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Intergenerational transmission of worklessness

Technical annex - Evidence from the Millennium Cohort (MCS)

Centre for Analysis of Youth Transitions

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Evidence from the Millennium Cohort (MCS)

This Technical Report first describes the data source, the Millennium Cohort Study (MCS), and outlines the level of attrition and missing data (which is part of all longitudinal surveys). We then define and report on the prevalence of temporary and repeated or persistent parental worklessness in England, and draw attention to differences in parental worklessness across the UK and its regions. From here we explore the characteristics of families experiencing long-term worklessness and assess to what extent the experience of repeated worklessness can be predicted by additional associated risk factors (i.e. family demographics, parental health, and regional deprivation). We furthermore explore potential protective factors that are available to children and families experiencing repeated worklessness. The remainder of the report examines the relationship between parental worklessness, associated risks and protective factors on a range of children's outcomes comprising academic attainment, cognitive ability, behavioural adjustment, as well as indicators of wellbeing of the child.

M1 Millennium Cohort (MCS)

The Millennium Cohort Study (MCS) is an ongoing survey of 18,818 babies born between September 2000 and January 2002 into 18,551 families living in the UK. It is the most recent of Britain's national longitudinal birth cohort studies. The study has been tracking the Millennium children through their early childhood years and plans to follow them into adulthood (Dex & Joshi, 2005; Hansen, Joshi, & Dex, 2010). Data collections took place at ages 9 months, 3, 5, and 7 years. Data are currently collected for 11 years olds and a future wave is planned to take place at age 14, in 2014.

The sample population for the study was drawn from all live births in the UK over 12 months from 1st September 2000 to 31st August 2001 in England & Wales and from 24th November 2000 to 10th January 2002 in Scotland & Northern Ireland. The sample was selected from a random sample of electoral wards, disproportionately stratified to ensure adequate representation of all four UK countries, deprived areas and areas with high concentrations of Black and Asian families. The sample design of the MCS differs from that of its predecessors (NCDS & BCS70) in that it took a whole year's births, and covers the whole of the United Kingdom for the first time. Survey weights are used to correct for the complex survey design and its clustering into electoral wards, which in turn are characterised by their level of disadvantage at the outset (Plewis, Calderwood, Hawkes, Hughes, & Joshi, 2004; Shepherd, Smith, Joshi, & Dex, 2004). Unless otherwise stated we report weighted data.

Data has been collected from parents, children, teachers and health visitors, using personal interview and self-completion questionnaires. It covers information on

socio-demographic family characteristics, children's cognitive, social, emotional and behavioural development, gender roles, health and well-being. The MCS also provides information on the quality of the relationship between parents and between parents and children, as well as information on parenting styles and housing. Here we focus on children born in England, to make the study more comparative to the LSYPE. Table M1.1. gives an overview of the timings of the survey and ages of the children. The response frequencies for all families and the English sub-sample are unweighted.

Table M1.1. Survey details of the Millennium Cohort

Wave of data collection	Year	Age of child	Families interviewed	English subsample (n)
1	2000/2	9 months	18,551	11,533
2	2003/4	3 years	15,590	10,086
3	2005/6	5 years	15,246	9,759
4	2007/8	7 years	13,857	8,887
Longitudinal Sample (wave 1- 4)			11,647	7,378

The number of families responding at each of the four surveys understates the number of children in the survey, since some families had twins and triplets. In our analysis we include only one child per family (in families with twins and triplets we used information on the first born only).

The longitudinal sample, including all families in England responding at waves 1-4, comprises 7,378 families. For all of these families we have information on employment status at the four waves of data collection. The analytic sample is largely representative of the original sample, although there are greater attrition rates for those experiencing greater socio-economic disadvantage (lower education, living in a flat (Ketende, 2008). Despite sample weights being applied to account for differential selection probabilities and non response bias, response bias at the individual level tends to underestimate the magnitude of effects of social disadvantage, because attrition is greatest among cohort members in more deprived circumstances.

Linking the data longitudinally and taking into account additional variables (such as interlinked risk factors and potential protective factors discussed in more detail in section M3.3 and M3.4) brings with it further sample loss, especially when considering data collected during wave 2. Table M1.2 gives the degree of item non-response for each of the interlinked risks discussed in section M4 and M5 of the report. The largest proportion of missingness is observed for data on income poverty (abut 8%) and long term limiting illness (about 4%).

Table M1.2: Item missing data for risks associated with parental worklessness in England

	Count	%
Associated Risks		
Mean age mother at CM birth (S1)	0	0
Language spoken at home (S1)	0	0
Housing tenure (S1)	13	0.2
Highest qualification (hhold) (S1)	8	0.1
Gained higher qual (hhold) (S1-S4)	8	0.1
Poverty (OECD median) (S1)	578	7.8
Marital status (S1)	2	0.03
Number of marital transitions (S1-S4)	47	0.6
LS limiting illness (S1-S4)	286	3.9
Mother's malaise score (S1)	0	0
Number of children in hhld (S4)	0	0
IMD deprivation (S1)		
n(unweighted)	7,378	100%

Table M1.3 gives the item missingness for the protective factors considered (see also section M6). The largest proportion of missing data is observed for indicators of school characteristics (in particular the mean KS1 point scores over three years: 33%), and parental reports on the quality of the parent-child relationship (Pianta, 1992) at age 3 (19%). Some caution in interpreting the findings is therefore necessary, especially findings including these variables.

Table M1.3: Item missing data for child protective factors for families in England with longitudinal workless information

	Count	%
Child Characteristics		
Birthweight (S1)	19	0.3
Child's gender (S1)	0	0
Child's age at interview (S4)	5	0.07
Child's ethnicity (S1)	23	0.3
Child's General Health (S3)	24	0.3
Child has LS limiting Illness (S4)	30	0.4
Child school experiences		
Whether like school (S4)	513	7.0
Does best at school (S4)	511	6.9
Has a lot of friends (S4)	432	5.9
Likes playing with friends (S4)	419	5.7
Parenting/Family cohesion		
Pianta (Parent-child relationship) (S2)	1,373	18.6
Read to child (S2)	0	0
Take to library (S3)	23	0.3
Number of activities family does together (S3)	34	0.5
Whether disorganised at home (S4)	41	0.6
CM has a regular term-time bedtime (S3)	22	0.3
School engagement / education aspirations		
Parents satisfied with the school? (S3)	114	1.5
Attend parents evening (S4)	41	0.6
Post16/university aspirations (S4)	284	3.8
School characteristics		
% SEN	1,467	19.9
% eligible for free school meals	1,467	19.9
Mean KS1 points score over 3 years	2,421	32.8
n(unweighted)	7,378	100%

Table M1.4 shows the item missingness for the child outcome variables. The largest proportion of missing data among the outcome variables is observed for teacher ratings of the child's behaviour (36%), and the Key Stage 1 results (19%) in reading, writing, maths and science, as well as parental reports on the quality of the parent-child relationship at age 3 (19%). Some caution in interpreting the findings is therefore necessary, especially findings including these variables.

Table M1.4: Item missing data for child outcomes for families in England with longitudinal workless information

	Count	%
Key Stage 1 results		
Key Stage 1 Reading (points score)	1,421	19.3
Key Stage 1 Writing (points score)	1,421	19.3
Key Stage 1 Maths (points score)	1,421	19.3
Key Stage 1 Science (points score)	1,426	19.3
BAS Cognitive Assessments		
BAS Word Reading score	14	0.2
BAS Pattern Construction score	37	0.5
Behaviour (Strengths & Difficulties)		
SDQ (parent rated)	200	2.7
SDQ (teacher rated)	2,652	35.9
Well-being measures		
How often feel unhappy at school?	530	7.2
How often are you bullied at school?	468	6.3
How often are you horrible to others at school?	469	6.4
N (unweighted)	7,378	100%

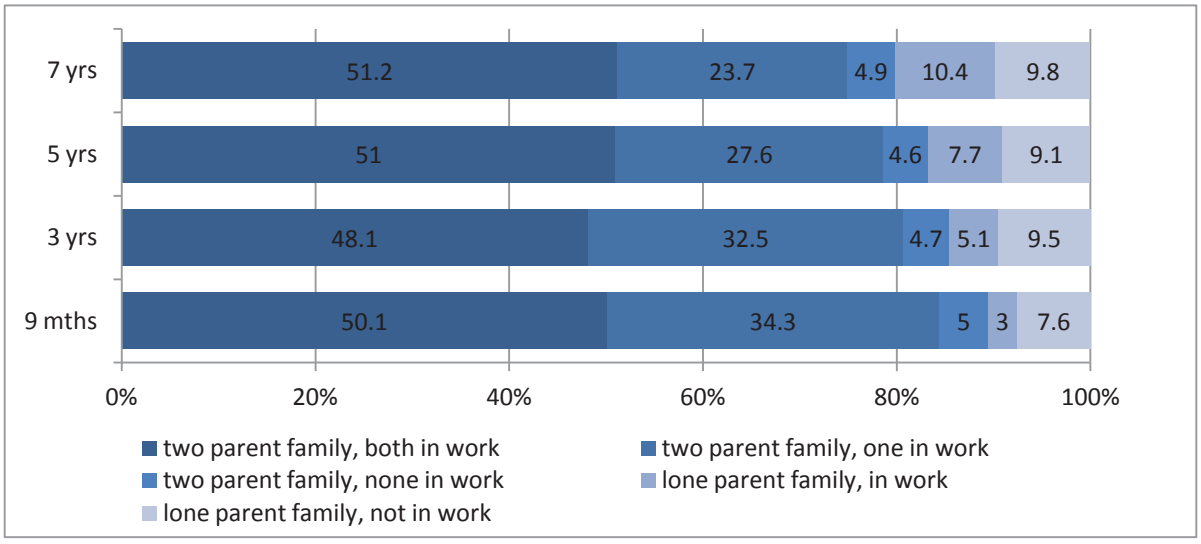
M2 Prevalence of Parental Worklessness in England

A workless family was defined as a family where no parent living in the household was in work at the time the family was interviewed. We look at worklessness in 2-parent families (both parents are not in work) and single parent families (parent not in work). Information on parental worklessness was collected at each of the four waves of data collection between 2000 and 2008.
Using the data longitudinally allows us to identify families who were:

* never workless at any of the four assessment points (*continuously working*)
* those who moved in and out of worklessness (*temporary worklessness*)
* and those who were workless at all four assessment points (*persistent worklessness*).

Figure M2.1 shows the prevalence of persistent worklessness for the longitudinal sample of 7,378 families in England who participated in each of the four surveys with complete information on their employment and family status across all four waves. In the longitudinal sample we find about 13-15% of workless families at each of the observation points, comprising about 5% two-parent families and 8-10% single parents.

Figure M2.1. Parental worklessness at each wave in England in MCS (ages 9 months to 7 years, 2001/2 to 2007/8)



Longitudinal sample (n=7,378)
Note: this pattern reflects the pattern of worklessness in the UK as a whole using weighted data

Linking the data waves longitudinally is associated with some sample loss, especially between wave 1 and 2. Figure M2.2. gives a more detailed picture of missingness among workless families across the 4 waves of data collection. For example, in the original [unweighted] sample the percentage of workless families at wave 1 is 21.2%. When the data is weighted to adjust for oversampling in relative disadvantaged and ethnic minority wards, the percentage of workless families is reduced to 17.2% at

wave 1. When the data is linked longitudinally and thus restricted to families who have participated at all four sweeps, the percentage of workless families at wave 1 is reduced further to 12.6% when the weights are applied (Figure M2.1: two parent and lone parent families combined, wave 1 at age 9 months).

We saw in table M1.1 that the greatest drop-out of all families participating in MCS occurred between wave 1 and 2, but this sample loss was not random. Workless families at wave 1 [as other disadvantaged families such as single parent families and those in income poverty] were far less likely to participate in later waves than working, and other advantaged, families at wave 1. Figure M2.2 shows that the percentage of workless families who dropped out between MCS1 to MCS2 was 29.4%, much higher than the 16.9% observed for families that were in work at wave 1 (not shown in Figure M2.2). Given this caveat the longitudinal sample is however largely representative of the sample population.

Looking further at the patterns of participation among the workless families originally in MCS1, Figure M2.2 also shows both working status and drop-out at each subsequent wave of data collection. Among the 21.2% of families who were workless at MCS1, 23.2% were in work at MCS2, 47.4% were again workless and 29.4% had dropped out at MCS2. Within this sample of families who were workless at MCS1, the percentage of families dropping out at each later wave was similar regardless of their workless status. (The percentages included in the boxes in bold show the percentage of workless families at MCS1 who were either in work or workless at later waves, with the missing families now excluded from the calculation.)

Figure M2.2 also shows the extent of repeated worklessness among the workless families at wave 1. More than two thirds of those workless at wave 1 (67.1%), remained workless at wave 2. Of those who were workless at wave 1 and wave 2, 78.3% remained workless at wave 3, and among those who were workless at waves 1-3, 77.1% remained workless at wave 4.

Figure M2.2 Attrition of workless families in MCS in England: unweighted frequencies and percentages

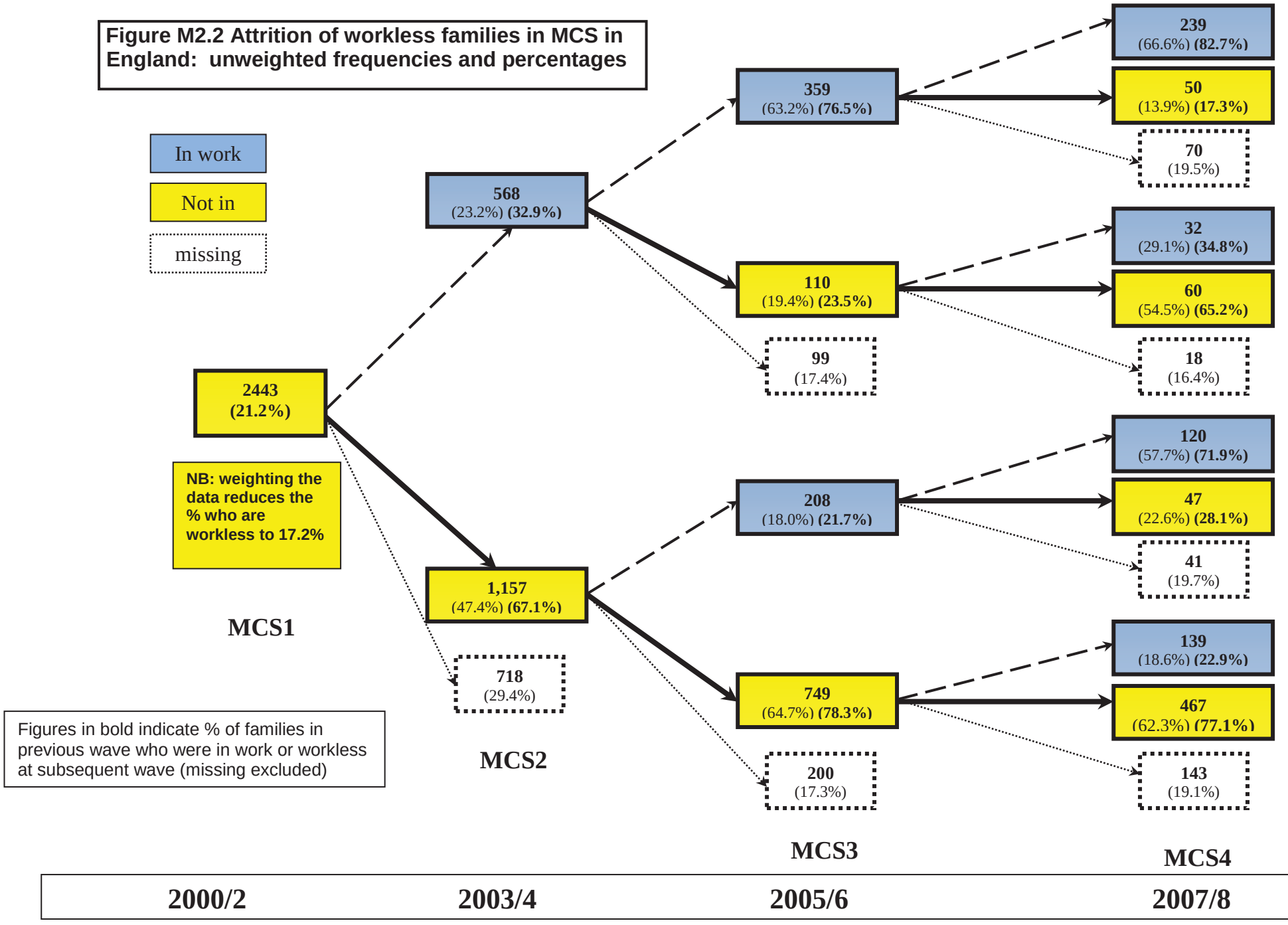


Table M2.3 gives a more detailed analysis of patterns of temporary worklessness for the 19.8% who moved in and out of worklessness over the 4 observations points. Most of the temporary workless families either experienced worklessness after initial employment, or during the first waves and then moved into employment. Fewer families moved in and out of worklessness at alternate waves.

Table M2.3: Pattern of parental worklessness for the temporary workless (2001/2-2007/8)

	Household work status				Per cent (weighted)	N (unweighted)
	2001/2	2003	2005	2007/8		
Workless 1 wave	Working	Working	Working	**Workless**	10.3%	*141*
	Working	**Workless**	Working	Working	4.4%%	*61*
	Working	Working	**Workless**	Working	3.2%	*47*
	Workless	Working	Working	Working	10.8%	*150*
Workless 2 waves	Working	Working	**Workless**	**Workless**	8.9%	*122*
	Working	**Workless**	Working	**Workless**	2.7%	*33*
	Working	**Workless**	**Workless**	Working	3.3%	*48*
	Workless	Working	Working	**Workless**	4.3%	*61*
	Workless	Working	**Workless**	Working	1.9%	*26*
	Workless	**Workless**	Working	Working	6.2%	*86*
Workless 3 waves	Working	**Workless**	**Workless**	**Workless**	15.5%	*239*
	Workless	Working	**Workless**	**Workless**	9.3%	*134*
	Workless	**Workless**	Working	**Workless**	7.8%	*107*
	Workless	**Workless**	**Workless**	Working	11.3%	*171*
Total					100%	*1426*

Regional variations in parental worklessness

Although this report is concentrating on the experience of worklessness in England only, we return briefly to the longitudinal UK sample to show differences across the four countries, before turning to regional differences in England. Table M2.4 shows the proportion of workless families across the four UK countries, differentiating between families that were always in work at the four survey waves, those who were temporarily workless (moved in and out of work), and those who were persistently workless at each of the four survey waves. Compared to other countries, more families with young children in Wales had experienced worklessness, in particular persistent worklessness. Families with young children in Scotland were the least likely to be persistently workless.

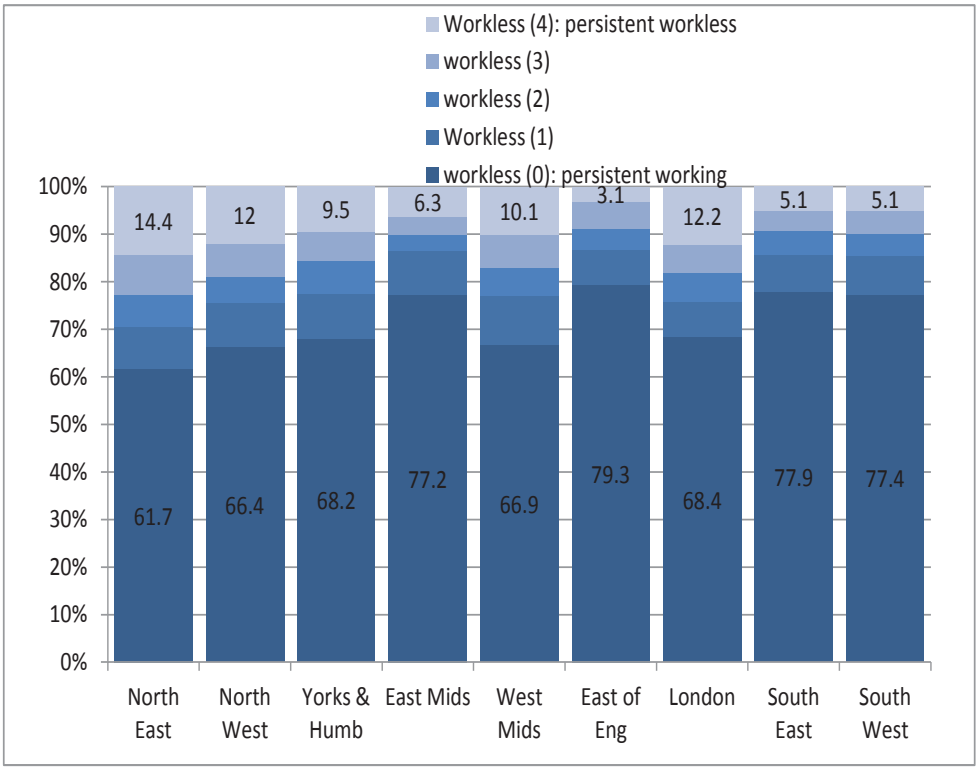
Table M2.4: Parental worklessness across the UK

	UK	England	Wales	Scotland	Northern Ireland
Always working	72.8	73.5	68.5	73.2	73.7
In work 3 waves	9.0	8.7	9.8	10.1	8.6
In work 2 waves	5.7	5.4	7.0	5.9	5.7
In work 1 wave	5.7	5.7	6.3	6.0	4.1
Persistent workless	6.8	6.7	8.4	4.7	7.9
Total N	*11,647*	*7,378*	*1,730*	*1,379*	*1,160*

Note: weighted percentages and unweighted n

Regarding regional differences, Figure M2.2 suggest that persistent worklessness was especially prevalent in the North East, North West and in London, while families in the East of England, in the South East and South West are less afflicted, as were (to a certain extent) families living in the East Midlands. However, we will see later in the report (sections M5) region is not a significant predictor of worklessness once other measures (i.e. interlinked risk factors) are controlled for.

Figure M2.2: Parental worklessness by region in England in MCS



M3 Analytic strategy

The data has been analysed using descriptive statistics and regression models. The analytic strategy adopted in this study proceeded in four steps:

1. We assessed parental worklessness over subsequent measurement points and how it related to a number of other risk factors, such as family socio-demographics, family structure, housing conditions, parental health and area deprivation.
2. We assessed the direct (or bivariate) association between parental worklessness and various child outcomes. This was done to establish whether there was an association or not;
3. Next we controlled for the interlinked risks listed above (table M1.2) to take into account the role of potential confounding factors;
4. Lastly we controlled for potential protective factors to assess whether they could further reduce the association between parental worklessness and child outcomes, after taking into account the interlinked risk factors.

Proceeding in these four steps enabled us to:

a. Assess the extent of parental worklessness in families with dependent children and examine how parental worklessnesss relates to other risk factors
b. Assess the strength of the association between parental worklessness and the different child outcomes;
c. Assess whether this association was largely due to the interlinked risk factors (i.e. household demographics, family structure, income poverty, housing conditions, parental health and area deprivation);
d. Gain a better understanding of potential protective factors.

Based on the theory of risk and resilience outlined earlier, we furthermore explored the mechanisms through which parental worklessness affected children's outcomes. In particular we allowed for six different types of mechanisms or set of protective factors:

i. Cumulative risk processes (taking into account the multiple interlinked risks associated with worklessness);
ii. Child characteristics (child gender, age, biological factors, ethnicity);
iii. Warm and engaged parenting behaviour (parent-child interactions);
iv. Parental engagement and support for school related activities (parental aspirations for the child, parental contact with school, parents attend school events)';
v. The child's school experiences (school engagement and attitude to school)
vi. School characteristics (socio-economic characteristics of the school).

For those less familiar with these modelling techniques, Box M3.1 provides further details of how to interpret the findings.

Box M3.1: How to interpret multiple regression results

Multiple Linear regression

The estimated multiple correlation coefficient, *R*, shows the strength of the relationship between a set of predictor variables (i.e. worklessness and associated risks) and an outcome (i.e. scores on the cognitive assessments). *R* has a range of 0 to 1. The closer to 1, the stronger the relationship between the predictors and the outcome. R^2 takes this further, giving the actual percentage of variation in the outcome measure that has been explained by the set of predictor variables included in the model.

A standardised regression coefficient [β] is also calculated for each predictor. These give the strength of the relationship between any *one* predictor, i.e., worklessness and the outcome, while holding constant the effect of the other predictors (i.e. the other risk factors). The regression coefficients range between -1 to +1. Using single parenthood as an example, the further from zero that β is, the stronger the relationship between single parenthood and the outcome. A positive score (towards +1) tells us that single parenthood has a positive impact on the outcome, while a negative score (towards –1) indicates a negative impact. Standardised regression coefficients do not directly indicate the effect of a unit change in the outcome, they rather represent change in terms of standard deviations.The predictor with the biggest regression coefficient is the most important predictor of the outcome, regardless of the direction of the relationship.

Multiple Logistic regression

A series of multivariate logistic regression analyses were performed to assess whether the observed differences between groups (i.e. being persistently workless versus temporary worklessness) were statistically significant after taking other characteristics into consideration. The results are discussed in terms of the 'odds ratio' (OR), or the ratio of the odds of an event (e.g. being workless) occurring in one group (e.g. single parents) to the odds of it occurring in another (e.g. two-parent families). The OR for the reference group is set as 1, thus an OR greater than 1 indicates that a characteristic (e.g. single parenthood) has a positive association with worklessness and an OR less than 1 indicates the characteristic has a negative association with worklessness.

Interpreting Odds Ratios (OR): for those who are not familiar with the interpretation of logistic regression models, it is important to clarify the meaning of the odds ratios reported. Using the example of the relative chances of children in a persistent workless household being part of a single parent household (table M4.1), we can see that 58.3% of children in a persistent workless household were part of a single parent household compared with 2.9% children living in a persistently working household. Expressing this in terms of odds rather than probabilities or percentages we obtain odds of 58.3: 41.7 or 1.40:1 that children in a repeated workless household would be part of a single parent household and 2.9:97.1 or 0.03:1 that children living in a persistently working household would be part of a single parent household. The odds of children in a persistent workless household being in a single parent household are therefore nearly 47 times (1.40 / 0.03) that of children living in a persistently working household; however, this does not mean that children in a persistent workless household are 47 times as likely as children living in a persistently working household to be in a single parent household.

M4 Parental worklessness and interlinked risk factors

We first turned to exploring the characteristics of families in the MCS experiencing long-term worklessness, and whether there were differences between persistently workless families and those moving in and out of work between the four waves of data collection (S1-4). We explored a range of additional risk factors that have also been shown to influence child adjustment and attainment, including family characteristics, parental health and living conditions, to gain a better understanding of the additional risks associated with family worklessness.

Table M4.1 shows the bi-variate relationship between exposure to worklessness and the additional risk factors, differentiating between experiences of families who were always in work, those with temporary worklessness (moving in and out), and persistently workless families . There was a clear relationship between worklessness and a number of other risk factors. For example, the majority (91%) of persistent workless families lived in poverty (earning less than 60% of equivalised median income before housing costs) –compared to 12% of families working continuously; 75% of persistent workless families lived in rented social housing compared with 11% of families working continuously; 58% of persistent workless families were single-parent families compared with just 3% of persistently working families; and 41% of persistent workless families had no qualifications compared with 3% of persistently working families.

Two other findings are also worthy of comment. It is striking that being worklessness at only one of the four occasions was associated with a number of additional risk factors, i.e. younger maternal age, living in social housing, lower qualifications, poverty, single parenthood, and relationship breakup in comparison to those persistently employed. Just one period of time spent workless was associated with a different profile of the family when compared to families who were always in work.

It is also interesting to note that those families who experienced temporary worklessness (i.e. worklessness at 1-3 out of the 4 observation points) were more likely to have acquired further qualifications than those persistently working or persistently workless. We might speculate that they took some time out to gain qualifications, and to improve their employment prospects.

Table M4.1: Relationship between linked risks and parental worklessness

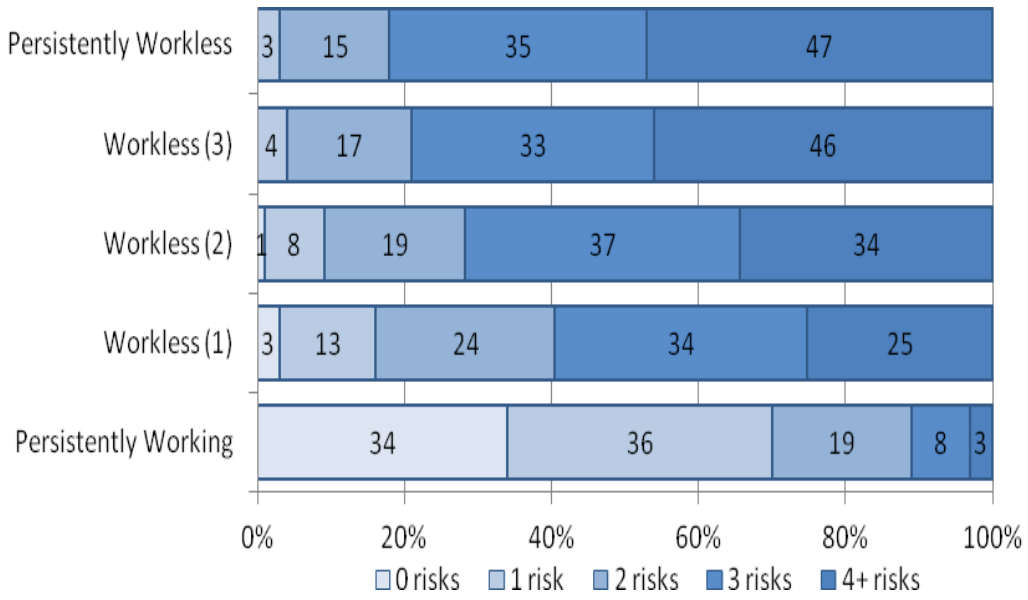
	0 Workless %	1 workless %	2 Workless %	3 Workless %	4 Workless %	All %	*N (all)*
No. times workless (S1-S4)	73.5	8.7	5.4	5.7	6.7	-	*7378*
Associated Risks							
Mean age mother at CM birth (S1)	30.1	25.9	24.8	25.2	25.4	28.8	*7378*
Other language spoken at home (S1)	9.7	15.9	13.9	14.4	17.9	11.3	*7378*
Housing tenure (S1)							
0wn/mortgage	79.2	32.8	17.2	12.5	4.7	63.0	*7365*
rent (social)	10.7	46.0	54.5	60.5	75.0	23.3	*7365*
rent (private)	6.0	12.6	18.5	14.5	13.4	8.2	*7365*
other	4.1	8.5	9.8	12.5	6.9	5.5	*7365*
Highest qualification (hhold) (S1)	53.9	23.2	12.2	9.6	5.2	43.2	*7370*
NVQ4+							
NVQ3	16.2	18.0	17.6	12.5	5.8	15.5	*7370*
NVQ2	23.0	32.4	31.5	35.7	25.2	25.2	*7370*
NVQ1/overseas	4.2	13.1	18.4	19.6	22.6	7.8	*7370*
No qualifications	2.7	13.4	20.3	22.6	41.1	8.3	*7370*
Gained higher qual (hhold) (S1-S4)	15.7	25.3	28.4	23.0	16.3	17.7	*7370*
Poverty (OECD median) (S1) below 60%	11.6	53.2	68.4	81.5	91.4	27.4	*6800*
Marital status (S1)							
married	73.1	41.2	28.0	26.1	20.5	61.7	*7376*
cohabiting	24.0	33.5	30.1	30.4	21.2	25.3	*7376*
single parent	2.9	25.4	41.8	43.5	58.3	13.0	*7376*
Mean number of marital transitions (S1-S4) (range: 0-3)	0.3	0.9	1.0	0.8	0.5	0.4	*7331*
LS limiting illness (S1-S4)	74.4	67.2	65.5	56.2	48.3	70.5	*7348*
none							
at S1 or S4	20.1	24.5	24.7	28.1	30.7	21.9	*7348*
at S1 and S4	5.5	8.3	9.8	15.7	21.0	7.6	*7348*
Mother's malaise score [mean] (S1) (range: 0-9)	1.5	1.8	1.9	2.4	2.4	1.6	*7092*
No. of children in hhld [mean] (S4) (range: 1-13)	2.4	2.6	2.6	2.8	3.0	2.5	*7378*
Mean IMD deprivation (employment) (S4) (deciles, low dep – high dep)	5.0	6.8	7.1	7.7	8.0	5.6	*7378*
n(low-high)	*5094-5484*	*583-651*	*331-376*	*367-399*	*425-468*		

Before turning to the multivariate analysis, we first looked at a combination of risk factors linked to worklessness to get an idea of the cumulative risks faced by families experiencing repeated worklessness. We constructed an **index of multiple risks,** including the following measures that were significantly associated with parental worklessness:

- Rented social housing
- Qualifications less than degree level
- Poverty (earning less than 60% of equivalised median income before housing costs)
- Mother's malaise score (4+ was used in the cut-off to indicate depression)
- Number of family/marital transitions (3+ was used in the cut-off)
- A higher number of children in the household (4+ was used in the cut-off)

These risks were summed together, giving a range of 0-6 (the number of risks experienced). The mean number of risks for all families was 1.7. It was highest at 3.4 for families who had been workless on three or four occasions, and lowest at 1.1 for families who had no experience of worklessness. Figure M4.1. shows that the number of risks experienced increased with the number of times a family was worklessness. Compared to families who were continuously working, even those families experiencing worklessness at only one time point had an increased exposure to multiple additional risks. The highest rate for multiple risk exposure was apparent for families experiencing worklessness at three and four subsequent observation points.

Figure M4.1 multiple risks by number of times workless



M5 Predicting parental worklessness

We now turn to results from the multivariate analysis. Multiple regression analysis was used to assess to what extent the experience of repeated parental worklessness could be predicted by the additional risk factors. Bivariate correlations between all the variables included in the model vary between -.00 and .61. The highest correlations were found between parental worklessness and poverty (.61), which is however still in the acceptable range to avoid the problem of multicollinearity. The majority of 'high' correlations were .3 or .4, which suggests that multicollinearity was not a problem.

We ran different models to assess the relationship between the associated risk factors and worklessness and to establish whether there were differences between families experiencing persistent versus temporary worklessness.

Linear regression was used to predict the number of times a family was workless. We used the workless variable as a continuous measure with a range 0 to 4[1].

Logistic regression was used to predict

- never being workless versus temporary worklessness (0 v 1-3 periods of worklessness) and
- temporary worklessness versus persistent worklessness (1-3 periods of worklessness v 4 periods of worklessness).

Table M5.1 shows the results from the different multiple regression models, showing the associations between different durations of worklessness and other risk factors that have also been shown to influence child adjustment and attainment. There was considerable consistency across the models, suggesting that there was substantial, yet not complete overlap between the risk factors associated with persistent versus temporary worklessness. Furthermore, most of the different risk factors showed an independent risk effect, i.e. they were associated with worklessness in addition and above the other factors included in the model, suggesting that to understand the experience of worklessness and its impact on child outcomes one has to take into account these multiple interlinked risk factors. In summary, we can see that the experience of worklessness was significantly associated with:

- younger age of the mother
- social housing or private rented accommodation

[1] We are aware that experiences of worklessness are not normally distribution, however, using linear regression allows us to gain an approximate understanding of the factors associated with repeated worklessness.

- lack of or low qualifications (especially among the persistent workless)
- did not gain further qualifications during the four waves of observation
- poverty (which was particularly marked for those experiencing temporary worklessnesss compared to those never workless)
- single parenthood (especially among the temporary workless versus never workless)
- family instability (especially among the temporary workless versus never workless)
- long term limiting illness (especially among the persistent workless versus temporary workless), and
- number of children in the household.

Younger mothers were more likely to experience worklessness, as were those living in rented accommodation, parents with low qualifications, parents with low income, single parents, parents experiencing changes in family composition, parents who suffer from a long-term limiting illness, and families with many children. In the MCS, language spoken in the home, region and area deprivation appeared to have no significant effect on worklessness in addition to and above the other variables included in the model, with the exception of living in the East Midlands and South West England.

The findings also suggested differences between the workless groups. For example, the experience of persistent rather than temporary worklessness appeared to be more likely for those families with lower qualifications, those with a long term limiting illness or maternal depression, while temporary worklessness was more strongly associated with single parenthood, family instability, and poverty than persistent worklessness .

A similar pattern emerged for teacher ratings of a child's behaviour (Figure M10.3): namely that the strongest relationship was found between parental worklessness and rating of hyperactivity of the child. Interestingly the teachers appeared to report fewer problems than the parent.

Figure M10.3: average SDQ sub-scale scores (teacher rated) for MCS children at age 7 by family workless status

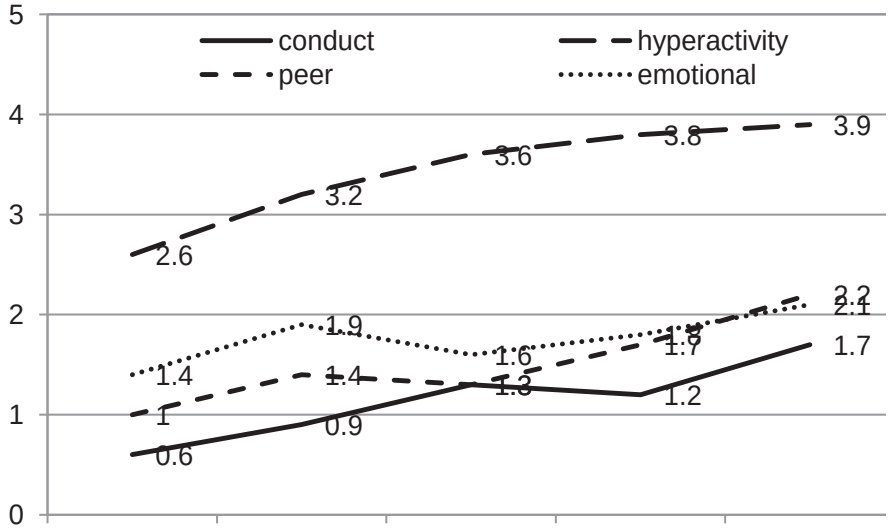


Table M10.2 gives the t-scores and significant differences of mean scores for each teacher rated child behaviour outcome by workless group.

Table M10.2: Relationship between average teacher-rated SDQ scores and number of times workless

	0 Workless %	1 workless %	2 Workless %	3 Workless %	4 Workless %	All %	*N (all)*
Behaviour (Strengths & Difficulties)							
SDQ overall score (teacher rated) (range: 0-40)	5.6	7.4 t=4.72***	7.9 t=5.02***	8.5 t=5.92***	10.0 t=9.55***	6.2	*4727*
SDQ sub-scale: conduct (range: 0-10)	0.6	0.9 t=2.85**	1.3 t=4.25***	1.2 t=4.23***	1.7 t=8.29***	0.8	*4728*
SDQ sub-scale: hyperactivity (range: 0-10)	2.6	3.2 t=3.32**	3.6 t=4.23***	3.8 t=5.39***	4.1 t=7.27***	2.9	*4728*
SDQ sub-scale: peer (range: 0-10)	1.0	1.4 t=3.30**	1.3 t=2.56*	1.7 t=4.62***	2.2 t=7.75***	1.3	*4727*
SDQ sub-scale: emotional (range: 0-10)	1.4	1.9 t=4.42***	1.6 t=1.90	1.8 t=2.76**	2.1 t=4.70***	1.5	*4727*
n	*3584*	*390*	*211*	*223*	*319-320*		

Note: T-tests were used to test mean score differences for each workless category compared against '0 workless', i.e. never workless.

The multiple regression results are now discussed for the SDQ total scores, differentiating between ratings by parent and teacher.

SDQ total scores: parent-rated and teacher-rated

Figures M10.4 and M10.5 show a bivariate relationship between persistent parental worklessness and behaviour problems reported by parents and teachers. Once risk factors linked to parental worklessness were controlled for, the size of the bar was greatly reduced, especially for parent rated behaviour problems. This indicated that the relationship between persistent worklessness and behaviour problems was largely explained by these other risk factors.

Regarding parental reports of behaviour problems (Figure M10.4) persistent worklessness did not remain as an independent risk factor once the different sets of protective factors were controlled for. However, quite the opposite was found for teacher-rated behaviour adjustment. Figure M10.5 shows that in every model, including the final models, persistent worklessness remained as independent risk factors for increased behaviour problems. Further to this, table M10.5 shows that temporary workless also remained an independent risk factor for increased behavioural problems reported by a teacher, but not by a parent.

Figure M10.4. Predicting parent-rated SDQ total scores (Standardised Beta coefficients of the multiple regression models

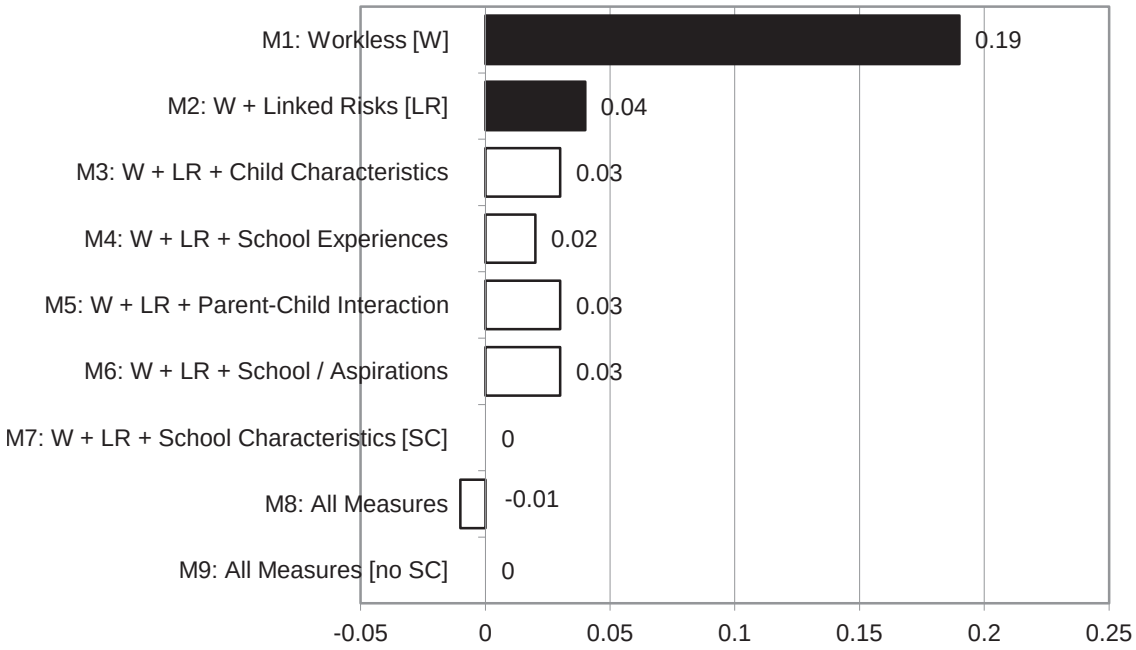
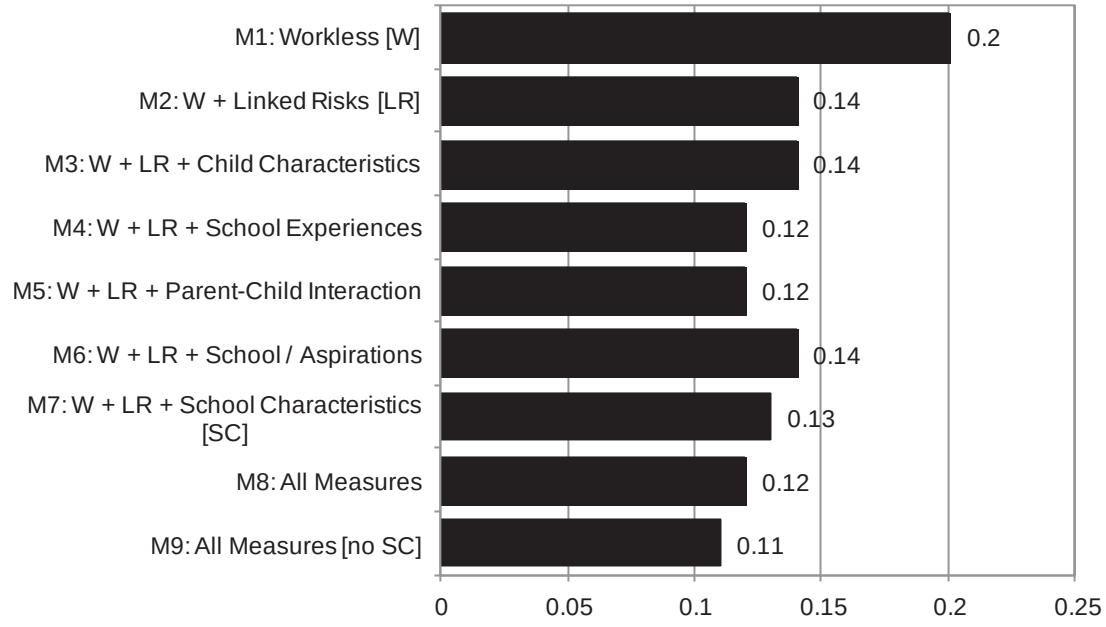


Figure M10.5. Predicting teacher-rated SDQ total scores (Standardised Beta coefficients of the multiple regression models



Tables M10.3 and M10.4 show the relationship between temporary and persistent worklessness and parent and teacher rated behaviour (respectively) in each of the

nine separate multiple regression models carried out and table M10.5 provides the results for the final models (Model 8 and 9).

Summary SDQ total score regression results

Regarding the predictors of behaviour adjustment we found that temporary and persistent worklessness shows an independent risk effect in addition to and above all other variables included in the model for teacher-rated but not parent-rated behaviour adjustment. While most of the association between parental worklessness and parental rating of behaviour adjustment of their child could be explained by the interlinked risk factors, the risk factors explained less of the association between parental worklessness and teacher rating of behaviour. Adding the different sets of protective factors removed the significant association between parental worklessness and parent-rated behaviour. The protective factors however showed little impact on the association between parental worklessness and teacher-rated behaviour - even in the final models. Table M10.5 shows that the individual potential risk and protective factors which had a significant association with cognitive performance were broadly similar for the two final models ran for parent and teacher rated behaviour adjustment, which again indicates relative stability of the findings. The specific risk and protective measures that had a significant independent association with behaviour adjustment after controlling for all the other factors in the model are now described.

Associated linked risks
Among the associated risks being a younger mother, parental long-standing illness and mother's malaise score remains significantly associated with parent rated behaviouradjustment of the child, after controlling for all the other factors in the model. Rented social housing and a low level qualifictions were independent risk factors for teacher-rated behaviour.

Child characteristics
Being a boy with a higher birthweight were each identified as potential protective factors for both parent and teacher reported behaviour scores. Being in good health and no long standing illness were both identified as additional potential protective factor for parent-rated behaviour. Being older was a protective factor for teacher-rated behaviour.

Child's school experiences
Positive school experiences, i.e. if the child liked school appeared to act as a potential protective factors for both parent and teacher rated behaviour scores. Enjoying playing with friends was a protective factor for teacher rated behaviour scores.

Parent-Child Interaction
A warm parent-child relationship and living in an organised home played a protective role for both teacher and parent rated behaviour adjustment. Parent-child activities reduced the association between parental worklessness and parent-rated behaviour..

Parental engagement with the school
Another set of potential protective factors include parental engagement with the school, and parental satisfaction with the school was significantly related to parent rated behaviour scores. High parental educational aspirations for their child, i.e. aspiring the child to go to university was an additional measure for parent-rated behaviour.

School Characteristics.
None of the school characteristics were found to be independently associated with either parent or teacher rated behaviour scores.

Table M10.3: Regression on SDQ (Parent) score

	Model 1 β (SE)	Model 2 β (SE)	Model 3 β (SE)	Model 4 β (SE)	Model 5 β (SE)	Model 6 β (SE)	Model 7 β (SE)	Model 8 β (SE)	Model 9 β (SE)
No. times workless (S1-S4)	***	*	*	ns	ns	**	*	ns	ns
1 workless	0.106***	0.011	0.010	0.017	0.020	0.004	0.008	0.027	0.019
	(0.270)	(0.279)	(0.277)	(0.284)	(0.297)	(0.292)	(0.441)	(0.421)	(0.309)
2 workless	0.114***	0.002	0.002	-0.009	0.018	-0.005	-0.021	0.001	0.001
	(0.349)	(0.416)	(0.418)	(0.404)	(0.386)	(0.425)	(0.515)	(0.476)	(0.397)
3 workless	0.175***	0.047**	0.043**	0.038*	0.039*	0.045**	0.054**	0.041	0.027
	(0.359)	(0.382)	(0.363)	(0.410)	(0.428)	(0.393)	(0.487)	(0.528)	(0.465)
Persistently workless	**0.192*** **	**0.042***	**0.031**	**0.019**	**0.025**	**0.027**	**0.004**	**-0.010**	**-0.000**
	(0.332)	(0.447)	(0.427)	(0.456)	(0.479)	(0.441)	(0.565)	(0.644)	(0.501)
R^2	0.075	0.152	0.198	0.184	0.262	0.182	0.157	0.314	0.314
Observations	*7079*	*6834*	*6788*	*6391*	*5920*	*6544*	*4129*	*3355*	*5339*

Standardized beta coefficients; Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table M10.4: Regression on SDQ (Teacher) score

	Model 1 β (SE)	Model 2 β (SE)	Model 3 β (SE)	Model 4 β (SE)	Model 5 β (SE)	Model 6 β (SE)	Model 7 β (SE)	Model 8 β (SE)	Model 9 β (SE)
No. times workless (S1-S4)	***	***	***	***	***	***	**	**	**
1 workless	0.089***	0.039*	0.042*	0.044*	0.042	0.035	0.061*	0.074*	0.049*
	(0.390)	(0.387)	(0.384)	(0.401)	(0.457)	(0.385)	(0.536)	(0.638)	(0.472)
2 workless	0.084***	0.047*	0.045*	0.044*	0.063**	0.055**	0.050*	0.067*	0.047*
	(0.446)	(0.488)	(0.498)	(0.476)	(0.563)	(0.512)	(0.631)	(0.769)	(0.583)
3 workless	0.110***	0.066**	0.062**	0.048*	0.060*	0.072**	0.085**	0.078*	0.044
	(0.477)	(0.593)	(0.600)	(0.592)	(0.644)	(0.592)	(0.715)	(0.861)	(0.684)
Persistently workless	**0.200*** **	**0.143*** **	**0.134*** **	**0.123*** **	**0.116*** **	**0.137*** **	**0.132*** **	**0.127*** **	**0.113*** **
	(0.463)	(0.723)	(0.709)	(0.738)	(0.758)	(0.708)	(0.950)	(1.133)	(0.866)
R^2	0.056	0.080	0.120	0.123	0.091	0.100	0.083	0.170	0.166
Observations	*5222*	*4701*	*4673*	*4443*	*4142*	*4537*	*3001*	*2490*	*3795*

Standardized beta coefficients; Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table M10.5: Final Regression: SDQ toal scores (Parent and Teacher rated)

	Behaviour (SDQ) (no School characteristics)		Behaviour (SDQ) (School characteristics)	
	Parent β (SE)	Teacher β (SE)	Parent β (SE)	Teacher β (SE)
No. times workless (S1-S4)				
1 workless	0.019	0.049*	0.027	0.074*
	(0.309)	(0.472)	(0.421)	(0.638)
2 workless	0.001	0.047*	0.001	0.067*
	(0.397)	(0.583)	(0.476)	(0.769)
3 workless	0.027	0.044	0.041	0.078*
	(0.465)	(0.684)	(0.528)	(0.861)
Persistently workless	-0.000	0.113***	-0.010	0.127**
	(0.501)	(0.866)	(0.644)	(1.133)
Associated Risks				
Age of mother at birth (S1)	-0.083***	-0.053**	-0.070***	-0.042
	(0.013)	(0.019)	(0.018)	(0.024)
Language spoken (S1): 0=English, 1=other	-0.014	-0.014	-0.019	-0.022
	(0.318)	(0.423)	(0.416)	(0.520)
Housing tenure (S1)				
0=own, 1=rent (social)	0.019	0.072**	0.032	0.091**
	(0.244)	(0.363)	(0.347)	(0.453)
0=own, 2=rent (private)	0.004	0.029	0.005	0.032
	(0.306)	(0.485)	(0.409)	(0.605)
0=own, 3=other	-0.002	-0.020	0.009	-0.002
	(0.389)	(0.559)	(0.512)	(0.829)
Highest qualification (household) (S1)				
0=NVQ4+, 1=NVQ3	0.009	-0.013	-0.002	0.009
	(0.211)	(0.265)	(0.257)	(0.346)
0= NVQ4+, 2=NVQ2	0.024	0.013	0.012	0.031
	(0.191)	(0.262)	(0.250)	(0.312)
0=NVQ4+,3=NVQ1/overseas	0.010	-0.040*	-0.038	-0.050*
	(0.384)	(0.480)	(0.514)	(0.613)
0= NVQ4+, 4=NVQ1	0.025	-0.013	0.006	-0.052
	(0.428)	(0.775)	(0.613)	(0.903)
Not gained higher qual (h'hold) (S1-S4)	0.009	-0.024	0.013	-0.030
0=yes, 1=no	(0.187)	(0.266)	(0.210)	(0.322)
Poverty (OECD median) (S1)	0.025	-0.017	0.054*	-0.013
0=above 60%, 1=below 60%	(0.207)	(0.367)	(0.273)	(0.479)
Marital status (S1): 0=married, 1=cohabiting	0.013	-0.013	0.030	-0.009
	(0.173)	(0.230)	(0.211)	(0.319)
0=married, 2=single parent	0.028	-0.014	0.018	-0.024
	(0.359)	(0.530)	(0.440)	(0.714)
No. of marital transitions (S1-S4)	0.043**	0.034	0.034	0.029
(range: 0-3)	(0.118)	(0.143)	(0.160)	(0.183)
LS limiting illness (S1-S4)				
0=none, 1=at S1 or S4	0.056***	0.035	0.051**	0.043
	(0.165)	(0.239)	(0.231)	(0.293)
0=none, 2=S1 and S4	0.046**	0.021	0.028	0.040
	(0.291)	(0.386)	(0.388)	(0.517)
Mother's malaise score (S1)	0.063***	0.026	0.064**	0.024
(range: 0-9)	(0.050)	(0.067)	(0.067)	(0.084)
No. of children in hhld (S4)	-0.011	-0.055*	-0.039*	-0.023
(range: 1-13)	(0.079)	(0.127)	(0.092)	(0.179)
IMD deprivation (employment) (S4)	0.008	-0.003	0.016	0.005
(deciles, low dep – high dep)	(0.026)	(0.043)	(0.041)	(0.056)

	Behaviour (SDQ) (no School characteristics)		Behaviour (SDQ) (School characteristics)	
	Parent β (SE)	Teacher β (SE)	Parent β (SE)	Teacher β (SE)
Child Characteristics				
Child's birthweight	-0.033*	-0.053*	-0.032*	-0.054*
	(0.121)	(0.193)	(0.141)	(0.250)
Child's gender (S1)	-0.062***	-0.141***	-0.040*	-0.151***
1=boy, 2=girl	(0.145)	(0.195)	(0.191)	(0.245)
Child's age at interview (S4)	-0.036*	-0.051**	-0.019	-0.060*
Range: 6.3-8.4 years	(0.308)	(0.432)	(0.379)	(0.521)
Child's ethnicity (S1)	-0.007	0.014	-0.027	0.030
0=other, 1=white	(0.264)	(0.408)	(0.359)	(0.520)
Child's General Health (S3)	-0.063***	-0.022	-0.061**	-0.031
1=very poor/poor/okay, 2=good/excellent	(0.224)	(0.302)	(0.312)	(0.359)
Child has LS Illness (S4)	-0.083***	-0.010	-0.062**	0.004
1=yes, 2=no	(0.158)	(0.222)	(0.209)	(0.267)
Child school experiences				
Whether like school (S4)				
1=never, 2= sometimes,	-0.055*	-0.057*	-0.058*	-0.041
	(0.238)	(0.318)	(0.302)	(0.406)
1=never, 3=all the time	-0.099***	-0.116***	-0.134***	-0.111**
	(0.235)	(0.289)	(0.272)	(0.392)
Does best at school (S4)				
1=never, 2=sometimes	-0.074	-0.031	-0.012	-0.029
	(0.736)	(0.830)	(1.037)	(1.127)
1=never, 3=all the time	-0.146*	-0.120	-0.086	-0.079
	(0.732)	(0.854)	(1.033)	(1.169)
Has a lot of friends (S4)	-0.038**	-0.045*	-0.030	-0.045
1=not many, 2=some/a lot of friends	(0.213)	(0.321)	(0.284)	(0.459)
Likes playing with friends (S4)	-0.002	-0.051**	-0.001	-0.074***
1=don't like, 2=sometimes/all the time	(1.065)	(1.499)	(1.215)	(1.625)
Parent-Child Interaction				
Parent-child relationship (Pianta) (S2)	-0.278***	-0.083***	-0.274***	-0.088***
Range: 30-75	(0.011)	(0.014)	(0.013)	(0.017)
Read to child (S2)	-0.043*	0.018	-0.030	0.008
Range: 1=not at all….6=every day	(0.093)	(0.113)	(0.123)	(0.159)
Take to library (S3)	-0.032*	-0.004	-0.033	0.005
Range: 1=never...7=everyday	(0.047)	(0.067)	(0.063)	(0.086)
Activities together scale (S3)	-0.022	-0.036*	-0.035*	-0.041
Range: 0-6	(0.114)	(0.149)	(0.139)	(0.206)
Whether disorganised at home (S4)	-0.133***	-0.081***	-0.134***	-0.081***
1=strongly agree…..5=strongly disagree	(0.074)	(0.102)	(0.090)	(0.120)
CM has a regular term-time bedtime (S3)	-0.015	-0.020	-0.028	-0.017
1=never/sometimes, 2=usually/always	(0.151)	(0.196)	(0.173)	(0.277)
School engagement / education aspirations				
Parents satisfied with the school? (S3)	-0.095***	-0.053**	-0.097***	-0.045
Range: 1=very dissatisfied – 5=very satisfied	(0.138)	(0.201)	(0.167)	(0.235)
Attend parents evening (S4)				
1=no,2=none held yet	0.014	-0.009	0.011	0.041
	(0.859)	(1.155)	(1.042)	(1.375)
1=no, 3=yes	-0.031	-0.071*	-0.008	-0.015
	(0.563)	(0.844)	(0.797)	(1.024)
Post16/university aspirations (S4)				
1=leave, 2=post-16 not university	-0.036	-0.038	-0.075*	-0.054
	(0.795)	(1.163)	(1.051)	(1.495)

	Behaviour (SDQ) (no School characteristics)		Behaviour (SDQ) (School characteristics)	
	Parent β (SE)	Teacher β (SE)	Parent β (SE)	Teacher β (SE)
1=leave, 2=post 16 d/k university	-0.038	-0.024	-0.053	-0.034
	(0.680)	(1.146)	(0.905)	(1.462)
1=leave, 4 university	-0.097**	-0.060	-0.156***	-0.097
	(0.611)	(1.026)	(0.810)	(1.253)
School characteristics				
% SEN			0.005	0.047
			(0.014)	(0.023)
% eligible for free school meals			-0.002	-0.051
			(0.012)	(0.016)
Mean KS1 points score over 3 years			-0.042	0.031
			(0.102)	(0.147)
R^2	0.314	0.166	0.314	0.170
Observations	*5339*	*3795*	*3355*	*2490*

Standardized beta coefficients; Standard errors in parentheses. * *p < 0.05,* ** *p < 0.01,* *** *p < 0.001*

M11 Child well-being measures

In addition to cognitive and behavioural adjustment, we examined the association between repeated worklessness and indicators of child wellbeing. In particular we focused on whether the child had been bullied by other children ('How often do other children bully you?'), whether the child had bullied other children ('How often are you horrible to other children at school?'), and whether children were happy in the school environment. The association between parental worklessness and these well-being outcomes was weaker than we found for academic, cognitive and behaviour outcomes. After controlling for the associated linked links, the significant association between the individual well-being outcomes and parental worklessness at the bivariate level was no longer significant. We do not, therefore, include the full set of tables containing the multiple regression results.

Figure M11.1 shows that children growing up in workless families were more likely to be bullied by other children than those growing up in persistent working families ($F(3.91,1519.61) = 18.72$ ($p<.000$).

Figure M11.1: Child being bullied ('How often do other children bully you?') by parental worklessness

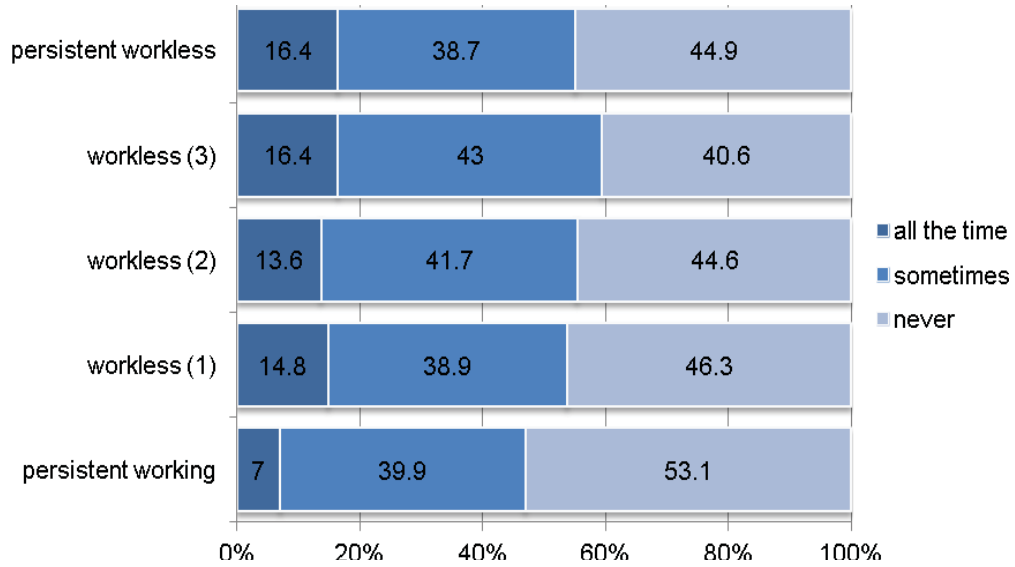


Table M11.1 gives the results of a logistic regression linking worklessness to being bullied (Model 1). After we controlled for the interlinked risk factors associated with worklessness (Model 2) the association between parental workless and being bullied did not remain significant, suggesting that parental worklessness is not a key driver of being bullied. We therefore did not examine the role of potential protective factors, as the association between parental worklessness and bullying was fully explained by the interlinked risk factors.

Table M11.1 : Logistic Regression odds ratios for 'never or sometimes' v 'always' bullied?

	Model 1 [W]	Model 2 [W + LR]
	OR (95% CIs)	OR (95% CIs)
No. times workless (S1-S4)	2.31***	1.16
1 workless v persistent working	(1.76-3.05)	(0.85-1.59)
2 workless v persistent working	2.10***	0.94
	(1.41-3.13)	(0.59-1.49)
3 workless v persistent working	2.67***	1.07
	(1.84-3.87)	(0.71-1.62)
Persistently workless v persistent	2.48***	0.92
working	(1.81-3.38)	(0.60-1.43)
Observations	*6992*	*6123*

Next we look at the association between parental worklessness and whether the child bullied other children, or specifically, how often were they horrible to other children. The data presented in Figure M11.2 furthermore suggests, that children growing up with workless parents were also more likely to bully other children when compared to children with parents who were persistently working (F(7.66, 2980.98) = 7.66; p<.000).

Figure M11.2. Bullying other children ('How often are you horrible to other children at school?') by parental worklessness

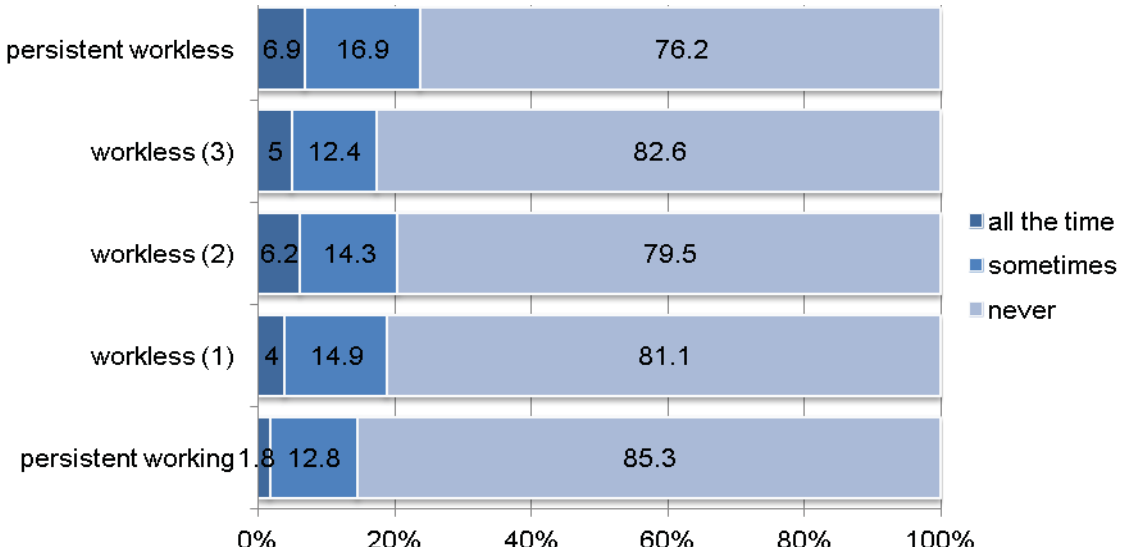


Table M11.2 gives the results of a logistic regression linking worklessness to being horrible to others (Model 1). After controlling for the interlinked risk factors the association between being horrible to other children and worklessness is no longer significant, suggesting that parental worklessness is not a key driver of a child being

horrible to others. We therefore did not examine the role of potential protective factors, as the association between parental worklessness and bullying was fully explained by the interlinked risk factors.

Table M11.2: Logistic Regression odds ratios for 'never' v' sometimes or always' horrible to others

	Model 1 [W]	Model 2 [W + LR]
	OR (95% CIs)	OR (95% CIs)
No. times workless (S1-S4)	1.33*	0.99
1 workless v persistent working	(1.02-1.73)	(0.72-1.36)
2 workless v persistent working	1.51**	1.11
	(1.13-2.00)	(0.77-1.60)
3 workless v persistent working	1.21	0.75
	(0.89-1.65)	(0.51-1.11)
Persistently workless v persistent	1.92***	1.08
working	(1.46-2.52)	(0.73-1.60)
Observations	*6993*	*6120*

We finally looked at whether children growing up in repeated and persistent workless households reported that they felt unhappy at school more often than children with working parents (F(7.46, 2901.42) = 10.96; p<.000). Figure M11.3 suggests that children growing up with repeatedly workless parents feel more often unhappy at school.

Figure M11.3. 'How often do you feel unhappy at school?'

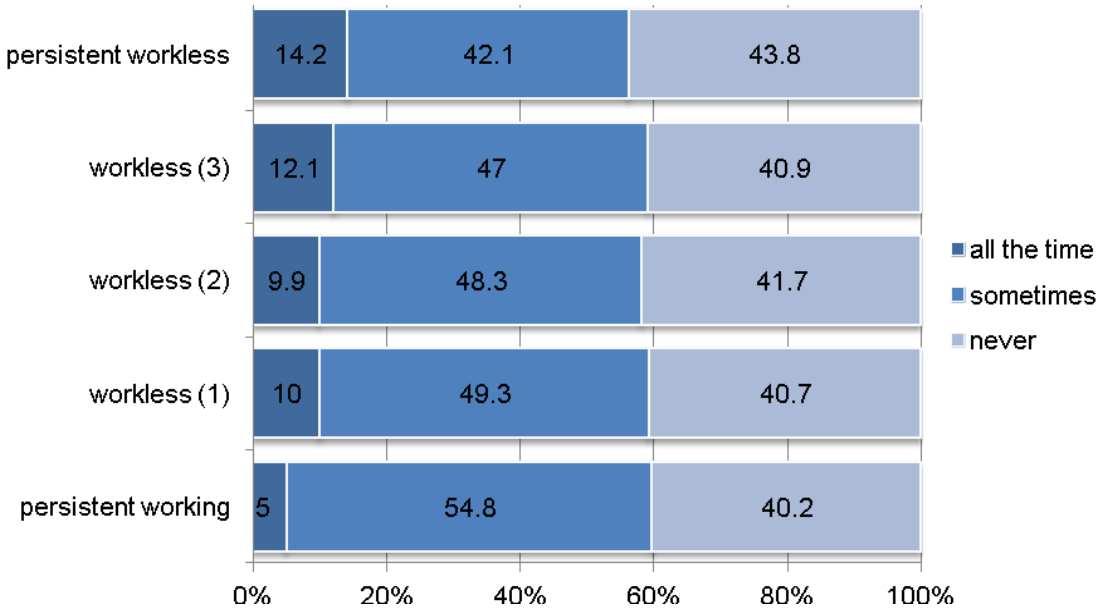


Table M11.3 gives the results of a logistic regression linking worklessness to feeling unhappy at school (Model 1). As in the previous models, the association between worklessness and happiness at school was no longer significant after controlling for the interlinked risk factors associated with worklessness, suggesting that parental worklessness is not a key driver of children's happiness at school. We therefore did not examine the role of potential protective factors, as the association between parental worklessness and happiness at school was fully explained by the interlinked risk factors.

Table M11.3: Logistic Regression odds ratios for 'never or sometimes' v 'always' unhappy?

	Model 1 [W]	Model 2 [W + LR]
	OR (95% CIs)	OR (95% CIs)
No. times workless (S1-S4)	2.10***	1.29
1 workless v persistent working	(1.50-2.92)	(0.86-1.93)
2 workless v persistent working	2.09***	1.26
	(1.35-3.23)	(0.75-2.12)
3 workless v persistent working	2.59***	1.57
	(1.72-3.90)	(0.99-2.52)
Persistently workless v persistent	3.18***	1.63
working	(2.32-4.37)	(0.95-2.79)
Observations	*6933*	*6066*

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