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# Family employment and child socioemotional behaviour: longitudinal findings from the UK Millennium Cohort Study

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## ABSTRACT

**Background** Levels of paid employment in two parent and lone parent families have increased in the UK but evidence of its impact on child socioemotional behaviour is limited and inconsistent.

**Methods** We conducted a longitudinal analysis using the first four sweeps of the Millennium Cohort Study (9 months, 3 years, 5 years and 7 years) to investigate the influence of family employment trajectories in the early years on socioemotional behaviour at 7 years, unadjusted and adjusted for covariates. In addition, mothers' employment was investigated separately.

**Results** Children from families where no parent was employed for one or more sweeps were at a greater risk of socioemotional problem behaviour compared with those where a parent was continuously employed, even after adjustment for covariates. Children of mothers who were non-employed for one or more sweeps were at greater risk of problem behaviour compared with mothers who were employed at all sweeps. Adjustment for covariates fully attenuated the excess risk for children whose mothers had moved into employment by the time they were 7 years. In contrast, the elevated risk associated with continuous non-employment and a single transition out of employment was attenuated after adjustment for early covariates, fathers' employment, household income and mothers' psychological distress at 7 years, but remained significant.

**Conclusions** Family and mothers' employment were associated with a lower risk of problem behaviour for children in middle childhood, in part explained by sociodemographic characteristics of families and the apparent psychological and socioeconomic benefits of employment. Results for mothers' transitions in or out of the labour market suggest that child problem behaviour is influenced by current status, over and above diverse earlier experiences of employment and non-employment.

patterns, with most working full time during their child's early years.<sup>3</sup> Consequently, research is limited and there is scant evidence of any effect of fathers' employment on child socioemotional behaviour.<sup>5 6</sup> Mothers' employment has received greater research attention, although findings are mixed. Employment in a child's infancy has been linked to poorer socioemotional behaviour.<sup>7</sup> However, other studies have shown no relationship<sup>8 9</sup> or fewer problem behaviours among children of employed mothers.<sup>10</sup>

Mechanisms through which mothers' employment status may affect child socioemotional behaviour are likely to be complex. The increase in levels of employment within families conceals differing patterns of employment and non-employment, including movements into and out of the labour market. Furthermore, the impact of employment on child behaviour may differ depending on timing of employment, with suggestions of sensitive early periods<sup>11</sup> and that effects of early employment may be ameliorated by current circumstances.<sup>5</sup> Non-employment could influence child behaviour positively through, for example, increased time for parental care, or negatively through reduced income and its impact on parental mental health and parenting behaviour.<sup>12</sup> Employment usually increases household income and there is some evidence that mothers' employment is particularly beneficial for the socioemotional behaviour of children in lone parent compared with couple households.<sup>13</sup>

This study sets out to investigate the influence of stable and varied family employment trajectories from infancy to 7 years on child socioemotional behaviour at 7 years, and to consider potential underlying mechanisms.

## METHODS

### Sample

We examined data from the Millennium Cohort Study (MCS), a longitudinal study of children born in the UK between September 2000 and January 2002. The first study contact with the cohort child was around age 9 months, when information was collected on 72% of those approached, providing information on 18 818 infants (our analyses were restricted to the 18 296 singletons). Survey interviews were carried out in the home with the main respondent (almost always the mother). We used data from the first four sweeps when the children were aged 9 months, and 3 years, 5 years and 7 years, resulting in a sample of 11 538 (61%) children who took part in every sweep. Exclusions for

## INTRODUCTION

The proportion of families with two parents in paid employment has increased over recent decades in the UK and other developed countries.<sup>1</sup> These changes mainly result from mothers entering the labour market, while employment among fathers has remained high throughout.<sup>2</sup> There has also been an increase in employment levels among lone mothers, although these remain lower than levels for mothers in two-parent families.<sup>3</sup> These trends partly reflect policy initiatives to encourage employment as a route out of family poverty.<sup>4</sup>

A problem with attempting to evaluate the impact of family employment on child outcomes is the lack of variation in fathers' employment



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missing data on the outcome and parent employment variables, and where the main respondent was someone other than the mother at one or more of the sweeps (in order to have a consistent rater of employment status and socioemotional behaviour) resulted in samples of 10 617 children for mothers' employment and 10 532 for family employment analyses. In multivariable analyses, full data were required on covariates, reducing analytical samples to 10 433 for mothers' employment and 10 344 for family employment (both samples 57% of the singletons included at 9 months).

## Measures

### Socioemotional behaviour

Socioemotional behaviour was assessed at 7 years using the Strengths and Difficulties Questionnaire (SDQ),<sup>14</sup> a 25-item measure completed by the mother. We used the total difficulties score, which is the sum of four difficulties components (peer problems, conduct disorders, hyperactivity and emotional problems) to classify children, using validated cut-offs,<sup>14</sup> as having 'normal' or 'borderline-abnormal' (problem) scores. If only one or two items in any component were missing, we used the average value from the remaining items to generate a complete component.<sup>15</sup>

### Family employment

Parents of the child reported their current employment status at each of the four data collection sweeps. A binary variable, family employment, was created for each sweep, identifying whether or not there was an employed parent, without distinction between mothers' and fathers' employment or one or two parent families. Non-employment comprised those who did not have paid work, those on long-term leave from work, and students. Sensitivity analyses excluding cases where a parent was on leave or in education are also reported. Trajectories of family employment were derived across the four sweeps, identifying patterns and culminating in status at 7 years, in order to differentiate potential effects of employment or non-employment over time and concurrent with the child socioemotional behaviour at 7 years.

The trajectories were:

- ▶ at least one parent employed at all four sweeps, referred to as 'continuous employment' hereafter
- ▶ a single transition from a position where no parent was employed to where at least one parent entered the labour market
- ▶ multiple transitions between employment and non-employment within the family during the first three sweeps, concluding in employment in the family at 7 years
- ▶ multiple transitions between employment and non-employment during the first three sweeps, concluding in non-employment in the family at 7 years
- ▶ a single transition from having an employed parent to having none
- ▶ no parent employed at any sweep, referred to as 'continuous non-employment' hereafter.

The employment experiences of families reported as in continuous employment or non-employment at all four MCS sweeps may in reality be more complex, and use of the term 'continuous' is therefore a shorthand description.

We assessed the fit of the employment trajectories variable by comparing it with one comprising all possible patterns of family employment status over the four sweeps (the saturated model), using likelihood ratio tests. The results showed that the employment trajectories variable was no worse at predicting

socioemotional problem behaviour at 7 years than the saturated model ( $p=0.37$ ), and so it was used in analyses of longitudinal family employment.

### Mothers' employment

Mothers' employment increased from 46.9% (5161) at age 9 months to 63.3% (6783) at 7 years, most part-time ( $\leq 30$  h paid work per week). We combined part-time and full-time employment because exploratory analyses showed that there were few differences in the risk of problem behaviour at 7 years according to hours worked. We derived mothers' employment trajectories using the same rationale as for family employment trajectories.

The mothers' trajectories were:

- ▶ Mother employed at all four sweeps, referred to as 'continuous employment' hereafter
- ▶ A single transition into employment
- ▶ Multiple transitions between employment and non-employment during the first three sweeps, concluding in employment at 7 years
- ▶ Multiple transitions during the first three sweeps, concluding in non-employment at 7 years
- ▶ A single transition out of employment
- ▶ Mother not employed at any sweep, referred to as 'continuous non-employment' hereafter.

Continuous employment (and non-employment) refers to a single employment status reported at all four MCS sweeps, and may not fully capture the employment experiences of these mothers. As with family employment, the term will be used as a shorthand description.

The mothers' employment trajectories variable was compared against one comprising all possible patterns of mothers' employment status over the four sweeps (the saturated model) with likelihood ratio tests. The employment trajectories variable was no worse at predicting socioemotional problem behaviour at 7 years than the saturated model ( $p=0.61$ ), and so it was used in analyses of mothers' employment.

Fathers' employment was above 90% in each of the four data collection sweeps, with 87% of fathers continuously employed, predominantly in full-time posts (above 30 h paid work per week). Given the consistently high level of employment among fathers in the MCS, fathers' employment was not analysed separately but included as a covariate in analyses of mothers' employment, categorised as father employed or not employed, or no father figure in the family.

### Potential covariates

A number of variables that may influence the relationship between family employment and child socioemotional behaviour were identified: child's gender, birth weight (z scores, adjusting for sex and gestational age), and preterm birth (born before 37 weeks gestation); mother's age at child's birth, ethnicity, highest educational qualification, and lone motherhood status; and number of children in the household when the child was aged 9 months. At 7 years, we considered low household income (less than 60% of the contemporary national median income, before housing costs, calibrated using a modified OECD equivalence scale,<sup>16</sup> and mothers' psychological distress (the Kessler-6 scale<sup>17</sup>). Age at the fourth sweep ranged from 6 years to 8 years, so we explored the child's age in months as a possible source of bias. We also considered increase in number of children in the household since 9 months as an explanatory variable. Child's age, birth weight and mothers' psychological distress are presented as categorical measures in the descriptive

**Table 1** Prevalence of family and mothers' employment trajectories and covariates, total weighted % (N) and % (N) with socioemotional problem behaviour

	% (N) Total	% (N) Problem behaviour
<b>Family employment trajectories</b>		
Continuous employment	74.0 (7936)	9.3 (688)
A single transition into employment	7.5 (774)	22.4 (154)
Multiple transitions, concluding in employment	4.5 (429)	20.2 (81)
Multiple transitions, concluding in non-employment	2.5 (255)	27.8 (69)
A single transition into non-employment	5.0 (495)	25.3 (124)
Continuous non-employment	6.4 (647)	32.2 (179)
		p<0.001
<b>Mothers' employment trajectories</b>		
Continuous employment	30.2 (3403)	8.6 (266)
A single transition into employment	23.0 (2326)	11.2 (255)
Multiple transitions, concluding in employment	10.1 (1054)	10.6 (105)
Multiple transitions, concluding in non-employment	5.8 (593)	18.9 (112)
A single transition into non-employment	7.3 (764)	17.1 (122)
Continuous non-employment	23.7 (2477)	22.9 (523)
		p<0.001
<b>Possible covariates</b>		
<b>Gender of child</b>		
Boys	51.2 (5390)	16.8 (845)
Girls	48.8 (5227)	11.1 (538)
		p<0.001
<b>Birth weight</b>		
Normal/high birth weight ( $\geq 2500$ g)	94.2 (9999)	13.6 (1261)
Low birth weight (<2500 g)	5.8 (607)	20.5 (122)
		p<0.001
<b>Preterm birth</b>		
Normal ( $\geq 37$ weeks)	93.1 (9835)	13.8 (1287)
Preterm (<37 weeks)	6.9 (718)	17.1 (119)
		p<0.05
<b>Mothers' age at child's birth</b>		
14–19 years	7.5 (687)	27.7 (180)
20–29 years	44.7 (4643)	16.6 (713)
30–39 years	45.6 (5035)	9.5 (470)
40+years	2.1 (252)	7.5 (20)
		p<0.001
<b>Mothers' ethnicity</b>		
White	89.0 (9307)	13.9 (1176)
Non-white	11.0 (1285)	14.8 (204)
		p=0.53
<b>Number of children in household (9 months)</b>		
1 child	42.3 (4469)	14.4 (592)
2 children	36.8 (3821)	12.6 (452)
3 children	14.4 (1592)	15.5 (223)
4 or more children	6.5 (735)	16.2 (116)
		p<0.05
<b>Lone parent household (9 months)</b>		
Yes	14.1 (1429)	25.9 (341)
No	86.0 (9188)	12.1 (1042)
		p<0.001
<b>Mothers' qualifications (9 months)</b>		
Degree	17.9 (2062)	5.2 (109)
Diploma	9.4 (1040)	9.7 (98)
A/AS/S Levels	9.9 (1117)	8.6 (96)
O Levels/GCSEs A-C	36.2 (3692)	13.5 (476)
O Levels/GCSEs D-G	11.1 (1086)	21.5 (220)
Other academic qualification	1.8 (201)	15.0 (32)
None of these qualifications	13.8 (1411)	27.3 (350)
		p<0.001

Continued

Table 1 Continued

	% (N) Total	% (N) Problem behaviour
Age of child at 7 year interview		
6 years 3 months to 6 years 11 months	18.1 (1942)	14.5 (256)
7 years to 7 years 2 months	35.5 (3771)	13.6 (480)
7 years 3 months to 7 years 5 months	31.7 (3391)	14.8 (465)
7 years 6 months to 8 years 5 months	14.7 (1508)	12.6 (181)
		p=0.31
Low household income (7 years)		
Below 60% average income	25.2 (2717)	24.4 (623)
60% average income and above	74.8 (7898)	10.5 (760)
		p<0.001
Increase in children in household (9 months–7 years)		
Yes	46.5 (4901)	15.2 (689)
No	53.5 (5716)	12.9 (694)
		p<0.01
Mothers' psychological distress (7 years)		
Distress	3.6 (352)	47.7 (164)
Not distressed	96.4 (10 096)	12.5 (1206)
		p<0.001
Fathers' employment (7 years)		
Father not employed	6.0 (639)	26.0 (157)
Father employed	74.0 (7970)	10.8 (800)
No father figure in household	20.0 (2003)	22.3 (426)
		p<0.001

Missing data for covariates: gender of child 0; birth weight 1; gestation 64; mothers' age at birth of child 0; mothers' ethnicity 25; children in household 9 months 0; lone parent household 9 months 0; mothers' education 8; child's age at 7 year sweep 5; low income at 7 years 2; increase in children in household 0; mothers' psychological distress at 7 years 169; fathers' employment at 7 years 5.

statistics (table 1), although they were entered into models as continuous variables.

### Statistical analysis

All analyses were conducted in Stata/SE V.12.1 (Stata Corporation, Texas, USA), using 'svy' commands to allow for clustered sampling design and attrition. Weighted percentages, univariable and adjusted analyses were calculated using survey and non-response weights. Data were downloaded from the UK Data Archive in May 2010.

Univariable analyses were undertaken to explore distributions of variables and associations with the SDQ. Covariates were included in subsequent multivariable models if  $\chi^2$  tests indicated that they were significantly associated with SDQ score and family (or mothers') employment trajectories, and if their inclusion significantly altered the association between family (or mothers') employment trajectories and socioemotional behaviour, tested using the Stata 'suest' command for comparing regression coefficients.<sup>18</sup>

We used Poisson regression models to estimate risk ratios (RRs) and 95% CIs for borderline-abnormal SDQ scores at 7 years, according to family employment trajectories. An unadjusted model was followed by adjusted models to investigate mechanisms underlying any associations, entering, in turn, covariates from birth to 9 months and at 7 years. Equivalent analyses were carried out using mothers' employment trajectories, with the inclusion of fathers' employment status (or no father figure) at 7 years as an additional covariate.

All multivariable analyses were carried out using complete samples so that risk ratios could be directly compared before and after adjustment. The interactions between child's gender

and family and mothers' employment trajectories were tested, but neither was statistically significant, so analyses are presented for boys and girls combined. Interactions between family and mothers' employment trajectories and family structure over time (continuous couple vs other up to 7 years) were non-significant, and so there was no stratification by this variable. As a sensitivity analysis, we repeated our analyses using linear regression to investigate the SDQ score as a continuous outcome. We also repeated the final models separately for internalising (peer and emotional problems) and externalising (conduct problems and hyperactivity) subscales. We carried out additional analyses taking into account fathers' employment or lone parent status (at 9 months and 7 years). Further sensitivity analyses were carried out in relation to family employment in a sample restricted to continuous couples; differentiating one and two earner households and including fathers' education and psychological distress in multivariable models.

## RESULTS

### Socioemotional behaviour

Fourteen per cent (1383) of children in the sample were identified as having borderline or abnormal (problem) socioemotional behaviour at 7 years.

### Family employment

Almost three quarters of families 74.0% (7936) included an employed parent at all sweeps between 9 months and 7 years (table 1). Only 6.4% (647) of families did not have an employed parent at any sweep. The proportion of families in other employment transition groups ranged from 2.5% (255) for multiple transitions ending in non-employment to 7.5% (774) where there was a single transition into employment. All

**Table 2** Risk ratios (95% CIs) for socioemotional problem behaviour by family employment status trajectories, unadjusted and adjusted for early covariates and low household income and mothers' psychological distress at 7 years

	Unadjusted RR A	+ Covariates from birth to 9 months‡	+ Low household income at 7 years	+ Mothers' psychological distress at 7 years
		B	C	D
Employment status trajectories				
Continuous employment	1.00	1.00	1.00	1.00
A single transition into employment	2.41 (2.00–2.91)***	1.52 (1.20–1.92)***	1.47 (1.16–1.87)**	1.35 (1.07–1.70)*
Multiple transitions, concluding in employment	2.17 (1.71–2.75)***	1.60 (1.25–2.04)***	1.55 (1.21–1.99)***	1.39 (1.09–1.77)**
Multiple transitions, concluding in non-employment	2.99 (2.36–3.80)***	1.84 (1.43–2.36)***	1.75 (1.34–2.27)***	1.37 (1.06–1.78)*
A single transition into non-employment	2.73 (2.28–3.27)***	1.99 (1.65–2.39)***	1.85 (1.50–2.28)***	1.48 (1.21–1.81)***
Continuous non-employment	3.47 (2.91–4.13)***	1.99 (1.60–2.48)***	1.84 (1.44–2.35)***	1.45 (1.14–1.84)**

N=10 344.

\*p&lt;0.05, \*\*p&lt;0.01, \*\*\*p&lt;0.001.

‡Lone parenthood at 9 months; mothers' highest qualification at 9 months; mothers' age at child's birth.

potential covariates were associated with socioemotional behaviour, with the exception of mothers' ethnicity and age of child at the fourth sweep (table 1). However, only mothers' age at birth, lone parenthood status, mothers' highest qualification (of the covariates from birth to 9 months), low household income and mothers' psychological distress (of the covariates at 7 years) were retained for multivariable analysis (fulfilling the criteria of an association with employment trajectories and significantly altering the association between employment trajectories and SDQ).

Table 2 shows the relationship between family employment trajectories and socioemotional behaviour, unadjusted and adjusted for covariates. The unadjusted model A indicates that any experience of non-employment across the period was associated with a higher risk of problem behaviour at 7 years compared with continuous employment (the risk was highest for families experiencing continuous non-employment). The elevated risk was attenuated but remained statistically significant after adjustment for covariates from birth to 9 months (model B), low household income when the child was 7 years (model C), and mothers' psychological distress at 7 years (model D). Results comparable with the final model were obtained when lone parent status at 7 years was included as a covariate, or when cases of non-employment related to long-term leave or education were excluded (data not shown).

Further analyses were carried out with continuous couple families in order not to confound employment and family structure. Family employment models were rerun with mothers' education and psychological distress replaced by those of the father, and patterns of risks were similar to those shown in table 2. Continuous employment (the predominant family employment trajectory) was further differentiated according to whether one or two parents were employed. More than half of the continuously employed couple families reported either two parents employed throughout or a single transition from one parent to two parent employment (35% and 24%, respectively). Children in these groups had a lower risk of problem behaviour than other trajectories of one or two parent employment (data not shown).

Given the high proportion of fathers in employment at all sweeps, further analyses focused on mothers' employment, which showed considerably more variation.

### Mothers' employment

The risk of problem behaviour in children increased with number of sweeps in which mothers were not employed, so that 22.9% (523) of children whose mothers had never been in paid employment at any of the four sweeps were rated as having problem behaviour at 7 years compared with 8.6% (266) of those whose mothers were employed at every sweep, with those in other groups positioned in between (table 1). In the unadjusted model in table 3, all employment trajectory groups carried higher risks of problem behaviour compared with the baseline of mothers who had been continuously employed. Risks were particularly elevated among children whose mothers were continuously non-employed, or had exited the labour market. Following adjustment for covariates from birth to 9 months (model B), the risks for these groups remained significantly higher than the baseline, whereas the excess risk observed for the mothers who entered employment by 7 years were attenuated and not significantly different from the risks for the mothers who were continuously employed. Adjustment for fathers' employment status (or no father figure) (model C) and low household income (model D) at 7 years resulted in some further attenuation, but the pattern of results was unchanged. A model also including mothers' psychological distress at 7 years (model E) attenuated the risks associated with continuous non-employment or a single transition out of employment, but these risks remained significant. For the group that had experienced multiple transitions culminating in non-employment, the risk was reduced to non-significance.

Modelling for mothers' employment was repeated using the continuous SDQ score and differentiating between externalising and internalising problems. In all cases, the patterns of results were similar to those for the dichotomised total score. Further analyses including fathers' employment (or no father figure) at 9 months did not alter the pattern of results, which were also unaffected when mothers experiencing non-employment relating to long-term leave or education were excluded.

### DISCUSSION

Following children over time, we found that having one or more periods in which there was no employed parent in the family was associated with an elevated risk of problem behaviour at 7 years. When differences between families in early

**Table 3** Risk ratios (95% CIs) for socioemotional problem behaviour by mothers' employment status trajectories, unadjusted and adjusted for early covariates and father employment, low household income and mothers' psychological distress at 7 years

	Unadjusted RR A	+ Covariates from birth to 9 months‡	+ Fathers' employment (or no father figure) at 7 years	+ Low household income at 7 years	+ Mothers' psychological distress at 7 years
	A	B	C	D	E
Employment status trajectories					
Continuous employment	1.00	1.00	1.00	1.00	1.00
A single transition into employment	1.29 (1.05 to 1.59)*	1.01 (0.81 to 1.24)	1.00 (0.81 to 1.24)	1.00 (0.80 to 1.23)	0.97 (0.79 to 1.20)
Multiple transitions, concluding in employment	1.24 (0.98 to 1.57)	1.06 (0.84 to 1.35)	1.06 (0.84 to 1.35)	1.06 (0.83 to 1.34)	1.01 (0.80 to 1.27)
Multiple transitions, concluding in non-employment	2.10 (1.67 to 2.64)***	1.39 (1.09 to 1.78)**	1.35 (1.05 to 1.72)*	1.31 (1.02 to 1.68)*	1.14 (0.90 to 1.45)
A single transition into non-employment	1.98 (1.57 to 2.51)***	1.65 (1.30 to 2.08)***	1.63 (1.29 to 2.05)***	1.59 (1.26 to 2.01)***	1.36 (1.09 to 1.71)**
Continuous non-employment	2.61 (2.20 to 3.09)***	1.58 (1.30 to 1.90)***	1.48 (1.22 to 1.79)***	1.43 (1.18 to 1.75)***	1.26 (1.03 to 1.53)*

N=10 433.

\*p&lt;0.05, \*\*p&lt;0.01, \*\*\*p&lt;0.001.

‡Lone parenthood at 9 months; mothers' highest qualification at 9 months; mothers' age at child's birth.

covariates, household income and mothers' psychological distress were taken into account, this elevated risk was reduced somewhat, but remained significant for all groups, and of similar magnitude for continuous and episodic non-employment. When mothers' employment was investigated, a transition into employment was associated with relatively low levels of socioemotional problem behaviour, similar to that of the children of mothers who were continuously employed. In comparison, children of mothers not employed at 7 years had an elevated risk of problems, whether the non-employment preceding that was continuous or episodic. Any excess risk associated with mothers making a single transition into employment (compared with continuous employment) disappeared after adjustment for early covariates. Attenuation associated with adjustments for fathers' employment (or no father figure), income and mothers' psychological distress was large among children whose mothers were non-employed, although risks remained significant for those whose mothers were continuously non-employed or who made a single transition out of the labour market. Our analyses suggest that differences between these employment groups may be largely explained by the socioeconomic circumstances into which the child was born and the psychological and socioeconomic benefits of employment within the family.

Our findings are consistent with other studies which show no detrimental, and in some cases positive, associations of mothers' employment with child socioemotional behaviour.<sup>8–10</sup> Our analyses go further and suggest a low risk of problem behaviour among children whose mothers made the transition into employment, even if they had multiple earlier labour market transitions; and after adjustment for early covariates the risk was no different from that of children of continuously employed mothers. Conversely, all trajectories that led to non-employment of mothers were associated with problem behaviour in children, irrespective of whether the mother experienced single or multiple transitions before exiting the labour market. The notable attenuation following adjustment for mothers' psychological distress, rather than income per se, among children of

non-employed mothers appears to support other research that shows that increased economic hardship has an impact on parent psychological adjustment and child outcomes.<sup>19</sup>

### Strengths and limitations of the study

While the SDQ is a validated measure of child socioemotional behaviour,<sup>14 20</sup> it is reported by mothers and could be subject to measurement error. For example, mothers not in employment may experience distress and rate their child's behaviour negatively compared with mothers in employment, or those in employment may spend less time with their children and underestimate behavioural problems. In these data, mothers' psychological distress predicts child socioemotional behaviour, but we cannot distinguish if the relationship arises through reporting bias or causally, or is a combination of both explanations. Furthermore, the effect of mothers' employment may differ for internalising and externalising behaviours, with fewer internalising problems among children of full-time employed mothers.<sup>9</sup> We carried out analyses separately for internalising and externalising behaviours. We also attempted to account for the possibility that scoring of the SDQ may have influenced results by repeating the analyses using continuous scores. These additional analyses supported the findings using dichotomised scores from the overall SDQ.

There are few sources of data suitable for the exploration of longitudinal relationships between family employment and child socioemotional behaviour. A particular strength of our study is the use of the large, UK-representative MCS, which allowed us to follow children over time. Attrition is a problem common to longitudinal studies, and we used response weights to account for attrition up to the 7 year survey.<sup>21</sup> However, only 61% of MCS singletons had data for all four sweeps, and, after exclusions for missingness and respondent identity, 57% of the original sample was included in the multivariable analyses. In addition, missingness was not at random. For example, non-employed mothers at 9 months were significantly less likely to have taken part in all sweeps (Not employed: 58% vs Employed: 70%, p<0.001). Children were more likely to have

taken part in all four sweeps if they had normal range SDQ scores at 7 years compared with those who had scores within the 'borderline-abnormal' range (Normal: 86% vs 'Borderline-abnormal': 81%,  $p < 0.001$ ). Therefore, our results may be subject to bias despite the use of the survey response weights.

The breadth of information recorded in MCS gave us the opportunity to consider the role of a wide variety of potential covariates from birth through 7 years. These covariates included an increase in the number of children in the family, which did not change the relationship between mothers' employment and child behaviour. Previous research has provided scant evidence that fathers' employment is associated with child socioemotional behaviour.<sup>5</sup> In this study lone parent status at 9 months and 7 years did not have a notable effect on the relationship between family employment trajectories and child behaviour, nor did adjustment for fathers' employment at 9 months and 7 years (or lone parent status) alter the pattern of results for mothers' employment. There were no significant interactions between either family or mothers' employment trajectories and a measure of family structure over time. Nevertheless, these analyses do not capture the complexity of family structure and its relationship to employment. Although not a focus of this study, future research might explore the relationships between family structure, parental employment and socioemotional behaviour in more detail. Unlike McMunn *et al*<sup>10</sup> in the same cohort at an earlier age, we did not find that the association of employment with socioemotional behaviour at 7 years differed for boys and girls.

This is one of the few studies to investigate longitudinal associations between family and mothers' employment and socioemotional behaviour in childhood. We considered employment recorded over 7 years, providing insight into the working lives of families during early childhood, and which will be less prone to the recall bias that is likely to result from the use of retrospective employment histories. However, the approach adopted does not attempt to detail the working lives of these parents, including employment and non-employment between sweeps, or working patterns such as shift work, irregular hours, and single versus multiple jobs.

This study focused on relationships between varied employment trajectories and subsequent child behaviour at 7 years. In doing so, we were not seeking to investigate relationships with earlier child behaviour. However, we acknowledge the possibility of reverse causality as an explanatory mechanism; for example, mothers with children with problem behaviour may be less likely to enter or maintain employment, and it would be useful for this pathway to be explored in future research.

### Implications for policy and research

In the UK, and elsewhere, governments have promoted policies to encourage uptake of paid work in two parent and lone parent families.<sup>2 4 22</sup> The evidence presented indicates that having a parent in paid work is associated with better socioemotional behaviour among children at 7 years, and that any period in which there is no employed parent is associated with poorer socioemotional behaviour. Further analyses focusing on mothers' employment status similarly shows an association with child socioemotional behaviour, but this is complex. Even after a prolonged period of mothers' non-employment, the risk of problem behaviour for children whose mothers made the transition into employment was no greater than among those with mothers in continuous employment. However, movement out of employment and continuous non-employment were associated with a higher risk of problem behaviour. Such results

suggest that the relationship between employment and child socioemotional behaviour may have long-term and reactive elements, although the pathways involved may differ. It will be valuable to make use of longitudinal data sets such as the MCS and qualitative studies in future research in order to understand more fully how these pathways develop over time.

### What is already known on this subject?

Levels of employment in two parent and lone parent families have increased over a number of years, principally because greater numbers of mothers are entering the labour market. Research on whether the employment of parents (particularly mothers) has any impact on child socioemotional behaviour has produced mixed results. There is a paucity of longitudinal research exploring the relationship between patterns of employment over time and child socioemotional behaviour.

### What this study adds?

Compared with children from families where there had been an employed parent at every time point in the study, those with any experience of having no parent in employment were at a greater risk of socioemotional problem behaviour, regardless of whether a parent later moved into employment. In contrast, findings focusing only on maternal employment suggest that child problem behaviour is influenced by current status, over and above diverse earlier experiences of employment and non-employment. Employment status of parents may have long-term and short-term influences on child socioemotional behaviour, which should be considered when conducting research and developing policy.

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## REFERENCES

- 1 Organisation for Economic Co-operation and Development. *Doing Better for Families*. Paris: OECD, 2011.
- 2 Organisation for Economic Co-operation and Development. *Babies and bosses: reconciling work and family life. A synthesis of findings from OECD countries*. Paris: OECD, 2007.
- 3 Walling A. Families and work. *Labour Market Trends* 2005.
- 4 Department of Work and Pensions. *Working for Children*. London 2007.
- 5 Lucas-Thompson RG, Goldberg WA, Prause J. Maternal work early in the lives of children and its distal associations with achievement and behavior problems: a meta-analysis. *Psychol Bull* 2010;136:915–42.
- 6 Parcel TL, Meneghan EG. Early parental work, family social capital, and early childhood outcomes. *AJS* 1994;99:972–1009.
- 7 Belsky J, Eggebeen D. Early and extensive maternal employment and young children's socioemotional development: Children of the National Longitudinal Survey of Youth. *J Marriage Family* 1991;53:1083–110.
- 8 Wills JB, Brauer JR. Have children adapted to the mothers working, or was adaptation unnecessary? Cohort effects and the relationship between maternal employment and child well-being. *Soc Sci Res* 2012;41:425–43.
- 9 Cooksey E, Joshi H, Verropoulou G. Does mothers' employment affect children's development? *Longitudinal Life Course Studies* 2009;1:95–115.
- 10 McMunn A, Kelly Y, Cable N, et al. Maternal employment and child socio-emotional behaviour in the UK: longitudinal evidence from the UK Millennium Cohort Study. *J Epidemiol Community Health* 2012;66:e19.
- 11 Waldfogel J. Parental work arrangements and child development. *Canadian Public Policy/Analyse de Politiques* 2007;33:251–72.
- 12 Conger RD, Donnellan MB. An interactionist perspective on the socioeconomic context of human development. *Annu Rev Psychol* 2007;58:175–99.
- 13 Harvey E. Short-term and long-term effects of early parental employment on children of the National Longitudinal Survey of Youth. *Dev Psychol* 1999;35:445–59.
- 14 Goodman R. The Strengths and Difficulties Questionnaire: a research note. *J Child Psychol Psychiatry* 1997;38:581–6.
- 15 Goodman A, Rowe R, Gan Y. SDQ: information for researchers and professionals about the Strengths and Difficulties questionnaires 2010. <http://www.sdqinfo.com/c3.html>
- 16 Bradshaw J, Holmes J. Child poverty in the first five years of life. In: Hansen K, Joshi H, Dex S, eds. *Children of the 21st century: the first five years*. The UK Millennium Cohort Series 2, Bristol: The Policy Press, 2010:13–31.
- 17 Kessler RC, Andrews G, Colpe LJ, et al. Short screening scales to monitor population prevalences and trends in non-specific psychological distress. *Psychol Med* 2002;32:959–76.
- 18 Kelly Y, Sacker A, Del Bono E, et al. What role for the home learning environment and parenting in reducing the socioeconomic gradient in child development? Findings from the Millennium Cohort Study. *Arch Dis Child* 2011;96:832–7.
- 19 Conger RD, Conger KJ. Resilience in Midwestern families: selected findings from the first decade of a prospective, longitudinal study. *J Marriage Family* 2002;64:361–73.
- 20 Goodman R. Psychometric properties of the Strengths and Difficulties Questionnaire. *J Am Acad Child Adolesc Psychiatry* 2001;40:1337–45.
- 21 SC Ketende, ed. *The Millennium Cohort Study: Technical Report on Response (Third Edition)*. London: Centre for Longitudinal Studies, Institute of Education, 2010.
- 22 Treasury HM. *Ending Child Poverty: Everybody's Business*. London, 2008.