



Maternal employment and children's socio-emotional outcomes: an Australian longitudinal study

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Abstract

Objectives Among children, poor socio-emotional functioning leads to poor health and well-being during childhood and later in life, and so understanding its social determinants is important. This study's objective is to examine how maternal employment influences children's socio-emotional outcomes in an Australian sample of families with two biological parents, testing the mediating role of maternal mental health, parenting practices, and parental income.

Methods We analyze six waves of panel data from the Longitudinal Study of Australian Children ($n = 7524$ children, 29,701 observations) using random-effect models.

Results Children of employed mothers display better socio-emotional outcomes than children of non-employed mothers, though the effect magnitude is only moderate. Associations are stronger for internalizing than externalizing problems, and not mediated by parental mental health, parenting practices, or household income.

Conclusions Our findings can inform sociopolitical debates on the social value of maternal labor force participation and its impacts on children. They suggest that incentivizing maternal employment should bear no detrimental consequences on their children's socio-emotional functioning. The different associations found for children's internalizing and externalizing problems stress the value of distinguishing these constructs.

Keywords Children · Socio-emotional functioning · Mental health · Maternal employment · Australia · LSAC

Introduction

Childhood is the most important period for skill acquisition and development (Shonkoff and Phillips 2000). The brain's architecture and the process of skill formation are strongly determined by individuals' experiences during childhood, and higher-order skills are built upon basic skills cultivated early in life (Heckman and Mosso 2014). An important aspect of child development is socio-emotional and behavioral functioning, i.e., children's ability to monitor,

evaluate, and modify their emotional reactions and social behaviors (Thompson and Meyer 2007). Poor socio-emotional functioning during childhood is associated with low educational attainment, poor labor market outcomes, anti-social behavior, substance abuse, and welfare dependency during adolescence and adulthood (Eisenberg et al. 2001; Kim et al. 2016; Schindler et al. 2015). Inculcating emotion and behavior regulation in children is a costly and time-consuming process, which requires a range of investments in the child. As parents are the most important agents in child development, parental resources are particularly influential in facilitating this process (Brooks-Gunn 1995). Parental resources include the quantity and quality of time available for children, the cognitive effort spent in supervising and communicating with children, and economic capital directed at activities that promote child development (Brooks-Gunn 1995; Cobb-Clark et al. 2016).

Women's labor market participation alters the mix of resources that mothers can use to enhance the development of their children. For example, it may increase household

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income (Coley and Lombardi 2013), improve maternal mental health (Roxburgh 2012), and expose children to formal childcare (Gialamas et al. 2014). These factors are likely to improve children's socio-emotional outcomes. On the other hand, maternal employment may also result in poor work–family balance (Craig and Powell 2011), work–family conflict (Kelly et al. 2014), and a reduction in mother–child time (Hsin and Felfe 2014), which are circumstances known to bear negative consequences on children's socio-emotional outcomes. As a result, it is theoretically unclear what the net effect of maternal employment on children's socio-emotional outcomes should be. Early US studies examining the associations between maternal employment and child well-being report inconsistent findings (Hoffman and Youngblade 1999). More recent research in the USA and the UK is also inconclusive: some studies (Hope et al. 2014; McMunn et al. 2011) find that maternal employment is beneficial to children's socio-emotional functioning, others find it to be detrimental (Baum 2003; Berger et al. 2008), and yet others find no statistically or substantively significant relationships (Kalil and Dunifon 2007; Lucas-Thompson et al. 2010). The Australian evidence is scarce. Using data from The Longitudinal Study of Australian Children (LSAC), Huerta and colleagues and Lombardi and Coley found weak evidence of an association between maternal employment and children's socio-emotional outcomes (Huerta et al. 2011; Lombardi and Coley 2017).

The goal of this paper is to revisit the relationship between maternal employment and children's socio-emotional functioning in an Australian sample of families with two biological parents, while making several contributions to knowledge. First, we provide an up-to-date and encompassing account of these associations in contemporary Australia, which is important to advance international comparisons. Second, we empirically examine three potential channels (or pathways) via which, according to interdisciplinary theoretical models (Becker and Tomes 1986; Bourdieu and Passeron 1990; Bowlby 1984; Brooks-Gunn 1995), maternal employment may be associated with children's socio-emotional outcomes: household income (Coley and Lombardi 2013), parental mental health (Roxburgh 2012), and parenting practices (Cobb-Clark et al. 2016). Ascertaining which mechanisms drive the associations between maternal employment and child outcomes is important in devising targeted interventions. Third, we consider the associations between maternal employment and two dimensions of children's socio-emotional functioning: internalizing problem behaviors, IPB (i.e., negative emotions, such as depression, fear, and anxiety), and externalizing problem behaviors (i.e., negative attitudes toward social norms, negative practices toward other people, and a limited ability to concentrate on a given task).

Methods

Dataset and sample selection

We use data from Growing Up in Australia: The Longitudinal Study of Australian Children (LSAC). LSAC is a nationally representative, biennial, accelerated dual-cohort, panel dataset that collects data from a sample of Australian children followed from baseline in 2004 to 2014, and thus spans 10 years. LSAC data have been collected from the study child's mother, father, carer, teacher, and the study child via face-to-face interviews and self-reporting questionnaires. LSAC has two independent cohorts; the Birth cohort (B cohort) includes children born between March 2003 and February 2004, while the Kindergarten cohort (K cohort) includes children born between March 1999 and February 2000. Overall, 72.4% of children in the initial sample were still in the study in its last wave (wave 6, 2014). Detailed information on the study properties has been published elsewhere (AIFS 2015). We use information from study waves in which data on children's socio-emotional outcomes are available (waves 3–6 for the B cohort and 1–6 for the K cohort). We restrict our sample to children living with both of their biological parents because the relationships between parental resources and children's outcomes are very different in other family types (e.g., single-parent households or blended families), as children in these “vulnerable” family types face more and different stressors (see, e.g., Hofferth 2006). The resulting analytic sample encompasses 29,701 observations from 7524 children.

Outcome variables

The outcome of interest is children's socio-emotional functioning, measured using the Strengths and Difficulties Questionnaire (SDQ) (Goodman 1997). The SDQ is a battery of 25 questions about social, behavioral, and emotional functioning in children and adolescents. For each of these, respondents are asked: “Please tick one box for each of the following statements to best describe the study child's behavior over the past 6 months: ...”. Informants can then choose between the following categories: [0] “Not true,” [1] “Somewhat true,” and [2] “Certainly true.” Scores are then summed into an additive index ranging from 0 to 50, where higher values indicate worse outcomes (i.e., more problem behaviors). We use mother-reported SDQ scores, as our interest is on maternal employment status; they have less missing data; and mothers generally spend more time with their children than fathers or teachers/carers. On a scale from 0 to 50, the mean for the SDQ is 9.28, and the standard deviation is

5.98. The scores in the 25 SDQ items can be grouped into five subscales capturing emotional symptoms, conduct problems, hyperactivity inattention, peer relationship problems, and prosocial behavior (reverse coded). Each of these subscales is constructed as the sum of the scores on five questions, and ranges from 0 to 10. Following previous studies, we derive two scales capturing different dimensions of children's socio-emotional functioning. The IPB scale is the sum of the emotional symptoms, and peer relationship problem subscales, while the EPB scale is the sum of the hyperactivity and inattention, and conduct problems subscales. For both scales, the possible range is 0 to 20. The IPB scale has a mean of 3 (SD 2.77), whereas the EPB scale has a mean of 4.52 (SD 3.33). The validity and reliability of the SDQ and its five subscales have been established in previous studies (see, e.g., Mellor and Stokes 2007). For the psychometric properties of the IPB and EPB scales, please refer to Gialamas et al. (2014).

Key explanatory variable

Information on maternal employment status comes from a question asking mothers "Which of the following best describes your current employment status?" and has the following response categories "employed" (73% of observations, $n = 22,469$), "unemployed/not in labor force" (27% of observations, $n = 8312$). A similar variable is constructed for fathers and is used as a control variable to account for the fact that maternal employment is often dependent on the employment situation of fathers, and to act as a comparison benchmark against which to evaluate the estimated effects of maternal employment.

Mediating variables

We examine three channels through which maternal employment may affect children's socio-emotional functioning: household income, parental mental health, and parenting style. Parental mental health is operationalized using the Kessler 6 depression scale (K6), a short version of the Kessler Psychological Distress scale measuring non-specific psychological distress. This is constructed by averaging out the scores on six items asking parents in LSAC about the degree to which they experienced certain negative feelings over the past 4 weeks, Cronbach Alpha = 0.9 (Kessler et al. 2002). The K6 is on a scale from 1 to 5, where higher scores indicate better mental health. In our sample, average maternal mental health is 4.5 (SD 0.6), and average paternal mental health is 4.5 (SD 0.5) (Table 1).

We use two measures of parenting style. Parental warmth captures the degree to which parents express affection toward the child and are aware of the child's

needs. In LSAC, this is measured by an additive scale ranging from 1 to 5 based on parents' answers to six questions about how often they: "...hug or hold study child for no particular reason?", "...tell study child how happy he/she makes you?", "...have warm, close times together with study child?", "...enjoy listening to study child and doing things with him/her?", "...feel close to this child both when he/she was happy and when he/she was upset?" and "...express affection by hugging, kissing and holding this child," Cronbach Alpha = 0.9 (Zubrick et al. 2014). Higher scores denote a warmer relation between the parent and the study child. The means of the warm parenting scale are 4.4 (SD 0.6) for mothers and 4 (SD 0.6) for fathers (Table 1). Angry parenting refers to practices characterized by parents displaying feelings of frustration and anger toward the child. In LSAC, this is measured by an additive scale ranging from 1 to 5 based on parents' answers to four questions: "Of all the times you talk to Study Child about his/her behavior, how often is this praise?" (reverse coded), "how often is this disapproval?", "how often are you angry when you punish Study Child?", and "how often do you feel you are having problems managing Study Child in general?" (Zubrick et al. 2014), Cronbach Alpha = 0.7. Higher scores denote behaviors and attitudes reflective of angry parenting. The mean maternal and paternal angry parenting scales are both 2.1 (SD 0.6) (Table 1). Our models include not only maternal but also paternal measures of mental health and parenting style. This is because these paternal variables explain some of the variance in child outcomes, may be correlated with the maternal measures (e.g., there may be assortative mating in mental health), and serve as comparators for the effects of maternal variables.

We derive an operational measure of household income by aggregating the weekly income of all adults living in the study child's household and adjust it for inflation using the Consumer Price Index, taking 2014 as the base year. We then equalize the resulting income variable by taking account of the household size and composition (ABS 2006). We use the resulting household income information to create a categorical income variable with four theoretically informed categories: [1] "income-poor families" (less than 70% of the weekly sample median income, 21.8% of observations), [2] "low-income families" (between 70% of the sample median weekly income and the median weekly income, 21.6% of observations), [3] "moderate-income families" (second quartile of the sample's weekly income distribution, 28.1% of observations), and [4] "high-income families" (top quartile of the sample's weekly income distribution, 28.6% of observations) (Table 1).

Table 1 Descriptive statistics

	Mean \pm SD (%)	Range	Obs.
<i>Outcome variables</i>			
Strengths and Difficulties Questionnaire (25 items)	9.28 \pm 5.98	(0–50)	29,701
Internalizing problem behaviors scale (10 items)	3.00 \pm 2.77	(0–20)	29,701
Externalizing problem behaviors scale (10 items)	4.52 \pm 3.33	(0–20)	29,701
<i>Explanatory variables</i>			
Maternal employment status			
Employed	73.00	(0–1)	22,469
Non-employed	27.00	(0–1)	8312
<i>Mediating variables</i>			
Maternal mental health (6 items)	4.50 \pm 0.55	(0–5)	29,136
Paternal mental health (6 items)	4.53 \pm 0.52	(0–5)	23,072
Maternal warmth scale (6 items)	4.36 \pm 0.56	(0–5)	29,699
Paternal warmth scale (6 items)	4.03 \pm 0.63	(0–5)	23,190
Maternal angry parenting scale (5 items)	2.14 \pm 0.61	(0–5)	29,691
Paternal angry parenting scale (5 items)	2.15 \pm 0.62	(0–5)	23,169
Equivalent household income			
Income-poor families	19.66	(0–1)	5422
Low-income families	20.84	(0–1)	5749
Moderate-income families	28.89	(0–1)	7968
High-income families	30.62	(0–1)	8446
<i>Control variables</i>			
Study child is female	48.92	(0–1)	15,087
Study child's age	8.10 \pm 3.19	(4–15)	30,840
Study child is Indigenous	2.06	(0–1)	634
Language at home is English	89.54	(0–1)	27,613
Cohort K	59.64	(0–1)	18,392
Age study child stopped breastfeeding (years)	0.72 \pm 0.64	(0–4.57)	30,548
Mother's age when study child was born (years)	33.36 \pm 5.15	(15–52)	30,840
Mother has bachelor degree or higher	36.98	(0–1)	11,388
Study child has a sibling			
Younger	37.96	(0–1)	10,876
Older	41.13	(0–1)	11,784
Both younger and older	20.91	(0–1)	5992
Somebody in the home is disabled (not study child)	28.06	(0–1)	10,905
Stressful life events index (22 items)	1.78 \pm 1.95	(0–22)	28,357
Socioeconomic indexes for areas	1.016 \pm 75	(584–1266)	30,837
Paternal employment status			
Employed	94.81	(0–1)	29,222
Non-employed	5.19	(0–1)	1600

Longitudinal Study of Australian Children (2004–2014), Cohort B, Waves 3–6; Cohort K, Waves 1–6 (Australia, 2004–2014)

SD standard deviation

Control variables

Our multivariate analyses adjust for an encompassing set of possible confounders (see Table 1). These represent factors known to be correlated with and causally prior to both maternal employment and children's socio-emotional well-

being and used in recent Australian scholarship in the field and can be seen in Table 1 (see, e.g., Perales et al. 2016).

Estimation method

We estimate the associations between maternal employment and children's socio-emotional outcomes via random-

effect panel regression models. These models account for hierarchical nesting in the panel data (child-wave observations at Level 1 nested within children at Level 2) and yield more unbiased and efficient estimates than ordinary least-square regression models (Wooldridge 2010). The estimated coefficients give the expected change in the outcome variable associated with a one-unit increase in the explanatory variables, all else being equal. Positive coefficients indicate that a variable is associated with *worse* socio-emotional functioning (i.e., more problem behaviors), while negative coefficients indicate *better* socio-emotional functioning (i.e., fewer problem behaviors).

Analytic approach

For each outcome variable we estimate a set of five random-effect regression models. Model 1 is a base model including only maternal employment and the control variables. Statistically significant coefficients on the maternal employment variables would provide evidence that this affects children's socio-emotional functioning. The substantial significance (i.e., magnitude) of the key parameters is also discussed in relation to the standard deviation of the outcomes. Models 2–4 add variables capturing mediating factors suspected to channel the effects of maternal employment on children's socio-emotional functioning. If the model coefficients on the key explanatory variable move toward zero, this would constitute evidence that the newly introduced variables mediate the associations between maternal employment and children's socio-emotional functioning. Model 5 includes all mediating factors at the same time, and is used to assess whether, collectively, these parental resources explain the associations between maternal employment and children's socio-emotional functioning. Statistical mediation is tested formally via Wald tests comparing the coefficients on the key explanatory variable in Models 1 and 5 (Baron and Kenny 1986). If the test statistic in these Wald tests is statistically significant, this would provide evidence of mediation. Because it is desirable that Models 1–5 are estimated using the same sample, we undertake list-wise deletion of missing data.

Results

Overall socio-emotional functioning

In bivariate analyses, the mean SDQ is 8.9 units among employed mothers, and 10.5 units among non-employed mothers. Results from a *t* test confirm that this difference (1.6 units) is statistically significant ($p < 0.001$). Estimates from the multivariate random-effect panel regression

models are shown in Table 2. Results from Model 1 indicate that children whose mothers are employed have better SDQ scores than children whose mothers are non-employed ($\beta = -0.4, p < 0.001$), *ceteris paribus*. As a point of comparison, there is no statistically significant association between father's employment status and children's SDQ scores ($\beta = 0.3, p > 0.1$). Model 2 adds a first set of mediating variables capturing mothers' and fathers' mental health. Both maternal ($\beta = -1.8, p < 0.001$) and paternal ($\beta = -0.5, p < 0.001$) mental health are associated with better socio-emotional functioning among children. Model 3 adds variables capturing parenting practices. Maternal ($\beta = 2.9, p < 0.001$) and paternal ($\beta = 1.1, p < 0.001$) angry parenting are associated with poorer SDQ scores, while maternal ($\beta = -0.8, p < 0.001$) and paternal ($\beta = -0.3, p < 0.001$) warm parenting are associated with better SDQ scores. Model 4 adds the measure of household income. Compared to children in income-poor families, children's SDQ scores are better in high-income ($\beta = -0.4, p < 0.001$), moderate-income ($\beta = -0.5, p < 0.001$), and low-income ($\beta = -0.6, p < 0.001$) families. Results are generally similar in the Model 5. Across Models 2–5, the addition of the variables capturing the potential pathways linking maternal employment to children's socio-emotional functioning bores only small changes for the estimated effects of maternal employment status, thus providing little evidence of mediation. The same pattern was observed in Wald tests comparing the coefficients on the maternal employment variable in Models 1 and 5, all of which fail to provide formal evidence of mediation.

Internalizing versus externalizing problem behaviors

The unconditional mean of the IPB scale for children of employed mothers is smaller (2.9 units) than for children of non-employed mothers (3.4 units), and this difference is statistically significant ($p < 0.01$). On average, children experience fewer IPB when their mothers are employed. Results from the base, multivariate, random-effect model (Model 1, Table 3) lead to similar conclusions ($\beta = -0.2, p < 0.001$). Models 2–4 add sets of potential mediators to Model 1. The model coefficients on the added variables indicate that maternal ($\beta = -0.8, p < 0.001$) and paternal ($\beta = -0.3, p < 0.001$) mental health are associated with fewer IPB (Model 2); maternal ($\beta = 0.8, p < 0.001$) and paternal ($\beta = 0.2, p < 0.001$) angry parenting are associated with fewer IPB (Model 3); maternal ($\beta = -0.1, p < 0.01$) and paternal ($\beta = -0.2, p < 0.001$) warm parenting are associated with fewer IPB (Model 3), and living in a poor household is associated with more IPB (Model 4). The estimated coefficient on maternal

Table 2 Random-effect panel regression models of children's socio-emotional outcomes

	Model 1	Model 2	Model 3	Model 4	Model 5
<i>Maternal employment (reference: non-employed)</i>					
Employed	− 0.4*** [− 0.6, − 0.2]	− 0.4*** [− 0.5, − 0.2]	− 0.4*** [− 0.6, − 0.3]	− 0.4*** [− 0.5, − 0.2]	− 0.3*** [− 0.5, − 0.1]
<i>Paternal employment (reference: non-employed)</i>					
Employed	− 0.2 [− 0.6, 0.1]	− 0.2 [− 0.05, 0.2]	− 0.4* [− 0.7, 0.0]	0.0 [− 0.4, 0.3]	− 0.2 [− 0.5, 0.2]
Maternal mental health		− 1.8*** [− 1.9, − 1.6]			− 1.3*** [− 1.4, − 1.1]
Paternal mental health		− 0.5*** [− 0.7, − 0.4]			− 0.3*** [− 0.4, − 0.1]
Maternal angry parenting			2.9*** [2.8, 3.1]		2.8*** [2.63, 2.9]
Paternal angry parenting			1.1*** [1.0, 1.2]		1.0*** [0.91, 1.2]
Maternal warm parenting			− 0.8** [− 0.9, − 0.7]		− 0.8** [− 0.9, − 0.6]
Paternal warm parenting			− 0.3*** [− 0.4, − 0.2]		− 0.3*** [− 0.4, − 0.2]
<i>Household income (reference: poor-income families)</i>					
Low-income families				− 0.4*** [− 0.6, − 0.2]	− 0.3** [− 0.5, − 0.1]
Moderate-income families				− 0.5*** [− 0.8, − 0.3]	− 0.4*** [− 0.7, − 0.2]
High-income families				− 0.6*** [− 0.9, − 0.4]	− 0.5** [− 0.7, − 0.3]
Base controls	Yes	Yes	Yes	Yes	Yes
R ²	0.09	0.16	0.33	0.09	0.35
Rho	0.63	0.60	0.55	0.63	0.54

Longitudinal Study of Australian Children (2004–2014), Cohort B, Waves 3–6; Cohort K, Waves 1–6. $n(\text{observations})$: 20,215; $n(\text{children})$: 6402 (Australia, 2004–2014). 95% confidence intervals in brackets. Base control variables are shown in Table 1. Full tables of coefficients available from the authors upon request

Significance levels: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

employment in Model 5 is similar to that in Model 1 and remains statistically significant ($\beta = -0.2$, $p < 0.001$), and the results of Wald tests do not provide formal evidence of mediation. The unconditional mean of the EPB scale for children of employed mothers is also smaller (4.3 units) than that for children of non-employed mothers (5.1 units), and the difference is again statistically significant ($p < 0.001$). Children experience fewer EPB when their mothers are employed. The base, multivariate random-effect model (Model 1, Table 3) yields similar results: children whose mothers are employed have fewer EPB than children whose mothers are not employed ($\beta = -0.2$, $p < 0.01$). Models 2–4 include sets of potential mediators to Model 1. In these, maternal ($\beta = -0.8$, $p < 0.001$) and

paternal ($\beta = -0.2$, $p < 0.001$) mental health are associated with fewer EPB (Model 2); maternal ($\beta = 1.7$, $p < 0.001$) and paternal ($\beta = 0.7$, $p < 0.001$) angry parenting are associated with more EPB (Model 3); maternal warm parenting ($\beta = -0.2$, $p < 0.001$) is associated with fewer EPB (Model 3); and living in poverty is associated with more EPB (Model 4). As for IPB, the maternal employment coefficients in Models 1 and 5 remain similar, and the results of Wald tests yield no evidence that the parental resources mediate the associations of interest. In additional analyses, we examined the impact of maternal employment on the five SDQ subscales (Table 4). Positive maternal employment effects were observed in base models for all SDQ subscales, being strongest on peer

Table 3 Random-effect panel regression models of children's internalizing and externalizing problem behaviors

	Model 1	Model 2	Model 3	Model 4	Model 5
<i>Internalizing problem behaviors scale</i>					
Maternal employment (reference: non-employed)					
Employed	− 0.2*** [− 0.3, − 0.1]	− 0.2*** [− 0.3, − 0.1]	− 0.2*** [− 0.3, − 0.1]	− 0.2*** [− 0.3, − 0.1]	− 0.2*** [− 0.3, − 0.1]
Paternal employment (reference: non-employed)					
Employed	− 0.2 [− 0.4, 0.0]	− 0.1 [− 0.3, 0.0]	− 0.2* [− 0.4, − 0.0]	− 0.1 [− 0.3, 0.1]	− 0.2 [− 0.3, 0.1]
Base controls	Yes	Yes	Yes	Yes	Yes
Parental mental health	No	Yes	No	No	Yes
Parenting practices	No	No	Yes	No	Yes
Household income	No	No	No	Yes	Yes
R ²	0.05	0.11	0.11	0.05	0.15
Rho	0.50	0.47	0.48	0.50	0.46
<i>Externalizing problem behaviors scale</i>					
Maternal employment (reference: non-employed)					
Employed	− 0.2** [− 0.3, − 0.1]	− 0.1* [− 0.2, 0.0]	− 0.2** [− 0.2, − 0.1]	− 0.1* [− 0.2, 0.0]	− 0.1* [− 0.2, 0.0]
Paternal employment (reference: non-employed)					
Employed	− 0.1 [− 0.3, 0.1]	− 0.1 [− 0.3, 0.1]	− 0.2 [− 0.4, 0.0]	0.0 [− 0.2, 0.2]	− 0.0 [− 0.3, 0.1]
Base controls	Yes	Yes	Yes	Yes	Yes
Parental mental health	No	Yes	No	No	Yes
Parenting practices	No	No	Yes	No	Yes
Household income	No	No	No	Yes	Yes
R ²	0.12	0.16	0.35	0.12	0.36
Rho	0.63	0.61	0.53	0.63	0.53

Longitudinal Study of Australian Children (2004–2014), Cohort B, Waves 3–6; Cohort K, Waves 1–6. $n(\text{observations})$: 20,2016; $n(\text{children})$: 6402 (Australia, 2004–2014). 95% confidence intervals in brackets. Base control variables are shown in Table 1. Full tables of coefficients available from the authors upon request

Significance levels: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

relationship problems ($\beta = -0.14$, $p < 0.001$) and weakest on conduct problems ($\beta = -0.05$, $p < 0.05$). In full models, mediators explained away the maternal employment effects on conduct problems and prosocial behavior, but not those on the other three dimensions.

Discussion

Our results for an Australian sample of families with two biological parents showed a statistically significant association between maternal employment and children's socio-emotional well-being. Net of confounders, children

whose mothers were not employed had SDQs that were on average 0.44 units higher, indicating worse outcome, than those of children of employed mothers. This difference amounts to about 7% of the standard deviation in the SDQ. While this is a modest effect, it is higher than the estimated effect of a 1-year increase in the study child's age and almost as important as breastfeeding. This finding is consistent with results from previous studies in the USA, UK, and Australia (Coley and Lombardi 2013; Lombardi and Coley 2017). It is, however, at odds with results reported by Huerta and colleagues, who found very weak positive associations between maternal employment and children's socio-emotional well-being in their Australian sample

Table 4 Random-effect panel regression models of children's socio-emotional outcomes, separate effects on five subscales of the Strengths and Difficulties Questionnaire

	Model 1	Model 5
<i>Maternal employment (reference: non-employed)</i>		
Effect on children's...		
... conduct problems	– 0.05* [– 0.11, – 0.00]	– 0.02 [– 0.06, 0.03]
... hyperactivity and inattention	– 0.10** [– 0.17, – 0.03]	– 0.08* [– 0.15, – 0.01]
... peer relationship problems	– 0.14*** [– 0.19, – 0.08]	– 0.11*** [– 0.16, – 0.05]
... emotional problems	– 0.12*** [– 0.18, – 0.06]	– 0.08** [– 0.14, – 0.02]
... prosocial behavior (reverse coded)	– 0.10*** [– 0.16, – 0.04]	– 0.06 [– 0.11, 0.00]

Longitudinal Study of Australian Children (2004–2014), Cohort B, Waves 3–6; Cohort K, Waves 1–6. $n(\text{observations})$: 20,215; $n(\text{children})$: 6402 (Australia, 2004–2014). 95% confidence intervals in brackets. Each cell in the table shows the coefficient on maternal employment from a separate regression model. Model 1 includes base control variables as shown in Table 1. Model 5 includes base control variables and all mediators. Full tables of coefficients available from the authors upon request

Significance levels: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

(Huerta et al. 2011). This divergence may be due to the fact that their study relied on cross-sectional models, failing to leverage longitudinal data for better estimation.

A contribution of this study was to distinguish the estimated effects of maternal employment on children's IPB and EPB. The results for our Australian sample showed that, compared to children whose mothers were non-employed, children whose mothers were employed displayed fewer IPB (0.24 units) and EPB (0.15 units), *ceteris paribus*. This is roughly equivalent to 9 and 5% of the respective standard deviations, suggesting that maternal employment has more substantial impacts on IPB than EPB. Most of the few studies that have considered these associations have used US data and found that maternal employment was not associated with children's IPB (Lucas-Thompson et al. 2010). However, in this study we found a significant association for Australian children. In our research, maternal employment was associated with fewer children's EPB, which also contradicts the scarce previous US evidence (Lucas-Thompson et al. 2010). These differences in results perhaps reflect the significant structural and institutional differences that separate Australia and the USA. For example, Australia has higher rates of maternal part-time employment, and fathers spend more time with their children (OECD 2016). The fact that our results are not always consistent with those from US studies highlights the importance of evaluating the associations between maternal employment and children's outcomes in the Australian context, rather than extrapolating from the available international evidence. The different associations found for children's IPB versus EPB stress also the value of distinguishing between these

constructs in health research: although IPB and EPB are often comorbid, they capture two independent categories of disorders and are differentially associated with maternal employment. In addition, IPB and EPB experienced during childhood and adolescence may bear different long-term economic costs and require different interventions (Betts et al. 2016).

We also contributed to knowledge by questioning the channels through which maternal employment may affect children's socio-emotional outcomes, focusing on three sets of parental resources: parental mental health, parenting style, and household income. For the most part, these parental resources were important determinants of children's socio-emotional outcomes in our Australian sample. However, these factors were unable to explain why the offspring of mothers who are employed fare better than those of mothers who are not. The collective inability of these factors to mediate these associations may be interpreted as suggesting that the effects run through other channels for which there was no measurement in our models. Likely candidates include the quantity and quality of time that mothers spend with their children (Hsin and Felfe 2014), and the extent of the child's participation in formal childcare (Gialamas et al. 2014). Future studies may take these factors into consideration.

Despite the study strengths, several methodological limitations must be acknowledged. First, we lack consistent information for the whole analytic sample on the degree of paternal involvement in the child's upbringing. This is a factor that could act as a further mediator of the associations between maternal employment and child outcomes. Second, we lacked measures of parental impulsivity and

antisocial history for the whole sample, and these remain potential confounders of the associations of interest. Third, our models do not adjust for the possibility that children's socio-emotional outcomes may have feedback effects on maternal employment, i.e., mothers whose children exhibit problem behaviors may be incentivized to seek employment (hence outsourcing care of a difficult child), or to remain home (to help the child adjust his/her temperament). In addition, poor child behavior may affect different dimensions of parental and family functioning, e.g., parenting stress, satisfaction, or relationship quality. New research examining using causal methods could be used to examine the existence and patterning of these processes.

The scope of our study could be expanded in several ways in further research. Examining the relationships between maternal employment and children's socio-emotional outcomes is a first step in understanding how the employment situation of mothers in Australia matters to their children's mental health. Australian studies examining the mediating and/or moderating role of maternal employment preferences and maternal job characteristics (e.g., work hours, job security and job prestige) are needed to further knowledge. Second, our findings pertain to a comparatively under-researched country context, Australia. However, Australia is a highly developed country, same as the UK and the USA, where most previous studies were conducted. Future research should focus on countries in the developing world, which have received substantially less attention and in which the relationships between maternal employment and child outcomes may play out differently.

The findings from this study have important implications for public health policy and practice. Our results on maternal employment have the potential to inform ongoing Australian sociopolitical debates about the social value of maternal labor force participation and its likely impacts on children. Australian governments can either incentivize or disincentivize mothers' participation in employment. Those in favor of incentivizing mothers' employment highlight the importance of women's work in contributing to family economic resources and in addressing gender inequalities in socioeconomic outcomes. Those in favor of disincentivizing it often make arguments around the well-being of children, arguing that appropriate child development is contingent on the presence of the mother in the family home. Our findings indicate that women's participation into paid employment per se is not detrimental to their children's socio-emotional development. In fact, the children of employed mothers do better than the children of non-employed mothers.

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Compliance with ethical standards

Conflict of interest All authors declare that they have no conflict of interest.

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