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The Influence of Employment on Depression: a Study of British Single and Partnered Mothers

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Abstract

This paper explores the relationship between mother's participation in paid employment and depression in the UK. It uses 18-waves of data from the British Household Panel Survey and the General Health Questionnaire (GHQ) to investigate this relationship at two points in time, 1993/98 and 2003/08. The findings show that maternal employment is associated with lower levels of mental distress for both married and single mothers. This relationship has become stronger over time for partnered mothers. For single mothers the association of work with a reduced incidence of depression is a new phenomenon only observed in the later period. Two potential reasons for these changes over time are investigated, those resulting from (i) changes in selection into employment and (ii) changes in occupation.

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1. Introduction

While the relationship between work and poor mental health has been well documented for men few studies have examined whether the same benefits apply to women, and in particular to mothers. Yet rising rates of depression, particularly among women, have been highlighted as a particularly important challenge for the future with the incidence of depression among women in Europe having doubled since the 1970s (Wittchen et al, 2011). Some commentators have suggested that there may be a link between rising rates of depression and increased female employment, which may have led to greater "role stress" among mothers.[1] Yet direct evidence on the influence of work on mental health among mothers remains scant. This paper aims to fill this gap. Using UK data it examines how employment influences the risk of depression among mothers, in particular looking at whether single mothers differ from those with partners.

Eighteen-waves of data, from 1991-2008, from the British Household Panel Survey (BHPS) are used to look at the relationship between work and depression, and at how it has changed over time, for partnered and lone mothers. The structure of the paper is as follows. First we review previous evidence on depression, family status and work and briefly discuss the policy context over which this study is conducted. In Section 3 we discuss our data and methods. Descriptive results are presented in Section 4 before presenting results from multivariate analysis in Section 5. Section 6 examines potential reasons for changes in the relationship between mothers, work and depression, examining questions of whether changes in selection into employment; changes in the types of jobs done; or changes in attitudes towards work and

[1] See for example The Guardian, 5 September 2011, ttp://www.guardian.co.uk/society/2011/sep/05/third-europeans-mental-disorder

in social support, may have influenced the shift that we observe in the relationship between depression and employment status. Section 7 concludes.

2. Previous Findings

Numerous studies have shown that for men unemployment and retirement are linked to poor mental health (see for example, Artazcoz et al 2004; Clark, 2003;' Dhaval et al 2006; Heliwell et al, 2011). While the higher incidence of depression among men who become unemployed or retire may be partly related to a loss of income, other "non-pecuniary" costs that result from loss of employment have been found to be much more substantial (Heliwell and Huang, 2011) because of work's role in acting as a "provider of social relationships, identity in society and individual self-esteem" (Winkelman and Winkelman, 1998:1). But does the same relationship between work and mental health hold for women? For mothers in particular many of these roles may be provided elsewhere, with social relationships and identity being forged through their role as a parent and carer. Indeed, the evidence to date suggests a much less clear relationship between work and mental health for mothers. For example, Llena-Nozal et al (2004) find that while being in employment is critical to men's mental health for women employment status is less important.[2] A review of the evidence on depression and work among married mothers similarly concluded that paid work either had a small overall positive effect or no effect on maternal depression (Repetti et al, 1989). However these effects were not homogenous for all married mothers: those with young children or babies; working class mothers; and mothers whose partner does not participate in household work and childcare have poorer mental health outcomes when they work (Romito, 1994; Dennerstein, 1995). However these studies may not reflect recent changes in women's

[2] For women they find that occupation (rather than employment status) does however matter.

education and increased expectations around work in the UK. More recent evidence, while not looking specifically at depression, does find partnered women to have higher levels of "life satisfaction" when they work (Booth and Van Ours, 2008).[3]

Studies of women, work and depression have in the main looked at partnered women. While lone mothers may also share some of the features that influence the risk of depression with those who have partners there are also likely to be important differences. For lone parents work may have a more important role in sustaining social relationships and in providing an income than for those with partners. On the other hand, "role strain" among single parents who work is likely to be much higher. Few studies have specifically looked at the influence of work on lone parents' well-being. One exception is Zabkiewicz (2008), who finds that among a sample of poor lone mothers in the US employment sometimes leads to improved mental health, with full-time, stable, longer term employment having the most beneficial effect. In the UK evidence suggests that working lone parents are happier than those that do not work, and that increasing rates of employment among lone parents since 1999 have led to significant improvements in lone parent well-being (Gregg et al, 2009).

Of course employment also has a strong relationship with income and any analysis of the relationship between work and depression needs to account for this. The numerous studies that have examined the link between income and poor mental health have all found low levels of income to be associated with a heightened risk of depression (see for example Kahneman and Deaton, 2010)[4] although some have questioned whether the relationship is causal

[3] This study used merged data from waves 6 to 13, or 1997-2004, of the BHPS.

[4] Note however that at higher levels of income further increases do little to reduce the risk (Zimmerman and Kanton, 2005).

(Zimmerman and Kanton, 2005). Finally, single parents are a group that are particularly likely to experience depression. The large psychology literature on lone mothers and depression finds key factors influencing the higher risk of depression among lone parents include low income and financial stress; role strain; social isolation and relationship breakdown (see for example Cairney et al, 2003; Hope et al, 1999; Crosier, Butterworth and Rodgers, 2007). These factors are discussed further in Section 5.

3. Data and Methods

Data

The data used in this paper comes from the UK British Household Panel Survey (BHPS), a panel survey conducted between 1991/92 and 2008/09. The BHPS is a rich data source which provides household level panel data on individuals' socio-economic circumstances, health and well-being. The first wave of the survey contained observations on over 5,000 households and 10,000 individuals. Between waves seven and eleven of the survey an additional sample of around 1,000 surveys was added as part of the European Community Household Panel survey. From wave 9 (2000/2001) onwards an additional sample of around 4,500 households were added from Scotland and Wales, and from wave 11 onwards more than 2,800 households in Northern Ireland were added. Inclusion of these new samples for Scotland, Wales and Northern Ireland almost doubles the sample size for lone parents, but reduces sample representativeness. As this paper is particularly interested in single parents, and as samples of lone parents in the BHPS are relatively small in the original sample and decline further over time, the full sample is included throughout the analysis and sampling weights are used to account for these differences over time.

The indicator of depression used in the paper is derived from the GHQ-12 (Goldberg, 1972). This is a measure of well-being widely used in the medical, psychological and sociological

literature which is considered to be a robust indicator of individuals' psychological state (Clark, 2003). Respondents are asked to fill in a self-completion questionnaire which contains 12 psychological questions. The questions asked are whether respondents have (i) been able to concentrate; (ii) had loss of sleep; (iii) feel they are playing a useful role; (iv) are capable of making decisions; (v) are constantly under strain; (vi) have problems overcoming difficulties; (vii) enjoy day-to-day activities; (viii) are able to face problems; (ix) are feeling unhappy or depressed; (x) are losing confidence; (xi) believe in their self-worth; and (xii) their general happiness. Responses are coded on a four-point scale with responses recording whether each of these conditions apply "not at all," "no more than usual," "rather more than usual," and "much more than usual".[5] The GHQ-12 then recodes these responses into a 0/1 variable, with a score of 1 indicating poorer mental health outcomes. These scores are summed across the twelve variables to give an overall indicator of well-being (the GHQ-12). As the paper's interest is in those that have poor mental health it examines those who exhibit "caseness. Cases are defined as those recording a score of four or more. This indicator for depression has been widely used as a screening device to detect psychiatric disorders and has been found to have a strong correlation with mental health disorders that would also be diagnosed by clinicians (Pappassotiopoulos and Heun, 1999).[6]

[5] Clark (2003) notes 'It might be thought that the reference to a "usual state" renders the responses problematic, with the term "usual" being defined as whatever the person is currently doing. However, the empirical literature on GHQ scores treats the responses unambiguously as indicators of the level of well-being, and it was for this purpose that the instrument was designed."

[6] While we look specifically at the risk of depression in this paper, new evidence suggests that the "income gradient" associated with well-being among the general population is dependent on what is measured: Kahneman and Deaton (2010) find *life satisfaction* to be

To assess the influence of work on depression, and to analyse whether this relationship has changed over time, two distinct periods are examined: 1993-1998 and 2003-2008. These periods reflect two distinct policy regimes: 1993-1998 precedes welfare reform and while in this period working single parents qualified for some in work benefits if they worked a minimum of 16 hours-a-week the level of in-work financial support was considerably lower than that which was available between 2003 and 2008. Second, since 1993-1998 the level of benefits available to families with children who are out-of-work has increased considerably. Single parents in particular have benefitted from these reforms with their incomes showing considerable improvement over the decade, both as a result of the increased generosity of state benefits but also as a consequence of increased income from employment. Mothers partnered to low-income men have also seen their incomes rise, although their gains have been smaller than for those that are single (see Gregg et al, 2009).

Throughout the analysis is confined to those mothers with dependent children who are aged under-55 and full-time students are also excluded from the sample. Separate analysis are carried out for mothers who have a partner (those that are married or cohabiting are grouped together) and single mothers (those who do not live with a partner but have dependent children). Many studies have found that relationship breakdown is a time of particular risk for hdepression[7], and at any point in time around 1 in 5 single parents have been a single parent for less than a year. In order to account for these "transition effects", which not only have an

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associated with income (up to a threshold of $75,000) while *happiness* (or emotional well-being) to be influenced by other factors including health, care giving, loneliness and smoking.

[7] For example Laporte and Windmeijer (2005) and Blekesaune (2008) report that while divorcees are less happy on average this is not a permanent state: mental health worsens around the time of separation but returns to pre-divorce levels around two years later.

adverse effect on mental health but are also associated with a fall in employment (see Gregg et al, 2009), the analysis of single parents is confined to those that have been a single parent for a year or more.

Methods

The paper exploits both the cross-sectional and panel elements of the BHPS data to analyse the effect of employment on depression among partnered and single mothers. It starts by building a simple descriptive picture of the relationship between employment status and depression, and at how it has changed over time. However, the risk of depression is also influenced by a considerable number of factors other than employment status: income (including direct measures of income as well as self-reported financial hardship); demographic characteristics (including education, race, age and gender); job characteristics (including job status and working hours); and perceived social support have all been emphasised in the literature as playing a significant role in influencing depression. In order to control for these factors we run logit models of depression as a function of a set of observable characteristics, described below, on cross-sectional data for two periods, 1993-98 and 2003-08. As the data is panel data, and individuals may therefore be observed more than once, standard errors are clustered on the individual.

The papers focus is on the relationship of depression with employment status. The initial analysis include controls for different work statuses (full-time work, defined as working over 30 hours a week; part-time work, defined as working between 16 and 29 hours; and mini-jobs, defined as working fewer than 16 hours). Unemployment and inactivity are not distinguished between as sample sizes for the unemployed are small. The later analysis aggregates employment statuses to look at the influence of doing any work on depression. Because employment status and income are closely linked, particularly for lone parents but

also for those in couples, inclusion of controls for income are particularly important. The models include the log of equivalised household income as a control variable. This measure has been used extensively in other studies of the income / happiness relations. As a robustness test the models were also run using a range of income specifications. In particular the models were also run with dummy variables for income quintile.

The literature on depression has extensively discussed the role of financial stress and poor health in influencing depression, although the measures included have often been self-reported and subjective. The analysis here includes objective measure of financial stress and health as control variables. These measures are chosen over self-reported measures because self-reported measures have been shown to be endogenous to depression. In particular Bridges and Disney (2010) show that while self-reported, subjective measures of financial hardship show a strong correlation with mental health "only a weak link exists between 'objective' measures of the financial position of the household. [..] much of the observed correlation between self-reported psychological well-being on the one hand and financial circumstances on the other, is a person-specific effect"(pp 402). For financial stress, following Bridges and Disney, the control we include for financial stress is an indicator of whether individuals are 2 or months behind in housing arrears.Similar problems of endogeneity bias are likely to arise with the inclusion of self-reported health status. The control for poor health status used here is a measure based on respondents answer to a question about whether they suffer from one or more of a specific set of conditions listed on a card[8]. Demographic variables are related to depression: among partnered women cohabitation

[8] Specifically individuals are asked whether they have any of the following illnesses. Poor health is coded as 1 if individuals answer yes to any of these conditions: problems or disability connected with: arms, legs, hands, feet back, or neck (including arthritis and rheumatism); difficulty in seeing (other than needing glasses to read normal size print);

(rather than marriage), and among single mothers being divorced (rather than never married) have been shown to raise the risk of depression (see for example Lamb et al, 2003 and Horwitz et al, 1998 on cohabitation; Afifi et al, 2006, on past marital status of lone mothers). These controls are also included in the multivariate analysis here. A dummy variable for having a child under-5 is also included. Throughout controls are included for age (grouped as age 20-29; 30-39; 40-49; 50-59); education (four categories: having a degree; A-levels or equivalent; 5+ GCSEs; and those with fewer than 5 GCSE); dummy variables for regions; and individual year dummies).

While the cross-sectional analysis does allow us to say something about how work influence depression, other factors that are harder to quantify may influence the risk of depression, and of non-employment, too. A genetic predisposition to depression, significant "life events" and early childhood experiences have all been argued to be important (Foley

et al, 2001). In order to account for these "unobservable" differences across individuals we therefore also exploit the panel element of the BHPS, following individuals to see how changes in employment status are correlated with changes in the risk of depression. As "sample members serve as their own control group" the influence of transitions into and out of work may give a strong indication of whether a causal relationship between work and well-being exists (Coleman and Glenn, 2009: 28). The estimated effects of changes in employment status on the risk of depression are reported first using simple one period

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Difficulty in hearing; Skin conditions /allergies; Chest/breathing problems, asthma, bronchitis; Heart/high blood pressure or blood circulation problems; Stomach/liver/kidneys or digestive problems; Diabetes; Anxiety, depression or bad nerves, psychiatric problems; Alcohol or drug related problems; Epilepsy; Migraine or frequent headaches; Cancer or Stroke.

transition matrices before looking at more formal tests of the relationship between work and depression using fixed effect logit models. Similar models have been used widely in the related literature (see for example Blekesaune, 2008; Clark, 2003; Llena-Nozal, Lindeboom and Portrait 2004; Zimmerman and Kanton 2005). While fixed effects estimators may provide convincing indication of a causal relationship between work status and well-being[9] they do however suffer from a substantial disadvantage in that individuals' observations are discarded if there is no variation in the dependent variable over the time period during which individuals are observed. In this study the effect is to reduce sample sizes by more than half. The resulting estimates are therefore computed only for those that ever move between a depressed and not depressed state – those that remain happier or are always depressed are not included in the models. Nonetheless, the fixed effects estimators can help to confirm the sign and significance of the influence of work on depression found in the cross-sectional estimates.

A potential concern may be that depression and employment status are contemporaneously determined. If this is the case then estimates obtained using standard regression based techniques will be biased and inconsistent. In order to deal with this potential problem an instrumental variable approach is used to obtain consistent estimates. A valid instrument requires that it is correlated with independent variable (employment) but not with the dependent variable (depression). We instrument employment with a set of variables on the mothers of the women in our samples' employment and occupational status. The BHPS data contains information on individuals' mothers' employment status and occupation. We assume these measures to be related to the probability of employment but uncorrelated with depression. No special considerations are required for the use of two stage least squares with

[9] By providing information on mental health before and after job transitions and thereby helping to account for unobserved heterogeneity.

an endogenous dummy variable (Heckman, 1978, reported in Wooldridge, 2002: 8.4 p622). The model is therefore fitted by first estimating a binary response model to predict the probability of employment. From this the fitted probabilities of work are found and these probabilities are then included as explanatory variables in the depression regression equations. In this instance a linear probability model is used to test the relationship between depression and work and the resulting coefficient both when work is and is not instrumented are compared.

4. Results

Descriptive Analysis: Employment Status and Depression

Over the decade from 1993/98 to 2003/2008 the BHPS shows a slight fall in the incidence of depression among mothers: for lone mothers the share at risk of depression fell 4 percentage points (ppt) to 31 percent while among partnered mothers the proportion dropped 2 ppt to 22 percent. At the same time employment rates among mothers grew, the share of partnered mothers in work rose by 6 ppt to 63-percent and the rate among single parents growing 17 ppt to 55-percent. Figure 1 shows changes in employment status and how employment status and the incidence of depression are related in the pre- and post-welfare reform periods, 1993/98 and 2003/08. Results are reported for both mothers in couples and single mothers.[10] Similar to results reported elsewhere, full and part-time employment rates grew considerably over the period, particularly for single mothers (see for example Gregg et al, 2009).

For partnered mothers the incidence of depression is lower among those in work than the not employed. Over the decade the incidence of depression fell slightly for those that did not

[10] The non-employed include both the inactive and unemployed. Around seven percent of lone parents are unemployed in each period and for this group depression is slightly higher than among those that are inactive.

work, while the share in-work that were depressed remained fairly constant. For single parents the picture shows a considerably different pattern over time. In 1993/98 rates of depression were similar among single parents whether in or out of work but by 2003/08 this picture had changed substantially. The incidence of depression showed a considerable drop over the decade among working single parents but a small rise among those that were not in work. As a result by 2003/08 depression among single parents was strongly correlated with employment status: lone parents were 18 ppt less likely to be depressed than the non-employed if they worked part-time and 23 ppt less likely if working full-time.

While those out of work are more likely to be depressed than those in work it does not necessarily follow that were mothers to move into employment their mental health would improve. In order to get a better understanding of the causal impact of work on depression we therefore exploit the panel element of the BHPS. Repeated observations of the same individual allow control for individual heterogeneity and by correlating changes in individuals' employment status with changes in depression over time therefore gives a simple test of whether the relationship between work and depression may be causal. Results are reported in Table 1. In 2003/08 there was a clear relationship between employment transitions and depression for single parents: those entering work saw a 26-ppt fall in the incidence of depression (compared to being out of work) while those who left employment saw a 25-ppt rise. This was a big shift compared to 1993/98 when the incidence of depression showed far smaller changes around the time of employment transitions. For couples, the association between depression and employment transitions is much weaker, although moves into (out of) work were associated with better (worse) mental health.

One reason that depression may have eased among lone parents that move into work could be that reforms to the welfare system have increased incomes and reduced financial stress among those that work. A cursory examination of the data does not however suggest a clear

correlation between position in the income distribution and the incidence of depression for single parents: those in the top income quintiles have similar rates of depression to those in the lowest quintiles. For mothers in couples rates of depression show a fall between the bottom and middle of the income distribution where-after rates of depression plateau. For couples this is in line with findings elsewhere that show while having a low income is an important factor in raising the risk of depression, for better off individuals further increases in income do not lead to greater happiness (see for example Zimmerman and Kanton, 2005; Kahneman and Deaton, 2010). The subsequent analysis uses multivariate analysis to account for these income differences and to control for other characteristics.

Multivariate Analysis

The marginal effects from cross-sectional logit models, run separately for single mothers and mothers with partners, and for two time periods, 1993/98 and 2003/08, are presented in Table 2. For single mothers there is a clear shift in the association between employment and depression over the decade: while in 1993/98 employment, whether full-time, part-time or in a mini job, had no statistically significant association with depression by 2003/08 all forms of employment were associated with substantial, and high statistically significant, reduction in the incidence of depression. In 2003/08 employment was associated with a reduced incidence of depression of between 13 and 18 percent. Among partnered mothers work, whether in "mini" jobs (under 16 hours), part-time (16-30 hours) or full-time (30+ hours), showed a negative association with the depression. The magnitudes of these effects were similar for all types of work and over time there was little change observed in this relationship: work led to a reduced incidence of depression of between 5 and 7 percent. Among the other control variables two other factors stood out as being important too: debt and illness (both of which raised the risk of depression) while for single mothers not having previously been married also reduced the risk of depression in 2003/08. Income does not appear as a statistically

significant correlate with depression, this results also held when income was re-specified using a set of dummy variables for income quintile.

The literature on depression suggests that individual specific effects, such as genetic make-up and early childhood experiences, have an important role in influencing depression. Fixed effects models can help to account from unobserved heterogeneity they also suffer from the substantial disadvantage of excluding information on all those for whom there is no variation in the dependent variable.[11] While the sample sizes reported in Table 2 are considerably reduced, nonetheless the fixed effects estimators can help to confirm the sign and significance of the influence of work on depression. Table 2 reports the coefficients from the logit and fixed effect logit models. For single mothers the magnitude and significance of the coefficients on work are similar in both periods. The FE models also suggest that changes in income has a significant effect in influencing the risk of depression at the 10-percent significance level. For partnered women, the coefficient on the work variable in the FE model is of a similar magnitude to that found in the cross-sectional data but increases

The analysis so far then suggests that work does appear to lead to improvements in mental health for both married and single mothers, although the positive beneficial effect of work for the latter group is a recent phenomenon. A second conclusion is that whether mothers work full or part-time has no significant impact on well-being, both lead to similar improvements in reducing the incidence of depression. This finding is in-line with the results of Booth and Van Ours (2007) who have shown that women with children are significantly happier if they have a job regardless of the number of hours worked. These findings confirm this result for

[11] Appendix Table A2 shows how depression is spread across the lone parent and partnered mothers' samples over time, and among those that never work a far higher share are both ever depressed or always depressed than among the sample that remains permanently in work.

depression, rather than life satisfaction as in Booth and van Ours study, but in addition show that this result held for both lone and partnered mothers in 2003/08.

Explanations of the changing relationship between Lone Parent Employment and Depression

A key question that arises from this analysis is why for single mothers in 1993/98 was work not associated with lower levels of depression but by 2003/08 showed a strong and significant negative association? This relationship holds even after conditioning on income and other characteristics. Two possible explanations are examined. First, it may be that as more single parent's enter work those that have been left behind face greater barriers to employment, and these barriers may include poorer mental health. This in turn may influence changes in the estimated relationship over time.[12] A second explanation could be that over the last decade strong economic growth and high levels of employment may have led to improvements in job quality. These changes may have eased the burden of work for single mothers. This section briefly explores each of these possible explanations.

Selection into Employment

It may be the case that single parents who work have a lower propensity to depression than those that do not. If this is the case, the observed relationship between work and depression picked up in the cross-sectional estimates may reflect selection of single mothers with better mental health into work rather than any causal relationship. Moreover, if single mothers who are not working are increasingly negatively selected over time (as overall employment rates

[12] Indeed, the raw data does indicate that the incidence of depression has risen among those out of work – see Figure 1.

increase) then any observed change in this relationship may simply reflect this change.

In order to gain some purchase on the causal nature of the relationship between depression and work an instrumental variable approach is taken. Employment status is instrumented using information on the sample of mothers' parents' employment status. Our assumption is that whether the women's mothers worked, and their occupation, will influence employment probabilities but not the risk of depression. Fathers' employment status at age 14 and occupation are also included as instruments. Both the dependent and instrumented explanatory variables are binary and so, following Wooldridge (2002), the first stage equation is estimated using a probit model. From this model the predicted probabilities of employment are obtained and these are then used as instruments in a linear probability model for depression. Table 4 presents results for both the linear probability model (OLS regression) and the two-stage least squares instrumental variable model. The Cragg-Donald F statistic for weak instruments is also reported and in all cases allows us to reject the null hyptothesis of weak instruments [13]For single mothers, the coefficients on employment in both the OLS and IV models are insignificant in 1993/98 but significant and suggest that work reduces depression in 2003/08 (the size of the coefficient being larger in the instrumental variables regression). For partnered mothers however the IV estimation leads to an increase in the standard errors and the significance of the relationship declines in spite of an increase in the magnitude of the coefficients.

[13] The problem of weak instruments arises when the excluded instruments are only weakly correlated with the endogenous variable and leads to the estimates being biased in the same direction as OLS and inconsistent.

Job Quality

While work may help alleviate depression, recent work has shown that job quality also matters. Broom et al (2006) find that, among employees age 40-44, poor quality jobs can be as bad for health as unemployment. They find poor mental health to be associated with job insecurity (measured by job security and career prospects) and high "stressors" (job strain being defined as low job control, including training and control of time, and high work demands measured by the intensity and pace of work) and conclude that their findings "temper the notion that any job confers unalloyed health benefits, suggesting instead that the health advantage of work depends on the quality of the job" (pp585). For lone parents, therefore, work may have a smaller effect on well-being because the jobs that lone parents in the UK do are typically part-time, low-wage jobs often with poor working conditions. However, non-pecuniary benefits from work are important to well-being, as Helliwell and Huang (2011) show. For women it has been well documented that job satisfaction is considerably higher than would be expected given their objective employment conditions (Clark, 1997). As a result, even when mothers are not substantially financially better off in employment work may still benefit overall well-being. Data on job satisfaction reported in the BHPS does not suggest that

improvements in single parents job satisfaction is an important contributor towards the falling incidence of depression at work: the proportions reporting being dissatisfied with their job grew slightly over the decade (from 9 to 11 present) with single mothers being less likely to be dissatisfied with levels of job security and hours of work, but more likely to be unhappy with the "work itself". Table 4 reports marginal effects from a logit regression of occupation on depression. The omitted category is non-employment, the reported coefficient give an indicator of whether working in any of these nine occupational categories is better than not working at all. For single mothers in 1993/98, even among those working in more managerial

and professional occupations showed no reduction in the incidence of depression in 1993/98. By 2003/08 however in all occupational categories other than machine operatives employment reduced the probability of depression by between 12 and 19 present. Partnered mothers, on the other hand, show smaller mental health gains from employment with those in lower occupational grades having smaller mental health gains. This is in line with Llena-Nozal et al (2004) finding that employment status is less important than occupation for women's mental health.

Discussion and Conclusion

The results presented here suggest that in 2003/08 work was strongly associated with a reduction in depression for both single and partnered mothers: for single mothers the effect was largest, those that worked were around 15 percent less likely to be depressed than those that did not, while for partnered mothers work reduced the likelihood of depression by around 6 present. For both married and single mothers the number of hours worked did not appear to matter: mini-jobs, part-time work and full-time employment all have similar effects on reducing the incidence of depression. These findings challenge the idea that the growing incidence of depression among women in Europe, and elsewhere, has been caused by an increase in role strain with more mothers going out to work (see for example the press reports of Wittchen et al, cited above).

While for partnered mothers work has a small and significant effect on reducing the incidence of depression, for single mothers this is a new phenomenon in the UK. Improvements in well-being among those in work cannot simply be attributed to the fact that welfare reform has raised the returns to working; even after conditioning on income the relation holds. The results presented here then suggest that improvements in single mothers mental health have occurred across all occupational categories and changes in job quality, measured by occupational status, does not appear to be the reason for lone parents mental health for those

in work improving. Many studies have argued that for unemployed men the non-pecuniary benefits of work are much more important to mental health than well-being than money (see for example Heliwell and Huang, 2010). However for women other factors, such as their identity as carers, may be of more important in influencing their sense of identity and esteem. Part of the reason for the observed change in the relationship between work and mental health for mothers may therefore relate to changes in attitudes of mothers towards their role as carers and providers. Data from the BHPS does indeed show that there has been a significant shift in single parent attitudes, with far fewer identifying themselves as strongly home-orientated. A second reason could be that welfare reform, over and above raising the incomes of single mothers, may have improved the infrastructure around working. Greater government support for childcare and family friendly flexible working arrangements may have eased the burden of work among single mothers in particular and this may have fed through to greater mental health benefits. The influence of these factors on depression among single mothers is an important area for future research.

Appendix Table A1: Mean Values

	Single Mothers		Partnered mothers	
	1993/98	2003/08	1993/98	2003/08
Depressed	.293	.290	.241	.216
Work	.411	.556	.587	.631
FT	.204	.265	.235	.259
PT	.111	.262	.228	.279
Mini job	.121	.047	.155	.133
Log income	9.06	9.78	10.08	10.49
Arrears (2+ months)	.049	.024	.024	.013
Physical illness	.573	.593	.492	.511
Child under 5	.375	.243	.438	.411
Single never married	.370	.442	-	-
Cohabitation	-	-	.102	.174
Age 30-39	.431	.365	.511	.458
Age 40-49	.228	.373	.277	.367
Age 50-59	.026	.059	.024	.040
Degree	.072	.089	.096	.200
As	.137	.252	.213	.273
5+ GCSE	.433	.321	.328	.194
< 5 GSE	.358	.338	.363	.333
Managers	.059	.066	.048	.109
Professionals	.036	.058	.077	.091
Associated professionals	.036	.080	.080	.111
Administrative	.091	.134	.176	.161
Skilled occupations	.016	.009	.015	.010
Personal services	.098	.111	.127	.127
Sales	.049	.080	.069	.052
Machine operatives	.021	.009	.023	.014
Elementary occupations	.072	.041	.063	.047
Mum did not work at age 14	.392	.294	.377	.310
Dad did not work at age 14	.079	.063	.035	.031

Table A2: The Distribution of Employment and Depression among lone parents, partnered women and single childless women

	Lone Parent		Partnered with kids	
	1993/1998	2003/2008	1993/1998	2003/2008
Depression				
% Depressed	34.1	32.1	24.6	21.8
% ever depressed	52.0	50.3	48.9	44.3
of ever depressed, % always depressed	57.6	57.0	44.1	43.4
Work	41.1	55.5	59.5	65.3
% ever work	50.2	60.0	69.0	73.0
of ever work, % always work	73.5	86.0	79.1	84.1
Among those that NEVER work:				
% depressed	33.4	43.4	30.3	29.0
% ever depressed	46.9	61.0	45.8	51.7
of ever depressed, % always depressed	59.4	62.4	52.6	50.7
Among those that ALWAYS work:				
% depressed	33.53	22.6	22.8	19.1
% ever depressed	**35.0**	43.5	23.6	39.9
of ever depressed, % always depressed	93.4	47.8	84.8	41.5
Number of observations	1597	2637	6923	10042
Number of individuals	600	851	1934	2698

Note: Data is un-weighted. Only those who remain in same family type over the period are included in the sample.

01/04/2012

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Table 1: Depression and Employment Transitions

	Single Mothers				Partnered Mothers			
	Share (%)	% Depressed			Share (%)	% Depressed		
1993/98		(t-1)	t	Change		(t-1)	t	Change
Not employed t-1 / Not Employed t	51	33	29	-4	32	29	28	1
Not employed t-1 / Employed t	8	37	24	-13	7	25	19	-6
Employed t-1 / not employed t	*5*	*41*	*37*	*-4*	6	27	31	4
Employed t-1 / Employed t	35	30	29	-1	55	20	21	1
N	1212				6928			
2003/08								
Not employed t-1 / Not Employed t	38	40	40	0	28	24	25	-1
Not employed t-1 / Employed t	5	44	18	-26	5	25	19	-6
Employed t-1 / not employed t	4	*25*	*50*	+25	5	23	25	2
Employed t-1 / Employed t	53	24	20	-4	62	19	20	1
N	2226				10580			

Note: Results are reported for single mothers who have been single for one year or more.

Table 2: Depression and Employment Status, Single and Partnered Mothers (Marginal Effects from Logit models)

Dependent variable: Depression	Single Mothers				Partnered Mothers			
	1993/98		*2003/08*		*1993/98*		*2003/08*	
Employment Status (omitted category not working)								
Mini job (<16 hours)	-0.061	(0.206)	-0.133+	(0.071)	-0.073**	(0.000)	-0.066**	(0.000)
Part time job (16-29 hours)	-0.028	(0.572)	-0.176**	(0.000)	-0.060**	(0.000)	-0.057**	(0.001)
Full-time job (30+ hours)	-0.021	(0.689)	-0.157**	(0.000)	-0.057**	(0.001)	-0.046*	(0.012)
Income and Debt								
Log income	0.045	(0.195)	-0.052	(0.123)	-0.019	(0.132)	0.018	(0.182)
Debt (2+ months housing arrears)	0.233**	(0.007)	0.322**	(0.002)	0.175**	(0.000)	0.281**	(0.000)
Poor health	0.167**	(0.000)	0.234**	(0.000)	0.133**	(0.000)	0.118**	(0.000)
Age (compared to 20-29)								
30-39	0.063	(0.232)	-0.029	(0.543)	0.043*	(0.027)	-0.002	(0.940)
40-49	0.032	(0.619)	-0.045	(0.453)	0.029	(0.262)	0.015	(0.557)
50-59	-0.081	(0.410)	-0.103	(0.106)	0.008	(0.878)	0.071	(0.124)
Education (compared to <5 GCSEs)								
Degree	-0.043	(0.527)	0.035	(0.596)	0.004	(0.887)	-0.003	(0.879)
A level or equivalent	-0.044	(0.403)	0.028	(0.593)	0.037+	(0.070)	0.030	(0.138)
5+ GCSE	0.002	(0.962)	0.099+	(0.062)	0.004	(0.827)	0.013	(0.562)
Demographics								
Child under 5	0.006	(0.886)	0.007	(0.881)	0.003	(0.841)	-0.009	(0.598)
Single, never married	-0.029	(0.556)	-0.139**	(0.002)	-	-	-	-
Cohabiting	-	-	-	-	0.055*	(0.019)	0.037+	(0.062)
R-squared	0.062		0.140		0.042		0.039	
Number of observations	1349		2171		6987		9879	

Notes: 1. Marginal effects reported; *p*-values in parentheses. 2. Standard errors are robust and clustered on the individual. 3. + p<.10, * p<.05, ** p<.01. 4. Models also include controls also for region and year. 5. Only single mothers who have been single for one year or more are included in the models.

Table 3: Depression and Employment Status, Coefficients from Cross-Sectional and Panel Fixed Effects Logit Models

	Single Mothers				Partnered Mothers			
	1993/98		2003/08		1993/98		2003/08	
	Logit	FE logit	Logit	FE logit	Logit	FE logit	Logit	FE logit
Employed	-0.117	0.098	-1.012**	-1.536**	-0.347**	-0.200	-0.274**	-0.225
	(0.193)	(0.388)	(0.204)	(0.451)	(0.080)	(0.144)	(0.900)	(0.174)
Log income	0.208	0.125	-0.187	-0.472+	-0.116+	0.071	0.115	0.158
	(0.166)	(0.253)	(0.168)	(0.270)	(0.069)	(0.139)	(0.078)	(0.142)
Debt (housing arrears)	0.921**	1.255*	1.403**	1.541+	0.869**	0.565	1.348**	0.285
	(0.344)	(0.578)	(0.417)	(0.904)	(0.189)	(0.331)	(0.232)	(0.369)
Poor health	0.895**	0.945**	1.308**	.968**	0.726**	0.405**	0.757**	0.716**
	(0.184)	(0.344)	(0.168)	(0.331)	(0.076)	(0.127)	(0.085)	(0.153)
Observations	1349	537	2171	907	6987	3263	9879	4235
Number of groups		131		217		651		868

Notes: 1. Coefficients reported; standard errors in parentheses. 2. Standard errors are robust and clustered on the individual in the cross-sectional estimates;. 3. + p<.10, * p<.05, ** p<.01. 4. Data is weighted using cross-sectional or panel weights, as appropriate. 5. Models contain the same set of controls as reported in Table 1 for the cross-sectional estimates. Region and marital status are excluded from the panel estimates as these exhibit little variation over time. Full results are available from the author on request. 6. 5. Only single mothers who have been single for one year or more are included in the models

Table 4: Depression and Employment Status, OLS and Instrumental Variable estimates

	Single Mothers				Partnered mothers			
	OLS		IV		OLS		IV	
	1993.98	*2003.08*	*1993.98*	*2003.08*	*1993.98*	*2003.08*	*1993.98*	*2003.08*
Employed	-0.025	-0.184**	-0.256	-0.558***	-0.061**	-0.046**	-0.332+	-0.205+
	(0.508)	(0.000)	(0.299)	(0.000)	(0.000)	(0.003)	(0.056)	(0.091)
Log income	0.040	-0.029	0.0996	0.0526	-0.021+	0.018	0.0311	0.0460+
	(0.204)	(0.294)	(0.140)	(0.200)	(0.097)	(0.147)	(0.385)	(0.059)
Debt (housing arrears)	0.194*	0.297**	0.207*	0.293***	0.187**	0.292**	0.198***	0.276***
	(0.013)	(0.000)	(0.011)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Poor Health	0.167**	0.219**	0.170***	0.178***	0.128**	0.122**	0.114***	0.118***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	1193	2130	1193	2130	6961	10243	6961	10243
R-squared	0.071	0.152			0.044	0.040		
Partial R-squared			.039	.076			.0095	.017
Cragg Donald F statistic			47.10	172.3			67.01	178.85

Notes: 1. Coefficients reported; p-values in parentheses. 2. Standard errors are clustered on the individual;. 3. + p<.10, * p<.05, ** p<.01. 4. Data is weighted using cross-sectional weights. 5. Models contain the same set of controls as reported in Table 1. Full results are available from the author on request. 6. Only single mothers who have been single for one year or more are included in the models

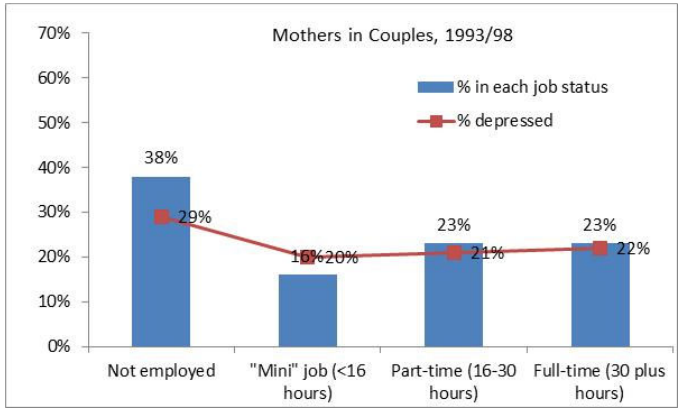
Table 5: The influence of occupation on Depression (compared to no work), Marginal Effects from the logit model

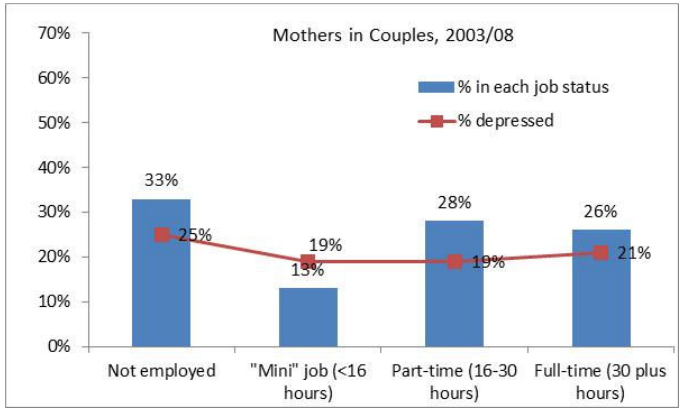
	Single Mothers		Partnered Mothers	
	1993/98	2003/08	1993/98	2003/08
Influence of occupation on depression (compared to not working)				
Managers	0.044	-0.116**	-0.046	-0.069**
	(0.660)	(0.010)	(0.146)	(0.001)
Professionals	-0.043	-0.125*	-0.041	-0.052*
	(0.629)	(0.023)	(0.161)	(0.026)
Associated Professional	-0.014	-0.134**	-0.013	-0.049*
	(0.859)	(0.009)	(0.628)	(0.016)
Administrative	-0.038	-0.187**	-0.061**	-0.075**
	(0.534)	(0.000)	(0.001)	(0.000)
Skilled occupations	-0.165*	-0.134	-0.112**	-0.064
	(0.048)	(0.299)	(0.000)	(0.196)
Personal services	-0.018	-0.143**	-0.078**	-0.043*
	(0.702)	(0.001)	(0.000)	(0.041)
Sales	0.033	-0.153**	-0.055*	-0.041
	(0.647)	(0.000)	(0.014)	(0.120)
Machine operatives	-0.108	0.071	-0.013	-0.055
	(0.112)	(0.729)	(0.776)	(0.241)
Elementary occupations	-0.116*	-0.130*	-0.067**	-0.012
	(0.027)	(0.041)	(0.004)	(0.690)
Income variables				
Log income	0.044	-0.049	-0.023+	0.022+
	(0.188)	(0.122)	(0.069)	(0.086)
Debt (2+ months housing arrears)	0.214*	0.310**	0.184**	0.283**
	(0.014)	(0.003)	(0.000)	(0.000)

Notes: 1. Marginal effects reported; p-values in parentheses. 2. Standard errors are clustered on the individual and robust;. 3. + p<.10, * p<.05, ** p<.01. 4. Data is weighted using cross-sectional weights. 5. Models contain the same set of controls as reported in Table 1. Full results are available from the author on request. 6. Only single mothers who have been single for one year or more are included in the models

Figure 1: Employment Status and Depression

Partnered Mothers





Lone Parents