Mixed ethnicity and behavioural problems in the Millennium Cohort Study

Afshin Zilanawala, Amanda Sacker, Yvonne Kelly

**ABSTRACT**

**Background** The population of mixed ethnicity individuals in the UK is growing. Despite this demographic trend, little is known about mixed ethnicity children and their problem behaviours. We examine trajectories of behavioural problems among non-mixed and mixed ethnicity children from early to middle childhood using nationally representative cohort data in the UK.

**Methods** Data from 16,330 children from the Millennium Cohort Study with total difficulties scores were analysed. We estimated trajectories of behavioural problems by mixed ethnicity using growth curve models.

**Results** White mixed (mean total difficulties score: 8.3), Indian mixed (7.6), Pakistani mixed (8.9) and Bangladeshi mixed (7.6) children had fewer problem behaviours than their non-mixed counterparts at age 3 (9.4, 10.1, 13.1 and 11.9, respectively). White mixed, Pakistani mixed and Bangladeshi mixed children had growth trajectories in problem behaviors significantly different from that of their non-mixed counterparts.

**Conclusions** Using a detailed mixed ethnic classification revealed diverging trajectories between some non-mixed and mixed children across the early life course. Future studies should investigate the mechanisms, which may influence increasing behavioural problems in mixed ethnicity children.

**INTRODUCTION**

Existing evidence shows ethnic variation for a variety of markers of health across the early life course. Ethnic inequalities may be a consequence of group characteristics or due to social/economic disadvantage. Very little research examines the consequences of mixed ethnicity status for children. Research on mixed ethnic differences in child behaviour is limited due to broad or homogeneous groups in data. Investigating children’s problem behaviours during the early life course is relevant because behavioural problems have been linked to subsequent academic achievement, adult economic well-being and crime.

Only one study investigated mixed ethnic differences in behavioural problems during early childhood and reported no link between mixed ethnicity and behavioural problems among 3-year-old children. Although evidence was based on a nationally representative cohort, a single, heterogeneous ‘mixed’ category was used. A London-based study (DASH) examining 11–13-year-old children found no difference in problem behaviours between mixed black Caribbean/white and their white counterparts. Both studies use a cross-sectional design, making it difficult to discern whether and how early potential differentials in behavioural problems emerge. Another paper using DASH data looked at growth trajectories to examine problem behaviours showed more favourable child behaviour profiles among adolescent (11–16 year olds) ethnic minority groups in the UK; however, authors did not disaggregate ethnic minority groups by mixed status.

Research has called for more robust evidence on mixed ethnicity children’s behavioural problems. Our analysis extends prior research in several ways. First, using a nationally representative cohort study, we estimate trajectories in behavioural problems from age 3 to 11, allowing us to detect declines or inclines in problem behaviours. Second, we use a detailed mixed ethnic classification, disaggregating ethnic groups accounts for the heterogeneity in socioeconomic, migratory and health profiles of these groups. Third, we compare the behavioural problems’ trajectories of mixed ethnicity cohort members with those of their non-mixed counterparts. This approach allows us to clarify whether children’s problem behaviours are sensitive to their mixed ethnic status.

**METHODS**

**Data**

The Millennium Cohort Study (MCS) is a nationally representative longitudinal study of 18,552 infants born in the UK between September 2000


Problem behaviours were assessed using the Strengths and Difficulties Questionnaire (SDQ), which was completed by the main respondent of each child. The SDQ is a widely used instrument for screening for psychiatric problems in children. The SDQ includes five subscales: emotional symptoms, conduct problems, hyperactivity, peer problems, and prosocial behavior. Each subscale consists of five items, rated on a 3-point scale (0 = not true, 1 = somewhat true, 2 = certainly true).

The total difficulties score (SDQ total) is the sum of the four behavioral domains (peer problems, conduct problems, hyperactivity, and emotional symptoms). A one-point change on the SDQ is considered to be clinically meaningful.

The SDQ total score is the main outcome of interest. The sample size at age 3 is 13,742; at age 5 is 13,555; at age 7 is 12,250; and at age 11 is 11,996.

The sample excludes children who were born as twins or triplets and respondents who are biological, step, adopted, or foster mothers. At ages 5, 7, and 11, children who had attention-deficit/hyperactivity disorder/Asperger syndrome or autism are excluded. The sample size at age 3 is 13,742; age 5 is 13,555; age 7 is 12,250; and age 11 is 11,996.

### Table 1: Problem behaviours by non-mixed and mixed ethnicity at ages 3, 5, 7 and 11

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### Results

We estimated growth curve models for children ages 3, 5, 7 and 11, allowing each child to contribute more than one observation. The pooled analyses had 16,330 children and 51,509 child-years. The sample was restricted to children for whom a parent report of problem behaviours was available and for whom ethnicity was observed. The sample size at age 3 is 13,742; at age 5 is 13,555; at age 7 is 12,250; and at age 11 is 11,996.

Our analyses included cohort member gender, age, sweep at interview, and the residual variance in the intercept and slope. We estimated means on problem behaviours using cross-sectional assessment as a measure of time and a quadratic term for time. We also estimated a quadratic term for ethnicity. The linear but not the quadratic term varied by ethnicity.

The sample was clustered at the electoral ward level to adjust for non-response and unequal probability of being sampled. All analyses are weighted to adjust for non-response and non-random sampling.

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### Discussion

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The sample excludes children who were born as twins or triplets and respondents who are biological, step, adopted, or foster mothers. At ages 5, 7, and 11, children who had attention-deficit/hyperactivity disorder/Asperger syndrome or autism are excluded. The sample size at age 3 is 13,742; age 5 is 13,555; age 7 is 12,250; and age 11 is 11,996.

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RESULTS

Mixed ethnicity and children’s problem behaviours

Table 1 presents mean problem behaviours by non-mixed and mixed ethnicity across the early life course. All sample sizes are reported in online supplementary appendix table 2. At age 3, most mixed ethnicity children had fewer problem behaviours compared with their non-mixed counterparts; White mixed, Indian mixed, Pakistani mixed and Bangladeshi mixed children had fewer problem behaviours than their non-mixed counterparts. Black Caribbean non-mixed and mixed children did not differ in their mean scores. Black African mixed children had slightly more problem behaviours compared with their non-mixed counterparts, but means were not statistically different (9.5 vs 9.2, respectively).

The patterns in problem behaviours are less consistent at age 11. White and Indian mixed children have fewer problem behaviours compared with their non-mixed counterparts. Pakistani, Bangladeshi and Black Caribbean mixed children have more problem behaviours than their non-mixed counterparts. Black African mixed children have fewer behavioural problems than their non-mixed counterparts. In order to closely scrutinise the increase and decrease in problem behaviours over time, we turn to growth curve models to more accurately distinguish differences between mixed ethnicity children and their counterparts.

Growth trajectories

Figure 1 displays the average fitted growth trajectories in problem behaviours by mixed status conditional on age and gender. Regression coefficients are in online supplementary appendix table 1 (model 1). The rate of growth in problem behaviours for white mixed children is significantly different from their non-mixed counterparts (b=0.075, se=0.037). Indian children experienced a decline in problem behaviours over time and trajectories do not differ between non-mixed and mixed Indian children. Pakistani and Bangladeshi mixed children experience rates of change in problem behaviours that are significantly different from those of their non-mixed counterparts. There were no differences in the rates of change between non-mixed and mixed black Caribbean children. Lastly, Black African non-mixed children experienced a decline in problem behaviours but their trajectories did not significantly differ from their mixed counterparts.

In sensitivity analyses, adjustments for equivalised household income decreased the mean differences in intercepts of child behaviour between mixed and non-mixed ethnic minorities. However, the magnitude and significance of trajectories were not sensitive to adjustments for income (see online supplementary appendix table 1, model 2).

DISCUSSION

In this paper, we extend our understanding of mixed ethnicity differences in behavioural problems by examining children’s trajectories beginning in early childhood and including a comprehensive mixed ethnic classification using nationally representative data. At age 3, we find white mixed, Indian mixed, Pakistani mixed and Bangladeshi mixed children to have fewer problem behaviours than their non-mixed counterparts. This finding is in stark contrast to previous research finding no differences in problem behaviours between a catch-all mixed group and non-mixed 3-year-old children. Growth curve models show that white

Figure 1  Predicted behavioural problems by mixed ethnicity.
mixed, Pakistani mixed and Bangladeshi mixed children experienced increases in problem behaviours compared with their non-mixed counterparts, most notably after age 7.

Our findings suggest that by age 11 some mixed children have more problem behaviours than their non-mixed counterparts. There are two possible explanations for this result. One, mixed ethnicity as a category may reflect not only social stratification processes but also shifts in identity and potential confusions between personal and social identities. The behavioural problems among mixed 11-year-old children in our data may very well reflect the strain from the nuanced nature of forming and maintaining a mixed ethnicity heritage. Second, we do not observe differences in problem behaviours between non-mixed and mixed black Caribbean children, but such differences are evident between non-mixed and mixed status among Pakistani and Bangladeshi children. This could be explained by the normative nature of interethnic partnerships among the black Caribbean community, while mixed partnerships are less common in South Asian communities. It could be that mixed partnerships yield less anxiety and strain, factors affecting child outcomes, when such interethnic families are more common within an ethnic group. Future studies should disentangle the influence of family context, psychosocial factors and problem behaviours among mixed ethnicity children.

The aim of this short report was to describe, for the first time, trajectories in problem behaviours for non-mixed and mixed ethnicity children in a nationally representative sample. White mixed, Pakistani mixed and Bangladeshi mixed children had significantly different growth trajectories compared with their non-mixed counterparts. Future research might examine the mechanisms, such as school, psychosocial and socio-demographic factors, behind these differences.

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Contributors All authors approved the final version of the article and have participated sufficiently in the work to take public responsibility for appropriate portions of the content. Specific author contributions as follows: YK generated the idea for the paper. AZ analysed the data based on a plan developed with YK and AS. AZ wrote the manuscript with YK and AS providing comments.

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Competing interests None declared.

Patient consent Obtained.

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