 (ref - 1993–1997)</i>	1.15	0.282	1.45	0.010
Constant	1.94	0.051	0.53	0.110

Source: UKHLS waves 1–12; own calculations.

motivation as those who wanted to continue education were more likely to do so even if they did not come from highly educated families. However, those who were less inclined to continue their education were less likely to do so, even if they came from highly educated families.

Next, we assessed the impact of adolescent mental health on EET of siblings between the ages of 16 and 19. Our analysis reveals that internalising problems, encompassing emotional symptoms and peer problems, tend to be associated with a higher probability of siblings pursuing the "Turbulent" trajectory. Conversely, externalising problems, which include conduct issues and hyperactivity/inattention, appear to hinder the chances of staying in education. Additionally, we observed

that low wellbeing, as indicated by lower life satisfaction, was also linked to reduced chances of siblings staying in education. While these patterns align with existing literature (e.g., Smith et al., 2021), we are cautious in drawing firm conclusions due to the relatively small sample sizes.

To further investigate how differences in early adolescent experiences between siblings affected their EET, we employed linear probability models with family fixed effects (Table 3). The primary objective of these analyses was to disentangle individual experiences from the impact of shared within-family experiences. Consistent with our earlier findings, we observed that lower birth order and an intention to continue education are associated with a higher probability of staying in education. Conversely, higher birth order was associated with an increased likelihood of siblings embarking on a "Turbulent" trajectory. These results contribute to the growing evidence suggesting that birth order and family size may play an important role in the process of status attainment within the family in various contexts (Behrman & Taubman, 1986; Black et al., 2005; Conley & Glauber, 2006; Kalmijn & can de Werfhorst, 2016; Lehmann et al., 2018; Isungset et al., 2022b).

6. Discussion

We have explored the similarities and differences in education and employment trajectories at ages 16–19 among siblings born between 1993 and 2002 using rich data from the UK Household Longitudinal Study. A core aim of our research was to explore which factors shape the trajectories with a particular focus on the role of individual-level experiences and attitudes in early adolescence, rarely considered in siblings studies. Evaluating both shared and individual influences and looking at how siblings' paths converge or diverge over time provide a more comprehensive understanding of the process of status attainment within the family.

The study has two key findings. First, siblings exhibited a greater tendency to follow similar post-16 EET compared to unrelated young people highlighting the pronounced family of origin effect. The type of EET was highly determined by parental background characteristics. Siblings from highly educated mothers and two-parent households faced fewer barriers to accessing further education and securing smoother school-to-work transitions. In contrast, siblings from less privileged backgrounds may share exposures to scarcity of financial, social and cultural resources that constrain their options after finishing school and thus increase the chances of following more turbulent EET. These results align with prior research emphasising the lasting impacts of family of origin on intergenerational transmission of status, in our example, by shaping early life course trajectories (Blau & Duncan, 1967; Goldthorpe, 1996; Breen and Jonsson, 2005; Chetty et al., 2017; Lareau, 2003; Berrington et al., 2016; Karhula et al., 2019; Anderson et al., 2024). Notably, the associations with parental background characteristics were much stronger among siblings than among unrelated dyads from similar backgrounds suggesting that unobserved qualities (i.e., shared genetic background as well as attitudes and practices inherited through families) also likely play an integral part in the status transmission. Our analysis also showed that first-born children and siblings from smaller families had substantively higher chance of staying in education which most likely will lead to more favourable occupational and income outcomes in the future. Collectively, those findings highlight an important role of shared family environment in predicting both more and less favourable EET outcomes. Such evidence indicates that early-life origin factors stemming from the family context continue to profoundly shape later transitions. In particular, adverse childhood experiences and shared family disadvantage could reinforce perpetuating inequalities into young adulthood, as evidenced by higher probability of experiencing turbulent labour market transitions.

Second, this study highlighted that siblings often diverge onto different trajectories, pointing to the role of individual experiences in the process of status attainment within the family. Although coming

a) by family support

b) by frequency of parental attendance of school evenings

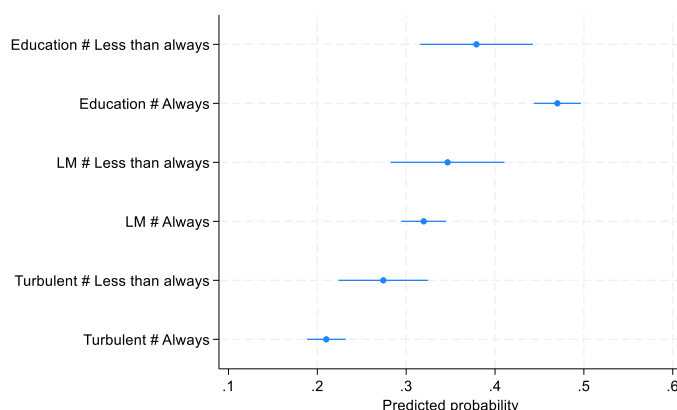
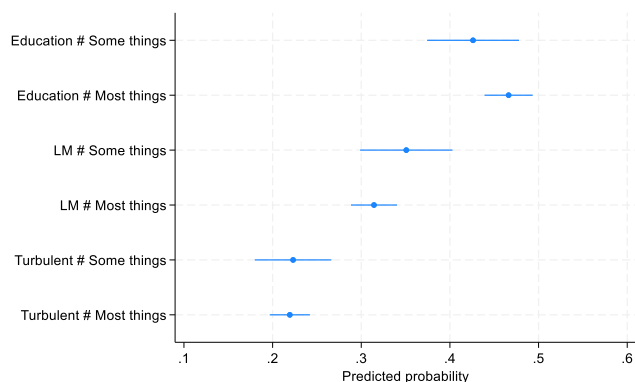


Fig. 5. Predicted probability of following a particular education and employment trajectory at ages 16–19, by type, among siblings; a) by family support; b) by frequency of parental attendance of school evenings. *Note:* The figure presents estimates with 95 % confidence intervals. The models are controlled for sex, birth order, family size, maternal education, family type, twin status, country of residence, own educational aspirations, frequency of conflicts and talking with parents, parental help with homework, sibling relationships, life satisfaction, mental health. Standard errors are clustered on a family level. *Source:* UKHLS, Waves 1–12; own calculations.

a) by own educational aspirations

b) by own educational aspirations and maternal education

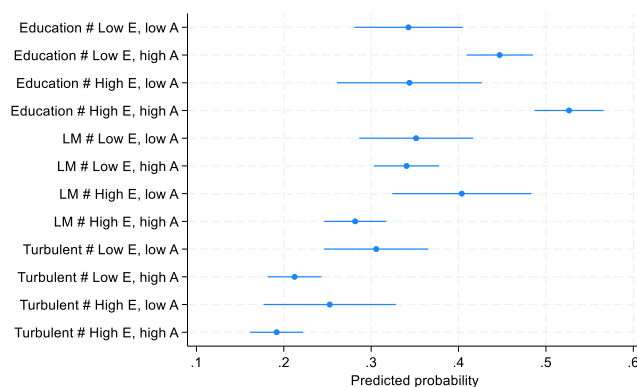
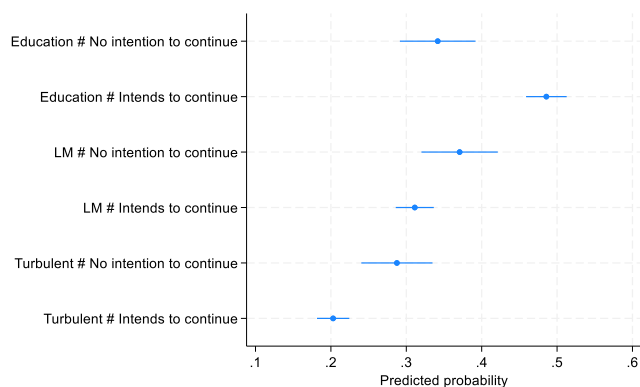


Fig. 6. Predicted probability of following a particular education and employment trajectory at ages 16–19, by type, among siblings; a) by own educational aspirations; b) by own educational aspirations and maternal education. *Note:* The figure presents estimates with 95 % confidence intervals. “Low E, low A” stands for “mother has less than higher education, young person does not intend to continue education”, “low E, high A” stands for “mother has less than higher education, young person intends to continue education”, “high E, low A” stands for “mother has higher education, young person does not intend to continue education”, “high E, high A” stands for “mother has higher education, young person intends to continue education”. The models are controlled for sex, birth order, family size, family type, twin status, country of residence, frequency of conflicts and talking with parents, family support, parental help with homework, frequency of parental attendance of school evenings, sibling relationships, life satisfaction, mental health. Standard errors are clustered on a family level. *Source:* UKHLS, Waves 1–12; own calculations.

from the same family environments, siblings may form differing aspirations and expectations (Conger & Little, 2010; Her et al., 2023). Our results demonstrate that positive educational aspirations were significant predictors of remaining in education and avoidance of turbulent pathways among siblings, even after accounting for shared family background. The findings also highlight that beyond parental socio-economic traits, siblings’ perceptions of their family environment are one of the key predictors of their EET. In particular, siblings reporting higher levels of family support during adolescence exhibited a higher likelihood of staying in education between ages 16–19 and avoided turbulent transitions. This result emphasises the importance of feeling supported and encouraged within the home environment especially in adolescent years. Our data, however, does not allow us to make

firm conclusions with regards to the nature of family support as this could include both emotional and financial support. Indicators of adolescent mental health also emerged as significant factors tied to pathways followed by siblings. More specifically, externalising problems like conduct issues and hyperactivity were associated with reduced probabilities of staying in education. Internalising problems encompassing emotional and peer-related difficulties showed links to heightened risks of turbulent trajectories marked by precarious labour market entry. These patterns align with prior research demonstrating academic challenges among youth with behavioural issues and risks of unstable school-to-work transitions for those facing internal distress (Smith et al., 2021; Rodwell et al., 2018). However, the role of mental health in shaping divergences between siblings represents a novel contribution.

Table 3

Within-family fixed effects analysis of factors affecting education and employment trajectories at ages 16–19 among siblings.

Variables	Staying in education		Labour market		Turbulent	
	Coef.	P > t	Coef.	P > t	Coef.	P > t
Sex: females (ref - males)	0.022	0.481	0.026	0.377	-0.048	0.079
Birth order (ref - first)						
second	-0.082	0.003	-0.008	0.770	0.089	< 0.001
third and higher	-0.134	0.004	0.057	0.194	0.077	0.061
Educational aspirations: intends to continue (ref - no intention to continue education)	0.097	0.018	-0.039	0.309	-0.057	0.109
Quarrelling with parents at least once per week (ref - less than once per week)	-0.030	0.404	-0.006	0.867	0.036	0.257
Talking to parents at least once per week (ref - less than once per week)	-0.032	0.347	-0.007	0.828	0.039	0.191
Family support: supported in most things (ref - supported in some things/not supported)	0.008	0.854	-0.032	0.413	0.025	0.501
Parental help with homework: always (ref - less than always)	0.043	0.321	-0.066	0.113	0.022	0.563
Frequency of parental attendance of school evenings: Always (ref - less than always)	0.033	0.529	-0.099	0.042	0.067	0.140
Sibling relationships (ref - frequent conflict)	0.013	0.709	0.020	0.558	-0.033	0.290
Low wellbeing (ref - not low wellbeing)	-0.102	0.191	0.110	0.135	-0.008	0.906
SDQ emotional symptoms (ref - none)	-0.033	0.592	-0.010	0.858	0.044	0.421
SDQ conduct problems (ref - none)	-0.067	0.217	0.054	0.289	0.013	0.790
SDQ hyperactivity/inattention (ref - none)	-0.020	0.677	0.013	0.779	0.007	0.862
SDQ peer relationships (ref - no problems)	-0.031	0.522	-0.020	0.671	0.051	0.235
Constant	0.412	< 0.001	0.478	< 0.001	0.110	0.111

Source: UKHLS, Waves 1–12; own calculations.

Note: Three columns refer to three separate analyses using linear probability models on a single trajectory outcome with family fixed effects.

Overall, our study highlights that early life course trajectories and the process of status attainment within the family are shaped by a complex interaction of family circumstances and individual experiences. We have used unique high-quality nationally representative longitudinal data rich in capturing a wide range of contextual variables, such as socio-demographic, employment, health, and attitudinal characteristics usually unavailable in sibling studies using register data. Moreover, the data was collected from both parents and young people directly which allowed us to investigate in more detail the role of those factors in shaping EET. We investigated the role of parental influence on EET both within and between families by comparing the similarity in EET between siblings to that of unrelated dyads, using randomly and conditionally matched samples from the general population. The key contributions of our study are that we were able to follow siblings from the early adolescence into early adulthood years allowing us to account for the individual early life experiences beyond the shared background/genetics background in explaining similarities and differences between siblings. In particular, our findings highlight the role of individual educational aspirations, perceived familial support and mental health in predicting individual EET. We acknowledge that some of the characteristics that we explored in RQ3 (i.e., sibling bullying and victimisation as well as frequency of engaging in conversations or arguing with parents) might also play an important role, despite not showing so in our analysis. We believe that the measures collected in the survey only partially capture the quality of sibling or family relationships. Further research with more robust measurements is required to fully evaluate how these relationships shape EET between siblings. Nevertheless, our exploratory analysis is one of the first attempts to go beyond assessing the role of family characteristics captured on the parental level by including self-reported data collected from each of the siblings independently.

Our study has some limitations. First, we acknowledge that less advantaged families have lower representation in our sample as some of the siblings in these families were lost to attrition and/or did not meet the inclusion criteria to be integrated in the analyses (Table A2 in the Appendix). This may lead to an underestimation of family environment effects among less advantaged groups of population. Second, we were unable to create EET sequences beyond age 19 due to the sample size issues resulting from the study design and cohort selection. This would

become possible in the future as more waves of data will become available and cohorts born in the early 2000s will reach their 20 s. Constructing longer sequences in the future would enable evaluating long-term outcomes of post-compulsory EET by combining it with data on the type of further and higher education and occupational trajectories. Lastly, we acknowledge that it difficult to interpret the main findings from these analyses as causal mechanisms as there could be there may be selection effects or endogeneity present. For example, certain unobserved characteristics could influence both individual experiences like educational aspirations and mental health as well as education and employment trajectories.

Our findings with regards to siblings exhibiting similarities in their post-16 education and employment trajectories, including following precarious pathways together, aligns with previous work by [Karhula et al. \(2019\)](#) using Finnish longitudinal data. Despite the notable differences between the Finnish and UK contexts, siblings in both settings appeared more likely to accompany one another in their transitions regardless of trajectory type compared to unrelated peers from similar backgrounds. This suggests that enduring impact of family background and unobserved dimensions like values and norms are likely generalisable as shared influences shaping siblings' pathways are observed even in societies with lower levels of socio-economic inequality. However, it is also important to consider how institutional variations across countries could modulate these relationships. For example, the UK's liberal market economy provides weak protections against precarious employment which may exacerbate similarities in disadvantaged siblings' turbulent transitions, especially during the early adulthood years. Overall, the parallels in siblings sticking together regardless of pathway speak to the fundamental role of family forces. More cross-national studies are warranted to investigate how institutional factors might dampen or amplify the risks tied to shared adversity in families. Understanding how family influences and institutional settings interact can help design policies and programmes to create more equitable socio-economic pathways across diverse settings.

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Declaration of Competing Interest

None.

Appendix

Table A1

Sibling dyads in 926 families in the analytical sample, which were not included in the analysis, by reason for exclusion

Type of reason	N	%	Reason for exclusion
1) Study design	123	3.2	Step, adopted, or foster siblings
2) Data availability	1295	34.2	One or both siblings were born after 2002 and have not reached age 19 by Wave 12; could join the sample in the future
3) Data availability	777	20.5	One of the siblings was not interviewed in Youth Panel, but information on economic activity status is available for ages 16–19 for both siblings (includes older cohorts who were not eligible for Youth Panel interview when enumerated, i.e. aged 16 and over and a small number of those who did not fill out the questionnaire at ages 10–15 despite being eligible)
4) Panel attrition	296	7.8	One of the siblings did not transition to the adult/main stage of UKHLS ('Rising 16 s'), but both were interviewed in Youth Panel
5) Data availability/panel attrition	116	3.1	One or both siblings were not interviewed in Youth Panel, and one or both were not followed into the main stage of UKHLS ('Rising 16 s')
Total (n) of sibling dyads not included in the analytical sample	2583	68.2	
Total (n) of sibling dyads included in the analytical sample	1206	31.8	
Total (n) of sibling dyads in 926 families in the study	3789	100	

Source: UKHLS, Waves 1–12; own calculations.

Note: The listed reasons might not be mutually exclusive as step, adopted or foster sibling dyads (n = 123; 3.2 %) could also have been excluded for other reasons (i.e., data availability or panel attrition).

Table A2

Socio-demographic characteristics of sibling dyads included and excluded from the analytical sample

Socio-demographic characteristics	Sibling dyads not included in the analytical sample		Sibling dyads included in the analytical sample	All
<i>Maternal education</i>				
Degree/other higher	725	518		1243
%	29.4	43.0		33.9
Medium/A-level etc	506	265		771
%	20.6	22.0		21.0
Low (GCSE/School)	1229	423		1652
%	50.0	35.1		45.1
<i>Family type</i>				
Parents together	1262	812		2074
%	51.3	67.4		56.6
Parents separated before any of the siblings in a dyad reached age 15	1198	394		1592
%	48.7	32.6		43.4
<i>Ethnicity</i>				
White British	1234	855		2089
%	50.2	70.9		57.0
Mixed or Other*	274	92		366
%	11.1	7.6		10.0
Indian/Pakistani/Bangladeshi	766	207		973
%	31.1	17.2		26.5
Black	186	52		238
%	7.6	4.3		6.5
Mean age gap between siblings, years (sd**)	7.0 (4.4)	2.6 (1.5)		5.6 (4.2)
Total	2460	1206		3666
	100	100		100

Source: UKHLS, Waves 1–12; own calculations. Note: * 'Mixed' refers to dyads where both siblings identify themselves as Mixed or where siblings reported discordant ethnicity (i.e. White British and Mixed). ** 'sd' stands for standard deviation.

Table A3

Socio-demographic characteristics of young people born in 1993–2002, who were interviewed in YP and for whom information on economic activity status available for ages 16–19

Socio-demographic characteristics	Individuals born in 1993–2002, who were interviewed in YP and for who info on economic activity status available for ages 16–19, but have no siblings [eligible for the study]	Sibling sample	Total
<i>Maternal education</i>			
Degree/other higher	914	886	1800
%	38.86	44.68	41.52
Medium/A-level etc	672	431	1103
%	28.57	21.73	25.44
Low (GCSE/School)	766	666	1432
%	32.57	33.59	33.03
<i>Family type</i>			
Parents together	1401	1363	2764
%	59.57	68.73	63.76
Parents separated before any of the siblings in a dyad reached age 15	951	620	1571
%	40.43	31.27	36.24
<i>Ethnicity</i>			
White British	1823	1454	3277
%	77.51	73.32	75.59
Mixed*	147	117	264
%	6.25	5.9	6.09
Indian/Pakistani/Bangladeshi	766	323	590
%	11.35	16.29	13.61
Black	115	89	204
%	4.89	4.49	4.71
<i>Cohort</i>			
1993–1997	1313	1045	2358
%	55.82	52.7	54.39
1998–2002	1039	938	1977
%	44.18	47.3	45.61
<i>Sex</i>			
Male	1090	950	2040
%	46.34	47.91	47.06
Female	1262	1033	2295
%	53.66	52.09	52.94
Total	2352	1983	4335
	100	100	100

Source: UKHLS waves 1–12; own calculations.

Table A4

Individual characteristics of individuals in the sibling sample

Covariates	N	%
<i>Birth order</i>		
first	685	34.54
second	793	39.99
third and higher	505	25.47
<i>Twins</i>		
singletons	1843	92.94
twins	140	7.06
<i>Sibship size</i>		
two	702	35.4
three	614	30.96
four+	667	33.64
<i>Country</i>		
England	1571	79.22
Wales	114	5.75
Scotland	126	6.35
Northern Ireland	172	8.67
<i>Educational aspirations</i>		
no intention to intends to continue	383	19.31
intends to continue	1533	77.31
missing	67	3.38
<i>Parental help with homework (reported by parents)</i>		
less than once per week	433	21.84
at least once per week	931	46.95
not known	619	31.22
<i>Quarrelling with parents</i>		
less than once per week	1267	63.89
at least once per week	593	29.9
missing	123	6.2

(continued on next page)

Table A4 (continued)

Covariates	N	%
<i>Talking to parents</i>		
less than once per week	738	37.22
at least once per week	1128	56.88
missing	117	5.9
<i>Family support</i>		
supported in some things/not supported	433	21.84
supported in most things	1434	72.31
missing	116	5.85
<i>Parents expressed interest in school performance</i>		
less than once per week	375	18.91
at least once per week	1486	74.94
missing	122	6.15
<i>Frequency of parental attendance of school evenings</i>		
less than always	283	14.27
always	1578	79.58
missing	122	6.15
<i>Sibling relationships</i>		
no frequent conflict	981	49.47
frequent conflict	876	44.18
missing	126	6.35
<i>Adolescent wellbeing</i>		
good	1871	94.35
low	105	5.3
missing	7	0.35
<i>SDQ emotional symptoms</i>		
no	1703	85.88
yes	162	8.17
missing	118	5.95
<i>SDQ conduct problems</i>		
no	1674	84.42
yes	191	9.63
missing	118	5.95
<i>SDQ hyperactivity/inattention</i>		
no	1605	80.94
yes	261	13.16
missing	117	5.90
<i>SDQ peer relationships</i>		
no	1609	81.14
yes	257	12.96
missing	117	5.90
<i>Age at interview < 15 (ref - 15)</i>		
less than 15	1591	80.23
15	392	19.77
<i>Total</i>	1983	100

Table A5

Multinomial logit models of education and employment pathways at ages 16–19 among siblings and conditionally assigned unrelated dyads, by type of pathway composition in a dyad (ref – Similar Education)

Variables	Similar LM		Similar Turbulent		Education vs LM		Education vs Turbulent		LM vs Turbulent	
	RRR	p > Z	RRR	p > Z	RRR	p > Z	RRR	p > Z	RRR	p > Z
<i>Sample type (ref - unrelated dyads)</i>										
sibling dyads	1.18	0.105	1.36	0.046	0.65	< 0.001	0.72	0.003	0.73	0.003
<i>Maternal education (ref - high)</i>										
medium	2.51	< 0.001	3.77	< 0.001	1.57	0.008	1.45	0.032	2.22	< 0.001
low	1.58	0.036	3.80	< 0.001	1.11	0.491	1.43	0.020	1.68	0.009
<i>Family type (ref - together)</i>										
separated	1.63	0.015	2.14	0.001	1.42	0.012	1.69	< 0.001	2.52	< 0.001
<i>Ethnicity composition (ref - both White British)</i>										
mixed	0.14	< 0.001	0.80	0.508	0.47	< 0.001	0.68	0.077	0.30	< 0.001
Ind/Pak/Bang	0.08	< 0.001	0.26	< 0.001	0.25	< 0.001	0.53	< 0.001	0.10	< 0.001
<i>Sex composition (ref - same)</i>										
mixed	0.95	0.720	1.11	0.524	1.13	0.228	1.09	0.440	1.08	0.531
<i>Age gap (ref - < 2 years)</i>										
3–4 yrs	1.53	0.011	1.44	0.073	1.27	0.079	1.39	0.019	1.27	0.145
> 4 yrs	1.34	0.236	1.55	0.154	1.43	0.067	1.07	0.717	1.12	0.640
<i>Cohort composition (ref - both 1993–97)</i>										
both 1998–02	1.31	0.240	1.87	0.019	1.47	0.024	1.66	0.005	2.03	0.001
mixed	0.83	0.359	0.87	0.589	1.03	0.864	1.17	0.320	1.20	0.323
Constant	0.45	< 0.001	0.08	< 0.001	1.13	0.443	0.59	0.001	0.39	< 0.001

Source: UKHLS waves 1–12; own calculations

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