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Sibling Bullying: A Prospective Longitudinal Study of Associations with Positive and Negative Mental Health during Adolescence

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Abstract

It is well documented that sibling bullying is associated with poor mental health. The prospective longitudinal relationships between sibling bullying and both positive and negative mental health remain unclear. Additionally, the developmental course of negative mental health after sibling bullying involvement is yet to be investigated. Regression models were fitted to data from a UK-based Millennium Cohort Study (n=17,157, 48% female). Adolescents self-reported on sibling bullying in early- (age 11 years) and mid-adolescence (14 years) and on positive (general well-being and self-esteem) and negative mental health (internalising problems, externalising problems, psychological distress, and self-harm) in late adolescence (17 years). Primary caregivers also reported on internalising and externalising problems throughout adolescence. Sibling bullying involvement as a victim-only or bully-victim in early adolescence was associated with more symptoms of negative mental health and lower levels of positive mental health in late adolescence compared to those not involved in any sibling bullying. Being a bully-only was associated with externalising problems but no other aspect of mental health in late adolescence. Persistent sibling bullying victimisation in early- and mid-adolescence was associated with more symptoms of negative mental health and reduced positive mental health in late adolescence. Finally, the developmental course of externalising, but not internalising, problems during adolescence differed depending on the sibling bullying role in early adolescence. These findings suggest that, if causality can be established, sibling bullying in early adolescence likely affects the developmental course of externalising problems and has a detrimental effect both positive and negative mental health in late adolescence.

Key words: sibling, bullying, longitudinal, mental health, wellbeing, adolescence
Sibling Bullying: A Prospective Longitudinal Study of Associations with Positive and Negative Mental Health during Adolescence

Childhood and adolescence are particularly vulnerable periods for the deterioration of positive (e.g. wellbeing, self-esteem, life-satisfaction etc.) and negative mental health (e.g. mood, anxiety, conduct problems etc.). A quarter of all diagnosable mental health conditions start before by the age of 7 years and half by age 14 years (Kessler et al., 2005). Similarly, the levels of happiness, self-esteem, and wellbeing drop, on average, as children transition into adolescence and beyond (Larson et al., 2002; Uusitalo-Malmivaara, 2014). In recent years, problematic sibling relationships have been identified as a key modifiable factor that may play an important role in the development of mental health during adolescence (Dantchev et al., 2019).

Sibling bullying is surprisingly common. Up to half of all children are involved in some form of sibling bullying (Wolke et al., 2015) and it is associated with lower levels of positive mental health and higher levels of negative mental health (e.g., Sharpe et al., 2021; Toseeb et al., 2018; van Berkel et al., 2018). The nuances of the relationship between sibling bullying and mental health remain unclear. For example, it is unclear whether sibling bullying is also associated with lower levels of positive mental health in the longer term and, if so, whether there may be a dose-response of sibling bullying on positive mental health as has been found for negative mental health. In the current paper, data from a large population cohort study were used to investigate the longitudinal relationships between sibling bullying and, both, positive and negative mental health.

Sibling Bullying

Sibling bullying is widespread in the general population. It is defined as “any unwanted aggressive behaviour(s) by a sibling that involves an observed or perceived power imbalance and is repeated multiple times or is highly likely to be repeated; bullying may
inflict harm or distress on the targeted sibling, including physical, psychological, or social harm” (Wolke et al., 2015, p918). Half of all 11 year olds are involved in sibling bullying either as a perpetrator, a victim, or both (Toseeb et al., 2018). This decreases to approximately a third by the time young people reach the age of 14 years (Toseeb, McChesney, Oldfield, et al., 2020). Despite this, the severity of the problem is underestimated. Sibling bullying is perceived as less severe than peer bullying (Khan & Rogers, 2015) and is often normalised by family members, health professionals, and sometimes by the victims themselves (Caffaro & Conn-Caffaro, 2005; Kettrey & Emery, 2006; Omer et al., 2008). Unlike peer bullying, sibling bullying is not yet recognised as a public health concern, which is problematic given the emerging evidence of its negative correlates (Dantchev et al., 2019).

The circumstances and personal characteristics that make young people more vulnerable to sibling bullying are starting to emerge. A recent study by Toseeb, McChesney, Dantchev, et al. (2020) investigated the role of child-level individual differences, parenting and parental characteristics, and structural family factors in sibling bullying involvement. They found that child-level individual differences, such as sex, temperament, and emotional regulation abilities are the strongest predictors of sibling bullying involvement. Structural family characteristics, such as birth order and number of siblings, were also found to be important but to a lesser extent. Parenting and parental characteristics, such as harsh parenting, also had some effect on sibling bullying involvement, which echoes the findings from previous work in a separate sample (Dantchev & Wolke, 2019).

Positive and Negative Mental Health

Theoretically, there is debate around whether positive and negative mental health are distinct constructs or whether they represent opposing ends of the same continuum. The term mental health is used in this paper to broadly encompass both positive and negative mental
health. The World Health Organisation defines health as “a state of complete physical, mental, and social wellbeing and not merely the absence of disease or infirmity” (World Health Organisation, 1948), thus emphasising the importance of positive aspects of mental health rather than just the absence of negative mental health, which has been the focus of contemporary research. More specifically, hedonic wellbeing is concerned with the presence of positive affect (e.g. happiness and life satisfaction) rather than merely the absence of negative affect and eudaimonic wellbeing (e.g. self-esteem) includes striving for optimal functioning and self-actualisation (Westerhof & Keyes, 2010). Negative mental health refers to mental health difficulties, defined as “a health condition involving changes in thinking, emotion or behaviour (or a combination of these) and is associated with distress and/or problems functioning in social, work or family activities” (American Psychiatric Association, 2013). Examples of common childhood mental health difficulties are depression, anxiety, and attention deficit hyperactivity disorder. The two-continua model of mental health posits that positive and negative mental health are related but distinct constructs (Westerhof & Keyes, 2010). Individuals without mental health difficulties do not always have high levels of wellbeing and similarly those with low levels of wellbeing do not necessarily experience mental health difficulties. Recent evidence from a population-based study on adolescent samples support this assertion. Positive and negative mental health are only weakly related during adolescence and the correlates of the two are largely distinct highlighting the importance of considering them separately (Patalay & Fitzsimons, 2016).

The Relationship between Sibling Bullying and Mental Health

There is extensive evidence linking sibling bullying to negative mental health. Cross-sectional studies in the United Kingdom (e.g., Toseeb et al., 2018) and elsewhere in the world (Liu et al., 2020; Liu et al., 2021; Lopes et al., 2019; Tucker et al., 2013; van Berkel et al., 2018) demonstrate that sibling bullying is associated with higher levels of a wide range of
mental health difficulties. There is also evidence for prospective longitudinal effects. Sibling bullying in childhood is associated with internalising and externalising problems in early adolescence (Toseeb, McChesney, Oldfield, et al., 2020), psychotic disorder in late adolescence (Dantchev et al., 2018), and depression, self-harm, and suicidal ideation in adolescence (Bowes et al., 2014) and in young adulthood (Dantchev et al., 2019), even when controlling for pre-existing mental health difficulties. Therefore, the current evidence suggests that there is a relationship between sibling bullying and mental health difficulties, both, cross-sectionally and longitudinally. What remains unclear is how mental health difficulties develop after sibling bullying involvement and how this differs depending on the sibling bullying role (i.e., victim-only, bully-only, bully-victim).

The research evidence on the relationship between sibling bullying and positive mental health in contrast is scant. Two recent small-scale studies reported that higher levels of sibling bullying are associated with lower levels of life-satisfaction and self-esteem, but both relied on retrospective reports from adults about childhood sibling bullying (Gan & Tang, 2020; Plamondon et al., 2018). A larger population-based study in the United Kingdom reported cross-sectional associations between sibling bullying and life satisfaction, whereby higher levels of sibling bullying were associated with lower levels of life satisfaction in adolescence (Patalay & Fitzsimons, 2016). In the same cohort, a prospective longitudinal study reported associations between persistent sibling bullying at age 11 and 14 years and life satisfaction and self-esteem at age 14 years (Sharpe et al., 2021). Both studies are limited by their narrow focus on specific aspects of positive mental health (life satisfaction and self-esteem). Positive mental health is a multi-dimensional construct (Ruggeri et al., 2020) and so focusing on one aspect may limit understanding of the broader relationships with sibling bullying. Furthermore, there is so far no knowledge of the potential longer-term associations between sibling bullying and positive mental health, beyond the age of 14 years.
The Effect of Persistent Sibling Bullying Victimisation

The evidence regarding persistent sibling bullying victimisation is starting to emerge. To the best of the authors’ knowledge only one longitudinal study has investigated the relationship between persistent sibling bullying victimisation and mental health. Sharpe et al. (2021) found that adolescents who experienced persistent sibling bullying victimisation between age 11 and 14 years had more mental health difficulties, lower life satisfaction, and lower self-esteem at age 14 years compared to those who did not. The study reported here builds on this work by investigating whether persistent sibling bullying victimisation in early-to-mid adolescence is associated with positive and negative mental health in late adolescence (i.e., beyond age 14 years).

The Current Study

In the current study the prospective longitudinal associations between sibling bullying and positive (general wellbeing and self-esteem) and negative mental health (internalising and externalising problems, general psychological distress, and self-harm) were investigated separately. A number of research questions were addressed.

Research Question 1

To what extent are sibling bullying roles in early adolescence associated with positive and negative mental health in late adolescence? It was hypothesised that sibling bullying involvement at age 11 years will be associated with higher levels of mental health difficulties and lower levels of general wellbeing and self-esteem at age 17 years.

Research Question 2

Is there a dose-response effect of sibling bullying victimisation in early adolescence on positive and negative mental health in late adolescence? It was expected that young people who are persistently bullied by siblings (i.e., at both age 11 and 14 years) will have higher levels of mental health difficulties and lower levels of wellbeing and self-esteem at age 17.
years compared to those who are not bullied or only transiently bullied by siblings (i.e., either age 11 or 14 years).

**Research Question 3**

Do the developmental course of mental health difficulties (internalising and externalising problems) from early to late adolescence differ depending on the sibling bullying role in early adolescence? It was expected that there will be a difference in trajectories of mental health difficulties between age 11 and 17 between those not involved in any sibling bullying at age 11 and those involved in any sibling bullying (i.e., victim-only, bully-only, bully-victim).

**Method**

**Sample**

The Millennium Cohort Study (MCS) is an ongoing, multi-disciplinary study that follows the lives of approximately 19,000 children born in the United Kingdom between 2000 and 2002. See (Plewis, 2007) and [https://cls.ucl.ac.uk/cls-studies/millennium-cohort-study/](https://cls.ucl.ac.uk/cls-studies/millennium-cohort-study/) for full sampling details. These details are summarised here in brief. Families were identified as eligible for participation in the MCS using child benefit records, which were universal social security payments made to all families with children. Families were recruited to the study when the children were 9 months old and were subsequently followed-up at age 3 years, 5 years, 7 years, 11 years, and 14 years, and 17 years. Trained researchers administered surveys and conducted interviews in family homes at each wave of data collection. Parents answered questions about demographic characteristics (e.g., socioeconomic status indicators) and indicators of child health and well-being (e.g., physical activity, cognitive development, socioemotional well-being). During the latter stages of the study, young people themselves also completed self-report questionnaires and took part in assessments.
Participants for the current analysis ($N = 17,157$, 48% female) were taken from the MCS, which is a population-based cohort study representative of the United Kingdom. For the analyses reported here, only the first child per family was included and those without any siblings at either age 11 or 14 years were excluded.

**Measures**

**Sibling Bullying**

At age 11 and 14 years, the young people were asked two questions about sibling bullying: “how often do your brothers or sisters hurt you or pick on you on purpose?” (victimisation) and “how often do you hurt or pick on your brothers or sisters on purpose?” (perpetration). Responses were re-coded on to a six-point scale (0=never, 1=less often, 2=every few months, 3=approximately once a month, 4=approximately once a week, 5 = most days). The correlation between a single item scale, such as the one used here, and multi-item scales (e.g., Wolke & Samara, 2004) was calculated in an independent sample (Avon Longitudinal Study of Parents and Children (Boyd et al., 2013; Fraser et al., 2013)), and it was shown to be high (victimisation: $r = .91$, $n = 6,909$, $p < .01$; perpetration: $r = .85$, $n = 6,856$, $p < .01$). Thus, there is good evidence for the validity of the single item scales.

**Self-Report Positive Mental Health**

Adolescents self-reported two aspects of positive mental health when they were 17 years old.

**General wellbeing.** The short Warwick-Edinburgh mental wellbeing scale (Tennant et al., 2007) was used to measure general wellbeing in the preceding two weeks. Sample questions were “I’ve been feeling optimistic about the future” and “I’ve been thinking clearly”. Responses to the seven questions were coded on a five-point scale ($1 = none of the time, 2 = rarely, 3 = some of the time, 4 = often, 5 = all of the time$). These were then summed
and scaled in line with scoring guidelines so that higher scores indicated higher levels of wellbeing. The internal reliability for the scale was good (α= 0.83).

**Self-esteem.** The shortened five-item Rosenberg self-esteem scale (Rosenberg, 1965) was used to measures self-esteem. Sample questions were “on the whole, I am satisfied with myself” and “I am a person of value”. Responses to the five questions were recoded on to a four point scale (0= strongly disagree, 1 = disagree, 2 = agree, 3= strongly agree). These were then summed so that a higher score indicated higher levels of self-esteem. The internal reliability for the scale was excellent (α= 0.91).

**Self-Report Negative Mental Health**

Adolescents completed several well validated measures of mental health difficulties when they were 17 years old.

**Internalising and externalising problems.** The self-report strengths and difficulties questionnaire (SDQ; Goodman, 1997) was completed by the young person. Responses were given on a three-point scale (0= not true, 1 = somewhat true, 2 = certainly true). In line with the scoring guidelines (sdqinfo.org), four five-item subscales were created: emotional problems (e.g. “I get a lot of headaches, stomachaches, and sickness”), peer problems (e.g. “I would rather be alone than with other people”), conduct problems (e.g. “I get very angry and often lose my temper”), and hyperactivity and inattention (e.g. “I am easily distracted, I find it difficult to concentrate”). In line with scoring guidelines and previous literature (e.g., Winsper et al., 2020), the emotional and peer problems subscales were combined to create an internalising problems subscale and the conduct and hyperactivity subscales were combined to create an externalising problems subscale. For all subscales, higher scores indicated more mental health difficulties. The internal reliability for both scales was acceptable (internalising α= 0.74 and externalising α= 0.75).
Psychological distress. The Kessler 6 scale (Kessler et al., 2003) was used to measure non-specific psychological distress. The scale consists of six questions relating to symptoms of depression and anxiety that the young person may have experienced in the preceding 30 days. Responses were re-coded on to a five-point scale (0=none of the time, 1=a little of the time, 2=some of the time, 3=most of the time, 4=all of the time). Sample items were “during the last 30 days, about how often did you feel so depressed that nothing could cheer you up?” and “during the last 30 days, about how often did you feel nervous?”. Responses were summed so that higher scores were indicative of higher levels of psychological distress. The internal reliability for the scale was good (α = 0.86).

Self-harm. Young people were asked whether they had hurt themselves on purpose in the preceding year. They were shown six types of self-harming behaviours and asked to respond on a binary scale (0=no, 1=yes). The behaviours were: “cut or stabbed yourself”, “burned yourself”, “bruised or pinched yourself”, “taken an overdose of tablets”, “pulled out your hair”, and “hurt your self in some other way”. Responses were summed so that a higher score indicated higher levels of self-harm. The internal reliability for the scale was good (α =0.81).

Parent-Report Negative Mental Health

The primary caregivers (mostly the biological mother) completed a number of questionnaires about their child.

Internalising and externalising problems. The parent-report SDQ (Goodman, 1997) was completed by the primary caregiver about their child when the adolescent was 11, 14, and 17 years old. The parent-report version of the SDQ has identical questions to the self-report version described previously except the wording reflects its parent-report nature. As with the self-report version, emotional and peer problems items were combined to create an internalising problems subscale. The conduct and hyperactivity items were combined to
create an externalising problems subscale. For all subscales, higher scores indicated more symptoms of mental mental health difficulties. The internal reliability for both scales was at least acceptable (internalising problems $\alpha$: 0.76 (11 years), 0.77 (14 years), 0.78 (17 years) and externalising problems $\alpha$: 0.81 (11 years), 0.81 (14 years), 0.80 (17 years)).

**Covariates**

A number of covariates were included in the statistical models. These are described in this section.

**Pre-existing mental health difficulties.** The parent-report strengths and difficulties questionnaire (SDQ: Goodman, 1997) was completed by the primary caregiver when the child was three years old. This has been described previously. The internal reliability of the scale was at least acceptable (internalising $\alpha = 0.61$ and externalising $\alpha = 0.78$).

**Sex.** At the first wave of data collection, primary caregivers reported their child’s biological sex ($0 = \text{female}$, $1 = \text{male}$).

**Poverty.** Primary caregivers reported income from all sources (government benefits, employment etc.) when the young person was 11 years old, and this was used to calculate overall income. The OECD-modified scale was then used to standardise this overall household income (Hagenaars et al., 1994). Poverty was categorised as those families whose income was lower than 60% of median income level ($0 = \text{not in poverty}$, $1 = \text{in poverty}$).

**Statistical Analyses**

STATA/MP version 16.1 (StataCorp, 2019) was used for data analysis. Given the large sample size, a more stringent statistical threshold of $p<.01$ was used instead of the conventional $p<.05$. The analyses reported here was preregistered (https://osf.io/63q45). Some analyses, which were preregistered (research question 4 in the preregistration document), were removed from this study and will be included as part of a separate paper.

**Missing Data**
There was some sample attrition over time. In line with the recommended use of the MCS dataset, the data were assumed to be missing at random (Plewis, 2007). To maximize power, multiple imputation was used to deal with missing data. The proportions of missing data for each variable are shown in Table 1. The “mi impute” command with “chained” equations was used, which generated 50 imputed datasets. The command fills in missing values for multiple different variables with a set of possible values by using chained equations, a sequence of univariate imputation methods with fully conditional specification of prediction equations. Two imputation models were fitted, the first for research question 1 and 3 and the other for research question 2 (a single model was attempted but failed). To account for the application of disproportionate stratification and sample attrition all estimates were weighted to population level. Weights were applied according to the MCS data handling guide (Agalioti-Sgompou & Johnson, 2020). Where possible, the “mibeta” command was used to calculate estimated standardised β coefficients.

[Table 1]

**Research Question 1**

Mutually exclusive sibling bullying groups were created based on established cut-offs (Dantchev & Wolke, 2018, 2019; Wolke & Samara, 2004): victim-only: victimized at least once a week but not perpetrated; bully-only: perpetrated at least once a week but not victimized; bully-victim: both perpetrated and victimized at least once a week; uninvolved: does not meet the criteria for any of the other categories. To test whether sibling bullying at age 11 years is associated with self-report positive and negative mental health at age 17 years, six multiple regression models were fitted: internalising problems (1), externalising problems (2), psychological distress (3), self-harm (4), general wellbeing (5), and self-esteem (6). For each model, the predictor was entered as sibling bullying group (uninvolved, victim-only, bully-only, bully-victim) and the outcome was entered as one of the previously
mentioned measures of positive and negative mental health. Sex, poverty, and pre-existing mental health difficulties were entered as co-variates in all models.

**Research Question 2**

To determine whether there is a dose-response effect of sibling bullying victimisation at age 11 and 14 years on self-report positive and negative mental health at age 17 years, six multiple regression models were fitted: internalising problems (1), externalising problems (2), psychological distress (3), self-harm (4), general wellbeing (5), and self-esteem (6). For each model, the predictor was entered as the victimisation frequency (0 = *not bullied at least once per week at either age 11 or 14 years*, 1 = *bullied at least once per week at either age 11 or 14 years*, 2 = *bullied at least once per week at both age 11 and 14 years*). Initially, the reference category in all models was uninvolved. Therefore, the model estimates were for uninvolved vs transient and uninvolved vs persistent. The postestimation command “mi test” was used to compare the transient group with the persistent group. Sex, poverty, and pre-existing mental health difficulties were entered as co-variates in all models.

**Research Question 3**

To determine whether the change in mental health difficulties between age 11 and 17 years was different depending on the type of sibling bullying involvement at age 11 years, two multilevel mixed effects regression models were fitted. The outcome variable was entered as parent-report internalising (1) or externalising problems (2). The predictors in the fixed part of the model were the linear effect of age, sibling bullying group (uninvolved, victim-only, bully-only, bully-victim), and the interaction between sibling bullying group and linear effect of age. Anonymised participant number and the linear effect of age were included in the random part of the model. Sex, poverty, and pre-existing mental health difficulties were entered as co-variates in all models.

**Results**
Prevalence of Sibling Bullying

Descriptive statistics for the key variables are shown in Table 2. At age 11 years old, 48% of the population sample were involved in at least one type of sibling bullying (victim-only 15%; bully-only 4%; bully-victim 29%). The remaining 52% were not involved in any type of sibling bullying. At age 14 years old, 34% of the population sample were involved in at least one type of sibling bullying (victim-only 8%; bully-only 5%; bully-victim 21%). The remaining 66% were not involved in sibling bullying.

[Table 2]

Associations between Sibling Bullying and Positive and Negative Mental Health

To address research question 1, i.e., whether there is a relationship between sibling bullying roles (uninvolved, victim-only, bully-only, and bully-victim) at age 11 years and positive and negative mental health at age 17 years, a series of multiple regression models were fitted (Table 3). Victim-only. Those in the victim-only group at age 11 years had poorer outcomes across all measures. They had more internalising and externalising problems, higher levels of psychological distress and self-harm, and lower levels of wellbeing and self-esteem at age 17 years compared to those in the uninvolved group. Bully-only. Young people in the bully-only group at age 11 years had more externalising problems at age 17 compared to those in the uninvolved group. No other significant effects were observed for the bully-only group. Bully-victim. For those in the bully-victim group at age 11 years, as with the victim-only group, they fared worse on all measures at age 17 years compared to the uninvolved group. They had more internalising and externalising problems, higher levels of psychological distress and self-harming behaviours, and lower levels of wellbeing and self-esteem compared to those not involved in any sibling bullying at age 11 years.

[Table 3]
Therefore, the first hypothesis was partially supported. Being a victim-only and bully-victim in early adolescence was associated with poorer positive and negative mental health in late adolescence. Being a bully-only in early adolescence, however, was only associated with increased externalising problems in late adolescence.

The Effect of Transient and Persistent Sibling Bullying Victimisation

To address research question 2, i.e., whether there is a dose-response effect of sibling bullying victimisation at age 11 and 14 years on positive and negative mental health at age 17 years, several multiple regression models were fitted (Table 4). Those in the transient group (i.e., bullied at both age 11 and 14 years) had poorer outcomes on all measures of positive mental health and most measures of negative mental health (except for self-harm) compared to those in the uninvolved group. That is, adolescents who were victimised by siblings at either age 11 or 14 years (but not both) had more internalising and externalising problems, higher levels of psychological distress, and lower levels of general wellbeing and self-esteem at age 17 years compared to adolescents who were not victimised by siblings at all. Similarly, those in the persistent group had poorer outcomes on all measures of positive and negative mental health at age 17 years compared to those in the uninvolved group. That is, adolescents who were victimised by siblings at both age 11 and 14 years had more internalising and externalising problems, higher levels of psychological distress, more self-harming behaviours, and lower levels of general wellbeing and self-esteem at age 17 years compared to those not victimised by siblings at either age 11 or 14 years. Additionally, outcomes for the transient group were compared with the outcomes for the persistent group. Adolescents who were victimised by siblings persistently between age 11 and 14 years had poorer outcomes on all measures of positive and negative mental health at age 17 years compared to those who were victimised at either age 11 or 14 years. These findings suggest that there may be a dose-
response effect of sibling bullying victimisation on later positive and negative mental health thus supporting the second hypothesis.

[Table 4]

Sibling Bullying and the Trajectories of Mental Health Difficulties during Adolescence

To address research question 3, i.e., whether trajectories of mental health difficulties from age 11 to 17 years differ depending on sibling bullying roles at age 11 years, two multi-level mixed effects models were fitted (one for parent-report internalising problems and one for parent-report externalising problems, Table 5). Overall, boys had fewer internalising problems and more externalising problems than girls (main effect of sex). Those in poverty had more internalising and externalising problems compared to those not in poverty (main effect of poverty). Pre-existing mental health difficulties (i.e. internalising or externalising problems at age 3 years) were positively correlated with mean levels of internalising and externalising problems (main effect of pre-existing mental health difficulties).

[Table 5]

For internalising problems, being involved in sibling bullying as a victim-only and bully-victim at age 11 years (but not a bully-only), was associated with higher mean rates of difficulties compared to those not involved in any form of sibling bullying (main effect of sibling bullying involvement group). There was an increase in internalising problems between age 11 and 17 years (main effect of age) but this effect was not different depending on the sibling bullying group (sibling bullying involvement group X age interactions). That is, the type of sibling bullying involvement at age 11 years was associated with the mean level of internalising problems between age 11 and 17 years but not the trajectory of change in internalising problems between age 11 to 17 years (see Figure 1).

[Figure 1]
The model for externalising problems was slightly different. Adolescents who were involved in any type of sibling bullying at age 11 years (victim-only, bully-only, or bully-victim) had higher mean rates of externalising problems overall (main effects of sibling bullying involvement group). Externalising problems decreased over time (main effect of age) and this effect was different depending on the type of sibling bullying involvement at age 11 (sibling bullying involvement group X age interactions). The interaction terms for victim-only and bully-victim were significant, suggesting that the rate of decrease in externalising problems between ages 11 and 17 years was faster for the victim-only and bully-victim groups compared to the uninvolved group (see Figure 1).

**Discussion**

**Summary of Main Findings**

In this large population-based longitudinal cohort study, the nature of the relationships between sibling bullying and positive and negative mental health were investigated. It was found that sibling bullying (as a victim-only or bully-victim) is associated with more mental health difficulties and lower levels of general wellbeing and self-esteem, at age 17 years. A dose-response effect of sibling bullying victimisation was also observed. Persistent sibling bullying victimisation between age 11 and 14 years was associated with a wider range of poorer outcomes at age 17 years, for both positive and negative mental health, compared to transient or no sibling bullying victimisation. Overall, internalising and externalising problems between age 11 and 17 years were higher in those who were victims or bully-victims at age 11 years compared to those not involved in any sibling bullying. The rate of change in externalising, but not internalising, problems between age 11 and 17 years, differed depending on the sibling bullying role at age 11 years. These findings are discussed with reference to relevant literature in the subsequent sections.

**Sibling Bullying and Positive and Negative Mental Health**
The associations between sibling bullying and positive and negative mental health are, for the most part, similar. Sibling bullying involvement as a victim-only or bully-victim in early adolescence is associated with higher levels of negative mental health (i.e. mental health difficulties) and lower levels of positive mental health in late adolescence. These findings are in line with expectations and support previous work on the prospective relationship between sibling bullying and mental health difficulties (Dantchev et al., 2019; Dantchev et al., 2018; Toseeb, McChesney, Dantchev, et al., 2020). Similarly, sibling bullying involvement in early adolescence is associated with lower levels of positive mental health in late adolescence, which is in line with previous cross-sectional (Gan & Tang, 2020; Patalay & Fitzsimons, 2016; Plamondon et al., 2018) and longitudinal research (Sharpe et al., 2021). The study extends previous work by focussing on two separate aspects of positive mental health (general wellbeing and self-esteem) in a single investigation. This is important given that positive mental health is a multi-dimensional construct (Ruggeri et al., 2020). The findings suggest that sibling bullying is similarly associated with both general wellbeing and self-esteem. Furthermore, to the best of the authors’ knowledge, this is the first study to focus on the prospective longitudinal associations between sibling bullying and general wellbeing adding to the literature demonstrating the possible long term detrimental effects of sibling bullying during early adolescence.

The findings somewhat contrast previous cross-sectional work by Patalay and Fitzsimons (2016), who found that a much larger proportion of variance in negative mental health was explained by common individual, family, and society level factors than positive mental health. Their findings suggest that positive mental health may be much less malleable and less susceptible to external influences than negative mental health. There was no evidence to support this in the current study. The standardised effects sizes were similar for sibling bullying and positive (β = .05-.07) and negative mental health (β = .05-.10). This
suggests that, at least in the longer term, if indeed causal, the magnitude of the influence of sibling bullying on positive and negative mental health is similar. Although significant, the effect sizes of sibling bullying in different roles were small ($\beta < 0.1$). However, as they affect a large number of adolescents any primary prevention that could shift the effect of sibling bullying to diminish would be highly significant in reducing mental health problems and increasing positive mental health in the population of young people.

Being a perpetrator but not a victim (i.e. a bully-only) of sibling bullying in early adolescence appears to have little effect on mental health outcomes in late adolescence. Those who bully their siblings but are not bullied by their siblings in early adolescence have more externalising problems in late adolescence compared to those not involved in any sibling bullying, which is in line with expectations (e.g. Dantchev & Wolke, 2018). But on all other measures of positive and negative mental health, outcomes for pure bullies were comparable to those not involved in any sibling bullying. These findings were replicated in the longitudinal trajectory modelling of parent-report mental health difficulties (research question 3), whereby those in the bully-only group did not differ in their mean levels of internalising problems compared to those not involved in any sibling bullying. This lack of effect has been observed in some previous work (Toseeb et al., 2018) but not others (Liu et al., 2020; Toseeb, McChesney, Oldfield, et al., 2020). Perpetrators of sibling bullying (those who are not also victims themselves) have higher levels of social cognition (Dantchev & Wolke, 2019). Evidence from the peer bullying research suggests that bullies are less likely to have long term mental health problems (Copeland et al., 2013). Bullies have higher theory of mind skills, which allow them to understand others mental states and use this to their advantage (Sutton et al., 1999). More recent findings suggest that bullies are neither superior nor deficient in early stages of information processing but are less likely to have hostile attribution biases than victims (Guy et al., 2017). Indeed, social cognition skills, such as
theory of mind, are impaired in those with common mental health disorders (Bora & Berk, 2016). Therefore, sibling bullies may indeed have social cognition skills which allow them to manipulate sibling relationships and protect their own mental health. This relationship between sibling bullying, social cognition skills, and mental health should be investigated to further understand the nature of these inter-relations.

**Sibling Bullying and Trajectories of Mental Health Difficulties**

This is the first study to investigate how mental health difficulties develop after sibling bullying involvement and how this differs depending on the sibling bullying role (i.e. victim-only, bully-only, bully-victim). It was found that the patterns of change in parent-report mental health difficulties from early to late adolescence are dissimilar for internalising and externalising problems. The mean levels of internalising problems across early, middle, and late adolescence were higher in those who were victim-only or bully-victims compared to those not involved in any sibling bullying. Contrary to expectations, however, patterns of increase in internalising problems from early to late adolescence did not differ between sibling bullying roles (i.e. uninvolved, victim-only, bully-only, bully-victim). That is, the growth in internalising problems is the same between groups and the between group differences are stable. Internalising problems increase uniformly between early and late adolescence irrespective of sibling bullying involvement in early adolescence. This is not in line with expectations based on the developmental cascades framework (Masten & Cicchetti, 2010). The framework predicts that adverse experiences, such as sibling bullying, will have cumulative effects that snowball and cascade into other areas of functioning (like a downward spiral). For example, it might have been expected that sibling bullying leads to impaired development of social skills having an adverse effect on friendships, which are known to be protective against mental health difficulties (van Harmelen et al., 2016). The findings for internalising problems do not support this expectation. There is no evidence to
suggest negative developmental cascades for sibling bullying on internalising problems during adolescence. Rather the findings appear consistent that normative changes is internalising scores during adolescence are related to multiple dimensions of maturation in the hypothalamo-pituitary-gonadal axis but the levels are associated with sibling bullying experience (Angold & Costello, 2006).

For externalising problems, however, the decrease from early to late adolescence was faster for the victim-only and bully-victim groups compared to the uninvolved group. The magnitude of the between group differences appears to be larger in early adolescence than in late adolescence, although this was not tested directly (see Figure 1). That is, the change in externalising problems is not the same between groups and the between group differences are not stable. This suggests that, if indeed the relationship between sibling bullying and externalising problems is causal, then the negative effects of sibling bullying become less pronounced over time. Again, this is does not support expectations based on the developmental cascades framework (Masten & Cicchetti, 2010), whereby sibling bullying would lead to a negative cascade of adverse outcomes. One may speculate that sibling bullying victimisation builds some resilience allowing adolescents to develop strategies to manage externalising problems (Rutter, 2013) and so as they progress through adolescence, even though they consistently have more externalising problems, these problems decrease at a faster rate compared to those not involved in any sibling bullying.

**Strengths and Limitations**

A key strength of the analyses reported here is the use of data from a large representative sample. This allows for inferences to be made about what the results mean for the general population of the United Kingdom. Furthermore, well validated and widely used measures of mental health difficulties and wellbeing were used allowing for comparisons to be made to other published research. Mental health was reported by both parents and young
people themselves with similar findings controlling for shared variance of the same data source. Whilst these are considerable strengths of the study, a number of limitations should also be borne in mind. The parent-report measure of mental health difficulties may be limited. In terms of internalising problems, parents may be less aware and less able to accurately report how their child is feeling. Indeed, at age 17 years, the factor structure of the parent-report SDQ shows less than satisfactory fit (Murray et al., 2021). Furthermore, the peer problems subscale of the SDQ was included as part of internalising problems, even though the items may be indicative of non-specific symptoms that are generalisable to externalising problems.

Conclusions

Sibling bullying as a victim-only and bully-victim in early adolescence is associated with poorer positive and negative mental health in late adolescence. There is a dose-response effect of sibling bullying victimisation on subsequent positive and negative mental health. Meaning that as the persistence of sibling bullying victimisation increases so does the strength of the associations with mental health outcomes. The trajectories of mental health difficulties following sibling bullying are dependent on the type of bullying role and or type of mental health difficulty. If replicated using causal methods, these findings suggest that sibling bullying in early adolescence has a long-term effect on both positive and negative mental health in late adolescence. Prevention and clinical interventions aimed at reducing mental health difficulties and promoting positive mental health during late adolescence are likely to benefit from reducing sibling bullying in early adolescence.
Table 1

_Missing data and imputed values_

<table>
<thead>
<tr>
<th>Variable</th>
<th>Complete</th>
<th>Imputed N</th>
<th>Imputed %</th>
<th>Total</th>
</tr>
</thead>
<tbody>
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<td>Weighting variable</td>
<td>17,157</td>
<td>0</td>
<td>0%</td>
<td>17,157</td>
</tr>
<tr>
<td>Sex</td>
<td>17,157</td>
<td>0</td>
<td>0%</td>
<td>17,157</td>
</tr>
<tr>
<td>Poverty 11 years</td>
<td>11,313</td>
<td>5,844</td>
<td>34%</td>
<td>17,157</td>
</tr>
<tr>
<td>Sibling bullying 11 years</td>
<td>10,818</td>
<td>6,339</td>
<td>37%</td>
<td>17,157</td>
</tr>
<tr>
<td>Sibling bullying 14 years</td>
<td>9,518</td>
<td>7,639</td>
<td>45%</td>
<td>17,157</td>
</tr>
<tr>
<td><strong>Positive Mental Health</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General wellbeing 17 years</td>
<td>8,619</td>
<td>8,538</td>
<td>50%</td>
<td>17,157</td>
</tr>
<tr>
<td>Self-esteem 17 years</td>
<td>8,617</td>
<td>8,540</td>
<td>50%</td>
<td>17,157</td>
</tr>
<tr>
<td><strong>Negative Mental Health</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internalising problems 3 years (PR)</td>
<td>12,975</td>
<td>4,182</td>
<td>24%</td>
<td>17,157</td>
</tr>
<tr>
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<td>10,888</td>
<td>6,269</td>
<td>37%</td>
<td>17,157</td>
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<td>Internalising problems 14 years (PR)</td>
<td>9,557</td>
<td>7,600</td>
<td>44%</td>
<td>17,157</td>
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<tr>
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<td>7,952</td>
<td>9,205</td>
<td>54%</td>
<td>17,157</td>
</tr>
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<td>Externalising problems 3 years (PR)</td>
<td>12,974</td>
<td>4,183</td>
<td>24%</td>
<td>17,157</td>
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<td>Externalising problems 11 years (PR)</td>
<td>10,883</td>
<td>6,274</td>
<td>37%</td>
<td>17,157</td>
</tr>
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<td>Externalising problems 14 years (PR)</td>
<td>9,556</td>
<td>7,601</td>
<td>44%</td>
<td>17,157</td>
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<tr>
<td>Externalising problems 17 years (PR)</td>
<td>7,956</td>
<td>9,201</td>
<td>54%</td>
<td>17,157</td>
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<tr>
<td>Internalising problems 17 years</td>
<td>8,395</td>
<td>8,762</td>
<td>51%</td>
<td>17,157</td>
</tr>
<tr>
<td>Externalising problems 17 years</td>
<td>8,395</td>
<td>8,762</td>
<td>51%</td>
<td>17,157</td>
</tr>
<tr>
<td>Psychological distress 17 years</td>
<td>8,624</td>
<td>8,533</td>
<td>50%</td>
<td>17,157</td>
</tr>
<tr>
<td>Self-harm problems 17 years</td>
<td>8,384</td>
<td>8,773</td>
<td>51%</td>
<td>17,157</td>
</tr>
</tbody>
</table>

PR = parent-report
### Table 2

*Descriptive Statistics for Sibling Bullying and Mental Health Variables*

<table>
<thead>
<tr>
<th></th>
<th>Range</th>
<th>Age 11 years</th>
<th>Age 14 years</th>
<th>Age 17 years</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sibling Bullying Perpetration Frequency</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>-</td>
<td>2,782 (26%)</td>
<td>3,077 (32%)</td>
<td>-</td>
</tr>
<tr>
<td>Less often</td>
<td>-</td>
<td>2,838 (26%)</td>
<td>2,723 (29%)</td>
<td>-</td>
</tr>
<tr>
<td>Every few months</td>
<td>-</td>
<td>802 (7%)</td>
<td>522 (5%)</td>
<td>-</td>
</tr>
<tr>
<td>Approximately once a month</td>
<td>-</td>
<td>959 (9%)</td>
<td>747 (8%)</td>
<td>-</td>
</tr>
<tr>
<td>Approximately once a week</td>
<td>-</td>
<td>2,172 (19%)</td>
<td>1,502 (16%)</td>
<td>-</td>
</tr>
<tr>
<td>Most days</td>
<td>-</td>
<td>1,361 (13%)</td>
<td>947 (10%)</td>
<td>-</td>
</tr>
<tr>
<td><strong>Sibling Bullying Victimisation Frequency</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>-</td>
<td>2,414 (22%)</td>
<td>3,274 (35%)</td>
<td>-</td>
</tr>
<tr>
<td>Less often</td>
<td>-</td>
<td>2,255 (21%)</td>
<td>2,384 (25%)</td>
<td>-</td>
</tr>
<tr>
<td>Every few months</td>
<td>-</td>
<td>647 (6%)</td>
<td>446 (4%)</td>
<td>-</td>
</tr>
<tr>
<td>Approximately once a month</td>
<td>-</td>
<td>802 (7%)</td>
<td>701 (7%)</td>
<td>-</td>
</tr>
<tr>
<td>Approximately once a week</td>
<td>-</td>
<td>2,283 (21%)</td>
<td>1,514 (16%)</td>
<td>-</td>
</tr>
<tr>
<td>Most days</td>
<td>-</td>
<td>2,469 (23%)</td>
<td>1,210 (13%)</td>
<td>-</td>
</tr>
<tr>
<td><strong>Sibling Bullying Roles</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uninvolved</td>
<td>-</td>
<td>5,619 (52%)</td>
<td>6,334 (66%)</td>
<td>-</td>
</tr>
<tr>
<td>Victim-only</td>
<td>-</td>
<td>1,698 (15%)</td>
<td>735 (8%)</td>
<td>-</td>
</tr>
<tr>
<td>Bully-only</td>
<td>-</td>
<td>470 (4%)</td>
<td>463 (5%)</td>
<td>-</td>
</tr>
<tr>
<td>Bully-victim</td>
<td>-</td>
<td>3,031 (29%)</td>
<td>1,986 (21%)</td>
<td>-</td>
</tr>
<tr>
<td><strong>Positive Mental Health</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General wellbeing</td>
<td>7-35</td>
<td>-</td>
<td>-</td>
<td>22.47 (4.09)</td>
</tr>
<tr>
<td>Self-esteem</td>
<td>0-15</td>
<td>-</td>
<td>-</td>
<td>10.04 (3.21)</td>
</tr>
<tr>
<td><strong>Negative Mental Health</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internalising problems (PR)</td>
<td>0-19</td>
<td>3.18 (3.12)</td>
<td>3.71 (3.4)</td>
<td>3.73 (3.43)</td>
</tr>
<tr>
<td>Externalising problems (PR)</td>
<td>0-20</td>
<td>4.50 (3.60)</td>
<td>4.40 (3.60)</td>
<td>3.63 (3.31)</td>
</tr>
<tr>
<td>Internalising problems</td>
<td>0-20</td>
<td>-</td>
<td>-</td>
<td>6.89 (4.88)</td>
</tr>
<tr>
<td>Externalising problems</td>
<td>0-20</td>
<td>-</td>
<td>-</td>
<td>5.61 (3.30)</td>
</tr>
<tr>
<td>Psychological distress</td>
<td>0-24</td>
<td>-</td>
<td>-</td>
<td>7.17 (4.90)</td>
</tr>
<tr>
<td>Self-harm problems</td>
<td>0-6</td>
<td>-</td>
<td>-</td>
<td>.42 (.95)</td>
</tr>
</tbody>
</table>

Values are numbers before imputation. For categorical/ordinal variables values represent n (%). For continuous values represent mean (standard deviation). All variables were self-report except for those labelled as PR, which were parent-report.
Table 3

The Relationships Between Sibling Bullying at age 11 Years with Self-Report Positive and Negative Mental Health at age 17 years

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Uninvolved</th>
<th>Victim-Only</th>
<th>Bully-Only</th>
<th>Bully-Victim</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Unstandardised β [95% CI]</td>
<td>Standardised β</td>
<td>Unstandardised β [95% CI]</td>
</tr>
<tr>
<td>Internalising problems</td>
<td>Reference</td>
<td>.97 [.62, 1.33]***</td>
<td>.07</td>
<td>.51 [-.07, 1.08]</td>
</tr>
<tr>
<td>Externalising problems</td>
<td>Reference</td>
<td>.52 [.27, .77]***</td>
<td>.06</td>
<td>.99 [.56, 1.42]***</td>
</tr>
<tr>
<td>Psychological distress</td>
<td>Reference</td>
<td>.96 [.60, .131]***</td>
<td>.07</td>
<td>.80 [.17, 1.43]*</td>
</tr>
<tr>
<td>Self-harm problems</td>
<td>Reference</td>
<td>.12 [.05, .19]**</td>
<td>.04</td>
<td>.10 [-.04, .24]</td>
</tr>
<tr>
<td>General wellbeing</td>
<td>Reference</td>
<td>-.83 [-1.11, -.13]***</td>
<td>-.07</td>
<td>-.42 [-.93, .10]</td>
</tr>
<tr>
<td>Self-esteem</td>
<td>Reference</td>
<td>-.48 [-.72, -.23]***</td>
<td>-.05</td>
<td>-.10 [-.54, .34]</td>
</tr>
</tbody>
</table>

*p<.05, **p<.01, ***p<.001 (p<.05 is not interpreted as significant – see statistical analysis section). All models include sex, poverty, and pre-existing mental health difficulties as covariates. For the internalising problem pre-existing mental health difficulties were internalising problems at age 3 years. For the externalising problems model pre-existing mental health difficulties was externalising problems at age 3 years. For all other models, pre-existing mental health difficulties were entered as both internalising and externalising problems at age 3 years.
Table 4

The Relationship Between Transient and Persistent Sibling Bullying Victimisation at age 11 and 14 years with Self-Report Positive and Negative Mental Health at age 17 years

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Transient Uninvolved</th>
<th>Transient Standardised β</th>
<th>Persistent Unstandardised β [95% CI]</th>
<th>Persistent Standardised β</th>
<th>Transient vs Persistent</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internalising problems</td>
<td>.77 [.51, 1.03]***</td>
<td>.08</td>
<td>1.53 [1.15, 1.90]***</td>
<td>.11</td>
<td>F(2, 401.6)= 40.80***</td>
<td>.001***</td>
</tr>
<tr>
<td>Externalising problems</td>
<td>.64 [.46, .82]***</td>
<td>.09</td>
<td>1.27 [1.03, 1.51]***</td>
<td>.13</td>
<td>F(2, 453.6)= 60.65***</td>
<td>.001***</td>
</tr>
<tr>
<td>Psychological distress</td>
<td>.70 [.45, .97]***</td>
<td>.07</td>
<td>1.90 [1.52,2.25]***</td>
<td>.13</td>
<td>F(2, 478.9)= 55.27***</td>
<td>.001***</td>
</tr>
<tr>
<td>Self-harm</td>
<td>.07 [.01, .12] +</td>
<td>.03</td>
<td>.24 [.16, .32]***</td>
<td>.08</td>
<td>F(2, 447.2)= 16.32***</td>
<td>.001***</td>
</tr>
<tr>
<td>General wellbeing</td>
<td>-.61 [-.83, -.39]***</td>
<td>-.07</td>
<td>-1.37 [-1.67,-1.07]***</td>
<td>-.11</td>
<td>F(2, 438.1)= 46.11***</td>
<td>.001***</td>
</tr>
<tr>
<td>Self-esteem</td>
<td>-.28 [-.46, -.10]***</td>
<td>-.04</td>
<td>-.82 [-1.07, -.58]***</td>
<td>-.09</td>
<td>F(2, 392.4)= 22.07***</td>
<td>.001***</td>
</tr>
</tbody>
</table>

*p<.05, **p<.01, ***p<.001 (p<.05 is not interpreted as significant – see statistical analysis section). All models include sex, poverty, and pre-existing mental health difficulties as covariates. Values for all co-variates are shown in the supplementary. For internalising problems pre-existing mental health difficulties refers to internalising problems at 3 years. For externalising problems pre-existing mental health difficulties refers to externalising problems at 3 years. For all other models, pre-existing mental health difficulties refers to both internalising and externalising problems at 3 years.
Table 5

Sibling Bullying Roles and Trajectories of Parent-Report Mental Health Difficulties During Adolescence

<table>
<thead>
<tr>
<th>Sibling Bullying Involvement Group (Age 11)</th>
<th>Internalising Problems Unstandardised Beta [95% CI]</th>
<th>Externalising Problems Unstandardised Beta [95% CI]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uninvolved</td>
<td>0 [Reference]</td>
<td>0 [Reference]</td>
</tr>
<tr>
<td>Victim-only</td>
<td>.87 [.33, 1.42]***</td>
<td>1.30 [.80, 1.80]***</td>
</tr>
<tr>
<td>Bully-only</td>
<td>.65 [-.37, 1.68]</td>
<td>1.83 [.81, 2.85]**</td>
</tr>
<tr>
<td>Bully-victim</td>
<td>.90 [.42, 1.38]***</td>
<td>1.88 [1.41, 2.35]***</td>
</tr>
<tr>
<td>Age</td>
<td>.12 [.10, .14]***</td>
<td>-.09 [-.11, -.07]***</td>
</tr>
</tbody>
</table>

Sibling Bullying Involvement Group X Age Interactions

| Uninvolved X Age                           | 0 [Reference]                                   | 0 [Reference]                                    |
| Victim-only X Age                          | -.02 [-.06, .02]                                 | -.07 [-.11, -.04]***                              |
| Bully-only X Age                           | -.03 [-.10, .05]                                 | -.08 [-.15, -.01]*                                |
| Bully-victim X Age                         | -.03 [-.07, -.00]                                | -.10 [-.13, -.06]***                              |

Sex

| Girls                                      | 0 [Reference]                                   | 0 [Reference]                                    |
| Boys                                       | -.25 [-.37, -.13]***                             | .82 [.70, .95]***                                 |

Poverty

| No                                         | 0 [Reference]                                   | 0 [Reference]                                    |
| Yes                                        | .89 [.73, 1.05]***                               | 1.04 [.70, .95]***                                |

Pre-existing mental health difficulties

| .36 [.33, .38]***                           | .36 [.34, .38]***                                |

*p<.05, **p<.01, ***p<.001 (p<.05 is not interpreted as significant – see statistical analysis section).
Figure 1

The Developmental Course of Mental Health Difficulties after Sibling Bullying in Early Adolescence
Ethics Approval

The study was performed in accordance with the ethical standards as laid down in the 1964 Declaration of Helsinki and its later amendments. Ethical approval for data collection for Millennium Cohort Study (Connelly & Platt, 2014) was granted by the National Health Service Research Ethics Committee. Full details of the ethical process for the MCS are available at [https://cls.ucl.ac.uk/wp-content/uploads/2017/07/MCS-Ethical-Approval-and-Consent-2019.pdf](https://cls.ucl.ac.uk/wp-content/uploads/2017/07/MCS-Ethical-Approval-and-Consent-2019.pdf).

Declarations

Consent to Participate

Primary caregivers provided informed consent on behalf of their child, and young people themselves provided assent.

Consent to Participate

Primary caregivers provided informed consent regarding publishing their data.
References


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