AUSTRALIAN JOURNAL OF LABOUR ECONOMICS
Volume 14 • Number 2 • 2011 • pp 153 - 172

Unemployment and the Wellbeing of Children Aged 5-10 Years

Matthew Gray, Australian National University
Matthew Taylor, University of Canberra
Ben Edwards, Australian Institute of Family Studies

Abstract

The extent to which an increase in the unemployment rate has an effect on children's wellbeing is not well understood. This article provides estimates of the potential impact of an increase in the unemployment rate on behavioural and emotional outcomes for New South Wales (NSW) children aged four to five to eight to nine years. It also examines the extent to which the negative impacts are concentrated within particular geographic areas. It is estimated that an increase in the unemployment rate leads to an increase in the number of children with behavioural or emotional problems. This finding underscores the importance of having macro-economic policies that limit the increases in the rate of joblessness during economic downturns, particularly policies aimed at reducing the rate of family joblessness.

JEL Classifications: I10; J64; R23

1. Introduction

Unemployment has been found to have negative effects on economic wellbeing and the mental and physical health of the unemployed. There is evidence that the effects can flow-on to other family members (Saunders, 2002; McClelland, 2000). There is, however, limited empirical evidence about the direct impacts of parental unemployment on child wellbeing, and in particular, there is very little evidence for Australia. Much of the existing research being based upon US data (Coelli, 2009; Kalil and Ziol-Guest, 2008). In one of the few Australian studies, Gray and Baxter (2011), find that family joblessness has a negative effect on a range of developmental outcomes for children

Address for correspondence: Matthew Gray, Research School of Social Sciences, Australian National University, Canberra ACT 0200 Australia. Email: matthew.gray@anu.edu.au
Acknowledgements and disclaimer: This article uses data from LSAC confidentialised unit record file. LSAC was initiated and is funded by the Department of Families, Housing, Community Services and Indigenous Affairs (FaHCSIA) and is undertaken in partnership with the Australian Institute of Family Studies (AIFS) and the Australian Bureau of Statistics (ABS). The views expressed in this article are those of the authors and may not reflect those of FaHCSIA, AIFS, ABS or the Australian Government. A previous version of this paper was presented to the 2011 Australian Social Policy Conference. The authors are grateful to Professor Alan Hayes, staff from the Benevolent Society and two anonymous for helpful comments on the paper. Funding from the Benevolent Society is gratefully acknowledged.

aged eight to nine years. While there is little research on the direct impact of parental unemployment or joblessness on children's wellbeing, there are many studies of the impact of low income or poverty on children (e.g., Bolger, Patterson, Thompson, and Kupersmidt, 1995; Brooks-Gunn and Duncan, 1997; Duncan and Brooks-Gunn, 1997).

There are three main mechanisms via which parental jobless might impact upon children's developmental trajectories (Kalil, 2009):

- joblessness generally has a negative impact upon a family's financial position and this means that jobless families tend to spends less on things such as education and food. The lower levels of investment in children may mean that children in jobless families do not do as well as they would have otherwise (Duncan and Brooks-Gunn, 1997; Solantaus, Leinonen and Punamäki, 2004);
- a lack of paid employment is psychologically stressful (Clark, 2003; Paul and Moser, 2009) and this can adversely impact on the quality of parenting provided or increase the chances of parental relationship breakdown (Conger and Elder, 1994; Conger, Rueter and Elder, 1999; Kraft, 2001; Liker and Elder, 1983; Mendolia and Doiron, 2008). This can have a negative impact upon children's wellbeing; and
- children without an employed parent as a role model may not learn the skills required to find and retain a job and may have diminished motivation to succeed in education.

An important but not well-understood question is whether recessions and the associated increase in unemployment and joblessness adversely impacts upon children's developmental outcomes. This article begins to fill this gap by estimating the potential impacts of increases in the unemployment rate of an order of magnitude that typically occurs during a serious recession on aggregate child behavioural and emotional wellbeing. The article also examines the extent to which the negative impacts of an increase in the aggregate unemployment rate are concentrated within particular geographic areas.

A significant focus of Australian policy is reducing the level of social and economic disadvantage in the geographic areas that are most disadvantaged. There is also a policy focus on supporting children at greatest risk of long-term disadvantage and helping jobless families with children.[1] This policy focus reflects, in part, the evidence that living in a socio-economic disadvantaged (high unemployment) neighbourhood can have a negative impact on the wellbeing of children, including learning and behavioural outcomes and physical health (e.g., Leventhal and Brooks-Gunn, 2000; Edwards and Bromfield, 2009).

In order to illustrate the likely effects of recessions on children's wellbeing and the geographic distribution of effects, estimates are produced for New South Wales (NSW), the Australian state with the largest population.[2]

[1] http://www.socialinclusion.gov.au/SIAgenda/Priorities/Pages/default.aspx <accessed 30 November 2011>

[2] The article focuses on NSW for the pragmatic reason that the research on which it is based was commissioned by the Benevolent Society who operate primarily within NSW.

The focus of this is on joblessness rather than the more narrowly defined measure of unemployment. The jobless includes all of those who do not have paid employment irrespective of whether they want paid employment, have caring responsibilities which prevent being in paid work or whether they have a health condition which means they can't be in paid employment. The joblessness measure includes the unemployed, marginal attached and other not-in-the labour force. The focus is on joblessness rather than unemployed because mothers with dependent children who would like a job but who are not employed tend to be not-in-the labour force (marginally attached) rather than unemployment. A further reason for the focus on joblessness is that a feature of the Australia labour market is that it has a relatively high proportion of households with children that are jobless compared to most other OECD countries (Whiteford, 2009).[3]

The remainder of this article is structured as follows. Section 2 provides an overview of the methodology and data used, presents information used for the unemployment scenarios, and describes how the statistical analyses were conducted. Section 3 presents the estimates of the impact of joblessness on children's behavioural problems. The effects of an economic downturn on the behavioural and emotional outcomes of NSW children are documented in section 4, while section 5 focuses on the Statistical Local Areas (SLAs) that are likely to be most affected. Section 6 concludes.

2. Empirical Approach

Overview of Empirical Approach

Ideally, in order to estimate the effect of a change in the unemployment rate on children's wellbeing by geographic regions, a data set which contained longitudinal information on the wellbeing of children in each geographic area and their parents labour force status and other demographic and human capital characteristics would be used. This would allow the effects of parental unemployment on child wellbeing to be directly estimated. Unfortunately such a data set is not available for Australia.

The approach used in this article is to combine data from the first three waves of Growing up in Australia: The Longitudinal Study of Australian Children (LSAC)[4], the 2006 Census and the Department of Education, Employment and Workplace Relations Small Area Labour Market (SALM) data. The LSAC data are used to estimate the impact of living in a jobless family on the likelihood of New South Wales children aged four to five years to eight to nine years experiencing a range of behavioural or emotional problems. These estimates are combined with information from the 2006 Census on the number of children in each Statistical Local Area (SLA). Data on parental educational attainment and the number of children in each SLA are used to estimate the impact of changes in the unemployment rate on the proportion and number of children who experience behavioural or emotional problems.

The statistical model used to estimate the relationship between family joblessness and behavioural and emotional problems are necessarily simple given that the coefficients from the regressions which estimate the effect of parental joblessness

[3] In contrast Australia's rate of individual joblessness is relatively low compared to the OECD average.

[4] The LSAC sample includes children in 163 of the 199 New South Wales SLAs that existed under the 2001 Australian Standard Geographical Classification (ASGC).

on child wellbeing (using the LSAC data) are then used in conjunction with area level data from the 2006 Census. In order to implement this method all explanatory variables included in the regression analysis need to be available from both the LSAC and the 2006 Census. While income measures are available both in the Census and LSAC data, an income measure is not included in the regression modelling given that one of the primary mechanisms by which joblessness is expected to impact upon children is via the negative impact of joblessness on income. Thus, including income is likely to disguise some of the real effects of joblessness which are the focus of this research. There are a range of other variables such as the length of time a child spends living in a jobless family which are available on the LSAC data, but which are not available in the census data and thus are not included in the regression modelling.[5]

In order to illustrate the likely impacts of a recession on child wellbeing the Commonwealth Treasury's projections of what impact the late 2000s Global Financial Crisis (GFC) was likely to have on Australia's unemployment rate are used. It was projected Australia's unemployment rate would increase from a low of 3.9 per cent in February 2008 to a high of 8.5 per cent in June 2011 (Australian Government, 2009: table 1). These projections are similar to the increase in the unemployment rate that occurred in the most recent recession in the early 1990s.[6] In this article this is termed the high unemployment rate scenario. However, at the time of writing it seems as if Australia has avoided a major increase in unemployment, with unemployment appearing to have peaked at 5.8 per cent in June 2009 and was 5.2 per cent in October 2010.[7] In this article this is termed the low unemployment rate scenario. The potential impact of increases in the unemployment rate for child wellbeing is illustrated by comparing the predicted proportion of children with behavioural or emotional problems under the high and low unemployment scenarios.

While the impact on child wellbeing of the high and low unemployment scenarios is estimated by SLA, it is important to note that the methods and data used in the report are not designed to produce accurate estimates of child wellbeing for small geographic areas. The estimates should not be used to identify areas with high proportions of children with behavioural or emotional problems. Rather, these estimates are designed to provide estimates of the impact of a change in the unemployment rate on child wellbeing at the SLA level. That is, the number of additional children who experience behavioural or emotional problems in each SLA during a recession as a result of an increase in the number of children living in jobless families.

A detailed description of the empirical methods used is provided below.

---

[5] Gray and Baxter (2011) provide estimates of the effects of joblessness on a range of measures of child developmental outcomes which include a wide range of explanatory variables such as parenting style, persistence of joblessness and parental mental and physical health. Gray and Baxter (2011) find that including income as a control variable reduces the estimated effects of joblessness on child wellbeing, but there still remain effects.

[6] Although the increase in the unemployment rate used in the simulations is similar to that which occurred during the early 1990s recession, the projected unemployment rate of 8.5 per cent used in the simulations is lower than the rate of around 11 per cent reached during the 1990s recession. This is because the unemployment rate was much higher at the start of the 1990s recession than it was during the late 2000s.

[7] Trend series for the unemployment rate.

Data Sets and Variables

This section provides a summary of the key data sets and variables used to implement the empirical approach. LSAC is a nationally representative large-scale longitudinal survey of two birth cohorts of Australian children who were aged zero to one (B cohort) and four to five years (K cohort) when the first wave of interviews was conducted in 2004. In this paper data for the K-cohort is used. The K-cohort was aged six to seven years in 2006 when the second wave was conducted and eight to nine years in 2008 when the third wave was conducted.[8] Only children who lived in NSW in at least one of the waves are included in the analysis presented in this article.

LSAC data provide detailed information on a range of measures of child wellbeing, parental labour force status and parental educational attainment. The LSAC measures of family joblessness and parental educational attainment are similar to the 2006 Census measures.[9]

This article examines behavioural and emotional outcomes. This area of child wellbeing was selected because the psychological stress of poverty has been found to have a more immediate influence on children's development by way of impairment of parental mental health and parenting practices and these factors are particularly relevant behavioural and emotional outcomes of children (Conger and Elder, 1994; Conger, Rueter and Elder, 1999). Child behavioural and emotional outcomes are measured using the Strengths and Difficulties Questionnaire (SDQ) (Goodman, 1997). The SDQ comprises five subscales as well as an overall measure, but the effects of joblessness on the fifth subscale (prosocial behaviour) has not been estimated because it captures positive behaviours that were largely unaffected by parental joblessness. The other four subscales measures are:

- **hyperactivity** – fidgetiness, concentration span and impulsiveness;
- **emotional symptoms** – frequency of display of negative emotional states (e.g., nervousness, worry);
- **peer problems** – ability to form positive relationships with other children; and
- **conduct problems** – tendency to display problem behaviour when interacting with others.

Each subscale is calculated from the mean score of five questions. The four subscales listed can be added together to form a total SDQ score. The SDQ has cut-offs that suggest that children who score above these are at risk of being in the clinical range of behavioural or emotional problems. LSAC contains both parent and teacher responses to the SDQ. We chose parent reports to try and ensure consistency with respect to the respondent and to minimise the amount of missing data. For virtually all children, their 'teacher' will differ in each wave as they move from kindergarten to school and then through school years. These measures have been chosen, in part, because they are available in comparable form for children at ages four to five, six to seven and eight to nine years.

[8] A detailed overview of the LSAC study, including attrition rates, is provided by Gray and Smart (2008).
[9] See Baxter *et al*. (2007) for a discussion of how the LSAC measure of employment compares to the standard ABS definition.

Table 1 shows the proportion of children who were at risk of behavioural problems in the clinical range for 2004-08. Overall, the total score suggests that the prevalence of risk of clinical levels of behavioural problems was highest when children were aged four to five years (11 per cent), and was lower for children aged six to seven and eight to nine years (seven per cent). The percentage of children in the clinical range for peer problems, emotional symptoms and hyperactivity were fairly stable across survey waves. The age pattern in the incidence of conduct problems differed, with 29 per cent of children aged four to five years having conduct problems which falls to 11 per cent of children aged six to seven years and nine per cent of children aged eight to nine years. This reflects the well-known child development trajectory, where conduct problems peak early in childhood and then decline (Petitclerc and Tremblay, 2009). Of the remaining measures of behavioural and emotional problems, peer problems had the highest percentage of children in the clinical range, followed by hyperactivity and then emotional symptoms.

Table 1 - Proportion of LSAC Children in NSW who are in the Clinical Range for Behavioural and Emotional Problems, 2004-08 Year

Year	*Behavioural/ Emotional Problems (total SDQ score)*	*Conduct Problems*	*Peer Problems*	*Emotional Symptoms*	*Hyperactivity*
2004 (4-5 years)	11	29	13	7	10
2006 (6-7 years)	7	11	12	7	10
2008 (8-9 years)	7	9	12	8	10
Average 2004-08 4-5 to 8-9 years)	8	17	13	7	10

Source: LSAC Waves 1-3.

The only regular information on labour market conditions in relatively small geographic areas is the SALM data which provide quarterly estimates of the unemployment rate for every SLA in Australia (DEEWR, 2009). Quarterly data on the unemployment rate of each SLA in NSW over the period 2004 to 2010 are used in this article.[10]

The 2006 Census is the best source of data on the characteristics of families living in each SLA and is therefore used as the source of information on the highest level of parental educational attainment, the number of children aged five to 10 years and the rate of parental joblessness of families with a child aged five to 10 years in each SLA.

[10] The boundaries of SLAs are revised periodically and this needs to be taken into account when examining changes in the unemployment rate in SLAs over time. Longitudinally consistent SLAs are constructed using a methodology proposed by Biddle (2009). This methodology involves using the Census Districts of an earlier edition of the ASGC to apportion population estimates – or in our case labour force estimates – across the SLA boundaries of a later edition of the ASGC, thereby enabling the construction of historical labour force estimates for the most recent statistical boundaries that are consistent across time.

Unemployment Scenarios

As outlined above, low and high unemployment rate scenarios are used. The low unemployment rate scenario is based on the Australian Government's forecasts of the future path of unemployment reported in its 2009-10 Budget. The high unemployment rate scenario is the unemployment rate that would have resulted if Australia had experienced a serious recession, such as that experienced in the early 1990s.[11] The unemployment rates for 2006 and 2008 in both scenarios are the actual rates for those years. Under the low unemployment scenario, the unemployment rate increases from 4.7 per cent in 2008 to 5.2 per cent in 2010 and then falls to 4.7 per cent in 2012. Under the high unemployment rate scenario, the unemployment rate increases from 4.7 per cent in 2008 to 8.2 per cent in 2010 and then to 9.4 per cent in 2012 (table 2).

The unemployment rates for each SLA for the low and high unemployment scenarios are obtained by calculating the change in the national unemployment rate between each time period and then adding this amount to the previous period's SLA unemployment rate.[12] This method is perhaps best illustrated using an example. For the high unemployment rate scenario, the national increase in the unemployment rate was 3.5 per cent between June 2008 and June 2010 and forecast to be 1.2 per cent between 2010 and 2012. These percentage increases are then applied to the actual SLA unemployment rate as of June 2008.[13]

The family joblessness rates for the two scenarios are derived from the correlation between the unemployment rate in the area and its estimated impact upon family joblessness (as described in section 2.2). The trends in family joblessness track the SLA unemployment rate (table 2).

[11] Data on the increase in unemployment rates during the 1990s recessions for the whole of Australia is from the Labour Force Survey (ABS, 2010). The unemployment rates forecasted in the 2010-11 Australian Government Budget are taken from Budget Paper No. 1, Statement Number 2: Economic Outlook (Australian Government, 2010). The unemployment rate for each SLA in NSW, given the state of the labour market implied by the Budget forecasts, are calculated by converting the forecast's annual changes into quarterly changes and applying these changes to our quarterly SLA unemployment rates, beginning in June 2009.

[12] The projections of the annual change in unemployment rates are distributed equally across quarters.

[13] An alternative method of projecting the effects of a change in the national unemployment rate on SLA unemployment rates is to increase the unemployment rate in each SLA by the proportional change in the national unemployment rate. Using this method means that the absolute increase in the SLA unemployment rate is smaller for SLAs with a lower unemployment rate and larger for SLAs with a higher unemployment rate. The results are quite similar, albeit somewhat weaker, because although the SLAs that had the worst unemployment rates in 2008 were more affected, the increases in the SLAs with the low unemployment rates were much smaller, so that in total fewer children were estimated to be at risk.

Table 2 - SLA Unemployment Rate and Family Joblessness Rate in NSW, Low and High Unemployment Scenarios, 2006-12

	Low Unemployment Scenario		*High Unemployment Scenario*	
	Unemployment Rate	*Family Joblessness Rate*	*Unemployment Rate*	*Family Joblessness Rate*
	%		%	
2006 (actual)	5.6	16.2	5.6	16.2
2008 (actual)	4.7	14.5	4.7	14.5
2010 (projected)	5.2	15.5	8.2	21.2
2012 (projected)	4.7	14.5	9.4	23.5

Empirical Approach in Detail

Given that the primary purpose of the statistical modelling is to estimate the possible effect of a change in the NSW unemployment rate on the average wellbeing of children in different SLAs, the specification needs to include explanatory variables that are available from LSAC and the Census.

We have defined child behavioural or emotional problems as binary variables (i.e., they take the value of 1 if the child has a behavioural or emotional problem in the clinical range and 0 otherwise). Estimating the impact of a change in the area-level unemployment rate on the wellbeing of children living in different geographic areas involves a number of steps.

Step 1: This step involves estimating the impact of living in a jobless family on children's wellbeing using data from Waves 1-3 of LSAC. The explanatory variables included are whether the child is living in a jobless family and the highest level of parental educational attainment (specified as a set of dummy variables). Given the measures of children's wellbeing are binary variables, logistic regression is used:[14]

$$\text{Prob}(Y_{it} = 1 | JOBLESS_{it}, EDUC_{it}) = \alpha + \delta JOBLESS_{it} + \gamma EDUC_{it} + \varepsilon_{it} \quad (1)$$

Where i = child/family i
t = time t
Y_{it} = {1,0}, = 1 if child has a behavioural problem and 0 if child does not have a behavioural problem
$JOBLESS_{it}$ = {1,0} = 1 if child i is living in a jobless family at time t
$EDUC_i$ = highest level of education attained by a parent in family i

[14] It was found that the effects of unemployment on child wellbeing occur for children whose parents are jobless and that there is no evidence of differences in the unemployment rate in the areas in which children live having an impact upon children whose parents are not jobless.

Step 2: This step involves estimating the relationship between the SLA unemployment rate[15] and the percentage of children living in a jobless family in the SLA using data from the 2006 Census of Population and Housing. The results of this regression are used to predict the joblessness rate in each SLA for the two (high and low) unemployment rate scenarios examined:

$$JOBLESS_j = a + bUR_j + \eta_j \tag{2}$$

where $JOBLESS_j$ is the proportion of children in SLA j that are living in a jobless family and UR_j is the unemployment rate of *SLA j* at the time of the 2006 Census. The data on joblessness are from the 2006 Census and those on the SLA unemployment rate are from the SALM data.

Equation (2) is estimated using ordinary least squares (OLS) regression.

Step 3: In this step, the results of estimating equation (2) are combined with information on the unemployment rate under each of the unemployment scenarios to produce a predicted time series of SLA joblessness rates for each SLA:

$$JOBLESS^*_{jt} = \hat{a} + \hat{b}\,UR^*_{jt} \tag{3}$$

where $JOBLESS^*_{jt}$ is the predicted proportion of jobless families in SLA j at time t. UR^*_{jt} is the counterfactual path of the SLA unemployment rate described at the beginning of the previous section, and $\hat{a}$ and $\hat{b}$ are estimated from equation (2).

Step 4: Estimates of the parameters contained in equations (1), (2) and (3) are combined with information from each SLA on the average parental educational attainment in households that contain children. This SLA average educational attainment is obtained from the 2006 Census by averaging the highest educational attainment of all the adults in households that contain children aged between five and 10. This is used to estimate the probability that a child with the average household characteristics has a level of behavioural problems that is above the abnormal cut-off under the different unemployment rate scenarios (see section 4).

The equation is:

$$\text{Prob}(Y^*_{jt} = 1 \mid JOBLESS^*_{jt}, EDUC_j) = \frac{\exp(\hat{\alpha} + \hat{\delta} JOBLESS^*_{jt} + \hat{\gamma} EDUC_j)}{1 + \exp(\hat{\alpha} + \hat{\gamma} JOBLESS^*_{jt} + \hat{\gamma} EDUC_j)} \tag{4}$$

where Y^*_{jt} is the predicted probability that a child living in area j at time t has behavioural or emotional problems that are at risk of being in the clinical range. $\hat{\alpha}$, $\hat{\delta}$ and $\hat{\gamma}$ are estimated from equation (1).

The number of children in each SLA that have behavioural problems in the abnormal range at time t, RISK_{jt} is then calculated using the estimate obtained from equation (4), multiplied by the number of children between the ages of five and 10 in each SLA:

[15] The SLA unemployment rate is obtained from local labour market data produced by the Department of Education, Employment and Workplace Relations.

$$RISK_{jt} = \text{Prob}(Y_{jt} = 1 | JOBLESS^{*}_{jt}, EDUC_{j}) \times KIDS_{jt} \quad (5)$$

where $KIDS_{jt}$ is the number of five to 10 year old children living in area j at time t.

This method of simulating the impact of a change in the national unemployment rate on child wellbeing requires a number of assumptions be made. First, because the relationship between area-level unemployment and the rate of family joblessness is estimated using data that was collected at a time of low unemployment (August, 2006), it is necessary to assume that the relationship remained unchanged during a period when the unemployment rate was increasing. Similarly, because the LSAC data was also collected during a period of low unemployment, it is assumed that the relationship between family joblessness and child wellbeing over the economic cycle.

Second, it is assumed that average parental education attainment and the number of children living in each SLA remain at their 2006 levels. We are therefore ignoring any impact of population changes on our estimates. Third, it is assumed that the impact of living in a jobless family is the same for children aged four to five years through to those aged eight to nine years. Fourth, it is assumed that the impact of living in a jobless family is immediate and disappears once the family is no longer jobless.[16]

The empirical approach is designed to estimate the impact of an increase in the unemployment rate on the proportion of children in different geographic regions with behavioural problems. The method and data are not designed to produce accurate estimates of child wellbeing for small geographic areas and therefore should not be used to identify areas with high proportions of children with behavioural or emotional problems.

3. The Impact of Joblessness on Child Wellbeing

This section provides a summary of the estimates of the impact of joblessness on child wellbeing made using the LSAC data. For all five measures of child wellbeing, living in a jobless family is estimated to increase the probability that a child has behavioural or emotional problems in the clinical range. The interpretation of the estimates of the logit model results themselves is not straightforward. The impact on the wellbeing of a child living in a jobless family compared to living in a family in which there is an employed parent is best illustrated using marginal effects, which hold all other variables constant. The marginal effects show the impact of living in a jobless family on the probability of the child having an emotional or behavioural problem compared to that for a child living in a family with at least one employed parent, holding constant the effects of the other explanatory variables included in the regression model.

Living in a jobless family increases the probability that a child will have behavioural problems (overall measure) by 13.0 percentage points, conduct problems by 13.4 percentage points, peer problems by 7.6 percentage points, emotional problems by 7.5 percentage points and hyperactivity by 7.2 percentage points (table 3). These effects are quite large. For example, the mean rate of behavioural problems (Total SDQ) in the LSAC samples is 8.0 percent and the effect of living in a jobless family is to increase the likelihood of a child having behavioural problems by 13 per cent.

[16] While this assumption is unlikely to be strictly true, with only three waves of LSAC data available and only being collected every two years, it is difficult to estimate the speed of recovery of children following a period of family joblessness.

Table 3 - Increase in Probability that a Child Living in a Jobless Family will have Behavioural and Emotional Problems

	Increase in Probability of Child Behaviour and Emotional Problems (%)
Behavioural/emotional problems (total SDQ score)	13.0*
Conduct problems	13.4*
Peer problems	7.6*
Emotional symptoms	7.5*
Hyperactivity	7.2*

Notes: * indicates that the marginal effect is statistically significant at the five per cent or better confidence level.
Source: Derived from estimates in appendix table A2.

4. The Effects of an Economic Downturn on Child Wellbeing

The previous section focused on the impact of living in a jobless family on children's behavioural and emotional problems. This section combines the estimates of the impact of living in a jobless family on children's behavioural and emotional problems (presented in section 3) with the estimates of the change in the proportion of children living in jobless families to estimate the proportion and number of children aged five to 10 years old living in New South Wales who have behavioural emotional problems for the low and high unemployment scenarios.

Under the continuing low unemployment scenario, there is very little change in the proportion of children with behavioural or emotional problems (table 4). The average proportion of children in the clinical range of emotional/behavioural problems declines by 0.01 of a per cent across each measure.

Under the high unemployment scenario (with the national unemployment rate reaching 9.4 per cent in 2012, compared to 4.7 per cent in the low unemployment rate scenarios) is projected to increase the proportion of NSW children experiencing behavioural problems by between 0.5 per cent and 0.9 per cent, depending upon the aspect of behaviour examined (table 4).[17] For example, the proportion of children with behavioural problems is estimated to increase from 7.2 per cent in the low unemployment scenario to 8.0 per cent in the high unemployment scenario. The relatively small increase in the proportion of children experiencing behavioural problems under the high unemployment rate scenario is a consequence of the fact that only those children directly affected by joblessness are likely to experience an increase in emotional/behavioural problems. The number of jobless families in the higher unemployment scenario, while quite large, will nonetheless only affect a minority of children.[18]

[17] One indicator of whether the approach used is reasonable is the extent to which the predicted percentages of children experiencing behavioural and emotional problems presented in table 4 for 2006 and 2008 are similar to the within-LSAC sample average. A comparison of table 1 and table 4 indicates that the proportions are reasonably close.

[18] The National Centre for Social and Economic Modelling (NATSEM) have developed a child social exclusion index from the 2006 Census of Population and Housing (Harding *et al*. 2009). We find that there was some correlation between the rates of behavioural problems and the child social exclusion index. The average proportion of children at risk of behavioural problems for each of the child social exclusion quintiles was higher in the most disadvantaged child social exclusion index quintile and lowest in the most advantaged quintile, and followed a linear trend downwards from the most disadvantaged to the advantaged quintile of the SLAs.

Table 4 - Effect of Increased Unemployment on Proportion of 5-10 year old Children in NSW having Behavioural and Emotional Problems, 2006-12

	Behavioural/ Emotional Problems (total SDQ score)	*Conduct Problems*	*Peer Problems*	*Emotional Problems*	*Hyperactivity*
			%		
2006	7.3	14.6	11.1	6.8	8.8
2008	7.2	14.4	11.0	6.7	8.7
Low Unemployment Scenario					
2010	7.3	14.5	11.1	6.8	8.8
2012	7.2	14.4	11.0	6.7	8.7
High Unemployment Scenario					
2010	7.8	15.1	11.4	7.1	9.1
2012	8.0	15.3	11.6	7.2	9.2

Although the increases in the proportion of children experiencing behavioural or emotional problems are relatively small across the state of NSW, there are still several thousand additional children aged five to 10 years who are likely to develop clinically significant behavioural or emotional problems (table 5) as a result of an economic recession. For the total behavioural problems measure, an additional 3,095 children would have significant clinical-level problems. For conduct problems, this would be even greater at 3,685. The increases in the numbers of children at risk of clinically significant peer problems, emotional problems and hyperactivity are 2,207, 2,007 and 2,023 respectively. About 6 per cent of the NSW population are aged five to 10 years, a similar percentage of the population aged zero to four years and 10-14 years respectively. If it is assumed that the increase in the unemployment rate would have a similar impact on the numbers of children with behavioural or emotional problems in these other age groups, the number of children with emotional/behavioural problems would approximately triple.

Another way to view these estimates of the increased numbers of children at risk is to consider the costs associated with behavioural or emotional problems. While it is difficult to estimate the costs associated with children's mental health, there are some Australian examples. For instance, Mihalopoulos, Sanders, Turner, Murphy-Brennan, and Carter (2007) provided Australian estimates of the costs of conduct disorder in 2002-03 Australian dollars. They estimated that the total additional public sector costs were $140,667 per additional child diagnosed with conduct disorder from the ages of 10 to 28 years. It would of course be inappropriate to extrapolate our findings on the basis of these costs, given that our measure of conduct problems is a measure of risk of clinically significant problems. The age group for which the costs were estimated was also different. This does, however, highlight the significant costs to the public of an increase in the number of five to 10 year old children having behavioural or emotional problems as a result of an economic recession.

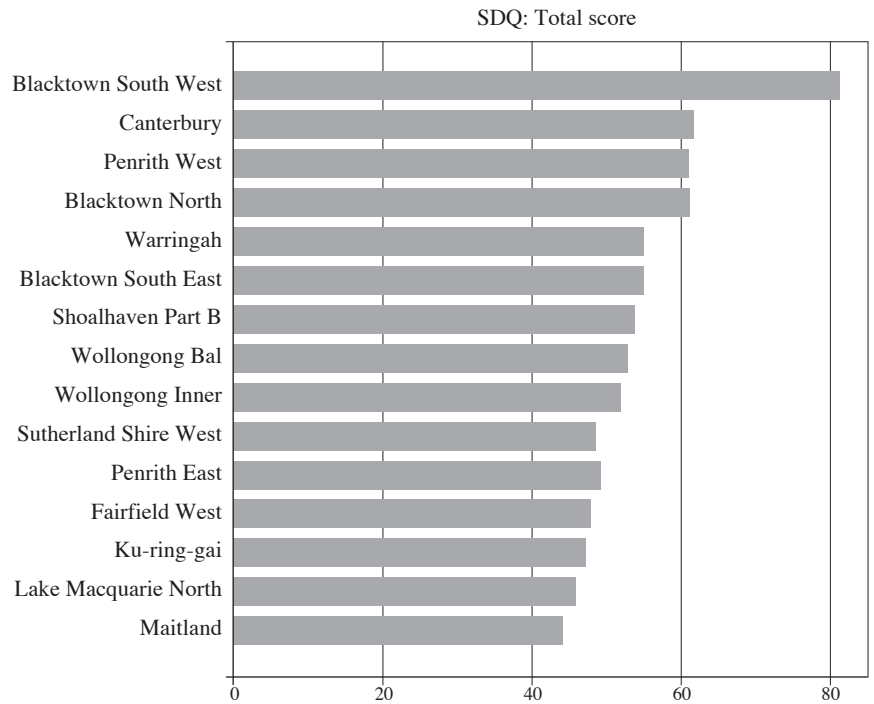
Table 5 - Effect of Increased Unemployment on Number of 5-10 year old Children in NSW having Behavioural and Emotional Problems, 2006-12

	Number of Children
Behavioural/emotional problems (total SDQ score)	3,095
Conduct problems	3,685
Peer problems	2,207
Emotional problems	2,007
Hyperactivity	2,023

Geographic Distribution

The effects of an economic downturn are likely to hit some areas harder than others. This section describes the geographic areas that are likely to experience the greatest increase in the number of five to 10 year old children at risk of having behavioural and emotional problems that result from an increase in the unemployment rate. The information presented is the difference in the projected estimates between the number of children at risk of behavioural or emotional problems in each SLA under the low and high unemployment scenarios for 2012.

Figure 1 - NSW SLAs that are likely to have the Biggest Increases in the Number of Children with Behavioural/Emotional Problems (total SDQ score)



The SLA level change in the number of children at risk of having behavioural and emotional problems will be heavily influenced by the number of children, aged five to 10 years, living in the area. Figure 1 shows the SLAs that are estimated to have the biggest increases in the number of children with behavioural/emotional problems. Blacktown South West has the largest increase in the number of children, with 80 children at risk of such problems, followed by Canterbury (60), Penrith West (60) and Blacktown North (60). It is interesting to note that Blacktown South East also has one of the larger increases in the number of five to 10 year olds with behavioural/emotional problems (55). The increased number of children for the three Blacktown SLAs is 197 additional children. Similarly, for the two Penrith SLAs there are 110 children and for the two Wollongong SLAs there are 107 children at risk. For the other SDQ subscales, the number of children at an increased risk of problems is roughly comparable to that for the total SDQ score. The detailed results are available from the authors on request.

Another way to look at these increases in the number of children at risk of behavioural/emotional problems is to examine their spatial distribution in maps of NSW SLAs. This has the added benefit of being able to more easily identify whether there are particular clusters of SLAs that are more affected.

Figure 2 presents the family jobless rate for NSW families with children aged five to 10 years based on the 2006 Census. In Sydney, the SLAs that had a family jobless rate of over 25 per cent were Blacktown South West, Fairfield East, Paramatta South, Auburn, Bankstown North East and Inner Sydney. Outside of Sydney, in the remainder of NSW, there are several SLAs that also have a jobless rate over 25 per cent – Urana in the south and Brewarrina and Walgett in the north of NSW. Inland from the Tweed Coast, the SLAs of Tenterfield, Kyogle and Clarence Valley and, a bit further south, Nambucca and Kempsey, all had family jobless rates over 25 per cent.

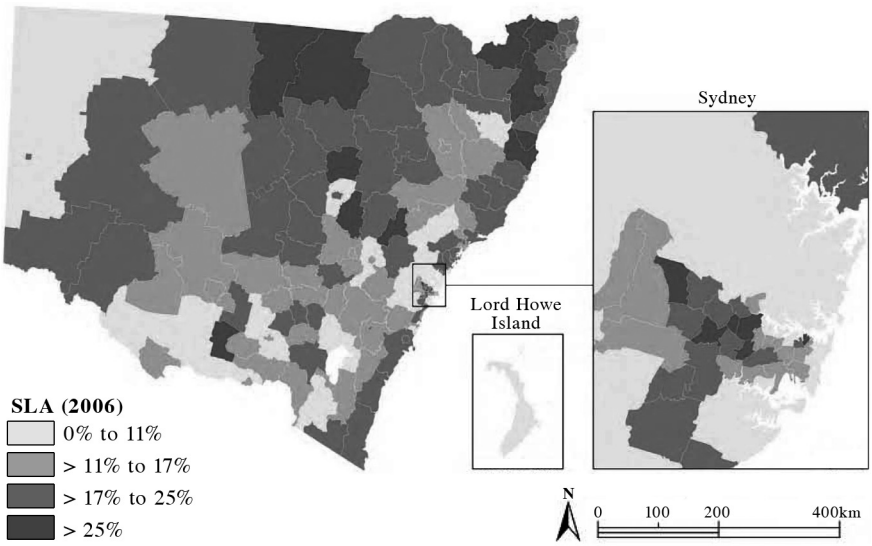
Figure 3 shows the projected increase in the family jobless rate in 2012 under the high compared to the low unemployment rate scenarios. For the majority of SLAs in NSW, the family jobless rate is likely to increase by between eight and 12 percentage points. There are some SLAs outside of Sydney where the increase in the family jobless rate is over 12 percentage points – Shoalhaven Part A and B, Wingelcaribee, Great Lakes, Walcha and Guyrn. In Sydney, the only SLA to increase by over 12 percentage points is likely to be Bankstown South.

Figure 4 illustrates the projected increase in the number of children at risk of clinically significant behavioural problems from the difference between the high and low unemployment scenarios. We focus only on the total number of five to 10 year old children at increased risk of experiencing clinically significant behavioural and emotional problems based on the total SDQ score. The projections for the SDQ sub-scales are available from the authors on request.

Although the maps of family joblessness suggest that there is a high degree of differentiation between SLAs in 2006, the increases in family joblessness are fairly consistent for most SLAs, although it is important to recognise that this is in part a consequence of the assumption that all SLAs have the same increase in their unemployment rate. The methodology applied in this article could be extended by undertaking a more sophisticated modelling of how these changes flow through to projected changes in behavioural and emotional problems, with relatively small increases in the number of children for most SLAs. However, there are some areas with large numbers of children aged five to 10 years that, coupled with larger projected increases in family joblessness, have larger projected increases in children with emotional/behavioural problems. In the

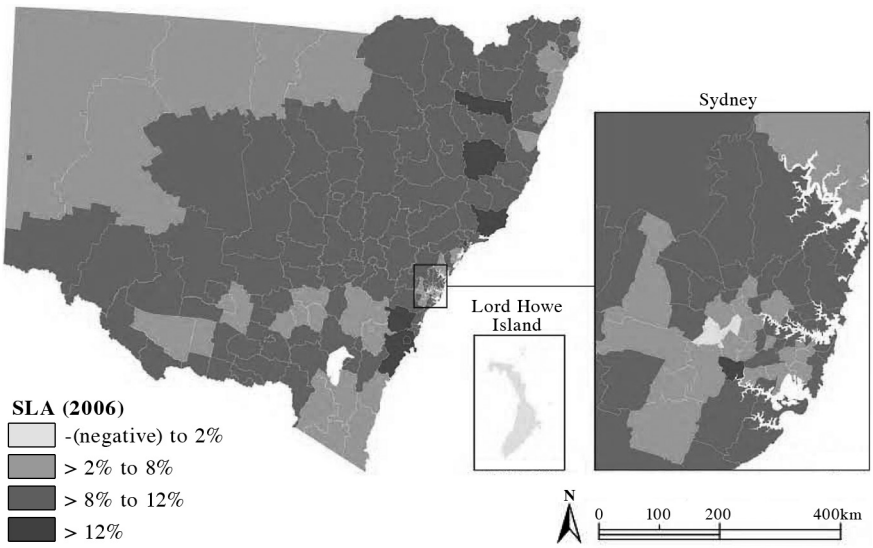
main, the spatial distribution of high-risk areas is confined to the high population areas around Sydney, from Newcastle in the north to Wollongong in the south.

Figure 2 - Family Jobless Rate for Each NSW SLA, 2006



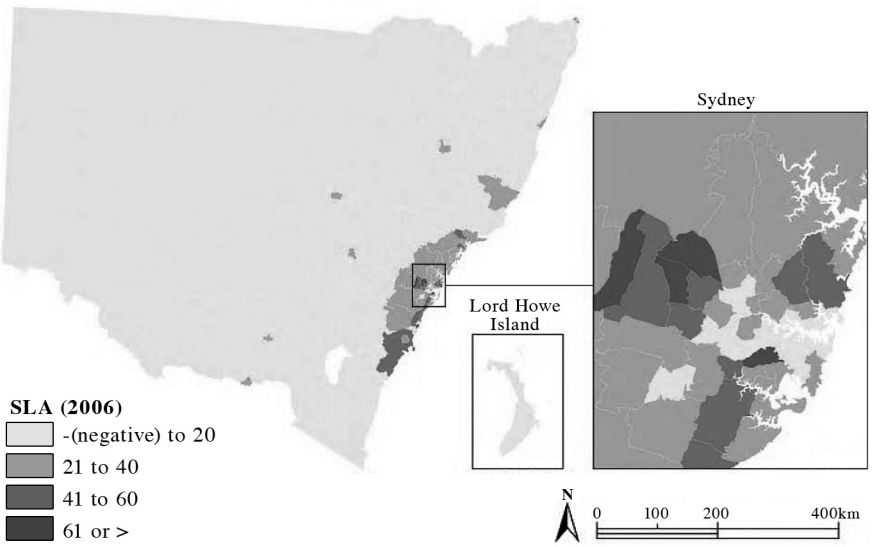
Source: 2006 Census of Population and Housing.

Figure 3 - Projected Increase in Family Jobless Rate for Each NSW SLA, 2012, under 1990s Recession Scenario



Source: 2006 Census of Population and Housing; DEEWR SALM data.

Figure 4 - Projected Increase in Number of 5-10 year old NSW Children in the Abnormal Range for Behavioural and Emotional Problems (total SDQ score)



Source: 2006 Census of Population and Housing; DEEWR SALM data; LSAC.

5. Concluding Comments

Recessions typically have adverse financial consequences and can have a range of adverse social and health impacts. The negative effects of parental joblessness are also likely to affect children, either because of the negative financial impact of unemployment or because of the impacts of unemployment on parental mental health and parenting. However, relatively little is known about how the changes in the macro-economy flow through to affect children's wellbeing via parental joblessness. This article begins to address some of the gaps in our understanding of the impact that an increase in the unemployment rate is likely to have on children's behavioural and emotional outcomes in New South Wales. It also examines the extent to which the negative impacts are concentrated within particular geographic areas.

Living in a jobless family has a negative impact upon a range of measures of children's behavioural and emotional problems, and these effects are quite large – an increased risk of between seven to 13 percentage points, depending upon the particular measure. Given that during economic downturns only a minority of children experience living in a jobless family as a result of an economic recession, the increase in the proportion of children aged five to 10 years who have behavioural problems is relatively small when averaged across all children in NSW.

Our estimates suggest that if NSW had experienced an increase in the unemployment rate similar to the increase during the 1990s recession, there would have been a 0.8 percentage point increase in the number of children who had behavioural and emotional problems in the clinical range. Nonetheless, the number of additional

children with behavioural problems as a result of an increase in the unemployment rate is estimated to be 3,095. Assuming that the risk of recession for child behaviour problems are similar for other age groups (zero to four years and 10-14 years) and given that these age groups are similar in number to the number of five to 10 year old NSW children, then the additional number of children age zero to 15 years with behavioural problems as a result of an increase in the unemployment rate is estimated to be over 9,000 children.

The findings suggest that an increase in the aggregate unemployment rate has a negative effect on children who are living in a jobless family as a consequence of the economic downturn. This finding underscores the importance of having macro-economic policies that limit the increases in the rate of joblessness during economic downturns, particularly policies aimed at reducing the rate of family joblessness. Such policies have the potential to minimise the potential negative effects on children.

Appendix A
Results of the Regression Modelling

Table A1 - Descriptive Statistics for the Logit Regression of Effects of Joblessness on Child Wellbeing made using LSAC Data

	Mean	*Standard Deviation*	*Minimum*	*Maximum*
Emotional and behavioural problems				
Total score	0.09	0.28	0	1
Conduct problems	0.17	0.38	0	1
Peer problems	0.13	0.33	0	1
Emotional problems	0.08	0.26	0	1
Hyperactivity	0.1	0.3	0	1
Labour force variables				
SLA Unemployment rate (%)	5.3	2.41	0.6	19.8
Family joblessness	0.11	0.32	0	1
Highest educational attainment				
Postgraduate degree	0.03	0.17	0	1
Graduate diploma or certificate	0.03	0.17	0	1
Advanced diploma	0.09	0.29	0	1
Year 12 or Certificate I or II	0.7	0.46	0	1
Missing information on education	0.01	0.09	0	1

Table A2 - Estimated Effect of Joblessness on Child Wellbeing, Logistic Model

	Behavioural/ Emotional Problems (total SDQ score)	*Conduct Problems*	*Peer Problems*	*Emotional Problems*	*Hyperactivity*
Joblessness	1.208***	0.794***	0.594***	0.850***	0.682***
	(0.159)	(0.126)	(0.149)	(0.173)	(0.171)
Highest level of parental education (omitted category = Bachelor degree)					
Postgraduate degree	-0.305	-0.079	0.58	-1.336	0.004
	(0.711)	(0.409)	(0.39)	(1.018)	(0.485)
Graduate diploma or certificate	0.301	0.357	0.189	0.854**	0.595
	(0.472)	(0.317)	(0.418)	(0.387)	(0.434)
Advanced diploma	0.161	0.044	-0.031	-0.117	0.115
	(0.356)	(0.266)	(0.306)	(0.326)	(0.354)
Year 12 or Certificate I or II	0.371	0.560***	0.409**	0.143	0.565**
	(0.257)	(0.186)	(0.196)	(0.229)	(0.249)
Missing information on education	0.739	0.891*	0.985**	0.426	0.85
	(0.669)	(0.533)	(0.443)	(0.765)	(0.594)
Constant	(0.243)	(0.176)	(0.183)	(0.212)	(0.238)
Percentage correct	91.44%	82.66%	87.40%	92.43%	90.17%
McFadden R^2	0.037	0.023	0.013	0.022	0.018
Number of observations	**3,832**	**3,834**	**3,834**	**3,833**	**3,835**

Notes: The fact that there are multiple observations per family/child is taken into account in the estimation of the standard errors. Significance levels: * $p < .1$, ** $p < .05$, *** $p < .01$. For the hyperactivity regression, there were a small number of respondents who did not state their educational attainment. For these respondents a dummy variable measuring not stated for education attainment is included.
Source: LSAC Waves 1 to 3.

Table A3 - Estimated Effect of SLA Unemployment Rate on the Probability of Living in a Jobless Family, OLS Model

	Joblessness
SLA unemployment rate	0.019***
	(0.002)
Constant	0.057***
	(0.009)

Notes: The fact that there are multiple observations per family/child is taken into account in the estimation of the standard errors. Significance levels: * $p < .1$, ** $p < .05$, *** $p < .01$.
Source: LSAC Waves 1 to 3; DEEWR SALM data.

References

ABS (2010), *Labour force Australia*, Catalogue No. 6202.0, ABS, Canberra.

Australian Government (2009), *Budget Strategy and Outlook: Budget Paper No. 1. 2009-2010*, Commonwealth of Australia, Canberra.

Baxter, J., Gray, M., Strazdins, L. and Bittman, M. (2007), 'Mothers and Fathers with Young Children: Paid Employment, Caring and Wellbeing', *Social Policy Research Paper No. 30*, Department of Families, Community Services and Indigenous Affairs, Canberra.

Bolger, K., Patterson, C., Thompson, W. and Kupersmidt, J. (1995), 'Psychosocial Adjustment Among Children Experiencing Persistent and Intermittent Family Economic Hardship', *Child Development*, 66(4), 1107-1129.

Brooks-Gunn, J. and Duncan, G. (1997), 'The Effects of Poverty on Children', *The Future of Children*, 7(2), 55-71.

Biddle, N. (2009), *A Note on Concordances and Indigenous Population Change, 2001 to 2006* (Mimeo), Centre for Aboriginal Economic Policy Research, Australian National University, Canberra.

Clark, A. (2003), 'Unemployment as a Social Norm: Psychological Evidence from Panel Data', *Journal of Labor Economics*, 21, 323-351.

Coelli, M. (2009), 'Parental Job Loss, Income Shocks and the Educational Enrolement of Youth', *Research Paper No. 1060*, Economics Department, University of Melbourne, Melbourne.

Conger, R. and Elder, G. (1994), *Families in Troubled Times: Adapting to Change in Rural America*, de Gruyter Aldine, Hawthorne, NY.

Conger, R., Rueter, M. and Elder, G. (1999), 'Couple Resilience to Economic Pressure', *Journal of Personality and Social Psychology*, 76, 54-71.

Department of Education, Employment and Workplace Relations (DEEWR) (2009), *Small Area Labour Markets*, DEEWR, Canberra.

Duncan, G and Brooks-Gunn, J. (1997), *The Consequences of Growing Up Poor*, Russell Sage, New York.

Edwards, B. and Bromfield, L. (2009), 'Neighbourhood Influences on Young Children's Conduct Problems and Pro-Social Behaviour: Evidence from an Australian National Sample', *Children and Youth Services Review*, 31(3), 317-24.

Evans, G. (2004), 'The Environment of Childhood Poverty', *American Psychologist*, 59(2), 77-92.

Goodman R. (1997), 'The Strengths and Difficulties Questionnaire: A Research Note', *Journal of Child Psychology and Psychiatry*, 38(5), 581-586.

Gray, M. and Baxter, J. (2011), 'Family Joblessness and Child Wellbeing in Australia', Paper Presented to the Advancing Child and Family Policy Through Research Conference, 31 January-1st February, The Australian National University, Canberra.

Gray, M. and Smart, D. (2008), 'Growing Up in Australia: The Longitudinal Study of Australian Children is Now Walking and Talking', *Family Matters*, 79, 5-13.

Harding, A., McNamara, J., Daly, A. and Tanton, R. (2009), 'Child Social Exclusion: An Updated Index from the 2006 Census', *Australian Journal of Labour Economics*, 12(1), 41-64.

Kalil, A. (2009), 'Joblessness, Family Relations and Children's Development', *Family Matters*, 83, 15-22.

Kalil, A. and Ziol-Guest, K. (2008), 'Parental Employment Circumstances and Children's Academic Progress', *Social Science Research*, 37, 500-515.

Kraft, K. (2001), 'Unemployment and the Separation of Married Couples', *Kyklos*, 54, 67-88.

Leventhal, T. and Brooks-Gunn, J. (2000), 'The Neighborhoods They Live In: The Effects of Neighborhood Residence on Child and Adolescent Outcomes', *Psychological Bulletin*, 126(2), 309-337.

Liker, J. and Elder, G. (1983), 'Economic Hardship and Marital Relationship and Marital Relations in the 1930s', *American Sociological Review,* 48, 343-359.

McClelland, A. (2000), 'Effects of Unemployment on the Family', *The Economic and Labour Relations Review*, 11(2), 198-212.

Mendolia, S. and Doiron, D. (2008), 'The Impact of Job Loss on Family Dissolution', Unpublished Mimeo, School of Economics, University of New South Wales, Sydney.

Mihalopoulos, C., Sanders, M., Turner, K., Murphy-Brennan, M. and Carter, R. (2007), 'Does the Triple P Positive Parenting Program Provide Value for Money?', *Australian and New Zealand Journal of Psychiatry*, 41, 239-246.

Paul, K. and Moser, K. (2009), 'Unemployment Impairs Mental Health: Meta-Analyses', *Journal of Vocational Behavior*, 74(3), 264-282.

Petitclerc, and Tremblay, R. (2009), 'Childhood Disruptive Behaviour Disorders: Review of Their Origin, Development, and Prevention', *Canadian Journal of Psychiatry*, 54(4), 222-231.

Saunders. P. (2002), 'Introduction: The Reality and Costs of Unemployment', in P. Saunders and R. Taylor, (eds.) *The Price of Prosperity: The Economic and Social Costs of Unemployment*, University of New South Wales Press, Sydney.

Solantaus, T., Leinone, J. and Punamäki, R. (2004), 'Children's Mental Health in Times of Economic Recession: Replication and Extension of the Family Economic Stress Model in Finland', *Developmental Psychology* 40, 412-429.

Whiteford, P. (2009), *Family Joblessness in Australia*, Social Inclusion Unit of the Department of the Prime Minister and Cabinet, Canberra.