


# A cross-sectional investigation into the role of intersectionality as a moderator of the relation between youth adversity and adolescent depression/anxiety symptoms in the community

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## Abstract

**Background:** Adolescents exposed to adversity show higher levels of depression and anxiety, with the strongest links seen in socially/societally disadvantaged individuals (e.g., females, low socioeconomic status [SES]), as well as neurodivergent individuals. The *intersection* of these characteristics may be important for the differential distribution of adversity and mental health problems, though limited findings pertain to the extent to which intersectional effects *moderate* this association.

**Methods:** Combined depression/anxiety symptoms were measured using the emotional problems subscale of the Strengths and Difficulties Questionnaire in 13–14-year-olds in Cornwall, United Kingdom in 2017–2019. In a cross-sectional design ( $N = 11,707$ ), multiple group structural equation modeling was used to estimate the effects of youth adversity on depression/anxiety symptoms across eight intersectionality profiles (based on gender [female/male], SES [lower/higher], and traits of hyperactivity/inattention [high/low]). Moderation effects of these characteristics and their intersections were estimated.

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**Results:** Youth adversity was associated with higher levels of depression/anxiety (compared to an absence of youth adversity), across intersectional profiles. This effect was moderated by gender (stronger in males;  $\beta = 0.22$  [0.11, 0.36]), and SES (stronger in higher SES;  $\beta = 0.26$  [0.14, 0.40]); with indications of moderation attributable to the intersection between gender and hyperactivity/inattention ( $\beta = 0.21$  [-0.02, 0.44]).

**Conclusions:** Youth adversity is associated with heightened depression/anxiety across intersectional profiles in 13–14-year-olds. The stronger effects observed for males, and for higher SES, may be interpreted in terms of structural privilege. Preliminary findings suggest that vulnerability and resilience to the effects of youth adversity may partially depend on specific intersectional effects. Importantly, the current results invite further investigation in this emerging line of inquiry.

#### KEYWORDS

ACEs, adversity, anxiety, depression, intersectionality, moderation

## 1 | INTRODUCTION

### 1.1 | Youth adversity and mental health problems

Youth adversity encompasses stressful and traumatic experiences during childhood or adolescence, occurring both within the home (e.g., domestic violence, problem drug/alcohol use in the family, often referred to as adverse childhood experiences [ACEs] [Felitti et al., 1998]), as well as outside the home (e.g., bullying-victimization) (Kalmakis & Chandler, 2014). This adversity is strongly linked to mental health difficulties throughout the life course (Bellis et al., 2019). For instance, 25%–40% of adult depression and anxiety cases are estimated to be attributable to adverse experiences in youth (Bellis et al., 2019). Moreover, exposure to youth adversity has proximal negative effects on mental health during childhood and adolescence (Scully et al., 2020). With evidence suggesting that half of all lifetime mental health problems emerge by adolescence (Caspi et al., 2020; Kessler et al., 2005), understanding the factors that may exacerbate or mitigate the effects of youth adversity on adolescent mental health is crucial. This knowledge can inform the development of more targeted clinical and community-level interventions during this critical developmental stage (Griner & Smith, 2006).

### 1.2 | Background characteristics

While youth adversity and mental health problems affect people across demographic divides, disadvantaged and/or minoritized societal and neurodivergent groups experience higher rates of youth adversity and elevated levels of mental health problems, compared to their counterparts. This includes, for example, individuals diagnosed with neurodivergent conditions, including autism and attention deficit hyperactivity disorder (Lai et al., 2019) and individuals with heightened levels of neurodivergent traits such as hyperactivity/inattention (Craig et al., 2020), those from lower socioeconomic status (SES) backgrounds (Walsh et al., 2019), females (Campbell et al., 2021), and members of underrepresented ethnic groups (Assini-Meytin et al., 2022).

The mechanisms linking these background characteristics with youth adversity and mental health problems are likely to be multifaceted and complex. For instance, in individuals diagnosed with and or self-identifying as neurodivergent, as well as those with heightened traits of neurodivergence – an individual's response *to* as well as *from* social/societal systems tailored to neurotypical functioning are likely to contribute to their experiences of adversity and mental ill health (Pantazakos & Vanaken, 2023). The specific mechanisms underlying these links are likely to differ to those underlying, for instance, ethnic marginalization and mental health problems (Williams et al., 2003), and observed gender differences in manifestations of mental health (Blakemore et al., 2010; Udry, 2000). Importantly, however, in the context of the current study – the collective findings strongly indicate that minoritized, disadvantaged, and neurodivergent individuals, are at heightened risk of experiencing adversity and mental health problems compared to their (socially/societally advantaged, and or neurotypical) counterparts.

### 1.3 | Multiple background characteristics and intersectionality

Further to these observations relating to background characteristics reflective of societal/social minoritization and neurodivergence in *isolation* – adolescents with *multiple* characteristics of disadvantage exhibit lower levels of wellbeing

compared to those with less disadvantage (Kern et al., 2020). Notably, in the context of the current study, because the *impact* of youth adversity on mental health problems has been found to be stronger in disadvantaged groups compared to their advantaged counterparts (Scully et al., 2020) – vulnerability to mental health problems in the face of youth adversity may be intensified in individuals with multiple characteristics of disadvantage (e.g., a neurodivergent female from a low SES background) (Ghavami et al., 2016).

Importantly, existing empirical findings highlight the *emergent* effects that may arise when considering the influence of multiple, interacting characteristics on youth adversity and mental health. For example, youth adversity was found to be more prevalent among nonimmigrant Hispanic compared to nonimmigrant White young people in the USA, with greater disparity among *high* compared to low SES families (Slopen et al., 2016). The findings from such empirical studies demonstrate the importance of considering markers of disadvantage, like low SES, in the context of other characteristics. However, only one study to our knowledge has investigated the extent to which the intersection of multiple characteristics *moderates the effect* of youth adversity on mental health problems in youth (Havers et al., 2024). This study reported suggestive evidence to indicate differential effects of youth adversity on change over time in depression/anxiety symptoms for males and females dependent on SES and traits of hyperactivity/inattention.

These emergent, *multiplicative*, effects can be contextualized in the broad analytic framework of intersectionality, originally developed in response to the specific systemic oppression encountered by *women of color* in the United States (Crenshaw, 1991). This framework posits that the *intersection* of an individual's characteristics (e.g., gender identity, ethnicity, SES, neurodivergence, sexual orientation) uniquely situates them within a complex system of structural power hierarchies, reflective of oppression and privilege (Cole, 2009). This intersection captures a social and societal position beyond disadvantage, or advantage, associated with individual characteristics (such as gender, or ethnicity) both in isolation and additively (Bowleg, 2012; Crenshaw, 1991). Importantly, as a critical period for the development of social identity (Lerner & Galambos, 1998), adolescence is a pertinent window for investigating associations between youth adversity and mental health in the context of intersectionality (Ghavami et al., 2016).

This inquiry is important, because investigation into the differential effects of youth adversity on adolescent mental health that may in part be dependent on an individual's intersectional position can contribute to developing a stratified framework for explicating the structural mechanisms that connect youth adversity and adolescent mental health problems. This in turn can inform the subsequent design of interventions tailored towards adolescents who are most vulnerable to the negative consequences of youth adversity, and importantly, contribute to an accumulation of evidence that can inform policy changes at a structural level (Hankivsky et al., 2014; Patil et al., 2018).

## 1.4 | Current study

Recognizing that the theoretical and judicial origins of intersectionality are rooted in gender and race (Crenshaw, 1991), the current study makes use of available measures in an existing cohort study to explore intersectionality conceptualized more expansively (Cole, 2009) in terms of gender (binary), SES, and traits of hyperactivity/inattention (as an index of neurodivergence) in a representative sample of adolescents living in a rural/coastal region of the United Kingdom (Hosang et al., 2023).

Of note, an emerging body of literature documents the advantages of utilizing a multilevel modeling framework for addressing research questions pertaining to intersectionality, in which intersectional identity is conceptualized as being a cluster, or strata-level characteristic (Evans et al., 2018; Merlo, 2018). Inherent in this framework from an empirical standpoint is the requirement for a reasonable minimum number of clusters, balanced with the number of within-cluster observations and model complexity, to estimate models with desirable properties (e.g., consistency, limited bias) (McNeish & Stapleton, 2016; Van de Schoot & Miočević, 2020). Because intersectionality in the current study was represented by a relatively low number of intersectionality profiles (i.e., 8; see *Methods*), we utilize a multiple group structural equation modeling framework—with the estimation of compound parameters specified to capture moderation attributable to intersectionality.

The current study addresses two research questions: (1) Does the effect of youth adversity on depression/anxiety *vary* across intersectionality profiles? It was hypothesized that the effect of youth adversity would vary across intersectionality profiles, and that the strongest effect would be observed for the profile reflecting multiple disadvantage (females, lower SES, high traits of hyperactivity/inattention). (2) Is the effect of youth adversity on depression/anxiety *moderated* by gender, SES, and hyperactivity/inattention, and their intersections? It was hypothesized that the effect of youth adversity would be moderated by these characteristics and their intersections, though no specific predictions were made regarding the direction of the intersectional moderating effects.

While the cross-sectional nature of the study design means that the temporal impact of youth adversity on mental health cannot be elucidated—importantly, the level of detail inherent in investigating moderation through an intersectional lens can, even in the absence of temporal precedence, shed light on the *conditions* under which youth adversity and mental health problems in adolescence are most (and least) strongly linked.

## 2 | MATERIALS AND METHODS

### 2.1 | Participants

Participants were drawn from the HeadStart Cornwall study (Deighton et al., 2019; Hosang et al., 2023). Year 9 pupils in all 31 state-maintained schools in Cornwall, United Kingdom, were invited to participate. Age data is not available for this sample, but the average age for Year 9 pupils in the United Kingdom is 13–14-years. The sample ( $N = 12,067$ ) comprises data pooled from collections undertaken in 2017 ( $N = 4,269$ ), 2018 ( $N = 4,194$ ), and 2019 ( $N = 3,604$ ). The final sample used in the main analysis was  $N = 11,707$  individuals with youth adversity and intersectionality profile data (detailed below).

All schools participated, except for one in 2017. Pupils assented ahead of participation at their school via an online portal. Parents were provided with information regarding the study ahead of data collection and consent was assumed unless children were opted out. Both pupil assent and parental consent was required for participation (Deighton et al., 2019).

### 2.2 | Measures

*Combined depression/anxiety symptoms* were measured using the 5-item self-report emotional problems subscale of the Strengths and Difficulties Questionnaire (SDQ) (items listed in Supplementary Table 7; note) (Goodman, 1997). The items capture usual experiences over the last 6 months (e.g., “I am often nervous in new situations”). Responses are made on 3-point rating scale (“Not true”, “Somewhat true”, “Certainly true”). Item-level data was used for the main analyses (see *Statistical Analyses*). Total scores (0–10) were used for the reporting of measured-variable level descriptive statistics.

*Youth adversity* was measured in two ways. First, through the SDQ peer problems subscale item on bullying-victimization: “Other children or young people pick on me or bully me”. Second, using local government data from the Supporting Families program (<https://www.gov.uk/government/publications/supporting-families-programme-guidance-2022-to-2025>). In this program, youth adversity is indicated where families experience any of the adversities listed in Supporting Information S1: Supplementary Materials 1 (including household substance misuse, household domestic violence, homelessness). Data regarding the number and type of local government recorded adversity was not available for this sample, therefore a binary variable was created to indicate the presence/absence of either bullying-victimization and or local government-recorded adversity.

*Gender* and *SES* data were sourced from School Census records. Gender was recorded as “female” or “male”. Free school meals eligibility was used to index “lower SES” or “higher SES”. *Hyperactivity/inattention* traits were measured using the SDQ hyperactivity/inattention subscale (five items). Total scores of 0–6 were used to indicate “low” levels, and 6–10 to indicate “high” levels, following scoring guidelines (Goodman, 1997).

Participants were classified into one of eight *intersectionality profile groups*. Group assignment was based on gender (female/male), SES (lower/higher), and traits of hyperactivity/inattention (high/low). For example, “female, lower SES, low hyperactivity/inattention”.

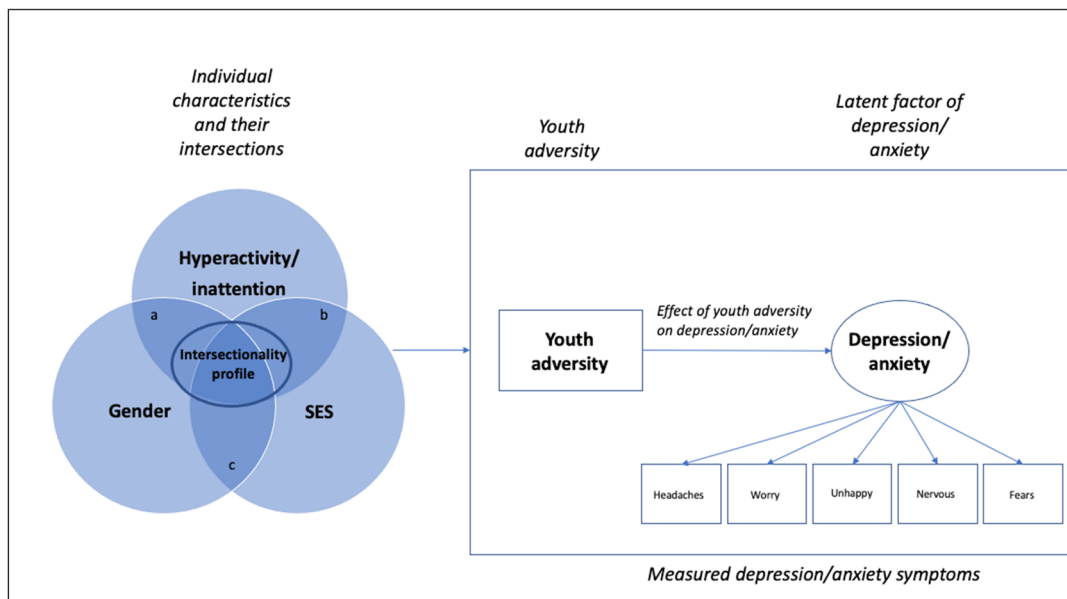
### 2.3 | Statistical analyses

Before the main analyses, confirmatory factor analysis was used to evaluate the measurement properties of depression and anxiety conceptualized as a common latent factor, indicated by the five SDQ emotional problems items. These analyses were conducted for the whole sample, and separately for each intersectionality profile group. Following this, measurement invariance analysis was conducted to assess the extent to which the measurement of depression/anxiety as a common factor is sufficiently consistent across intersectionality profile groups (Supporting Information S1: Supplementary Materials 2). Recommendations for modeling ordered categorical response data were used (Svetina et al., 2020; Wu & Estabrook, 2016).

To address the first research question, the constrained measurement model from the analysis above was imbedded in a multiple group structural equation model. The necessary adjustments for scaling are detailed in Supporting Information S1: Supplementary Table 9; note. In this model, the latent factor of depression/anxiety was regressed on the binary youth adversity variable, and on dummy variables representing cohort effects (chosen for comparison to the 2019 cohort) (see Supporting Information S1: Supplementary Materials 3: *Mplus* script; and Figure 1: schematic diagram).

A model with youth adversity regression slopes freely estimated for each intersectionality profile group was compared to a model where they were constrained to equality. A better fit of the unconstrained model would suggest, at an omnibus level, that the relation between youth adversity and depression/anxiety varies across intersectionality profiles. Wald statistics were used to evaluate the significance of the difference between the unstandardized regression estimates between intersectionality groups. The false discovery rate method was applied (at  $\alpha = .05$ ) for multiple testing correction (Benjamini & Hochberg, 1995).

Diagonally weighted least squares estimation was used to model the ordered categorical response data, using pairwise present data. Model fit was primarily assessed using the comparative fit index (CFI), root mean square error of



**FIGURE 1** Schematic diagram of multiple group structural equation model. SES, socioeconomic status. Intersectionality profile (depicted at the center of the Venn diagram) is the grouping variable in the multiple group model, where all parameters inside the box are estimated separately for each intersectionality profile (e.g., the profile of female, lower SES, low hyperactivity/inattention). Compound parameters are estimated, reflecting the extent to which the individual characteristics (e.g., gender) and their intersections (labelled with superscript letters in the diagram: a) gender by hyperactivity/inattention, b) hyperactivity/inattention by SES, and c) gender by SES) moderate the path from youth adversity to the depression/anxiety latent factor. The five items of the Strengths and Difficulties Questionnaire emotional problems subscale are specified as indicators of the latent factor of depression/anxiety. The model depicted schematically in this figure provides the framework for addressing the research questions detailed in the Methods section.

approximation (RMSEA), and standardized root mean square residual (SRMR). Acceptable fit was broadly indicated by CFI > 0.95, RMSEA < 0.08, and SRMR < 0.06 (Hu & Bentler, 1999; Marsh et al., 2004). To accommodate missing data (under the assumption that it was missing at random), the final model was rerun with multiply imputed item-level data and youth adversity data from 10 datasets, and the results are reported as sensitivity analyses.

To address the second research question, compound parameters of the weighted least squares parameter estimates from the final analysis model (from research question one) were estimated. These compound parameters were specified to approximate the extent to which the parameters reflecting the effect of youth adversity on depression/anxiety are moderated by the individual characteristics of gender, SES, and hyperactivity/inattention, and by *interactions* between these characteristics (reflecting intersectionality effects, e.g., gender by SES) (Figure 1). Standard errors and confidence intervals for these compound parameters were estimated from 1000 bootstrapped draws.

R software (version 4.2) was used to calculate descriptive statistics. *Mplus* (version 8.8) was used to conduct structural equation modeling.

### 3 | RESULTS

Table 1 details the sample characteristics. More than a third of participants (36.37%, 95% CI = 35.50, 37.25,  $N = 4,267$ ) experienced youth adversity. The sample-wide mean for measured (nonlatent) depression/anxiety symptoms was 4.15 (SD = 2.69).

Rates of youth adversity and mean depression/anxiety symptoms for the individual characteristics, and for each intersectionality profile, are shown in Supporting Information S1: Supplementary Tables 1 and 2, respectively. Both the *highest* prevalence of youth adversity and the *highest* mean for depression/anxiety symptoms were observed in the intersectionality profile of female, lower SES, and high hyperactivity/inattention. Rates of youth adversity were *lowest* for the intersectionality profile of female, higher SES, and low hyperactivity/inattention. The *lowest* mean for depression/anxiety symptoms was observed in the intersectionality profile of male, higher SES, and low hyperactivity/inattention.

The common factor model for depression/anxiety showed adequate fit for the whole sample, and for each intersectionality profile. The average weighted omega estimate across intersectionality profiles was  $\omega = 0.80$ , 95% CI = 0.80, 0.81. Model fit statistics and the reliability (omega) estimates derived from these models are reported in Supporting Information S1: Supplementary Table 3. In the analysis of measurement invariance, threshold and loading



TABLE 1 Descriptive characteristics.

| Variable  | N (% [95% CI])                |
|---|-------------------------------|
| <b>Gender</b>   |                               |
| Female  | 5934 (50.74% [49.84, 51.64])  |
| Male  | 6112 (49.26% [48.36, 50.16])  |
| <b>SES</b>  |                               |
| Lower   | 1507 (12.49% [11.90, 13.09])  |
| Higher  | 10559 (87.51% [86.91, 88.09]) |
| <b>Hyperactivity/inattention</b>                        |                               |
| High  | 3229 (27.32% [26.52, 28.13])  |
| Low   | 8590 (72.68% [71.87, 73.48])  |
| <b>Youth adversity</b>                                  |                               |
| Yes   | 4267 (36.37% [35.50, 37.25])  |
| No  | 7465 (63.63% [62.75, 64.50])  |
| <b>Measured depression/anxiety symptoms<sup>a</sup></b> |                               |
| Mean (SD)   | 4.15 (2.69)                   |
| Range (of 0–10)   | 0–10                          |
| Median (IQR)  | 4 (2–6)                       |

Note: Percentage of individuals with data available for each variable.

Abbreviations: IQR, interquartile range; SES, socioeconomic status.

<sup>a</sup>N = 11,841.

invariance of the common factor model across intersectionality profiles was supported (Supplementary Table 4). Parameter estimates from the constrained thresholds and loadings measurement model are included in Supporting Information S1: Supplementary Table 5.

### 3.1 | Research question 1: Does the effect of youth adversity on depression/anxiety vary across intersectionality profiles?

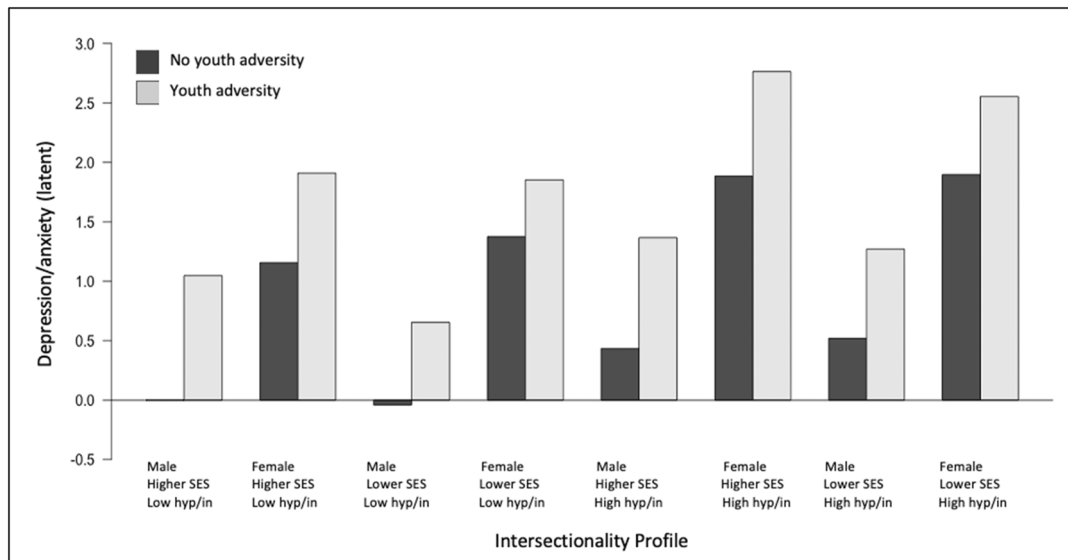
The unconstrained multiple group model demonstrated acceptable fit (Supporting Information S1: Supplementary Table 6). Across all intersectionality profiles, youth adversity was associated with higher average levels of depression/anxiety, compared to an absence of youth adversity (Figure 2).

At an omnibus level, the effect of youth adversity on depression/anxiety varied across intersectionality profiles, indicated by the better fit of the unconstrained model compared to the constrained model (Supporting Information S1: Supplementary Table 6). Supporting Information S1: Supplementary Table 7 shows the parameter estimates of the measurement model within the main structural equation model. Specifically, in terms of parameter estimates, the effect of youth adversity on depression/anxiety varied across intersectionality profiles (Supporting Information S1: Supplementary Table 8). The strongest effect of youth adversity was observed in the male, higher SES, low hyperactivity/inattention profile.

After adjusting for multiple testing, the only significant difference ( $p < .004$ ) between the parameter estimates reflective of the effect of youth adversity on depression/anxiety was observed between the male, higher SES, low hyperactivity/inattention group (where the effect was stronger) and the female, higher SES, low hyperactivity/inattention group (Wald statistic = 4.632,  $p < .001$ ) (Supporting Information S1: Supplementary Table 9).

### 3.2 | Research question 2: Is the effect of youth adversity on depression/anxiety moderated by gender, SES, and hyperactivity/inattention, and their intersections?

Table 2 shows the compound parameter estimates for evaluating moderation effects attributable to the individual characteristics of gender, SES, and hyperactivity/inattention, and their intersections. Moderating effects were detected for



**FIGURE 2** The effect of youth adversity on depression/anxiety by intersectionality profiles. SES, socioeconomic status. Latent depression/anxiety scaled relative to the intercept for the male, higher SES, low hyperactivity/inattention intersectionality profile (mean-centered at zero). Parameter estimates shown in Supporting Information S1: Supplementary Table 8.

**TABLE 2** Compound parameter estimates of the effect of youth adversity on depression/anxiety by intersectionality profiles.

| Parameter description                    | Effect of youth adversity on depression/anxiety |               |                            |               |
|--|---|---------------|----------------------------|---------------|
|  | Unstandardized estimate (SE)                    | 95% CI        | Standardized estimate (SE) | 95% CI        |
| <b>Weighted averages</b>                 |   |               |                            |               |
| Males                                    | 0.982 (0.039)                                   | 0.901, 1.053  | 0.938 (0.036)              | 0.865, 1.002  |
| Females                                  | 0.754 (0.041)                                   | 0.672, 0.835  | 0.705 (0.035)              | 0.639, 0.778  |
| Higher SES                               | 0.903 (0.032)                                   | 0.834, 0.970  | 0.861 (0.027)              | 0.809, 0.914  |
| Lower SES                                | 0.626 (0.075)                                   | 0.488, 0.756  | 0.558 (0.066)              | 0.433, 0.676  |
| Low hyperactivity/inattention            | 0.867 (0.033)                                   | 0.799, 0.936  | 0.851 (0.030)              | 0.794, 0.912  |
| High hyperactivity/inattention           | 0.874 (0.056)                                   | 0.756, 0.983  | 0.756 (0.045)              | 0.659, 0.841  |
| <b>Weighted main effects</b>             |   |               |                            |               |
| Gender (male - female)                   | 0.228 (0.052)                                   | 0.123, 0.323  | <b>0.215 (0.049)</b>       | 0.114, 0.36   |
| SES (higher - lower)                     | 0.277 (0.079)                                   | 0.144, 0.420  | <b>0.262 (0.075)</b>       | 0.136, 0.397  |
| Hyperactivity/inattention (low - high)   | -0.007 (0.060)                                  | -0.123, 0.119 | -0.006 (0.057)             | -0.115, 0.120 |
| <b>Weighted interaction effects</b>      |   |               |                            |               |
| Gender × SES                             | 0.064 (0.158)                                   | -0.234, 0.370 | 0.060 (0.150)              | -0.221, 0.356 |
| Gender × hyperactivity/inattention       | 0.221 (0.120)                                   | -0.023, 0.470 | 0.209 (0.113)              | -0.019, 0.442 |
| SES × hyperactivity/inattention          | 0.110 (0.177)                                   | -0.230, 0.469 | 0.104 (0.167)              | -0.219, 0.449 |
| Gender × SES × hyperactivity/inattention | 0.117 (0.353)                                   | -0.649, 0.738 | 0.110 (0.333)              | -0.619, 0.618 |

Note: N = 11,707 with intersectionality profile data and youth adversity data. Weighted pooled standard deviations used for calculation of standardized estimates. Compound parameter estimates specified using the weighted least squares estimates derived from the main multiple group model of latent depression/anxiety regressed on youth adversity, weighted by intersectionality profile sample size. SE and bias-corrected bootstrapped CI from 1000 draws. The effect of youth adversity on depression/anxiety reflects the average unit change in latent depression/anxiety with exposure to youth adversity, compared to an absence of youth adversity. Results were substantively unchanged where missing item-level data and youth adversity data was imputed (10 datasets, N = 11,797). Standardized estimates for main and interaction effects with non-zero CI shown in bold typeset. Abbreviation: SES, socioeconomic status.

gender, and for SES, with a stronger effect of youth adversity on depression/anxiety for *males* compared to females ( $\beta = 0.215$ , 95% CI = 0.114, 0.360), and for individuals with *higher* compared to lower SES ( $\beta = 0.262$ , 95% CI = 0.136, 0.397).

There was also evidence suggesting moderation attributable to the intersectional (interaction) effect between gender and hyperactivity/inattention. Although the confidence intervals for this effect included zero, it warrants discussion as its effect size ( $\beta = 0.209$ ) was comparable to the effects discussed above (i.e., for gender, and for SES). Specifically, the difference between the estimates for low hyperactivity/inattention females ( $b = 0.723$ ,  $SE = 0.048$ ) and males ( $b = 1.010$ ,  $SE = 0.043$ ), was 0.209 SD greater (95% CI =  $-0.019$ , 0.442) compared to the difference between high hyperactivity/inattention females ( $b = 0.840$ ,  $SE = 0.078$ ) and males ( $b = 0.906$ ,  $SE = 0.078$ ). This suggests a more pronounced moderating effect of gender (where the effect is stronger for males compared to females) at a *low* level of hyperactivity/inattention compared to a high level of hyperactivity/inattention.

## 4 | DISCUSSION

This study stands among the first to explore the intersectional role of gender, SES, and hyperactivity/inattention, in moderating the effect of youth adversity on depression/anxiety during adolescence. It adds to existing findings showing that youth adversity adversely affects adolescent mental health—further providing evidence to suggest that these negative effects pervade across the different societal intersections under consideration in the current study. The findings from this study suggest a stronger effect of youth adversity and depression/anxiety for males than for females, and for individuals from higher than from lower SES backgrounds. Additionally, there was some indication of moderation reflecting the intersection between gender and hyperactivity/inattention. Though the confidence intervals for this estimate included zero, the effect size was noteworthy, prompting discussion and further investigation in other samples to evaluate the robustness of this finding.

Contrary to our hypothesis, the most substantial effect of youth adversity on depression/anxiety was seen in males from higher SES backgrounds with low hyperactivity/inattention. While this effect was significantly greater only compared to the effect in the female, higher SES, low hyperactivity/inattention group, it aligns broadly with the moderating effects of gender and SES that were observed (i.e., stronger effects for males, and for higher SES). The direction of these effects contrast with findings from other studies that have reported greater effects of youth adversity in females (Assini-Meytin et al., 2022), and in individuals from lower SES backgrounds (Walsh et al., 2019). Comparative studies are required to ascertain the extent to which our differing results may reflect, for example, the inclusion of bullying-victimization as contributing to youth adversity rather than the sole inclusion of within-household ACEs (see *Introduction*), and the current focus on narrow symptoms of depression/anxiety specifically, rather than considering a broader range of mental health problems.

The current results may also be interpreted from the perspective of stress inoculation theory (Compton & Pfau, 2005). From this theoretical perspective, the findings may be understood to reflect that females and individuals from lower SES backgrounds may exhibit more resilience to depression and anxiety in the face of youth adversity due to resistance, or enhanced inoculation, to stress. For example, it could be speculated that females who experience youth adversity are more robust to depression and anxiety, compared to males, because of their development under inherent structural conditions of oppression (similarly, individuals from lower SES compared to higher SES backgrounds) (Banyard & Graham-Bermann, 1993). Further regarding SES, there may also be specific pressures affecting higher SES individuals that have detrimental effects on their mental health and wellbeing (Luthar et al., 2018; Luthar et al., 2020). How this may manifest further in the context of youth adversity and intersectionality stands as an interesting avenue for future research. However, as outlined in the introduction of the current paper, importantly – the intersection of an individual's characteristics may define their social/societal position within a system of structural hierarchies, *beyond* the effects of individual characteristics in isolation (Crenshaw, 1991).

Before discussing the suggestive evidence for moderation attributable to intersectionality, it is important to highlight the absence of moderation attributable to hyperactivity/inattention (in isolation). This finding could imply that this characteristic does not affect the relation between youth adversity and depression/anxiety in mid-adolescence. While previous findings indicate higher depression and anxiety symptoms in youths with elevated levels of hyperactivity/inattention (Meinzer et al., 2014), whether this characteristic, or trait, has a specific role in moderating the effect of youth adversity on mental health has not been extensively investigated. Further research is required to unpack the role of hyperactivity/inattention, and neurodivergence more broadly, in the context of youth adversity and mental health. However, even though a moderating effect of hyperactivity/inattention in isolation was not detected in the current study, its intersectional relations with other characteristics such as gender may be of potential importance, as is discussed below.

With regard to the intersectional moderation effect of gender and hyperactivity/inattention, the lack of statistical confidence reflected the interval for the estimate prompts caution in interpretation. Nonetheless, because the estimated effect size was comparable to those estimated for gender and for SES, it is discussed in terms of providing preliminary evidence to suggest that the effect of youth adversity on adolescent depression/anxiety may partly depend on the intersection between gender and hyperactivity/inattention. Specifically, this result indicates a stronger differential effect of gender (i.e., a greater



effect for males than for females) in individuals with low compared to high levels of hyperactivity/inattention. While replication of this effect in other samples and using other measures is necessary, through a lens of social and societal oppression and privilege – the results may tentatively suggest that youth adversity has a particularly pronounced impact on depression/anxiety in neurotypical males, due to their relatively privileged position in society (Banyard & Graham-Bermann, 1993). Notwithstanding, an accumulation of findings from across further studies is needed to draw conclusions that can meaningfully contribute towards theoretical and clinical advancements.

To this point, it should be considered that the current findings may at least in part be reflective of specific factors such as the binary operationalization of youth adversity, the conceptualization of depression/anxiety as a single construct, and the operationalization of the individual characteristics contributing to the intersectional profiles (e.g., using free school meals eligibility as an index of SES, using a cut-off score for hyperactivity/inattention symptoms as an index of neurodivergence). Importantly, the results of our measurement invariance analyses indicate that the current findings are unlikely to be solely due to noninvariance in the measurement of depression/anxiety across intersectional profiles. This contributes to recent intersectionality research findings demonstrating invariance in the measurement of depression across intersectional groups in adulthood (Cintron et al., 2023). It is also crucial to consider that other demographic and individual-level characteristics such as ethnicity (Mersky et al., 2021), immigration status (Kern et al., 2020), gender diverse identification and sexual orientation (Jonas et al., 2022) – all of which were not measured in the current sample, are likely to be important components of intersectionality (Ghavami et al., 2016). As intersectionality theory was developed specifically in terms of the intersectional position of *women of color* (Crenshaw, 1991), this absence is particularly poignant for ethnicity. The inclusion of ethnicity as an individual component of intersectional identity should be prioritized in future studies addressing research questions in this emerging line of inquiry and is planned in future studies within our research group (Hosang et al., 2023).

Given the use of compound parameters in our study to approximate the moderating effects of intersectionality, these estimates cannot be used for sample size planning in future studies in the same way for example that maximum likelihood estimates could be used (Hancock & French, 2013). Nonetheless, pseudo power analyses indicated that doubling the current sample size would lead to non-zero overlapping confidence intervals for the intersectional moderating effect of gender by hyperactivity/inattention ( $b = 0.221$ , 95% CI = 0.051, 0.392). This gives a very crude indication of the extent to which future sample sizes may need to be increased to detect moderation effects for intersectionality as conceptualized in the current study.

## 5 | STRENGTHS AND LIMITATIONS

The current study has multiple strengths, such as the use of both self-report and objective (local government) measures of youth adversity, and data from a large sample of adolescents. However, interpretations of our results should consider several limitations. Only self-reported data regarding depression/anxiety was available in the current study (indexed by the emotional problems subscale of the SDQ). It is noted that the SDQ was developed to incorporate multi-informant reports (self, parent, teacher). It is therefore highlighted that the current findings pertain specifically to individuals' perceptions of their own emotional problems. Future studies incorporating multi-informant reports would provide an interesting basis for investigating how self, parent, and teacher interpretations may differ by intersectionality groups. Also related to the specific use of the SDQ emotional problems subscale in our analyses, further incorporating other subscales of the SDQ would facilitate a more comprehensive evaluation regarding, for example, the extent to which the observed gender differences in the effect of youth adversity may also manifest differentially across other dimensions of psychopathology (e.g., prosocial behavior, conduct problems).

Details regarding the specific types of adversities that were experienced were not available. Recent research suggests that patterns of specific types of adversity (e.g., reflected in latent classes) may be important for investigating associations with characteristics such as gender and SES (Lacey et al., 2022). Additionally, as youth adversity was recorded concurrently to mental health, the temporal impact of youth adversity cannot be inferred. Future work planned in our group will incorporate *prospective* records of adversity in investigating mechanisms linking youth adversity and later mental health problems across intersectional identities, in other geographic regions of the UK (Hosang et al., 2023).

## 6 | CONCLUSIONS

In summary, our findings indicate that youth adversity has detrimental effects on the mental health of 13–14-year-olds living in Cornwall in the United Kingdom, and that these detrimental effects transcend the intersectional identities considered in this study. Specifically, however, male gender and a higher SES background are linked to higher average levels of depression/anxiety in the face of youth adversity, compared to female gender, and lower SES, respectively. Importantly, because this may be due to effects such as stress inoculation, caution should be taken in concluding that these (latter) demographic subgroups do not require support.

While intersectionality is an increasingly recognized theoretical framework for situating inquiry into adolescent mental health (Patil et al., 2018), investigating the *links* between youth adversity and adolescent mental health within a framework of intersectionality is an emerging field. Our findings are among the first to contribute to this specific line of inquiry and provide a preliminary platform for subsequent research. An accumulation of research in this area can contribute to better understanding how structural conditions of oppression and privilege may act together to influence the differential effects of youth adversity. Insights from this growing research area could lead to a more stratified approach in exploring mechanisms of change, thereby informing and enhancing interventions aimed at mitigating the adverse effects of youth adversity.

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## CONFLICT OF INTEREST STATEMENT

The authors have declared that no competing interests exist

## DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from Cornwall Council. Restrictions apply to the availability of these data, which were used under licence for this study. Data are available with the permission of Cornwall Council ([www.cornwall.gov.uk](http://www.cornwall.gov.uk)). *Mplus* code for the main analysis model is provided in Supplementary Materials 3. Additional analytic code can be requested from the corresponding author.

## ETHICS STATEMENT

The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008. All procedures involving human subjects/patients were approved by the University College London Ethics Committee for the HeadStart study (approval number: 8097/003).

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## SUPPORTING INFORMATION

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