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Family complexity and young children's health outcomes in the UK: A longitudinal study

Michaela Kyclova, Julia Mikolai, Nissa Finney and Katherine Keenan, University of St Andrews

Abstract

This paper investigates the association between family complexity and children's health outcomes. Families have become more complex due to a rise in divorce, cohabitation, non-marital childbearing and multi-partner fertility. Thus, children are increasingly likely to grow up in a non-traditional family structure. Evidence suggests that children from two-parent married families fare better in terms of health, behavioural, developmental and educational outcomes compared to children from complex families (e.g. single parent families, divorced families, or stepfamilies). However, existing studies on family complexity and its consequences for children's outcomes only very rarely include detailed longitudinal measures of both parental relationship trajectories and children's outcomes. Using data from the UK Household Longitudinal Study, we employ longitudinal measures of both parental relationship trajectories and children's physical and mental health outcomes. Sequence analysis is used to comprehensively capture the first five years of children's lives and the family environment they grow up in. The states used in sequence analysis include maternal marital status, sibling presence, and father relation. Different cluster solutions are then incorporated to shed light on family complexity processes that go beyond maternal relationship status. Our preliminary results confirm previous findings – children not living with married mothers are at a higher risk of mental health problems. Children experiencing having either a non-biological father or non-natural sibling in the household seem to be at the highest risk of mental health problems. Further exploration of comprehensive measures of family complexity is warranted.

Background and Motivation

Due to recent sociodemographic trends, family complexity has grown rapidly in the last 60 years – specifically due to a rise in divorce, cohabitation, non-marital childbearing and multi-partner fertility (Van Winkle, 2018; Thomson *et al.*, 2014). Thus, children are increasingly likely to grow up in a non-traditional family and might have to adapt to various family transitions throughout their childhood. Past literature has raised concerns about the potential detrimental effects of growing up in a complex family. Early childhood health is a critical domain of focus in family research as it might set the direction for health and socioeconomic outcomes in adulthood (Case and Paxson, 2010; Case, Fertig and Paxson, 2005). Past evidence consistently suggests that children from two-parent married families fare better in terms of both physical and mental health outcomes compared to children from complex families such as single parent families, divorced families or stepfamilies (Fiori, 2020; Goisis, Özcan and Van Kerm, 2019; Jensen and Harris, 2017; McMunn *et al.*, 2001).

However, recent studies report that the negative effects of growing up in a complex family on health are smaller than originally thought, and raise caution against stigmatising children that do not come from a ‘perfect’ family (Härkönen, Bernardi and Boertien, 2017). Existing studies on family complexity and its consequences for children’s outcomes either capture parental relationship trajectories comprehensively or study children’s outcomes over time; only very rarely do they include detailed longitudinal measures of both. There are different ways family scholars capture family complexity – however, certain aspects of complexity might often be overlooked. These relate to sibling constellations which are often not included in studies (Carlson and Meyer, 2014). Looking beyond the marital status means looking at the possibility of non-natural siblings in the household, as well as non-biological fathers – the two layers are likely to be connected, and are likely bringing further complexity beyond the mother’s marital status (for example, a separated mother or a mother that has never been in union might have children who have different fathers; a married couple of natural parents might have a child from a previous partnership that now co-resides with the new family unit). Furthermore, grandparental presence in the household might bring further complexity in terms of the family and household functioning (Harvey, 2020; Radl, Salazar and Cebolla-Boado, 2017; Ziol-Guest and Dunifon, 2014). To date, most family complexity and child outcomes studies use data from the US – whilst the US context is often compared to the UK as the most similar compared to other European countries (e.g., Thomson, 2014), evidence is needed whether the same patterns of negative effects of family complexity for child health also stand when studying UK children.

To address these gaps, this study aims to explore the association between family complexity and young children’s physical and mental health using comprehensive longitudinal measures of both

maternal relationship trajectories (with extended sibling and father specification) and children's physical and mental health outcomes; whilst accounting for important covariates guided by theory in the statistical models.

Data and Methods

To investigate the role of parental partnership trajectories for young children's physical and mental health outcomes, we use data from the UK Household Longitudinal Study (UKHLS; also known as Understanding Society). UKHLS provides detailed longitudinal information on parental partnership trajectories, as well as children's physical (mother-rated child health and longstanding condition variable) and mental health (strengths and difficulties questionnaire; Goodman, 1997). Sequence analysis is used to holistically capture parental partnership trajectories. To capture the context of early childhood in great detail, we focus on the first five years and the relationship trajectories the mother has experienced, and in addition exploring sibling and father influence on child health. The resulting cluster categories are then used in random effects panel regression to investigate the association between maternal relationship trajectories and children's health outcomes.

Sequence analysis is a statistical tool for holistic analysis of longitudinal data – each sequence of states (in our case, 60 monthly states) is taken as a whole. It then proceeds to calculate a “pairwise sequence dissimilarity score”, which is then used in cluster analysis (Halpin, 2017: 546). Once cluster analysis is performed and reveals different cluster solutions, Duda-Hart and Calinski-Harabasz matrices in Stata are used to determine the optimal number of clusters (Halpin, 2016).

To understand how children's early family environment might be associated with health, we show three different ways of operationalising maternal relationship trajectories. The first solution focuses on maternal relationship trajectories only (Figure 1.). The second solution is enhanced by sibling status from a child perspective – a child can have no siblings, one or more natural siblings, or there might be a non-natural sibling present in the household (Figure 2.). The third solution instead uses father relation to the child as an extension to the maternal relationship status (Figure 3.).

Preliminary Results

Although the aim of this paper is to investigate the association between family complexity and children's both physical and mental health, at the moment, we present results connected to mental health only. Firstly, we estimate a random-effects linear regression model on children's mental health using the first solution containing maternal relationship trajectory only (Figure 1.). The resulting categories show that either the mother is stably married, stably cohabiting (although some variation is shown in terms of mothers never in union who have a short run relationship and quickly transition to separation),

mother has never been in union, and mother is separated or will at some point transition to separation. Table 1. shows the sample composition when using this first solution – as expected, most children grow up with either married mothers (64%) or cohabiting mothers (20%); however, 16% of children experience some form of complexity at birth and moving forward (this is most likely a living arrangement where the father is absent and the mother has either never been in union or has experienced separation very early on in regards to the time of child’s birth). Child mental health is observed at two time points – age 5 and age 8. Thus, we are not only looking at mental health at one point at a time, but also a possible development of children’s mental health in either direction during the years between. Higher total difficulties scores (TDS) are indicative of higher risk of mental health problems. The first model is controlled for child sex, child age, maternal employment, financial situation perceived by the mother, whether household income is above or below poverty line, maternal health, and natural and non-natural sibling presence (full regression tables are shown in Appendix). The results show that compared to children who grow up with married mothers in their first five years, children experiencing any other scenario are at a higher risk of mental health problems. This is especially shown for children of mothers who separate, although surprisingly, children of cohabiting mothers closely follow the TDS increase (Table 2.).

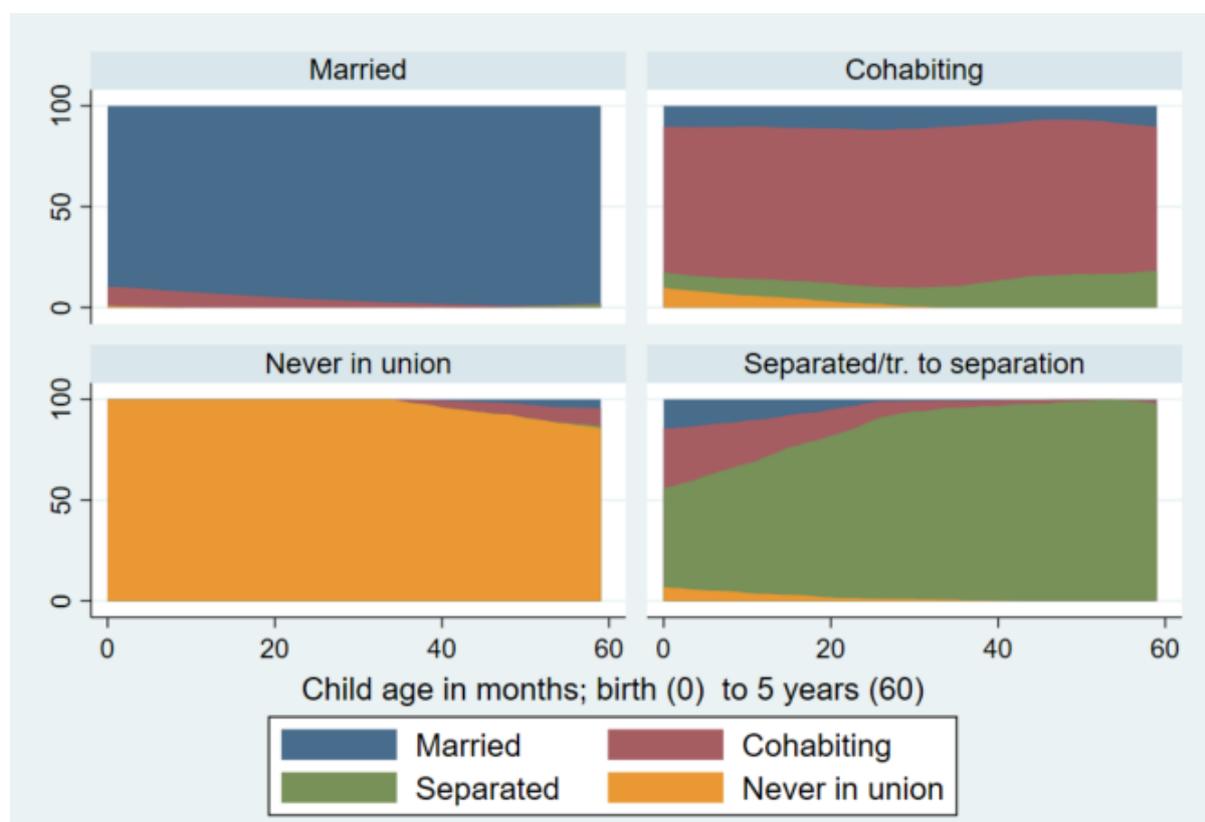


Figure 1. Four cluster solution, maternal partnership status only.

Table 1. Sample composition for maternal relationship only four cluster solution.

| Maternal relationship status only clusters | Observations | Percent |
|---|--------------|---------|
| Stably married | 6,265 | 63.95 |
| Cohabiting | 1,979 | 20.20 |
| Never in union | 566 | 5.78 |
| Separated/tr. to separation | 987 | 10.07 |
| Total | 9,797 | 100 |

Table 2. Results of random effects linear regression on children's mental health (TDS) in the UK.

| Maternal relationship status clusters | |
|--|---------------------|
| Married | |
| Cohabiting | 1.319*** (0.163) |
| Never in union | 1.042*** (0.271) |
| Separated/late separation | 1.437*** (0.218) |
| Observations | 9,796 |
| Children | 7,544 |

Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Model controlled for: child sex, child age, maternal employment, financial situation perceived by the mother, whether household income is above or below poverty line, maternal health, natural and non-natural sibling presence.

Secondly, we estimate a random-effects linear regression model on children's mental health using the second solution – that is, employing both maternal partnership status and sibling presence from a child perspective (Figure 2.). This is a five cluster solution – we can see in Table 3. that most children in their first five years grow up with a married mother without a sibling (30%), followed by married mothers and a natural sibling (27%) and cohabiting mothers without a sibling (16%). When accounting for

sibling presence, a noticeable group here emerges – children of separated mothers who are also most likely to co-reside with a non-natural sibling (20%).

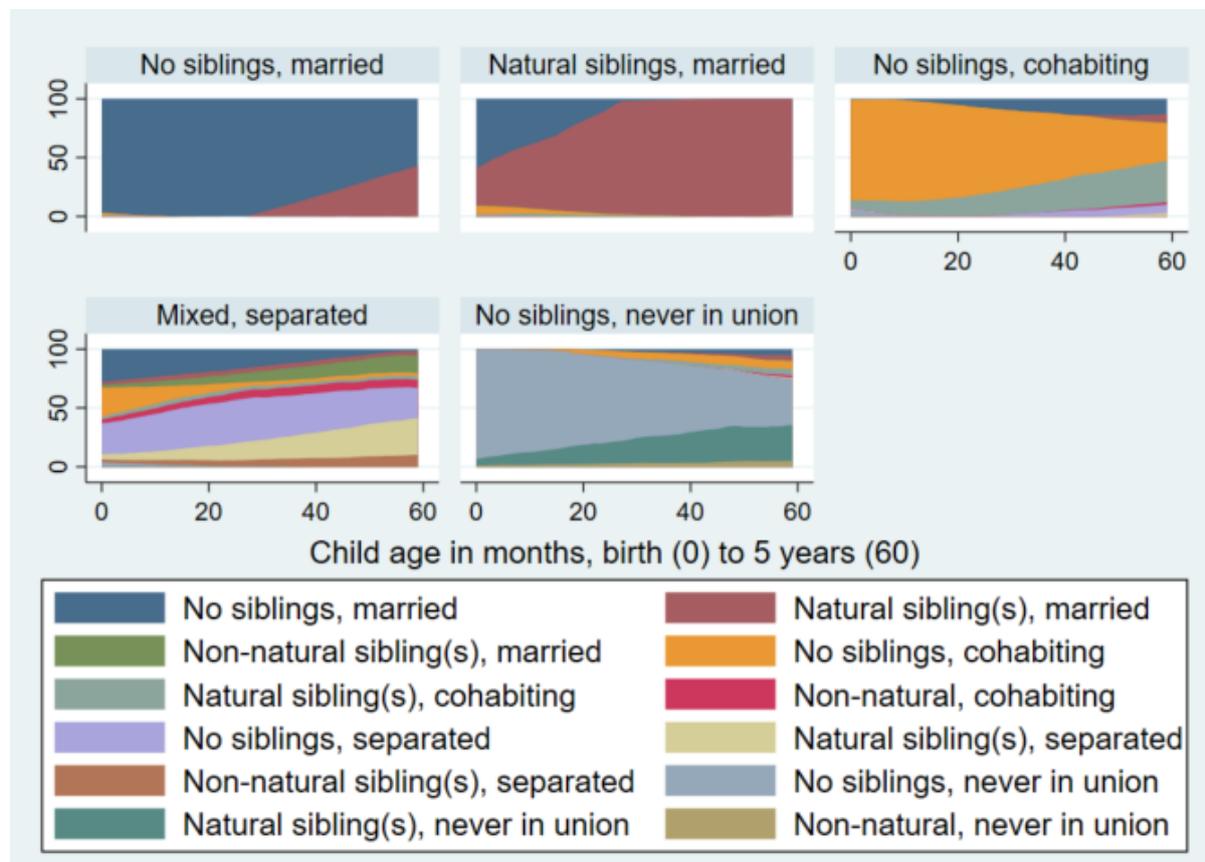


Figure 2. Five cluster solution, maternal relationship status and sibling status from a child-perspective.

Table 3. Sample composition of maternal relationship and sibling presence five cluster solution.

| Maternal relationship and sibling presence | Observations | Percent |
|---|---------------------|----------------|
| No siblings, married | 2,948 | 30.08 |
| Natural sibling(s), married | 2,667 | 27.21 |
| No siblings, cohabiting | 1,519 | 15.50 |
| Mixed, separated | 1,987 | 20.27 |
| No siblings, never in union | 680 | 6.94 |
| Total | 9,797 | 100 |

The results reveal that compared to children of married mothers without siblings, children of mothers that were cohabiting, separated or never in union, are at a higher risk of mental health problems. These results are in parallel with the first regression model, although we can observe an increase not only in the size of the cluster containing separated mothers but also some non-natural siblings (which might be

indicative of more complexity than just the ‘separated mother’ group) but also the TDS increase (from 1.4 to 1.8 point increase compared to the married group). Again, we observe a surprisingly high number for children growing up with cohabiting mothers with no siblings.

Table 4. Results of random effects linear regression on children’s mental health (TDS scores) in the UK.

| Maternal relationship and sibling status clusters | |
|--|---------------------|
| No siblings, married | |
| Natural siblings, married | -0.0278 (0.170) |
| No siblings, cohabiting | 1.328*** (0.195) |
| Mixed, separated | 1.759*** (0.182) |
| No siblings, never in union | 1.435*** (0.260) |
| Observations | 9,797 |
| Children | 7,546 |

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Model controlled for: child sex, child age, maternal employment, financial situation perceived by the mother, whether household income is above or below poverty line, maternal health.

Thirdly, we estimate random-effects linear regression on child mental health (TDS) using the last solution that includes maternal relationship status and father relation to the child. Figure 3. shows a six cluster solution – in the child’s first five years, mothers were most often married to a biological father (63%), cohabiting with a biological father (13%), separated (10%), experienced a varied trajectory including transition to separation and a relationship with a non-biological/social father (7%), were never in union (5%) or were married to a biological father but separated around when the child was three years old (2%; Table 5).

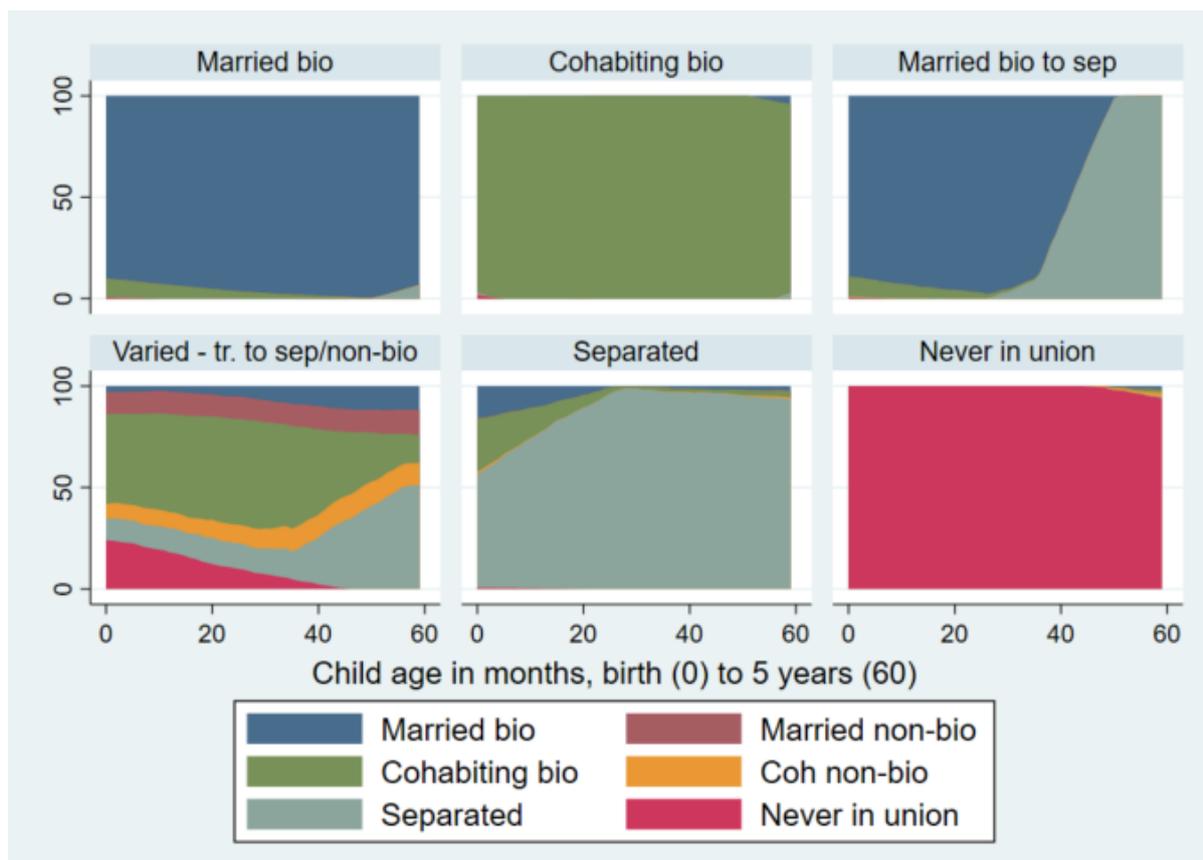


Figure 3. Six cluster solution, maternal relationship status and father relation from a child-perspective.

Table 5. Sample composition of maternal relationship and father relation six cluster solution.

| Maternal relationship status and father relation | Observations | Percent |
|---|--------------|---------|
| Married biological | 6,091 | 63.25 |
| Cohabiting biological | 1,209 | 12.55 |
| Married biological to separated | 201 | 2.09 |
| Varied | 664 | 6.9 |
| Separated | 956 | 9.93 |
| Never in union | 509 | 5.29 |
| Total | 9,626 | 100 |

Table 6. Random-effects regression on children's health in the UK, regression coefficients.

| Maternal relationship and father relation clusters | |
|---|---------------------|
| Married, biological father | |
| Cohabiting, biological father | 1.183*** (0.196) |
| Married biological, tr. to separation | 1.143*** (0.442) |
| Varied - tr. to separation/non-biological father | 2.345*** (0.257) |
| Separated | 1.628*** (0.221) |
| Never in union | 1.163*** (0.285) |
| Observations | 9,626 |
| Children | 7,401 |

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Model controlled for: child sex, child age, maternal employment, financial situation perceived by the mother, whether household income is above or below poverty line, maternal health, natural and non-natural sibling presence.

The results (Table 6.) again show that compared to children that grow up with a mother married to their biological father, children experiencing any other setting are at a higher risk of mental health problems. Here, the group at the highest risk is the 'varied' group capturing most varied trajectories including transitions to a union with a non-biological father/social father, as well as short-run relationships for mothers never in union at birth and unstable cohabitation. Children in this category are likely to score 2.3 points higher on the SDQ even when their sex, age, maternal education, maternal employment, household income, maternal health, and sibling presence are controlled for.

Conclusions and Next Steps

In summary, we found that children who do not live with two married biological parents have more mental health problems than those who do. However, incorporating different set of states in sequence analysis allowed us to comprehensively capture the first five years of children's lives and to explore

further layers of family complexity beyond marital status. The results reveal that children who experience parental separation as well as co-reside with a non-natural sibling are at a higher risk of mental health problems compared to children experiencing any other scenario. However, controlling for sibling presence, the random-effects linear regression on mental health employing the last cluster solution incorporating maternal relationship status and father relation to the child reveals that children who experienced most varied maternal transitions including co-residence with a non-biological/social father are at the highest risk of mental health problems. This finding suggests that even though the marriage optimum is again shown, complexity related to separation or mothers who have never been in a union is not as detrimental as complexity involving new partner entrances. This might further support the instability hypothesis – however, we might also assume that non-natural sibling presence would increase instability and complexity – it seems that non-natural siblings do not have such a detrimental impact compared to unstable relationship trajectories involving different partners other than the biological father. Next steps include an exploration of these measures linked to child physical health as well as further layers of complexity, such as extended household members. Moreover, our results warrant further investigation of fathers' influence on child mental health.

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Appendix

Appendix 1. Full random-effects regression model on child mental health (TDS) in the UK.

Maternal relationship status clusters

| | |
|---|----------------------|
| Married | |
| Cohabiting | 1.319*** (0.163) |
| Never in union | 1.042*** (0.271) |
| Separated/late separation | 1.437*** (0.218) |
| Male | |
| Female | -1.274*** (0.124) |
| Age 5 | |
| Age 8 | 0.262*** (0.0884) |
| Mother is employed | |
| Self-employed | 0.177 (0.215) |
| Unemployed | 0.817*** (0.275) |
| Other | 1.130*** (0.133) |
| Financial situation perceived by mother | |
| Good | |
| Getting by | 0.483*** (0.122) |
| Bad | 0.919*** (0.179) |
| Household above poverty line | |
| Below | -0.205 (0.187) |
| Poor maternal health | |
| Good maternal health | -1.811*** (0.161) |
| Mother has higher education | |
| A-levels | 0.704*** (0.224) |
| GCSE/O-level | 1.011*** (0.153) |
| None of the above | 1.258*** (0.197) |
| No natural sibling | |
| Natural sibling present | -0.492*** (0.185) |
| No non-natural sibling | |
| Non-natural sibling present | 0.338 |

| | |
|--------------|---------|
| | (0.263) |
| Observations | 9,796 |
| Children | 7,544 |

Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Models are controlled for: child sex, child age, maternal employment, financial situation perceived by the mother, whether household income is above or below poverty line, maternal health, natural and non-natural sibling presence, father presence and relation to the child

Appendix 2. Random-effects regression on children's mental health in the UK, regression coefficients.

| Maternal relationship and sibling status clusters | |
|--|----------------------|
| No siblings, married | |
| Natural siblings, married | -0.0278 (0.170) |
| No siblings, cohabiting | 1.328*** (0.195) |
| Mixed, separated | 1.435*** (0.260) |
| No siblings, never in union | 1.759*** (0.182) |
| Male | |
| Female | -1.273*** (0.125) |
| Age 5 | |
| Age 8 | 0.282*** (0.0901) |
| Mother in employment | |
| Self-employment | 0.114 (0.216) |
| Unemployed | 0.927*** (0.275) |
| Other | 1.221*** (0.132) |
| Financial situation perceived by the mother: good | |
| Getting by | 0.549*** (0.122) |
| Bad | 0.940*** (0.179) |
| Household income above poverty line | |
| Below | -0.141 (0.187) |
| Mother health poor | |
| Good | -1.877*** (0.162) |
| Interview at original address | |
| Different address | |

| | |
|-----------------------------------|-------|
| Biological father | |
| Non-biological father | |
| No father present | |
| Grandparents not in household | |
| Grandparents present in household | |
| Observations | 9,797 |
| Number of chpidp | 7,546 |

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Appendix 3. Random-effects regression on children's mental health in the UK, regression coefficients.

| | Model 1 |
|---|----------------------|
| Maternal relationship and father relation clusters | |
| Married, biological father | |
| Cohabiting, biological father | 1.183*** (0.196) |
| Married biological, tr. to separation | 1.143*** (0.442) |
| Varied - tr. to separation/non-biological father | 2.345*** (0.257) |
| Separated | 1.628*** (0.221) |
| Never in union | 1.163*** (0.285) |
| Male | |
| Female | -1.274*** (0.126) |
| Age 5 | |
| Age 8 | 0.289*** (0.0890) |
| Mother employed | |
| Self-employed | 0.120 (0.217) |
| Unemployed | 0.840*** (0.281) |
| Other | 1.221*** (0.134) |
| Financial situation perceived by mother: good | |
| Getting by | 0.535*** (0.123) |
| Bad | 0.966*** (0.181) |
| Household income above poverty line | |
| Below poverty line | -0.139 (0.189) |

| | |
|-------------------------------|-----------|
| Poor maternal health | |
| Good maternal health | -1.817*** |
| | (0.163) |
| No natural sibling | |
| Natural sibling present | -0.438** |
| | (0.188) |
| No non-natural sibling | |
| Non-natural sibling present | 0.224 |
| | (0.270) |
| Interview at original address | |
| New address | |
| Grandparent(s) in household | |
| No grandparents in household | |
| Observations | 9,626 |
| Number of chpidp | 7,401 |

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1