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Childhood Psychological Health During the Great Recession in Ireland

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Abstract: The aim of this paper is to quantify the effect of economic, parental and lifestyle factors on the psychological health of children at significant points in recent economic history in Ireland. The paper uses data from the *Growing Up in Ireland* Study and employs a dynamic random effects ordered logistic regression model to test the magnitude of these effects.

The results indicate that proxy income variables, such as ability to make ends meet and homeownership, are relevant in predicting child psychological health outcomes. Equally important are intergenerational health associations between the mother and the psychological health of children.

I INTRODUCTION

There is a large body of evidence to suggest that difficult economic periods are linked to poor health outcomes (Margerison-Zilko *et al.*, 2016; Ruhm, 2005; Tapia Granados and Ionides, 2017; Birgisdóttir and Asgeirsdóttir, 2017). Effects vary across studies and time periods. Country-specific results are often studied and compared as the nature of unemployment safety nets are more comprehensive in some countries compared to others (Riumallo-Herl *et al.*, 2014; Stuckler *et al.*, 2009a). Literature in this area very often focuses on percentage point increases in unemployment and its associated effects on physical and mental health or wellbeing outcomes. In terms of physical health, the literature has been mixed, finding both positive and negative health effects as a result of increasing unemployment (Astell-Burt and Feng, 2013; Ruhm, 2000; 2015; Toffolutti and Suhrcke, 2014). While there is conflicting evidence on the direction of all-cause mortality rates during

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periods of high unemployment, evidence on the effects of economic strain on mental health and wellbeing is more consistent, although the research tends to focus primarily on adult mental health. More recently, research reports that the mental health effects associated with the COVID-19 crisis are likely to be profound as a result of, but not limited to, uncertainty, job loss, financial losses, school closures and stigma (Gunnell *et al.*, 2020; Holmes *et al.*, 2020). An increase in stress related, depressive and anxiety disorders may result and those with existing psychological illness are likely to be particularly vulnerable during this crisis (Pfefferbaum and North, 2020).

In Ireland, the macroeconomic effects felt by the Great Recession were significant. Unemployment rose from between 4 and 5 per cent in 2007 to 15 per cent in 2011 (Savage *et al.*, 2019). Austerity budgets, following an international bail-out, were introduced, along with tax increases and government spending cuts to social welfare benefits for young people, public sector pay and health care budgets (Thomas *et al.*, 2014). This was paired with falling house prices, a decimated construction industry and subsequent high levels of net emigration.

A systematic review of the Great Recession and its effect on mental health outcomes (Frasquilho *et al.*, 2015) concludes that significant evidence highlights a strong link between economic recessions and poor mental health in adults such as psychological wellbeing and suicide behaviour. Reeves *et al.* (2014) discuss the substantial rise in “economic suicides” noting that, across North America and Europe, the Great Recession is associated with 10,000 additional economic suicides between 2008 and 2010. Stuckler *et al.* (2009b) report that a one percentage point increase in unemployment is associated with a 0.79 per cent rise in suicides for those younger than 65 years of age. In Ireland, Corcoran *et al.* (2015) provide compelling evidence that this period of economic downturn led to an increase in suicides in males and non-fatal suicide behaviour in both men and women.

A lot of the evidence on the link between periods of economic difficulty and health, and/or mental health, has been focused on adults, but with the growing availability of data such as the Millennium Cohort Study (MCS) (UK) and the *Growing Up in Ireland* (GUI) study there are opportunities to investigate the extent to which children are affected by recessionary cycles. Using the GUI, Reinhard *et al.* (2018) investigate the effects of a number of economic related variables on a range of child health outcomes and report significant health effects as a result of changes working hours, affording basic necessities and reductions in welfare benefits. McKenna *et al.* (2017), using data from the MCS, investigate the link between recent economic instability and a range of child health outcomes, finding that increases in financial strain felt by the household was associated with new or continuing poor health and wellbeing in children. Using two cross-sectional datasets and the Strengths and Difficulties Questionnaire (SDQ), Fink *et al.* (2015) report similar levels of mental health difficulties between boys and girls between 2009 and 2014.

In Ireland, various studies make use of one (Cheevers and O'Connell, 2013; McAuley and Layte, 2012; McCrory and Layte, 2012; Reulbach *et al.*, 2013) and two (Layte and McCrory, 2018; O'Connor *et al.*, 2018) waves of the child cohort of the GUI data. The main contribution of this study is to use three waves of the GUI data to implement an ordered logistic model on the child-specific dependent variable; the Strengths and Difficulties Questionnaire (SDQ). We investigate the effect of recessionary variables such as family income, other income proxies including parental economic activity, parental working hours, and financial strain on the psychological health of the child. We also include variables pertinent to child psychological health such as exercise (Biddle *et al.*, 2019; Blain *et al.*, 2020; LaVigne *et al.*, 2016) and subjective weight status (Jansen, 2008; Dolenc, 2019; Haynes *et al.*, 2019). We control for child and parent health status and, given the mental health effects of recession on adults, we also address links between parental and child psychological health given that reported intergenerational health links, especially maternal, are common in the literature (Lewis *et al.*, 2017; Pietikäinen *et al.*, 2020; Wickham *et al.*, 2015).

II DATA

The data used in this paper are from the *Growing Up in Ireland* (GUI) study and were collected in three waves between 2007 and 2016. The GUI data are longitudinal and panel in nature and contain information from a nationally representative sample of children living in Ireland. There are two cohorts to the panel; an Infant Cohort (N = 11,134) who were recruited at nine months old and a Child Cohort (N=8,568) recruited at nine years of age. This analysis uses the Child Cohort for which three waves are available from 2007-2008, 2011-2012 and 2015-2016 when the children were around 9, 13 and 17 years of age respectively. Approximately one-in-seven 9-year-olds living in Ireland at the time is included in the sample which was extracted using a stratified sampling strategy based on the primary school system. A two-stage sampling design was used to collect these data. For the first stage, a sample of 900 schools (nationally representative) was recruited from a population of 3,200 primary schools in Ireland and secondly the sample of 8,568 9-year-old children was extracted from the first stage process.

Each wave consists of several questionnaires (both core and supplemental) filled out by the child, their primary and secondary caregivers, their teachers and/or school principals. In general, most of the information collected for the study was from the Primary Caregiver, which, in the most part, is the child's biological mother and collection took place in the home via face-to-face interviews. The primary caregiver and secondary caregiver data are readjusted and recoded to represent the study child's mother and father. This takes into consideration that, even though most primary caregivers were the study child's mother, some fathers answered the

primary caregivers' questionnaires. The understanding of best international practice in similar longitudinal studies such as the Millennial Cohort Study in the UK informed the procedures and materials for the *Growing Up in Ireland* study (Williams *et al.*, 2014). The study received ethical approval from the Irish Health Research Boards Ethics Committee. A paper by Cheevers and O'Connell (2013) highlights the importance of data such as this being available in Ireland as it provides the opportunity to follow the progress of children across time and is the first of its kind in Ireland.

The timing of the data collection points of the GUI is interesting as the Wave 1 data were collected between the months of August 2007 and June 2008 which is before the recession was officially declared in Ireland. Wave 2 data were collected between August 2011 and March 2012 which coincides with the deepest point of the recession and, as Watson *et al.* (2015) point out, before evidence of employment growth. Wave 3 data were collected between the dates of April 2015 and August 2016 when the recession was declared over.

2.1 The Dependent Variable, The Strengths and Difficulties Questionnaire (SDQ)

The child psychological health variable used in this study is the Strengths and Difficulties Questionnaire (SDQ) and is among one of the widely used short questionnaires to measure psychological health problems in children. It has been used in a variety of income settings around the world since its development in 1997 (Goodman *et al.*, 2010). The SDQ is a 25-item instrument with five subscales. Four of these subscales measure difficulties which are commonly experienced by children and adolescents; conduct problems (such as temper tantrums, obedience, lying or cheating and fighting), peer problems (such as solitary, having friends, liked by others, bullied), hyperactivity (such as restlessness, fidgeting, concentration, thinks things out) and emotional symptoms (such as headaches, worries, downhearted, nervous, fearful). The fifth subscale assesses strengths; pro-social behaviour (such as being considerate, sharing, helpful, kind and volunteering) (Goodman, 2001). Given the dynamic analysis and focus of this paper, the original, three band, scoring method is used where three categories are generated from the overall SDQ score. The pro-social subscale is not used in the calculation of the overall score, from which the three-band method is applied. Goodman *et al.* (2010) note that the Total Difficulties score, the composite of the conduct, peer, hyperactivity and emotional subscales is found to be a sound measure of overall child psychological health from a variety of studies around the world. Given that there are 20 questions from which the Total Difficulties score is calculated, and each question contains one of three responses; *not true*, *somewhat true* and *certainly true*, from which a score of 0, 1 or 2 points are allocated respectively, the scale of the overall measure ranges from between 0 to 40 points. The three band classifications are "*Normal*", when a child has a score of between 0 and 13 points

overall; “*Borderline*”, is calculated when a child has a score of between 14 and 16 points inclusive overall and “*Abnormal*” applies to a child who scores between 17 and 40 points on the Total Difficulties scale.

Using these categories, a young person in the *Normal* range has a range of responses which would be expected of their peers. Within the *Borderline* range, their SDQ scores fall somewhat outside the range otherwise expected in *Normal* and it could be that their mental health is under some strain. In the *Abnormal* range, the SDQ falls considerably outside the range of expected responses and it is very likely that there is considerable strain with respect to mental health and wellbeing.

Table 1 displays the percentages of girls and boys in each SDQ category at each of the three waves. It shows that boys display improvements in their psychological health state score over time, with an increase of over five percentage points in the *Normal* SDQ category. Girls do not display the same increase over time. While there is a higher proportion of girls in the *Normal* range at nine years of age compared to boys, this increases slightly by age 13 but decreases again by the age of 17. The relationship between gender and psychological health, as both genders approach adulthood, is similar to the pattern observed in adult mental health across a variety of studies, albeit with the disparity between male and female psychological patterns often being much greater (see Table 2).

**Table 1: Percentage of Boys and Girls in each SDQ State;
Wave 1 to Wave 3.**

	<i>Wave 1 (2007/2008)</i> <i>Age 9</i>		<i>Wave 2 (2011/2012)</i> <i>Age 13</i>		<i>Wave 3 (2015/2016)</i> <i>Age 17</i>	
	<i>Girls</i>	<i>Boys</i>	<i>Girls</i>	<i>Boys</i>	<i>Girls</i>	<i>Boys</i>
Normal	89.27	86.61	91.24	89.45	89.43	91.84
Borderline	5.50	7.28	4.11	5.33	5.65	3.86
Abnormal	5.23	6.11	4.66	5.22	4.92	4.29

Source: Growing Up in Ireland Study data.

2.2 The Independent Variables

In addition to lagged and initial SDQ values (see Methodology section), we present several recession-related independent variables in this analysis, the proportions of which, across the three GUI waves, can be seen in Table 2. Our main measure of income is equivalised annual household income deciles, which is calculated using the number of adults and children living in the household, thereby allowing comparison between living standards across households of varying composition (Harris *et al.*, 2011). We also include difficulty in making ends meet, homeownership, Medical Card eligibility, family health insurance, main economic activity and working hours of the male and female caregiver. In addition, we include maternal and paternal education level (degree holder), maternal and paternal levels

of depression as measured by the CESD-8, and chronic health status of both the parents and the study child. We also include child lifestyle factors, often cited as being associated with psychological health, such as light exercise and a subjective weight perception variable.

We include a transition matrix (see Table 3) to provide some additional information on the equivalised annual household income deciles. The transition matrix shows us that just over 42 per cent of households remained in Income Decile 1 across the three time periods, while almost 60 per cent remained in Income Decile 10. The rows show the decile the household started in at Wave 1 and the columns show the decile the household reaches at the end of the period. Most transitions involved moving to the next decile. The last row provides the proportion of households in each decile on average throughout the panel, taking all the transitions into consideration. Table 2 provides these values per wave.

Table 2 reports the proxy income variables over the three waves. There was a large increase in the proportion of households reporting a difficulty in making ends meet. Between Wave 1 and Wave 2 this proportion more than doubles from around 25 per cent to just over 55 per cent and by 2015/2016 remains high at 46 per cent.

The level of homeownership (with or without a mortgage) in this cohort is high at between 83 per cent and 88 per cent. Medical Card eligibility increases by five percentage points from Wave 1 to Wave 2 and remains high. Medical Card eligibility, which is means tested in Ireland and entitles the cardholder to free GP care, increases from just under 22 per cent to nearly 27 per cent of the sample. Health insurance, which is not compulsory in Ireland and mainly provides cover for private acute hospital services with reimbursement options for some primary care expenses (Nolan and Layte, 2014), is included as an income proxy variable. Around 50 per cent of the population have private health insurance (PHI) cover. Our sample shows a decrease in PHI over the course of the recessionary cycle.

Over the pre-, mid- and post-recession periods there are significant changes in the proportion of maternal participation in the workforce, with an increase in employment of just under 12 percentage points over the nine-year period. There are some small changes in the overall unemployment figure as some mothers moved from the home duties/student/other category into the employment category, with an equivalent percentage-point reduction in this category over the period.

In contrast, 94 per cent of fathers in this sample are employed pre-recession, this falls to just over 87 per cent and does not recover to pre-recession levels. There are increases in the home duties/student/other category over time, with a three-fold increase in unemployment from pre- to mid-recession and a subsequent reduction thereafter.

Across the three waves the proportion of mothers working over 30 hours per week grew significantly from 21 per cent in Wave 1, just before the recession, to 25 per cent mid-recession and up to 34 per cent by the time the third wave of the data was collected. The opposite pattern was observed in fathers during the same

Table 2: Variable Proportions, All Observations by Wave

<i>Variable Name</i>	<i>Wave 1</i>	<i>Wave 2</i>	<i>Wave 3</i>
Males	0.486	0.489	0.487
SDQ Normal	0.880	0.904	0.906
SDQ Borderline	0.064	0.047	0.048
SDQ Abnormal	0.057	0.049	0.046
EAHH Income Decile 1	0.062	0.072	0.066
EAHH Income Decile 2	0.074	0.081	0.070
EAHH Income Decile 3	0.084	0.079	0.083
EAHH Income Decile 4	0.090	0.093	0.087
EAHH Income Decile 5	0.094	0.094	0.096
EAHH Income Decile 6	0.103	0.094	0.101
EAHH Income Decile 7	0.109	0.117	0.111
EAHH Income Decile 8	0.119	0.115	0.113
EAHH Income Decile 9	0.130	0.125	0.133
EAHH Income Decile 10	0.134	0.131	0.141
Difficult to Make ends Meet	0.246	0.551	0.461
Homeowners	0.835	0.861	0.878
Medical Card	0.216	0.269	0.267
Health Insurance	0.649	0.604	0.583
Mother Activity: Employed	0.576	0.628	0.693
Mother Activity: Unemployed	0.015	0.032	0.023
Mother Activity: Home duties, student, other	0.409	0.339	0.284
Father Activity: Employed	0.941	0.871	0.886
Father Activity: Unemployed	0.026	0.081	0.051
Father Activity: Home duties, student, other	0.033	0.048	0.063
Mother working 30hrs + / week	0.207	0.248	0.341
Father working 30hrs + / week	0.898	0.802	0.822
Mother Degree	0.262	0.314	0.314
Father Degree	0.274	0.308	0.319
Mother CESD-8 Depression	0.084	0.103	0.119
Father CESD-8 Depression	0.043	0.055	0.067
Mother Chronic Health	0.131	0.178	0.174
Father Chronic Health	0.086	0.136	0.146
Child Light Exercise: Never	0.010	0.113	0.068
Child Light Exercise: Sometimes	0.436	0.636	0.545
Child Light Exercise: Often	0.554	0.251	0.387
Child Chronic Health	0.102	0.102	0.134
Child Self-Describe: About Right	0.730	0.563	0.506
Child Self-Describe: Skinny	0.190	0.208	0.226
Child Self-Describe: Overweight	0.080	0.228	0.268

Source: Author's analysis of *Growing Up in Ireland* data.

time. In Wave 1, fathers working more than 30 hours per week was at almost 90 per cent, falling to just over 80 per cent mid-recession and increasing slightly to 82 per cent by the time the recession was officially over.

We control for socioeconomic status by including parental education levels, given that the proportion of those choosing “other” in social class category in the questionnaire was high. Thus, the objective level of education can be used as a proxy (Kim and Park, 2015). There were increases in degree status, for both mothers and fathers, over the duration of the panel.

With respect to the psychological health of adults during recessions and the intergenerational link to child psychological health, we include a measure of depression for both mothers and fathers. This is measured by the CESD-8, an eight-item measurement tool for depression-related symptoms, presented here in binary format (Van de Velde *et al.*, 2009). Compared to fathers, mothers are almost twice as likely to display the identifying symptoms of depression across the period. We also include adult chronic health conditions in general and find that a higher proportion of mothers report the existence of chronic conditions. Chronic conditions are also included for the child, where the proportion of children reporting these increases as the child approaches adulthood.

Research suggests that exercise can positively affect the psychological health of children and young people (Biddle *et al.*, 2019; Blain *et al.*, 2020; LaVigne *et al.*, 2016). Thus, and with this in mind, we include a control variable for light exercise (to include walking, slow cycling, and physical education class). Across the cohort of boys and girls, 9-year-olds are very likely to often participate in light exercise which decreases by the time they are around 13 years of age, increasing again at 17/18 years of age. We can report that in Wave 1 boys are 15 per cent more likely than girls to report (light) exercising often, this increases to 33 per cent in Wave 2 and up to 40 per cent more likely than girls to report frequent light exercise in Wave 3.

We do not include an explicit measure for childhood BMI in this analysis given the data required to create rankings using BMI-for age percentile charts. However, we include a subjective weight perception variable which asks how the child views their own weight status; underweight, about right, or overweight. Studies have shown that subjective weight perception can be more useful than objectively measured weight in predicting psychological health outcomes in children (Jansen, 2008; Dolenc, 2019; Haynes *et al.*, 2019). On average, the percentage of children who describe themselves as “about right” decreases as they age. Table 2 does not stratify by child gender, but we can report that the differences are negligible initially. However, gender disparities become evident as they become older and by the time the cohort reaches 17/18 years of age the gender deviations for under- and overweight are significant. At 17/18 almost 30 per cent of boys report they feel underweight compared to 16 per cent of girls, while 35 per cent of girls feel overweight compared to just under 19 per cent of boys.

Table 3: Income Deciles Transition Matrix

From/ To	1	2	3	4	5	6	7	8	9	10	
1	42.12	17.66	15.51	8.83	5.61	3.10	2.63	2.15	0.72	1.67	100
2	17.35	29.31	16.55	12.76	9.87	4.59	3.59	3.19	1.99	0.80	100
3	12.14	16.74	27.78	12.42	9.38	8.74	5.52	2.39	3.50	1.38	100
4	7.77	10.07	11.13	26.76	13.42	11.78	7.86	6.30	3.11	1.80	100
5	5.51	7.24	9.29	12.99	26.30	12.44	9.76	8.58	5.12	2.76	100
6	2.80	4.50	5.46	10.11	12.32	23.47	16.83	12.25	8.93	3.32	100
7	2.03	2.69	4.72	6.82	9.78	12.99	28.22	14.90	12.53	5.31	100
8	1.27	2.41	2.41	4.65	6.22	10.32	16.11	29.21	17.68	9.72	100
9	0.90	2.31	2.43	2.54	4.85	5.64	10.32	15.51	35.31	20.19	100
10	0.53	0.90	1.06	1.74	2.37	3.43	5.70	7.49	18.52	58.26	100
Total	6.90	7.63	8.08	8.99	9.51	9.70	11.41	11.42	12.84	13.53	100

Source: Author's analysis of *Growing Up in Ireland* data.

III METHODOLOGY

We employ a dynamic random effects ordered logistic panel regression model to examine the predictors of child psychological health. We use an ordered logistic regression model given the ordered categories of the dependent variable; *Normal*, *Borderline* and *Abnormal*. The analysis was run on Stata version 14 using the *xtlogit* command. Given the inconsistent maximum likelihood estimators that exist when ordered logistic models use fixed effects, we run these models as random effects (Greene, 2004).

Fixed effects ordered logistic models (*feologit* in Stata) were considered. However, according to Bartram (2018), a small sample size would result, as this fixed effect model specification only uses the data for respondents whose SDQ category changes over time, thus resulting in a sample size of only 507 children (239 boys and 268 girls). Given the association reported between gender (time invariant) and psychological health, the random effects model is more appropriate for this analysis. A fixed effects estimation on the continuous Total Difficulties score (*xtreg, fe*) was explored and while the coefficient magnitudes cannot be compared, the significance levels on relevant indicators are similar.

Our model employs robust standard error clustering on the individual in order to account for the correlated structure of panel data (Thébaud and Sharkey, 2016). GUI supplied weights are used to ensure that the sample is representative of the population. To formally test for persistence in psychological states over time the models employed include variables for lagged SDQ and SDQ at t0. According to Wooldridge (2005), including the initial value (t0) of the dependent variable in this

capacity results in a likelihood function based on the joint distribution of the observations, conditional on the first observations.

The regression takes the following form:

$$y_{it} = y_{it0}\beta + y_{it-1}\gamma + x_{it}\delta + \nu_i + \varepsilon_{it}$$

Where y_{it} is SDQ for child i in year t , y_{it0} is initial SDQ, y_{it-1} is lagged SDQ, x_{it} represents the cohort of independent variables, ν_i is unobserved individual heterogeneity and ε_{it} is the error term.

The coefficient (γ) for y_{it-1} is also known as a measure of state dependence. Hauck and Rice (2004: 990) define state dependence as “the direct impact previous periods health has on current health”. State dependence provides a way to measure the psychological health persistence in individuals (Hauck and Rice, 2004).

In total, three models are estimated: all children, girls and boys. The results from these ordered logistic regressions are presented as odds ratios meaning that the exponential function of the regression coefficient is reported, that is e^b rather than b , and is the odds ratio associated with a one unit increase in the explanatory variable.

Odds ratios were originally proposed to measure whether the probability of an event differs across two groups, the range of which goes from 0 to infinity (Bland and Altman, 2000; Chen *et al.*, 2010). A value of 1.00 indicates no association with the specified risk, however if the odds ratio is greater than 1.00 and is statistically significant, then exposure to that explanatory variable is associated with a higher odds of the outcome. Likewise, if the odds ratio is less than 1.00 and statistically significant, then the presence of the explanatory variable is associated with a lower odds of the outcome (Szumilas, 2010). In our analysis, an OR greater than 1.00 on any given variable is associated with an increased odds, to the value of that OR, of being in the *Abnormal* SDQ state. We might expect, based on the previous literature and baseline category in the analysis, to see OR values less than 1.00 for income, homeownership, health insurance, parental degree status and exercise; and greater than 1.00 for lagged SDQ, Medical Card holders, parental unemployment, parental depression, chronic health and subjective weight perceptions.

IV RESULTS AND DISCUSSION

The results for the dynamic random effects ordered logistic models are presented in Table 4. We include lagged SDQ to calculate a measure for state dependence while also controlling for initial conditions (as per Wooldridge, 2005). We can report that the ORs on these variables are as we have hypothesised. For example, scoring in the *Abnormal* range on the SDQ in $t-1$ and $t0$ increases the odds of being in the *Abnormal* SDQ category by 5.591 times and 3.755 times respectively. This provides

evidence of the dynamic nature of psychological health over time. Lagging health variables to uncover trajectories across time is common in the literature (see Contoyannis *et al.*, 2004; Hauck and Rice, 2004; Reiss, 2013; Zivin *et al.*, 2009).

The equivalised income decile measure is not associated with child psychological health. However, the values of the ORs are in the expected direction, as they are generally below 1.00. Therefore, compared to the lowest income decile there appears to be a protective, albeit insignificant, income effect. In subsequent regressions, which incorporated a number of different income variables from the GUI study, the ORs remained not statistically significant.

In relation to making ends meet, the statistically significant OR of 1.32 indicates that children that are living in a household where parents have expressed difficulty in making ends meet have an increased odds, 1.32 times greater, of being in the *Abnormal* SDQ range. The making ends meet variable could be viewed as a measure of financial strain, which may have increased over the duration of the recession. This financial strain could have been the result of pressure felt from increased debt servicing and not necessarily from a change in income status. It is conceivable that increases in debt servicing may have dwarfed or masked any effect felt from a change in the absolute level of income.

The OR for the homeownership status is 0.75, thus suggesting that the odds that children whose parents own their own home will be in the *Abnormal* SDQ range is 0.75 lower than for children whose parents are not homeowners. We might have expected that homeowners may have been under increased financial pressure considering the increase in mortgage interest rates during the recession, however this does not seem to manifest in the results. As this variable includes people who currently have a mortgage and those whose mortgage is paid, we cannot identify the driver of this effect.

Specific to girls only are the working hours of both mothers and fathers. Both indicators report ORs below 1.00 highlighting that in the presence of parental working hours of above 30 hours per week, the odds of being in the *Abnormal* SDQ range is lower. This is perhaps evident of a link between financial security and good child psychological health. For girls, there may be a trade-off between parents spending more time at home and the feeling of security that may come from a subsequent reduction in household financial strain. In relation to our proxy measure for social class, degree status, the significance on the ORs highlight that boys whose father holds a degree and girls whose mother holds a degree have a decreased odds of being in the *Abnormal* SDQ range.

Maternal depression, as measured by the CESD-8, is a statistically significant indicator of poor psychological health. Children whose mother exhibits depression symptoms have an increased odds of 2.347 times of being in the *Abnormal* SDQ range. Johnston *et al.* (2013) report strong intergeneration links between mothers and children, with evidence that mother's mental health can affect children some

Table 4: Ordered Logistic Model Results

	<i>All</i> <i>OR</i>	<i>Girls</i> <i>OR</i>	<i>Boys</i> <i>OR</i>
SDQ Borderline t-1	3.118***	3.098***	3.719***
SDQ Abnormal t-1	5.591***	5.457***	7.668***
SDQ Borderline t0	2.730***	2.498*	2.487*
SDQ Abnormal t0	3.755***	2.760**	3.533*
EAHH Income Decile 2	0.731	0.775	0.687
EAHH Income Decile 3	1.087	1.144	0.971
EAHH Income Decile 4	0.739	0.615	0.889
EAHH Income Decile 5	0.755	0.767	0.770
EAHH Income Decile 6	0.977	0.745	1.270
EAHH Income Decile 7	0.926	0.692	1.103
EAHH Income Decile 8	0.844	0.922	0.734
EAHH Income Decile 9	0.779	0.620	0.939
EAHH Income Decile 10	0.830	1.054	0.704
Difficult to Make ends Meet	1.320**	1.186	1.413**
Homeowners	0.750*	0.787	0.730
Medical Card	1.076	0.886	1.262
Health Insurance	0.911	0.736*	1.083
Mother Activity: Unemployed	0.848	0.437	1.541
Mother Activity: Other	0.918	0.800	1.074
Father Activity: Unemployed	1.001	0.941	1.138
Father Activity: Other	0.929	0.647	1.471
Mother 30hrs +	0.822	0.614**	1.086
Father 30hrs +	0.928	0.694*	1.420
Mother Degree	0.808*	0.658**	1.215
Father Degree	0.940	0.961	0.718**
Mother Depression	2.347***	2.441***	2.174***
Father Depression	0.824	0.651	0.988
Mother Chronic Health	1.405**	1.318	1.501**
Father Chronic Health	1.049	1.127	1.023
Child Light Exercise: Sometimes	0.855	0.801	0.886
Child Light Exercise: Often	0.852	0.891	0.798
Child Chronic Health	2.837***	3.142***	2.447***
Child Self-Describe: Skinny	1.296**	1.302	1.280
Child Self-Describe: Overweight	1.346**	1.429**	1.188
Child Gender	0.862		
/cut1	2.880***	2.102***	3.766***
/cut2	3.901***	3.027***	4.873***
/sigma2_u	0.470	0.204	0.397
n	6,458	3,203	3,225

Source: Author's analysis of *Growing Up in Ireland* data.

Note: ***p<0.01; **p<0.05 and *p<0.10. Coefficients in bold and italics are significant following Bonferroni adjustment.

20 years later. Wachs *et al.* (2009) report that the children of women who are depressed are themselves at risk of development, health and behavioural problems.

The OR for maternal chronic health is also above 1.00 and statistically significant, although the odds are somewhat lower than the depression indicator. Comparing the child specific chronic health, albeit a control variable, we see a very strong association with poor psychological health, as hypothesised.

With respect to subjective weight perception status, both feeling underweight and feeling overweight, when compared to feeling about right, have an increased odds of being in the *Abnormal* SDQ range, the magnitudes of the odds are similar at 1.236 and 1.346 respectively. The results indicate that when analysed separately, feeling overweight, in girls, is associated with an increased odds of being in the *Abnormal* SDQ range. There is a growing body of evidence documenting the association between weight (generally overweight/obese) and mental health problems in young people (Gibson *et al.*, 2017; Lankinen *et al.*, 2018; Whitehead *et al.*, 2017); and interestingly, as is the case in this study, much of this recent research relates to perceived as opposed to measured weight status.

Results for the analysis are presented before and after Bonferroni adjustments were made to help protect against an increased risk of type 1 error (Ratcliffe *et al.*, 2019; Reilly *et al.*, 2018; Wlodarczyk *et al.*, 2017). Some studies cite the Bonferroni adjustment method as being quite conservative in its estimation; however less conservative adjustments (both Holm and Sidak) were also applied and all adjustments returned similar results. Following the Bonferroni adjustment, and as expected, given the highly statistically significant ORs, the lagged SDQ values remain significant. The maternal depression variable and the child chronic health status also retain statistical significance.

V CONCLUSION

In this paper we have sought to develop a dynamic panel approach to understand the effect of the Great Recession on children in Ireland. This paper exploits the data collection periods of the *Growing Up in Ireland* study as these periods are significant in recent Irish economic history. This paper uses a novel approach in analysing the Strengths and Difficulties Questionnaire (SDQ) data by employing an ordered logistic model and reporting odds ratios. The results are presented for all children and then disaggregated by gender for comparison purposes. The results, overall, are generally as expected and although many are not statistically significant following Bonferroni adjustment, they are still worthy of discussion.

There is evidence to suggest that displaying a degree of financial capability has health and wellbeing benefits (Allmark and Machaczek, 2015). In this paper, we report an association between the psychological health of children and parental ability to make ends meet. While unemployment/reduction in wages may be outside

an individual's control, the ability to acquire the skills necessary to make ends meet may not. Financial skills may help to negate some of the effects of a reduced income on wellbeing, health and child psychological health.

The reported association between maternal health and child psychological health is large, but variables relating to paternal health are not statistically significant. Similar parent-child associations have been reported in Schepman *et al.* (2011) and Johnston *et al.* (2013). Genetic and environmental reasons for this are discussed in Tully *et al.* (2008). Depending on the specific features of a recession, a disproportionately heavy burden on females may exacerbate our findings from the Great Recession thereby making policies in relation to maternal mental health outcomes even more important.

It is necessary for policymakers to be aware of the knock-on effects that can filter through the household unit, especially in the form of financial strain and maternal psychological health levels. This study provides results on psychological health determinants throughout childhood into adolescence during an economic crisis. Given the evidence that psychological health in childhood and adolescence can have a long reaching impact on adult education, future household income and wellbeing (Delaney and Smith, 2012; Kieling *et al.*, 2011; Strazdins *et al.*, 2014; Johnston *et al.*, 2013), there are implications therein with respect to how economic crises are managed, resources are allocated, and healthcare needs are met.

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