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Have Girls Been Left Behind During the COVID-19 Pandemic? Gender Differences in Pandemic Effects on Children's Mental Wellbeing

Silvia Mendolia^{a,d,e}, Agne Suziedelyte^b, and Anna Zhu^{c,d,e}

^a University of Wollongong

^b City, University of London

^c Royal Melbourne Institute of Technology (RMIT) University

^d Institute for the Study of Labor (IZA)

^e ARC Centre of Excellence for Children and Families over the Life Course

Abstract

Using data from the UK, we show that girls have been affected more than boys by the COVID-19 pandemic in terms of their mental wellbeing. These gender differences are more pronounced in lower-income families. Our results are consistent with previous findings of larger pandemic effects on mental health of women.

Keywords: COVID-19; pandemic; mental health; children

JEL Codes: I10; I31; J13

'Declarations of interest: none'.

1. Introduction

The COVID-19 pandemic has impacted men and women differently. Gender gaps exist not only in the direct disease effects (Richardson et al. 2020) but also in the way lockdowns and the stress of home-schooling have affected mental health of individuals (Brooks et al 2020). There is a push for more research on the gendered experiences of the pandemic (Brady et al. 2021).

More gender-specific analysis is also required on the impact of the pandemic on children. On average, the pandemic led children's mental health to deteriorate (Blanden et al. 2021). Yet, it remains unclear if the effects are equally shared by boys and girls. Previous studies suggest that younger boys are more sensitive to adverse circumstances (Autor et al. 2020). By contrast, older girls' greater pre-existing vulnerabilities in mental health may make them more sensitive compared to older boys (Davis et al. 2018). A health pandemic may involve experiences that make it different to other sources of disadvantage. Furthermore, gendered impacts may occur because of differences in parental time and money inputs (Del Bono et al. 2021).

In this paper, we ask: (1) Does the COVID-19 pandemic have a gendered impact on the mental wellbeing of children? and (2) Are the gendered impacts offset or exacerbated by the pre-existing circumstances? Understanding if the pandemic has differently affected girls' and boys' mental health and the potential buffers against such effects is important. First, it may undermine society's efforts to achieve gender equality. Second, children's mental health spills over to educational outcomes and longer-term wellbeing (Waite et al. 2021).

We focus on the United Kingdom's (UK) experience with the COVID-19 pandemic. Children were directly affected by the closure of schools and childcare facilities. In all parts of the UK, the closures began on 20 March during the first wave of the pandemic and applied to most children with the exception of vulnerable children and for children of health, social care, and other critical workers (Blanden et al 2021). Schools partially re-opened in June 2020. The re-opening was staggered to allow children in Reception, Year 1 and Year 6 to return first, followed by Year 10 and Year 12 children (on a part-time basis), whereas children from other year levels only returned to school in September. Schools remained open during the second lockdown between November and December 2020. Schools were closed again on 4 January 2021, when the third lockdown started, followed by another staged relaxation of restrictions. Schools re-opened on 8 March, and the final restrictions were lifted on 19 July 2021.

Our results point to strong gendered impacts. The COVID-19 pandemic negatively impacted on girls to a larger extent than boys, in terms of their mental wellbeing. We find that these gender differences are more pronounced in lower-income families.

We contribute to two bodies of work. First, we add to the literature on the impacts of the COVID-19 pandemic on children's outcomes (e.g., Waite et al. 2021). Second, we contribute to the literature on the determinants of gender inequality in schooling and non-cognitive outcomes (e.g., Pope and Sydnor 2010; Bertrand and Pan 2013).

2. Data and Methods

Our analysis is based on the data from the UK Household Longitudinal Study (UKHLS), known as Understanding Society. As part of the study, approximately 40,000 households have been surveyed annually since 2009-10. Ten waves of data are currently available. In April 2020, all respondents of the UKHLS were invited to take part in a new COVID-19 survey, which includes questions on the impact of the pandemic. The participants who accepted the invitation have been surveyed once a month (every two months from July 2020). We use all COVID-19 surveys available to date, which include information about children's mental well-being (July; September and November 2020 and March 2021). In the analysis period, schools were closed during the first and third lockdowns but not during the second lockdown, as explained above (see Online Appendix A for detailed information on the UK's experience with the COVID-19 pandemic).

As a measure of child mental wellbeing, we use the scores of the Strengths and Difficulties Questionnaire (SDQ). The SDQ is a behavioural screening questionnaire for children, which includes 25 questions covering five areas: hyperactivity/inattention, emotional symptoms, conduct problems, peer relationship problems, and pro-social behaviour.^{1 2} Answers to these questions (excluding those on prosocial behaviour) are summed to create a 'total difficulties' score ranging from 0 to 40. In every UKHLS wave, parents answer the SDQ for 5- and 8-year-old children. In every second wave, 10-15-year-old children self-complete the SDQ. In the COVID-19 survey, parents complete the SDQ for 5-11-year old children, and 10-15-year-old children self-complete the SDQ in selected waves.³ Our analysis mainly focuses on 10-15-year-old children, whose answers to the SDQ are expected to measure their mental wellbeing more accurately. The results

¹ See Online Appendix B for the questionnaire.

² See Goodman (1997) for a detailed analysis of SDQ.

³ Parents completed the SDQ in July and September 2020, and March 2021, and children in July and November 2020, and March 2021.

on 5-8-year-old children, which are largely consistent but less precise, are presented in Online Appendix C.

We use all waves of the regular and the COVID-19 survey available to-date (as of July 2021). Excluding observations with missing information, the sample of 10-15-year-old children includes over 21,000 observations. Table 1 presents the descriptive statistics of this sample.

Table 1: Means and Standard Deviations of Key Variables in 10-15-year-old Children Sample

Child's SDQ scores:	
Total Difficulties (0-40)	10.70 (5.77)
Emotional Symptoms (0-10)	2.90 (2.30)
Hyperactivity/Inattention (0-10)	3.92 (2.35)
Conduct Problems (0-10)	2.06 (1.75)
Peer Relationship Problems (0-10)	1.81 (1.68)
Prosocial Behaviour (0-10)	7.74 (1.81)
Child female	0.50
Child's age	12.60 (1.68)
Child's ethnicity: White	0.74
Mother's ethnicity: White	0.73
Mother's age at child's birth	29.78 (5.79)
Mother's education: Degree/ Other HE qualification	0.42
Mother's education: A levels	0.18
Mother's education: GCSE	0.24
Mother's education: Other or no qualification	0.16
COVID-19 wave	0.12
Observations	21,269

Notes: Standard deviations of continuous variables are presented in parentheses. HE stands for higher education. GCSE stands for General Certificate of Secondary Education.

To analyse whether the COVID-19 pandemic affected boys' and girls' mental wellbeing differently, we estimate difference-in-difference (DID) models. The child's SDQ scores are regressed on an indicator for whether the child is female, an indicator for the COVID-19 waves, and the interaction of these two variables. The coefficients on the interaction term show the gender-differences in the effect of the pandemic on child mental wellbeing. We control for the child's age and ethnicity, the mother's age-at-birth and education, and wave fixed-effects.

To attribute estimated gender differences to the COVID-19 pandemic, we assume that girls' and boys' mental wellbeing would have evolved in the same way in the absence of the pandemic (parallel trends assumption). We also assume that any gender differences in reporting of mental

wellbeing⁴ either remain constant over time or evolve in the same manner. To test the validity of these assumptions, we include gender-specific linear trends in the DID models. We also assume that the sample composition of girls and boys remains the same over time, except for any changes in the observed variables. As a robustness check, we include child fixed-effects in the DID models. Additionally, we estimate DID models with gender and age interactions to allow for gender-differences in the evolution of mental wellbeing as children get older.

3. Results

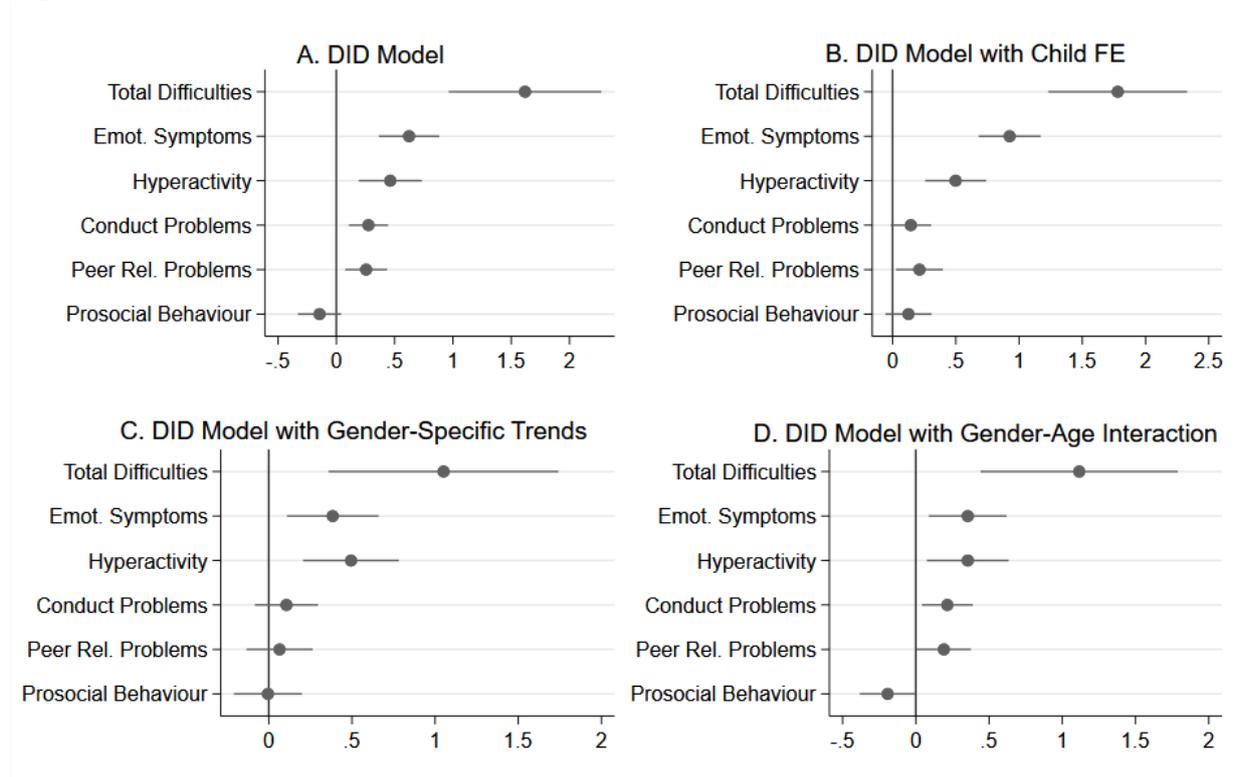
Graph A of Figure 1 presents the estimates of the DID model⁵. We find that girls' mental wellbeing during the COVID-19 pandemic (relative to pre-pandemic years) declined more than boys' mental wellbeing. Girls' total emotional and behavioural difficulties increased by 1.619 points more compared to boys (corresponding to 28% of a standard deviation). This difference is statistically significant at the 1% level. Before the pandemic, there was no difference in total difficulties by gender. During the pandemic, total difficulties increased among girls, but not among boys. We observe a larger increase among girls compared to boys across most domains of the SDQ (emotional symptoms, hyperactivity, conduct problems, and peer problems). Conduct problems decreased among both boys and girls during the pandemic, but more so among boys.

The main results remain robust to the inclusion of child fixed-effects (graph B), gender-specific linear trends (graph C), and gender-age interactions (graph D). The increase in total difficulties is 1.780 point higher among girls than among boys in the fixed-effects model, 1.051 point higher in the model with gender-specific trends, and 1.116 point higher in the model with gender-age interaction. Gender differences in specific SDQ domains largely persist, although some differences become statistically insignificant once gender-specific trends are included. This is unsurprising, since these trends absorb a large portion of gender-specific evolution of SDQ scores. Consistently, Online Appendix Table D.2 shows a larger increase in overall life dissatisfaction among older girls than among boys during the pandemic. Girls also experienced a larger increase in dissatisfaction with school, friends, and appearance, compared to boys.

⁴ Studies in the psychological literature find that females tend to recognise and admit their true state of mental health (such as loneliness) more easily than males. This is especially true during adolescence and young adulthood according to Borys and Perlman (1985).

⁵ Online Appendix Table D.1 presents numerical coefficient estimates and standard errors.

Figure 1: Gender Differences in Pandemic Effects on SDQ Scores of 10-15-Year-Old children



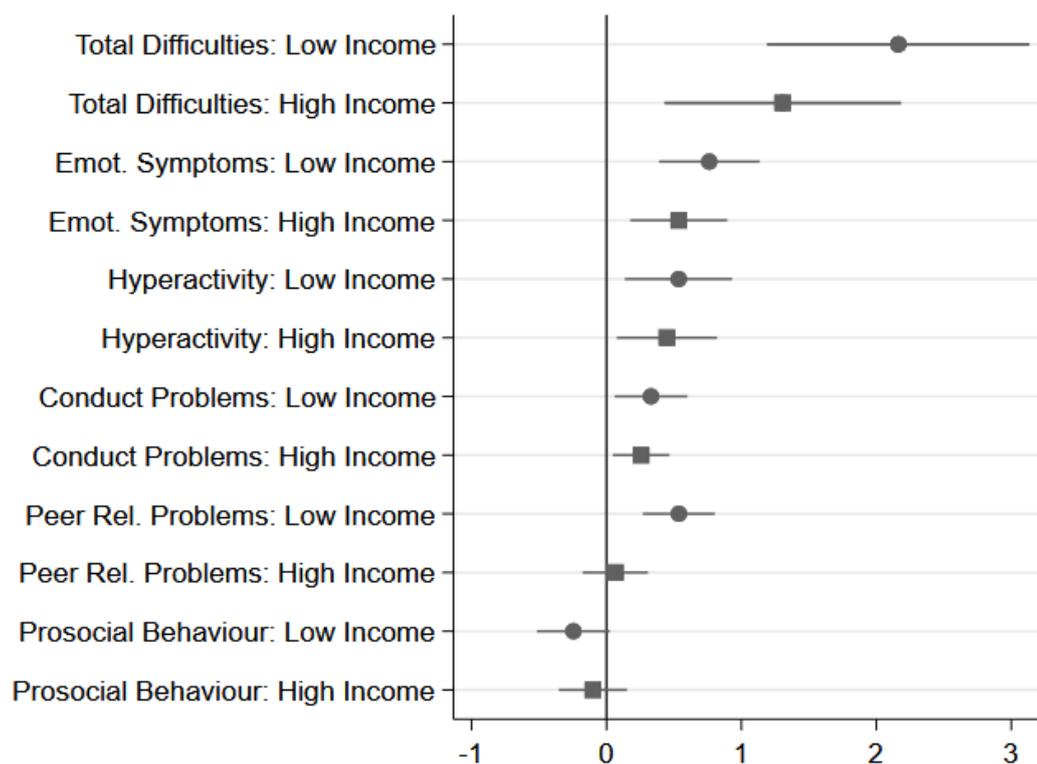
Notes: The figure presents estimated coefficients on the interaction between female and pandemic indicators from DID models and corresponding 95% confidence intervals. Standard errors are clustered by the mother. Sample size is 21,269 observations.

Figure 2⁶ shows larger gender differences in pandemic effects on the mental wellbeing of older children from lower-income⁷ families, although both income groups are affected. Girls from lower-income families experienced a 2.162 point (37% of a standard deviation) higher increase in total difficulties compared to boys during the COVID-19 pandemic. In higher-income families, the gender difference is 1.306 points (22% of a standard deviation). The triple difference model (Online Appendix Table D.4) shows, however, that the difference in the results by income is statistically significant only in peer problems. Gender differences in pandemic effects are somewhat larger among children with worse pre-pandemic mental health but not statistically significantly so, as shown in Online Appendix Tables D.3 and D.4.

⁶ Online Appendix Table D.3 presents numerical coefficient estimates and standard errors.

⁷ Lower (higher)-income families are those with incomes below (above or equal to) the median before the pandemic.

Figure 2: Gender Differences in Pandemic Effects on SDQ: Heterogeneity by Household Income



Notes: The figure presents estimated coefficients on the interaction between female and pandemic indicators from DID models and corresponding 95% confidence intervals. Standard errors are clustered by the mother.

4. Conclusions

We find that emotional and behavioural difficulties increased more among 10-15-year-old girls than boys during the COVID-19 pandemic relative to the pre-pandemic years. The results on life satisfaction are consistent. We find gender differences in pandemic effects on children’s mental wellbeing among all income groups, although these differences are more salient in lower-income families. The findings (presented in Online Appendix C) are qualitatively similar for younger children, but less statistically significant and robust. Our results suggest that the COVID-19 pandemic affected the mental wellbeing of girls more than boys, especially those from lower-income families. In future research, it would be interesting to explore if the results depend on whether parental or child reports of SDQ scores are used and if school closures affected mental wellbeing of boys and girls differently.

References

Autor, David, David N. Figlio, Krzysztof Karbownik, Jeffrey Roth, and Melanie Wasserman (2020). Males at the Tails: How Socioeconomic Status Shapes the Gender Gap. National Bureau of Economic Research. No. w27196. May 2020.

<https://www.nber.org/papers/w27196>

Bertrand, M. & Pan, J. (2013). The trouble with boys: Social influences and the gender gap in disruptive behaviour. *American Economic Journal: Applied Economics*, 5(1), 32-64.

Blanden, J., Crawford C., Fumagalli, L., & Rabe, B. (2021). School closures and children's emotional and behavioural difficulties. ISER Report March 2021.

<https://www.iser.essex.ac.uk/research/publications/536633>

Borys S., & Perlman D. Gender differences in loneliness. (1985). *Personality and Social Psychology Bulletin*, 11(1), 63–75.

Brady, E., Nielsen, M.W., Andersen, J.P., & Oertelt-Prigione S. (2021). Lack of consideration of sex and gender in COVID-19 clinical studies. *Nature Communications* 12, 4015.

Brooks, S. K., Webster, R. K., Smith, L. E., Woodland, L., Wessely, S., Greenberg, N., & Rubin, G. J. (2020). The psychological impact of quarantine and how to reduce it: Rapid review of the evidence. *The Lancet*, 395(10227), 912–920.

Davis, J., Vizard, T., Forbes, N., Pearce, N., Nafilyan, V., Merad, S., ... Goodman, A. (2019). Mental health of children and young people in England 2017: Predictors of mental disorders. NHS Digital. London.

<https://files.digital.nhs.uk/85/7FFC57/MHCYP%202017%20Predictors.pdf>

Del Bono, E., Fumagalli, L., Holford A., & Rabe, B. (2021) Coping with school closures: the changing responses of schools, parents and children during COVID-19. ISER Report July 2021.

<https://www.iser.essex.ac.uk/files/news/2021/little-inequality-homeschool/coping-with-school-closures.pdf>

Goodman, R. (1997) The strengths and difficulties questionnaire: a research note. *Journal of Child Psychology and Psychiatry* 38, 581–586.

Pope, D. G., & Sydnor, J. R. (2010). Geographic variation in the gender differences in test scores. *Journal of Economic Perspectives*, 24(2), 95-108.

Richardson, S., Hirsch, J.S., Narasimhan, M., Crawford, J.M., McGinn, T., Davidson, K.W., ... Cookingham, J. (2020). Presenting characteristics, comorbidities, and outcomes among 5700 patients hospitalized with COVID-19 in the New York City area. *JAMA*, 323(20), 2052-2059.

Waite, P., Pearcey, S., Shum, A., Raw, J.A., Patalay, P., & Creswell, C. (2021). How did the mental health symptoms of children and adolescents change over early lockdown during the COVID-19 pandemic in the UK? *JCPP Advances*, 1(1), e12009.

Online Appendix (NOT FOR PUBLICATION)

A. The COVID-19 pandemic in the UK

The first two cases of COVID-19 in the UK were recorded on 29 January 2020, when two tourists tested positive, and a month later the illness was transmitted inside the UK for the first time (Aspinal 2020). Since then, the number of cases, hospitalizations, and deaths increased rapidly. By 16 March, there were 55 deaths and 1,543 confirmed cases, though the actual number of cases was believed to be much higher. The UK government responded to the rapid spread of COVID-19 by announcing a closure of entertainment, hospitality and indoor leisure premises on 20 March and a national lockdown on 23 March (Aspinal 2020; Priddy, 2021). Since then, UK residents could only go outside to buy food, to exercise once a day, or to go to work if they could not work from home. They faced fines if they failed to comply with these measures.

To support the UK economy and residents, the UK government announced a £12 billion package in March 2020 (Aspinal 2020). Affected businesses were given grants. The furlough scheme covered 80% of the wages of workers who were at risk of losing their jobs. Affected self-employed individuals could also apply for income support. As a result, the unemployment rate did not increase significantly: in Mar-May 2020 (2021) it was 4.15% (4.84%), compared to 3.80% in Mar-May 2019 (Office for National Statistics 2021).

Schools and childcare facilities were closed on 20 March in all parts of the UK to most children, except for a small proportion of vulnerable children and for children of health, social care, and other critical workers (Blanden et al 2021). Teaching and support provided to the rest of the children during school closures varied across schools and families. One in five schools provided less than one offline lesson per day, whereas a similar proportion of schools provided four or more lessons per day (Bayrakdar and Guveli 2020). The differences in online teaching were even starker: more than half of the schools provided no online lessons, whereas a small proportion provided four or more hours of lessons per day. There was also variation in the amount of schoolwork checked by teachers. Close to half of parents spent less than an hour per day with their children on schoolwork, but a quarter spent at least two hours per day (Benzeval et al 2020). As to children themselves, close to 60% of boys and 70% of girls spent at least two hours per day on schoolwork, but the proportion of children who spent more than 4 hours was very small among both genders.

Schools started re-opening in June 2020. On 1 June, Reception, Year 1 and Year 6 children could return to school (Blanden et al 2021). On 15 June, Year 10 and Year 12 children were also invited to return to school, but only part-time. By the end of June, most restrictions imposed during the lockdown were relaxed, as the number of COVID-19 cases and deaths decreased (Aspinal 2020).

All children were back at school in September (after summer holidays), and schools remained open during the second lockdown from 5 November until 2 December (Aspinal 2020). Schools were closed again on 4 January 2021, when the third lockdown started. UK administered the first COVID-19 vaccine on 8 December, and most vulnerable individuals were offered the first dose of a vaccine by the end of February (1 in 3 adults). Since then, a staged relaxation of restrictions began, with schools re-opening on 8 March. The final restrictions were lifted on 19 July 2021.

As mentioned in the main text, parents of younger children completed the SDQ in July, September 2020, and March 2021, and older children completed the SDQ in July, November 2020, and March 2021. Even if most of the SDQ scores in our analysis were measured in the periods when schools had re-opened (September, November, 2020 and March 2021), our estimates likely capture the negative effects of school closures on children's mental health documented by Blanden et al (2021). The latter study found that these negative effects persisted for at least several months.

B. Strengths and Difficulties Questionnaire

“Now for some questions about how you see yourself as a person. For each item, please tick the box for Not True, Somewhat True or Certainly True. It would help us if you answered all items as best you can even if you aren’t absolutely certain. Please give your answers on the basis of how things have been for you over the last six months.”

Emotional Problems Scale

- I get a lot of headaches, stomach-aches or sickness
- I worry a lot
- I am often unhappy, down-hearted or tearful
- I am nervous in new situations. I easily lose confidence
- I have many fears, I am easily scared

Conduct problems Scale

- I get very angry and often lose my temper
- I usually do as I am told
- I fight a lot. I can make other people do what I want
- I am often accused of lying or cheating
- I take things that are not mine from home, school or elsewhere

Hyperactivity Scale

- I am restless, I cannot stay still for long
- I am constantly fidgeting or squirming
- I am easily distracted, I find it difficult to concentrate
- I think before I do things
- I finish the work I’m doing

Peer problems Scale

- I am usually on my own. I generally play alone or keep to myself
- I have one good friend or more
- Other people my age generally like me
- Other children or young people pick on me or bully me
- I get on better with adults than with people my own age

Prosocial Scale

- I try to be nice to other people. I care about their feelings
- I usually share with others (food, games, pens, etc.)
- I am helpful if someone is hurt, upset or feeling ill
- I am kind to young children
- I often volunteer to help others (parents, teachers, children)

C. Results for 5-8-year Old Children

Excluding observations with missing information, the sample of younger children (5-8 years⁸) includes over 11,000 observations. Table C.1 presents the descriptive statistics of this sample.

Table C.1: Means and Standard Deviations of Key Variables in 5-8-year-old Children Sample

	Mean (S.D.)
Child's SDQ scores:	
Total Difficulties (0-40)	8.55 (5.89)
Emotional Symptoms (0-10)	1.79 (2.00)
Hyperactivity/Inattention (0-10)	3.69 (2.60)
Conduct Problems (0-10)	1.68 (1.62)
Peer Relationship Problems (0-10)	1.39 (1.67)
Prosocial Behaviour (0-10)	8.37 (1.81)
Child female	0.49
Child's age	6.61 (1.45)
Child's ethnicity: White	na
Mother's ethnicity: White	0.59
Mother's age at child's birth	30.59 (5.88)
Mother's education: Degree/ Other HE qualification	0.49
Mother's education: A levels	0.20
Mother's education: GCSE	0.22
Mother's education: Other or no qualification	0.09
COVID-19 wave	0.12
Observations	11,294

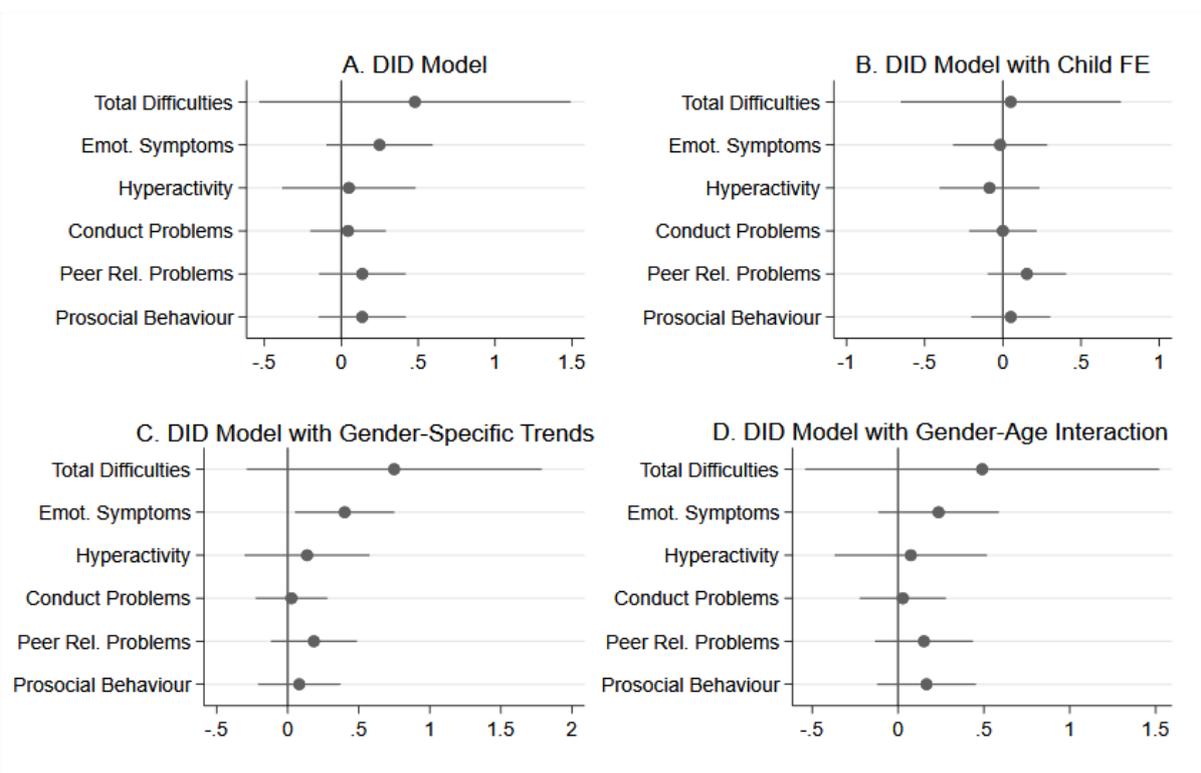
Notes: Standard deviations of continuous variables are presented in parentheses. Child's ethnicity is unavailable for 5-8-year-old children in the data. Instead, we control for the mother's ethnicity. HE stands for higher education. GCSE stands for General Certificate of Secondary Education.

Figure C.1 and Table C.2 suggest that among younger children, girls are also found to experience a larger increase in total difficulties than boys (mainly driven by emotional symptoms), but these gender differences are largely not statistically significant or consistent across model specifications.

In Figure C.2 (and Tables C.3 and C.4), we find gender difference in pandemic effects in lower-income families, as among older children, but these effects are not statistically significant.

Figure C.1: Gender Differences in Pandemic Effects on SDQ Scores of 5-8-Year-Old Children

⁸ We restrict the age range of younger children to 5-8 years, to avoid an overlap between samples and to keep the range the same before and after the start of the pandemic.



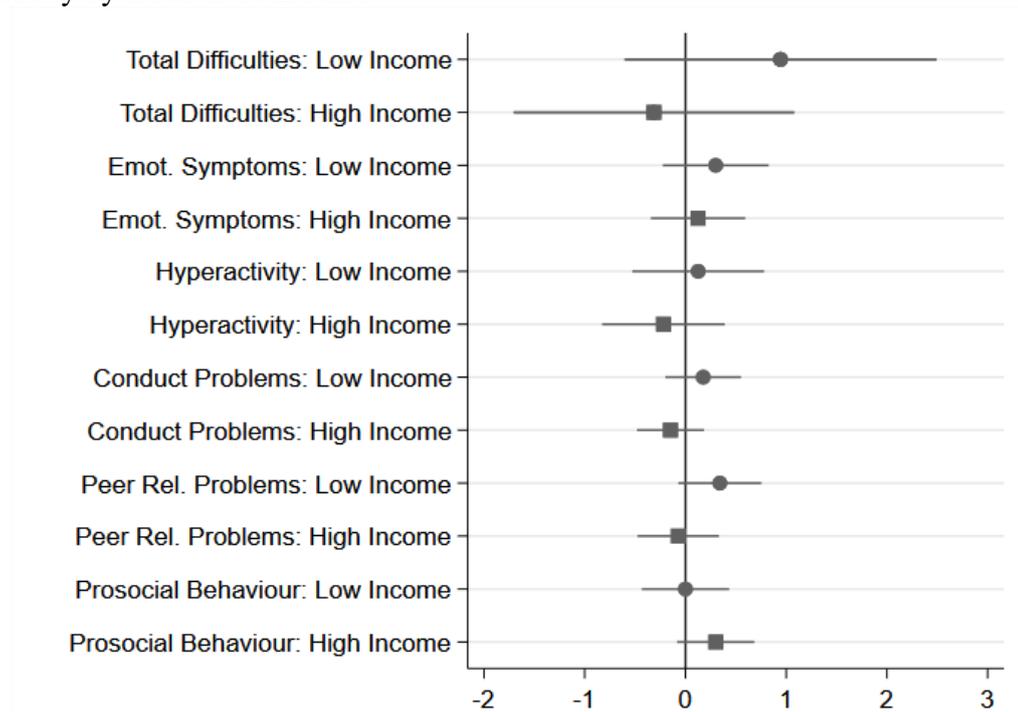
Notes: The graphs present estimated coefficients on the interaction between female and pandemic indicators from DID models and corresponding 95% confidence intervals. Standard errors are clustered by the mother. Sample size is 11,294 observations. Numerical coefficient estimates and standard errors are presented in Table C.2 below.

Table C.2: Gender Differences in Pandemic Effects on SDQ scores of 5-8-Year-Old Children

	(1)	(2)	(3)	(4)
Total Difficulties	0.479 (0.516)	0.051 (0.359)	0.749 (0.530)	0.490 (0.526)
Emotional Symptoms	0.249 (0.176)	-0.018 (0.154)	0.401** (0.178)	0.236 (0.179)
Hyperactivity/Inattention	0.049 (0.221)	-0.085 (0.163)	0.137 (0.224)	0.075 (0.226)
Conduct Problems	0.044 (0.126)	-0.000 (0.110)	0.027 (0.129)	0.028 (0.128)
Peer Relationship Problems	0.137 (0.144)	0.154 (0.128)	0.185 (0.155)	0.151 (0.146)
Prosocial Behaviour	0.136 (0.145)	0.051 (0.129)	0.082 (0.148)	0.166 (0.147)
Child Fixed effects	No	Yes	No	No
Gender-Specific Trends	No	No	Yes	No
Gender-Age Interaction	No	No	No	Yes
Sample size	11,294	11,294	11,294	11,294

Notes: The table presents estimated coefficients on the interaction between female and pandemic indicators from DID models and corresponding standard errors in parentheses (clustered by the mother).

Figure C.2: Gender Differences in Pandemic Effects on SDQ Scores of 5-8-Year-Old Children: Heterogeneity by Household Income



Notes: The graphs present estimated coefficients on the interaction between female and pandemic indicators from DID models and corresponding 95% confidence intervals. Standard errors are clustered by the mother. Numerical coefficient estimates and standard errors are presented in Table C.3 below.

Table C.3: Gender Differences in Pandemic Effects on SDQ Scores of 5-8-Year-Old Children: Heterogeneity by Household Income

	Low pre-pandemic family income	High pre-pandemic family income
Total Difficulties	0.961 (0.779)	-0.240 (0.708)
Emotional Symptoms	0.294 (0.265)	0.135 (0.238)
Hyperactivity/Inattention	0.164 (0.330)	-0.196 (0.309)
Conduct Problems	0.170 (0.190)	-0.123 (0.169)
Peer Relationship Problems	0.333 (0.207)	-0.056 (0.205)
Prosocial Behaviour	-0.001 (0.218)	0.291 (0.195)
Sample size	5,477	5,501

Notes: The presented figures are estimated coefficients on the interaction between female and pandemic indicators from DID models and corresponding standard errors in parentheses (clustered by the mother). Children with low (high) pre-pandemic family income have lower than (higher than or equal to) median family income before the start of the pandemic.

Table C.4: Heterogeneity in Gender Differences in Pandemic Effects on 5-8-year-old Children's SDQ Scores by Family Income, Triple Difference Model Estimates

	Coefficient (S.E.)
Total Difficulties	1.187 (1.060)
Emotional Symptoms	0.149 (0.357)
Hyperactivity/Inattention	0.343 (0.455)
Conduct Problems	0.297 (0.254)
Peer Relationship Problems	0.398 (0.294)
Prosocial Behaviour	-0.288 (0.293)
Sample size	10,978

Notes: The presented figures are estimated coefficients on the interaction between female, pandemic, and low-income indicators from triple difference models and corresponding standard errors in parentheses (clustered by the mother).

D. Supplementary Figures and Tables

Table D.1: Gender Differences in Pandemic Effects on SDQ scores of 10-15-Year-Old Children

	(1)	(2)	(3)	(4)
Total Difficulties	1.619*** (0.334)	1.780*** (0.280)	1.051*** (0.353)	1.116*** (0.343)
Emotional Symptoms	0.624*** (0.132)	0.925*** (0.125)	0.384*** (0.140)	0.355*** (0.135)
Hyperactivity/Inattention	0.463*** (0.138)	0.498*** (0.123)	0.495*** (0.147)	0.355** (0.142)
Conduct Problems	0.276*** (0.086)	0.144* (0.082)	0.106 (0.097)	0.215** (0.089)
Peer Relationship Problems	0.256*** (0.092)	0.213** (0.095)	0.065 (0.102)	0.192** (0.094)
Prosocial Behaviour	-0.144 (0.095)	0.125 (0.093)	-0.005 (0.104)	-0.192** (0.098)
Child Fixed effects	No	Yes	No	No
Gender-Specific Trends	No	No	Yes	No
Gender-Age Interaction	No	No	No	Yes
Sample size	21,269	21,269	21,269	21,269

Notes: The table presents estimated coefficients on the interaction between female and pandemic indicators from DID models and corresponding standard errors in parentheses (clustered by the mother).

Table D.2: Gender Differences in Pandemic Effects on Dissatisfaction with Life, 10-15-year-old Children

	(1)	(2)	(3)
Dissatisfaction with life as a whole	0.282*** (0.103)	0.405*** (0.136)	0.152 (0.115)
Dissatisfaction with school	0.219* (0.119)	0.354** (0.160)	0.182 (0.135)
Dissatisfaction with friends	0.197** (0.087)	0.139 (0.124)	0.090 (0.100)
Dissatisfaction with family	0.130 (0.088)	0.291** (0.113)	0.106 (0.102)
Dissatisfaction with appearance	0.296** (0.125)	0.623*** (0.172)	0.283** (0.140)
Child Fixed-Effects	No	Yes	No
Gender-Specific Time Trends	No	No	Yes
Sample size	19,145	19,145	19,145

Notes: Life dissatisfaction ranges from 1 (completely satisfied) to 7 (completely unsatisfied). The presented figures are estimated coefficients on the interaction between female and pandemic indicators from DID models and corresponding standard errors in parentheses (clustered by the mother).

Table D.3: Heterogeneity in Gender Differences in Pandemic Effects on 10-15-year-old Children's SDQ Scores by pre-Pandemic Mental Health and Income

	Low pre-pandemic family income	High pre-pandemic family income	Poor pre-pandemic mental health	Good pre-pandemic mental health
Total Difficulties	2.162*** (0.495)	1.306*** (0.446)	2.333*** (0.530)	1.800*** (0.381)
Emotional Symptoms	0.762*** (0.190)	0.536*** (0.184)	0.907*** (0.221)	0.782*** (0.156)
Hyperactivity/Inattention	0.535*** (0.203)	0.448** (0.189)	0.654*** (0.223)	0.599*** (0.174)
Conduct Problems	0.330** (0.137)	0.256** (0.107)	0.348** (0.155)	0.268*** (0.102)
Peer Relationship Problems	0.536*** (0.136)	0.066 (0.124)	0.424** (0.166)	0.150 (0.105)
Prosocial Behaviour	-0.245* (0.138)	-0.101 (0.129)	-0.027 (0.156)	-0.024 (0.126)
Sample size	10,664	10,560	3,455	5,237

Notes: The presented figures are estimated coefficients on the interaction between female and pandemic indicators from DID models and corresponding standard errors in parentheses (clustered by the mother). Children with low (high) pre-pandemic family income have lower than (higher than or equal to) median family income before the start of the pandemic. Mental health problem score before the start of the pandemic for children with poor (good) pre-pandemic mental health is higher than or equal to (lower than) 2.

Table D.4: Heterogeneity in Gender Differences in Pandemic Effects on 10-15-year-old Children's SDQ Scores, Triple Difference Model Estimates

	By family income	By pre-pandemic mental health
Total Difficulties	0.801 (0.669)	0.538 (0.654)
Emotional Symptoms	0.220 (0.264)	0.098 (0.267)
Hyperactivity/Inattention	0.058 (0.278)	0.059 (0.285)
Conduct Problems	0.056 (0.174)	0.078 (0.186)
Peer Relationship Problems	0.467** (0.184)	0.286 (0.196)
Prosocial Behaviour	-0.137 (0.188)	-0.002 (0.201)
Sample size	21,224	8,692

Notes: The presented figures are estimated coefficients on the interaction between female, pandemic, and low income (poor mental health) indicators from triple difference models and corresponding standard errors in parentheses (clustered by the mother).

References

Aspinal, Elvie (2020) COVID-19 Timeline. British Foreign Policy group.

<https://bfpg.co.uk/2020/04/covid-19-timeline/>

Bayrakdar, Sait and Guvel, Ayse (2020) Inequalities in home learning and schools' provision of distance teaching during school closure of COVID-19 lockdown in the UK. ISER Working Paper 2020-09.

Benzeval, M., Borkowska, M., Burton, J., Crossley, T. F., Fumagalli, L., Jäckle, A., ... & Read, B. (2020). Understanding society COVID-19 survey briefing note, Wave 1: April, Home schooling.

Blanden, J., Crawford C., Fumagalli, L., & Rabe, B. (2021). School closures and children's emotional and behavioural difficulties. ISER Report March 2021.

<https://www.iser.essex.ac.uk/research/publications/536633>

Office for National Statistics (2021). Employment in the UK: September 2021. Statistical bulletin

Priddy, Sarah (2021) The coronavirus timeline: Measures taken by the House of Commons. House of Commons Library. <https://commonslibrary.parliament.uk/house-of-commons-coronavirus-timeline/>