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Fathers' Postnatal Mental Health and Child Well-Being at Age Five: The Mediating Role of Parenting Behavior

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Abstract

Fathers' postnatal mental health is associated with emotional and behavioral outcomes for children in early childhood. The aim of this study was to examine whether parenting behavior mediated the relationship between fathers' postnatal psychological distress and emotional–behavioral outcomes for children at age 5. The sample consisted of 2,025 fathers participating in Growing Up In Australia: The Longitudinal Study of Australian Children. Data collected when the children were aged 0 to 12 months and 4 to 5 years were used. Results revealed that the relationship between fathers' postnatal distress and children's outcomes was mediated by parenting hostility (angry and frustrated reactions toward the child such as yelling), and this remained significant after controlling for fathers' concurrent mental health and mothers' postnatal mental health. These findings underscore the important contribution of fathers' postnatal mental health to later parenting behavior and child outcomes. Implications for policy and practice focused on improving mental health and parenting support to fathers in the early childhood period is discussed.

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Keywords

fathers, mental health, postnatal, parenting, child well-being

Fathers' postnatal mental health difficulties have been associated with children's emotional and behavioral difficulties in the early years (Ramchandani, Stein, Evans, & O'Connor, 2005; Ramchandani et al., 2008). However, the mechanisms by which fathers' mental health may contribute to children's outcomes have received little attention. One likely pathway is via the negative effects of mental health difficulties on parenting behaviors that are important for promoting child well-being and development. Although the relationships between mothers' postnatal mental health, parenting, and child outcomes are well established (e.g., Lovejoy, Graczyk, O'Hare, & Neuman, 2000), this is yet to be substantiated with fathers. The present study addresses this notable gap in the research by investigating whether parenting behavior mediates the relationship between fathers' postnatal mental health and children's emotional-behavioral outcomes at age 5 years in a large sample of fathers participating in Growing Up In Australia: The Longitudinal Study of Australian Children (LSAC).

Fathers' Postnatal Mental Health and Child Outcomes

Estimates of postnatal depression in men vary from 1% to 25% (J. Goodman, 2004; Paulson, Dauber, & Leiferman, 2006; Ramchandani et al., 2005), with a meta-analysis of 43 studies reporting a meta-estimate of 10.4% (Paulson & Bazemore, 2010). For anxiety disorders, estimates range from 10% to 17% (Ballard & Davies, 1996; Matthey, Barnett, Howie, & Kavanagh, 2003). Fathers' postnatal mental health difficulties have been associated with depression among both partners in a couple relationship (J. Goodman, 2004; Paulson & Bazemore, 2010), as well as relationship dissatisfaction and conflict (Dudley, Roy, Kelk, & Bernard, 2001).

Fathers' postnatal mental health difficulties have also been associated with a range of emotional and behavioral outcomes for children during early and late childhood. For instance, in a study of 8,431 families participating in the Avon Longitudinal Study of Parents and Children, fathers' postnatal depressive symptoms were associated with emotional and behavioral difficulties for children at age 3 and 7 years, even after controlling for maternal postnatal depressive symptoms and concurrent paternal depression (Ramchandani et al., 2005; Ramchandani et al., 2008). These findings have been replicated with 2,620 fathers from two-parent families participating in the LSAC (Fletcher,

Freeman, Garfield, & Vimpani, 2011). Children whose fathers reported postnatal depressive symptoms were more likely to experience social, emotional, and behavioral difficulties at age 5, even after controlling for mothers' postnatal mental health and fathers' concurrent mental health. This small but emerging body of research highlights the important contribution of fathers' postnatal mental health to children's well-being. Not surprisingly, there is growing interest in understanding how fathers' postnatal mental health can have an enduring influence on outcomes for children later in the childhood period.

Parenting: A Mechanism Underpinning the Relationship Between Fathers' Postnatal Mental Health and Child Outcomes

Parents' mental health is thought to influence children's outcomes in several ways, including (a) genetic inheritability, (b) prenatal in utero exposure, (c) indirect negative effects via impact on couple relationship and stress in the family environment, (d) modeling of negative cognitive coping styles and affective responses, and (e) direct effects on parenting behavior and the quality of care provided to children (S. Goodman & Gotlib, 1999). The relationship between postnatal mental health and parenting was of particular interest in this study. Grounded in developmental models of child emotional and behavioral disorders as well as social learning and attachment theories (e.g., Cicchetti, Toth, & Bush, 1998; Patterson, DeBaryshe, & Ramsey, 1989), it is proposed that fathers' mental health difficulties may directly interfere with warm and nurturing interactions with their children and parenting behaviors such as firm and consistent parenting.

For mothers, the associations between depressive symptoms, parenting behaviors, and child outcomes are well established. Maternal depression has been associated with less responsiveness and sensitivity to their baby's needs and cues (Gelfand & Teti, 1990; Lovejoy et al., 2000) and less engagement in age-appropriate early learning and communication activities (McLearn, Minkovitz, Strobino, Marks, & Hou, 2006). Maternal warmth, characterized by enjoyment, pleasure, and/or displays of affection toward the child (Waylen & Stewart-Brown, 2009), is viewed as an important part of parenting responsiveness and attachment and has been associated with a range of positive cognitive, behavioral, emotional, and physical outcomes for children (Dallaire & Weinraub, 2005; Landry, Smith, & Swank, 2006). A lack of maternal warmth, on the other hand, has been identified as a

strong predictor of externalizing behaviors among boys (Blatt-Eisengart, Drabick, Monahan, & Steinberg, 2009). Maternal depression has also been associated with increased irritability and frustration in parent-child interactions (Cornish et al., 2006; Gelfand & Teti, 1990). Irritable or hostile parenting behaviors such as angry reactions and displays of frustration toward the child are known risk factors for externalizing behavior difficulties, poor academic achievement, and poor physical health (Dallaire & Weinraub, 2005; Low & Stocker, 2005).

Notably, research establishing relationships between postnatal depression, parenting, and child outcomes has been much slower in the case of fathers. Of the research available, one study of approximately 2,000 fathers participating in the Fragile Families and Child Well-being Study found that major depression at 1 year postpartum was associated with aggravation and stress in parenting, even after controlling for mothers' depression and other socioeconomic characteristics such as education level and poverty status (Davis, Davis, Freed, & Clark, 2011). Depressed fathers were more likely to report spanking their children and were less likely to engage in reading, singing songs, and telling stories. Although this study documents important cross-sectional relationships, the longer term effect of fathers' postnatal mental health on parenting behavior is not well known.

To the best of our knowledge, one study examined the relationships between the depressive symptoms at 9 months postpartum and engagement in reading and learning activities and children's language development at 2 years of age for 4,109 fathers (Paulson, Keefe, & Leiferman, 2009). Fathers' depressive symptoms were associated with decreased engagement in reading and learning activities and increased language problems for children at age 2, suggesting that postnatal depressive symptoms can have an enduring influence on parenting behaviors to promote children's longer term language development. Although this study adjusted for child gender and found similar results, it is important to note that several studies have found stronger associations between fathers' postnatal depression and conduct problems for boys (Fletcher et al., 2011; Ramchandani et al., 2005; Ramchandani et al., 2008), and emotional problems for girls (Fletcher et al., 2011). These findings suggest that relationships between fathers' postnatal mental health, parenting, and child outcomes may differ for boys and girls, and therefore should be assessed more closely.

Another important consideration is the role of socioeconomic status in understanding the relationships between father's mental health, parenting, and child outcomes. It is well established that socioeconomic disadvantage is associated with increased rates of distress among fathers (Giallo et al., 2012)

and that socioeconomic status accounts for the association between parental depression and a range of children's health and developmental outcomes (Mensah & Kiernan, 2009; Turney, 2011). Extending this to explore whether the strength of the relationships between fathers' mental health, parenting, and child outcomes varies between families from differing socioeconomic backgrounds (e.g., stronger associations between paternal depression, poorer parenting, and child outcomes for families from low socioeconomic backgrounds than higher socioeconomic backgrounds) is important and may provide supporting evidence for targeted interventions and support for vulnerable families with fewer economic resources.

The Proposed Model

In summary, further research is needed to understand the contribution of fathers' postnatal mental health to a broader range of parenting behaviors and child outcomes. Without this knowledge, it is hard to advocate for prioritizing early intervention, treatment, and policy initiatives targeting fathers' postnatal mental health in addition to mothers' postnatal mental health and support.

The aim of the study was to investigate whether parenting behavior mediates the longitudinal relationship between fathers' postnatal psychological distress and emotional-behavioral outcomes for children at age 5 (see Figure 1). It was hypothesized that fathers' postnatal psychological distress (Wave 1) would be associated with lower parenting warmth and higher parenting hostility when the children were aged 5 (Wave 3) and that these in turn would be associated with higher emotional and behavioral difficulties in children.

A second aim was to test the model accounting for maternal postnatal mental health given that it is well documented that mothers' postnatal mental health is strongly related to children's short- and long-term well-being and development (Grace, Evindar, & Stewart, 2003; Halligan, Murray, Martins, & Cooper, 2007). We hypothesized that associations between fathers' postnatal distress, parenting, and children's emotional-behavioral functioning would remain significant even after accounting for relationship between mothers' postnatal mental health and child outcomes.

The final aim was to assess for the moderating influence of child gender and socioeconomic position (SEP). Given the literature reviewed above, we anticipated that there may be differences in the strength of the model pathways between fathers' distress, parenting behavior, and the emotional-behavioral functioning of boys and girls in the present study. Furthermore,

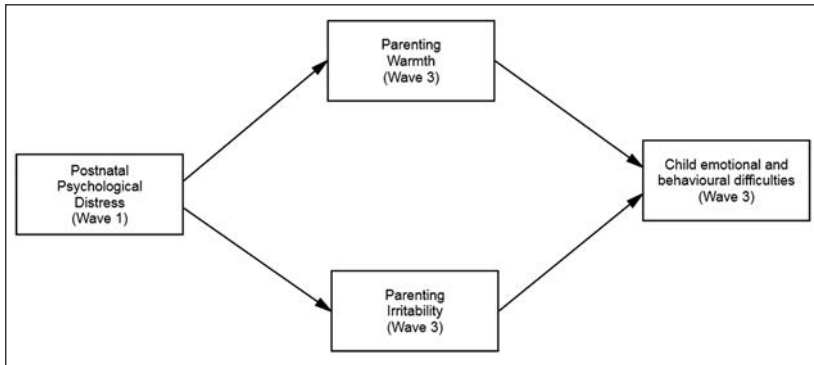


Figure 1. Hypothesized model of the relationships between postnatal psychological distress, parenting behavior, and child emotional and behavioral difficulties

we expected that the model pathways may be stronger for fathers experiencing greater socioeconomic disadvantage as they may have fewer economic and social resources in which to buffer the effects of distress on parenting and later child outcomes.

Method

Study Design and Sample

The data for this study come from the LSAC birth cohort. The study design and sampling are detailed elsewhere (Soloff, Lawrence, & Johnstone, 2005); however, briefly, a two-stage clustered sample design was used. First, approximately 10% of all Australian postcodes stratified by state of residence and urban versus rural status were selected. Next, a number of children proportional to population size were randomly selected from each postcode using the national health insurance database (Medicare). At Wave 1, the cohort consisted of 5,107 infants aged 3 to 12 months, and they were reassessed when aged 2 to 3 years and 4 to 5 years. The overall retention rates were 90.2% at Wave 2 ($n = 4,606$) and 86.9% at Wave 3 ($n = 4,386$), with the greatest sample loss coming from households where the primary carer spoke a language other than English and also Indigenous families.

The sample for the current analysis was biological fathers living with their children and who had data available at Waves 1 and 3 when the children were 3 to 12 months and 4 to 5 years of age, respectively. Furthermore, fathers with

less than 15% of data missing across all measures of interest were included in the analyses.

Measures

Psychological distress. This measure was assessed using the Kessler-6 (K6; Kessler et al., 2003) at Waves 1 and 3. Fathers reported on the extent to which they experienced symptoms of psychological distress such as feeling nervous, hopeless, restless, extremely sad, and worthless in the last 4 weeks. The six items are rated on a scale ranging from 0 (*none of the time*) to 4 (*all or most of the time*) and are summed with higher scores indicating greater psychological distress. The K6 has strong psychometric properties and can screen for serious mood and anxiety disorders. Cronbach's α for fathers in the current sample at Waves 1 and 3 were .79 and .82, respectively. For mothers at Wave 3, Cronbach's α was .80.

Child behavioral and emotional problems. These measures were measured at Wave 3 using the Total Difficulties scale of the Strengths and Difficulties Questionnaire (R. Goodman, 1997). Mothers' report was used as fathers' reports were not available. The Total Difficulties scale is composed of 20 items assessing emotional symptoms, conduct problems, hyperactivity, and peer relationship problems. The items are rated on a scale ranging from 0 (*not true*) to 2 (*certainly true*). Cronbach's α for the current sample was .75.

Parenting warmth. Parenting warmth at Wave 3 was measured using a modified 5-item subscale from the Child Rearing Questionnaire (Sanson, 1995), which asked fathers to indicate how often they feel close to and express affection toward their child (e.g., "Hug or hold this child for no particular reason"). Items were rated on a scale ranging from 1 (*never/almost never*) to 5 (*always/almost always*). Cronbach's α for the current sample was .87.

Parenting hostility. This measure was measured at Wave 3 using four adapted items from the Early Childhood Longitudinal Study of Children (National Center for Education Statistics, 2000). Fathers rated how often they experience feelings of irritability, frustration, and anger toward the study child (e.g., "I have raised my voice with or shouted at this child" and "I have lost my temper with this child") on a scale ranging from 1 (*not at all*) to 10 (*all of the time*). Higher scores indicated greater irritability. Cronbach's α for the current sample was .80.

Sociodemographic characteristics. Information pertaining to fathers' and mothers' age, country of birth, Aboriginal and Torres Strait Islander status, language spoken at home, education level, and employment status was

collected. Family weekly income and SEP and demographic information for the child such as gender and age were obtained.

Data Analysis Strategy

Path analysis using MPlus Version 6 (Muthén & Muthén, 1998-2011) was conducted to test a series of models. First, the hypothesized model (Figure 1) was estimated along with direct, indirect, and total effects. Second, the hypothesized model accounting for fathers' concurrent distress at Wave 3 was tested. Third, the model accounting for maternal postnatal mental health was estimated. Given the complex survey design, all models were estimated making adjustments for the stratification by state of residence and urban versus rural status and clustering by postcodes. Maximum likelihood estimation with robust standard errors (MLR) was used, and assessed using the chi-square test, and other practical fit indices including Tucker–Lewis index (TLI), the comparative fit index (CFI), and root mean square error of approximation (RMSEA). Indices for the TLI and CFI should exceed .90 for an acceptable fit, and values close to or below .05 for the RMSEA were considered acceptable (Hu & Bentler, 1999).

Finally, multigroup analyses were conducted to test whether the models differed significantly by child gender and whether SEP moderated any of the regression paths for both the adjusted and unadjusted models. For each analysis, a model with all parameters freely estimated was compared to a model with all parameters constrained to be equal, using the Satorra–Bentler scaled chi-square difference test for the MLR estimation method as outlined on the Mplus website (<http://www.statmodel.com/chidiff.shtml>).

Results

Sample Characteristics

Of the 5,107 families recruited into the birth cohort, 846 (16.6%) were excluded as they were female-headed single-parent households, 730 (15.8%) were excluded due to attrition at Waves 2 and 3, 1,445 (28.3%) were excluded because fathers did not consent to fill out the study questionnaire, and a further 61 (1.2%) were excluded due to 15% or more missing data. There were significantly more fathers born outside Australia, from non-English speaking and Aboriginal Torres Strait Islander backgrounds, with low SEP, lower income, and educational attainment in the excluded group than in the final sample.

The final sample consisted of 2,025 fathers, and their demographic characteristics are presented in Table 1. The majority of fathers were born in Australia, spoke English at home, had an educational level Year 12 or above, and were in full-time employment. All fathers were in a couple relationship. The mean age of the children at Wave 1 was 8.8 months ($SD = 2.5$) and 57.4 months ($SD = 2.7$) at Wave 3.

Descriptive Statistics

After excluding the cases described above, there was less than 2% missing data across all variables. Missing data were imputed using the expectation-maximization algorithm option available in SPSS 16.0 (Schafer & Graham, 2002). Descriptive statistics are presented in Table 2. Mardia's coefficient was 8.05, suggesting some multivariate nonnormality; therefore, robust maximum likelihood estimation was used to adjust the fit indices and parameter estimates.

Testing the Hypothesized Model

The hypothesized model (unadjusted for concurrent psychological distress at Wave 3) in Figure 1 was an excellent fit to the data, $\chi^2(1, N = 2,025) = 0.46$, $p = .50$, CFI = 1.00, TLI = 1.02, RMSEA = .00 (.00-.05). It accounted for 6% of the variance in Child outcomes ($R^2 = .06$, $p < .001$), 3% of variance in Irritability ($R^2 = .03$, $p < .001$), and 0.1% of variance in Warmth ($R^2 = .001$, ns). Figure 2 presents the standardized parameter estimates for the final model. High postnatal distress was significantly associated with high parenting hostility but not parenting warmth at Wave 3. High irritability and low warmth were in turn associated with increased children's emotional and behavioral difficulties.

The total indirect effect of postnatal distress on child outcomes via the parenting variables was small but significant (.04, $t = 6.22$, $p < .001$), and the specific indirect pathways are provided in Table 3. The strongest indirect pathway was via parenting hostility, while the indirect effect via parenting warmth was nonsignificant.

Testing the Hypothesized Model Accounting for Fathers' Concurrent Psychological Distress

The hypothesized model was adjusted to account for the relationships between fathers' concurrent psychological distress, parenting, and child

Table 1. Demographic Characteristics for the Final Sample

Demographic characteristics	<i>n</i> (%)
Father characteristics (<i>N</i> = 2,025)	
Primary caregiver	59 (2.9)
Age ^a (years)	32.35 (4.57)
Born in Australia or New Zealand	1,690 (83.5)
Language other than English at home	161 (8.0)
Aboriginal or Torres Strait Islander	16 (0.8)
Education level—Year 12 and above	1,321 (65.2)
Employment status	
Unemployed/not in the labor force	89 (4.4)
Work part-time (1-34 hours/week)	104 (5.1)
Work full-time (35-44 hours/week)	784 (38.7)
Work long full-time (45+ hours/week)	1,048 (51.8)
Weekly income from all sources ^a	1075.18 (777.57)
Mother characteristics (<i>n</i> = 1,965)	
Age ^a (years)	31.69 (5.05)
Born in Australia/New Zealand	1,643 (83.6)
Language other than English at home	182 (9.3)
Aboriginal or Torres Strait Islander	17 (0.9)
Education level—Year 12 and above	1,284 (65.3)
Employment status	
Unemployed/not in the labor force	1,091 (55.5)
Work part-time (1-34 hours/week)	699 (35.6)
Work full-time (35-44 hours/week)	119 (6.1)
Work long full-time (45+ hours/week)	56 (2.8)
Weekly income from all sources ^a	326.40 (420.06)
Infant and family characteristics	
Study child gender—Male	1,049 (51.8)
Number of children in household ^a	1.92 (1.02)
Family structure—Two-parent family	2,025 (100)
Socioeconomic position	
Low	230 (11.4)
Middle	1,066 (52.5)
High	778 (36.0)
Not reported	1 (0.01)

a. Mean (standard deviation).

outcomes at Wave 3. The model was an excellent fit to the data, $\chi^2(1, N = 2,025) = 0.86, p = .35, CFI = 1.00, TLI = 1.00,$ and $RMSEA = .00 (.00-.06)$. The model accounted for 7% of the variance in the Child outcome ($R^2 = .07, p < .001$), 7% of variance in Irritability ($R^2 = .07, p < .001$), and 0.1% of

Table 2. Descriptive Statistics and Correlations for the Study Variables ($N = 2,052$)

Indicator variables	1	2	3	4	5
1. Psychological distress—Wave 1	—	.48***	-.04 ^{ns}	.17**	.06*
2. Psychological distress—Wave 3		—	-.09***	.25***	.13***
3. Parenting warmth—Wave 3			—	-.22***	-.11***
4. Parenting hostility—Wave 3				—	.24***
5. Child emotional and behavioral difficulties—Wave 3					—
Range	0-24	0-24	12-30	4-34	0-28
M	3.20	2.95	25.39	11.56	7.69
SD	3.01	3.10	3.28	4.79	4.37
Skewness	1.69	1.81	-0.56	1.23	0.82

* $p < .05$. ** $p < .01$. *** $p < .001$. *ns* = nonsignificant.

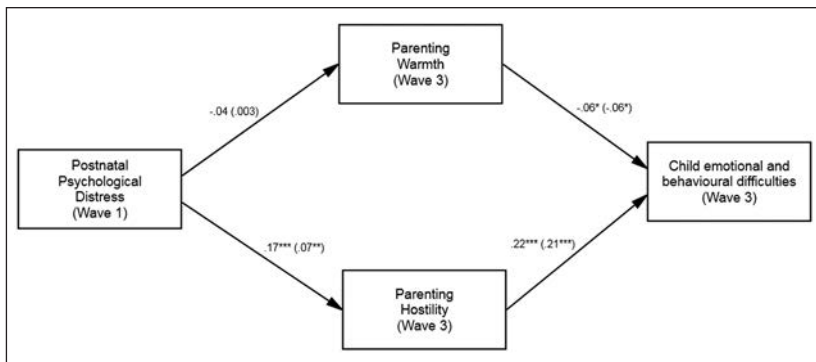


Figure 2. Standardized coefficients for the hypothesized model unadjusted and adjusted for fathers' concurrent mental health

Note. Adjusted model in brackets.

* $p < .05$. ** $p < .01$. *** $p < .001$.

variance in Warmth ($R^2 = .01$, *ns*). All paths remained significant in this adjusted model. The standardized coefficients for the adjusted model are provided in brackets in Figure 2.

After accounting for concurrent levels of distress at Wave 3, the indirect effects of postnatal distress on the child outcome were still significant (.07, $t = 5.61$, $p < .001$). The strongest indirect effects were via parenting hostility and concurrent distress at Wave 3 (see Table 3). The indirect effect via

Table 3. Specific Indirect Pathways From Postnatal Distress on Child SDQ Total Difficulties for the Unadjusted and Adjusted Models

Specific indirect pathways	Indirect effect
Unadjusted model	
Psychological Distress (Wave 1) → Parenting Warmth → Child SDQ Total Difficulties	.002 ^{ns}
Psychological Distress (Wave 1) → Parenting Hostility → Child SDQ Total Difficulties	.04 ^{***}
Model adjusted for fathers' psychological distress at Wave 3	
Psychological Distress (Wave 1) → Parenting Warmth → Child SDQ Total Difficulties	.00 ^{ns}
Psychological Distress (Wave 1) → Parenting hostility → Child SDQ Total Difficulties	.02 ^{**}
Psychological Distress (Wave 1) → Psychological Distress (Wave 3) → Child SDQ Total Difficulties	.03 ^{**}
Psychological Distress (Wave 1) → Psychological Distress (Wave 3) → Parenting Warmth → Child SDQ Total Difficulties	.002 ^{ns}
Psychological Distress (Wave 1) → Psychological Distress (Wave 3) → Parenting hostility → Child SDQ Total Difficulties	.02 ^{***}

Note. SDQ = Strengths and Difficulties Questionnaire.

* $p < .05$. ** $p < .01$. *** $p < .001$. ns = nonsignificant.

parenting warmth was only significant when accounting for the relationship between fathers' concurrent distress at Wave 3.

Testing the Hypothesized Model Accounting for Maternal Postnatal Distress

The model accounting for the relationship between maternal postnatal distress and child outcomes was an excellent fit to the data, $\chi^2(3, N = 2,025) = 6.26, p = .10, CFI = .99, TLI = .97, \text{ and } RMSEA = .02 (.00-.05)$. This model accounted for 9% of the variance in the Child outcome ($R^2 = .09, p < .001$), explaining an additional 2% than the hypothesized model. All paths remained significant in this model. The indirect path from fathers' distress and the child outcome via maternal postnatal distress was significant (.04, $p < .001$), with the strongest path via fathers' parenting hostility (.04, $p < .001$). The path via parenting warmth remained not significant.

Table 4. Multigroup Comparisons for Child Gender and Socioeconomic Position

Multigroup analyses	χ^2	<i>df</i>	Satorra–Bentler scaled χ^2 difference test (<i>df</i>)
Child gender (male, <i>n</i> = 1,049, vs. female, <i>n</i> = 976)			
Unconstrained	0.58	2	
Constrained	1.11	6	0.56 (4) ^{ns}
Socioeconomic position (low, <i>n</i> = 231; middle, <i>n</i> = 1,066; vs. high, <i>n</i> = 728)			
Unconstrained	3.63	3	
Constrained	8.27	11	4.86 (8) ^{ns}

Note. *ns* = nonsignificant.

Testing for Moderating Effects

Multi-group analyses revealed that there was no evidence of moderation by child gender, SEP, or whether there were other siblings in the household. Given that the pattern of results were similar for both the unadjusted and adjusted models, the chi-square difference test results are only presented for the unadjusted model in Table 4.

Discussion

This study is one of the few to explore parenting behavior as a potential mechanism underpinning the relationship between fathers' mental health in the postnatal period and later emotional–behavioral outcomes for children aged 5. Consistent with previous research (Fletcher et al., 2011; Ramchandani et al., 2005; Ramchandani et al., 2008), fathers' postnatal distress was associated with increased emotional–behavioral difficulties for children aged 5. The relationship was mediated by irritable parenting behaviors rather than parenting warmth, and this pattern of results was maintained even after accounting for fathers' concurrent mental health when children were aged 5 and mothers' postnatal mental health. Given the correlational nature of the study, it is not possible to establish causal relations; however, our findings provide some empirical support for a potentially enduring effect of fathers' postnatal distress on later parenting behavior and children's well-being in the early childhood period.

The strongest pathway between postnatal distress and children's outcomes was via irritable parenting behaviors such as losing temper with and yelling at the child. High levels of distress may make it harder for fathers to respond

to difficult interactions with their children in a positive way. They may get frustrated and angered more easily, reacting with yelling, criticism, and smacking, which are well-known risk factors for child behavior difficulties (Dallaire & Weinraub, 2005; Low & Stocker, 2005; Patterson et al., 1989). The present study also found that increased parenting hostility was associated with increased child emotional and behavioral difficulties at age 5. It is possible that patterns of irritable parenting begin in the first postnatal year for fathers experiencing significant distress, and it becomes part of their repertoire of parenting behaviors or style over time, thus contributing to children's emotional and behavioral difficulties. This is supported by research indicating that parents experiencing depression often continue to have parenting difficulties even after their mood has improved (Brown & Harris, 1978). We acknowledge a potential limitation to this interpretation. In the present study, assessments of child behavior problems and parenting irritability were completed simultaneously (Wave 3). Causal direction cannot be ascertained conclusively. It is possible that challenging and frustrating child behavior elicits more reactive, irritable parenting and that the association we observed is transactional. A better understanding of how patterns of irritable parenting develop across the early childhood period and how this relates to changes in fathers' mental health and child behavior is needed to disentangle these potential bidirectional relationships.

In contrast to parenting hostility, parenting warmth characterized by displays of affection and closeness toward the child did not mediate the relationship between postnatal distress and outcomes for children at age 5. As expected and consistent with previous research, parenting warmth was associated with fewer child emotional-behavioral problems (Dallaire & Weinraub, 2005; Landry et al., 2006); however, postnatal distress did not significantly predict parenting warmth when the children were aged 5. This is inconsistent with cross-sectional research in the postnatal period with mothers, and to a lesser extent with fathers, demonstrating that depressive symptoms are associated with reduced sensitivity and warmth with the infant (Gelfand & Teti, 1990; Lovejoy et al., 2000). It is possible that fathers' perceptions around the acceptability of reporting hostile parenting behaviors (such as shouting) versus the acceptability of reporting lack of warmth (never hugging their child) may have somewhat skewed the parenting warmth data in this analysis. Nonetheless, these findings suggest that postnatal distress may not have an enduring influence on parenting warmth and child functioning later in the early childhood period like it may for parenting hostility. This is somewhat consistent with research indicating that the relationship between depressive symptoms is stronger for negative parenting behaviors (i.e., hostility and

punitive discipline) than for lack of positive parenting behaviors (i.e., warmth, consistency, and monitoring; Kane & Garber, 2004; Lovejoy et al., 2000). Taken together, these findings suggest that focusing specifically on decreasing hostile or punitive parenting behaviors of fathers experiencing distress may be more effective in preventing child emotional and behavioral difficulties than approaches that focus only on strengthening parenting warmth, sensitivity, and affection in the parent–child relationship.

Finally, it should be noted that a strong correlation was observed between postnatal distress at Wave 1 and psychological distress at Wave 3. This is consistent with previous research showing that distress can be persistent and unrelenting for some fathers (Giallo et al., 2012). Taken together, findings from this study further highlight the importance of early identification and support for fathers experiencing distress in the postnatal period.

A secondary aim of the study was to examine whether the nature of the relationships between fathers' postnatal mental health, parenting behavior, and child outcomes varied by child gender and socioeconomic background. There was no evidence of moderation, suggesting that the direction and strength of the associations were consistent for fathers of boys and girls and also for fathers from different socioeconomic backgrounds. It is important to note, however, that the sample size for fathers of lower SEP was small compared to fathers from more socioeconomically advantaged backgrounds, and further work in this area is needed.

Limitations

There are several limitations to note. First, it was not possible to establish causality, and one possible pathway among the variables was tested. We acknowledge that the relationships between fathers' mental health and child outcomes are likely to be complex and transactional, whereby child characteristics (i.e., temperament) and functioning (i.e., sleeping and settling issues) may influence fathers' well-being and vice versa, particularly over time. Alternative models with variables not explored in this study, such as child temperament, quality of the couple relationship, and social support, may also be tested. Furthermore, although we have addressed a significant gap in the literature by examining the longitudinal relationships among the variables, we have not examined how changes in the variables over time relate to each other. This is an area for future research using the LSAC data.

Second, although weighting methods are used to ensure that LSAC is representative of the Australian population (Soloff et al., 2005), fathers included in the present analysis were more socioeconomically advantaged than fathers

excluded due to missing data. Generalizability of the findings to fathers born overseas, who speak a language other than English, and from a lower SEP is also limited, given that these groups were underrepresented. Furthermore, the present findings reflect the well-being and parenting experiences of fathers who remained in a couple relationship across waves and may not be generalized to single fathers or fathers not living with their children.

It was not possible to account for fathers' past history of mental health as this information was not collected for secondary caregivers who were mostly fathers. A past history of depression and anxiety are strong predictors of fathers' postnatal depression (Ramchandani et al., 2008), and it is possible that the pathways between postnatal mental health and child well-being difficulties may be stronger for fathers with a past history of mental health difficulties. Similarly, it was not possible to examine differences between fathers who were making the transition to parenthood and fathers who already had children as this information was not available. Fathers making the transition to parenthood may be particularly vulnerable to distress, and this may have a stronger influence on their parenting behavior than for fathers who already have children and whose repertoire of parenting behavior may be more established.

Finally, we acknowledge the relatively small effect sizes reported in this study. Our data were drawn from a nationally representative population sample, and it is likely that effect sizes would be smaller than those reported in intervention or observational studies with clinical samples. Furthermore, the survey measures used in LSAC were necessarily brief, and perhaps under- rather than overestimate the presence of distress and child behavior problems, contributing to weaker observed effects. We draw our conclusions in light of the small effect sizes reported here.

Implications and Conclusions

Despite its limitations, the current study addresses significant gaps in our knowledge about the relationships between postnatal mental health, parenting behavior, and child outcomes in a large sample of Australian fathers. The recruitment and retention of fathers in the study is exceptionally high, and such a large, nationally representative sample has not been previously available. Building on research with mothers, this study provides empirical support for parenting behavior as a potential mechanism underpinning the longitudinal associations between fathers' postnatal mental health and later child well-being. These findings are further corroborated by the fact that child outcomes in this analysis were rated by mothers, whereas paternal psychological distress was self-reported by

fathers, thus reducing rater-associated bias as well as variance that may be introduced when predictor and outcome ratings are provided by the same individual. This study also identifies several areas for future investigation such as exploring how fathers' mental health changes from the postnatal period across the early parenting period and how this relates to changes in parenting behavior and later child outcomes.

From a clinical perspective, this study demonstrates that fathers' postnatal mental health difficulties are a potential risk factor for later parenting and child well-being difficulties, underscoring the importance of early postnatal health care for fathers. In Australia and other countries, much work has gone toward the early identification of maternal postnatal depression through routine screening in universal settings and the provision of early intervention and support. There is a need to move toward a postnatal mental health assessment that is inclusive of the whole family, ensuring that appropriate mental health support is provided to all members of the family including fathers, particularly if the relationships observed here are repeated in clinical samples of fathers in the postnatal period.

In addition to access to mental health support, fathers experiencing well-being difficulties early in parenthood may benefit from specific strategies and support targeting parenting in the postnatal and early childhood period. For example, psychoeducation about the range of well-being experiences and adjustment difficulties in the postnatal period can be provided, along with information about how fathers' well-being can have an impact on parenting. Given that the strongest pathways between postnatal distress and child outcomes were via parenting hostility, fathers may also benefit from preventative support and strategies that focus on emotional regulation to manage frustration and anger during stressful and challenging interactions with their children. Promoting use of age-appropriate positive behavior management strategies such as praise, positive reinforcement and planned activities for high stress times may also be important. Research is needed to evaluate whether these support approaches reduce the risk of postnatal distress and parenting difficulties for fathers both in the short and long terms. Not only is this critical for improving the well-being and parenting outcomes for fathers but also for the long-term investment in the well-being of children in the early childhood period.

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References

- Ballard, C., & Davies, R. (1996). Postnatal depression in fathers. *International Review of Psychiatry, 8*, 65-71.
- Blatt-Eisengart, I., Drabick, D., Monahan, K., & Steinberg, L. (2009). Sex differences in the longitudinal relations among family risk factors and childhood externalizing symptoms. *Developmental Psychology, 45*, 491-502.
- Brown, G. W., & Harris, T. O. (1978). *Social origins of depression: A study of psychiatric disorder in women*. New York, NY: Free Press.
- Cicchetti, O., Toth, S., & Bush, M. (1998). Developmental psychopathology and incompetence in childhood. Suggestions for interventions. In B. Lachey & A. Kazdin (Eds.), *Advances in clinical child psychology* (Vol. 11, pp. 1-71). New York, NY: Plenum.
- Cornish, A. M., McMahon, C. A., Ungerer, J. A., Barnett, B., Kowalenko, N. M., & Tennant, C. C. (2006). Maternal depression and the experience of parenting in the second postnatal year. *Journal of Reproductive and Infant Psychology, 24*, 121-132.
- Dallaire, D. H., & Weinraub, M. (2005). Predicting children's separation anxiety at age 6: The contributions of infant-mother attachment security, maternal sensitivity, and maternal separation anxiety. *Attachment & Human Development, 7*, 393-408.
- Davis, R. N., Davis, M. M., Freed, G. L., & Clark, S. J. (2011). Fathers' depression related to positive and negative parenting behaviors with 1-year-old children. *Pediatrics, 127*, 612-618.
- Dudley, M., Roy, K., Kelk, N., & Bernard, D. (2001). Psychological correlates of depression in fathers and mothers in the first postnatal year. *Journal of Reproductive and Infant Psychology, 19*, 187-202.

- Fletcher, R., Freeman, E., Garfield, C., & Vimpani, G. (2011). The effects of early paternal depression on children's development. *Medical Journal of Australia*, *195*, 685-689.
- Gelfand, D., & Teti, D. (1990). The effects of maternal depression on children. *Clinical Psychology Review*, *10*, 329-353.
- Giallo, R., D'Esposito, F., Christensen, D., Mensah, F., Cooklin, A., Wade, C., & Nicholson, J. M. (2012). Father mental health during the early parenting period: Results of an Australian population based longitudinal study. *Social Psychiatry and Psychiatric Epidemiology*, *47*, 1907-1916. doi:10.1007/s00127-012-0510-0
- Goodman, J. (2004). Paternal postpartum depression, its relationship to maternal postpartum depression, and implications for family health. *Journal of Advanced Nursing*, *45*, 26-35.
- Goodman, R. (1997). The strengths and difficulties questionnaire: A research note. *Journal of Psychological Psychiatry*, *38*, 581-586.
- Goodman, S., & Gotlib, I. (1999). Risk for psychopathology in the children of depressed mothers: A developmental model for understanding mechanisms of transmission. *Psychological Review*, *106*, 458-490.
- Grace, S., Evindar, A., & Stewart, D. (2003). The effect of postpartum depression on child cognitive development and behavior: A review and critical analysis of the literature. *Archives of Women's Mental Health*, *6*, 263-273.
- Halligan, S., Murray, L., Martins, C., & Cooper, P. (2007). Maternal depression and psychiatric outcomes in adolescent offspring: A 13-year longitudinal study. *Journal of Affective Disorders*, *97*, 145-154.
- Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, *6*, 1-55.
- Kane, P., & Garber, J. (2004). The relation between fathers' depression and children's externalizing and internalizing symptoms and conflict: A meta-analysis. *Clinical Psychology Review*, *24*, 339-360.
- Kessler, R., Barker, P., Cople, L., Epstein, J., Gfroerer, J., Hiripi, E., & Zaslavsky, A. M. (2003). Screening for serious mental illness in the general population. *Archives of Psychiatry*, *60*, 184-189.
- Landry, S. H., Smith, K. E., & Swank, P. R. (2006). Responsive parenting: Early foundations for social, communication, and independent problem-solving skills. *Developmental Psychology*, *42*, 627-641.
- Lovejoy, M., Graczyk, P., O'Hare, E., & Neuman, G. (2000). Maternal depression and parenting behavior: A meta-analytic review. *Clinical Psychology Review*, *20*, 561-592.
- Low, S., & Stocker, C. (2005). Family functioning and children's adjustment: Associations among parents' depressed mood, marital hostility, parent-child hostility, and children's adjustment. *Journal of Family Psychology*, *19*, 394-403.

- Matthey, S., Barnett, B., Howie, P., & Kavanagh, D. (2003). Diagnosing postpartum depression in mothers and fathers: Whatever happened to anxiety? *Journal of Affective Disorders, 74*, 139-147.
- McLearn, K., Minkovitz, C., Strobino, D., Marks, E., & Hou, W. (2006). Maternal depressive symptoms at 2 to 4 months postpartum and early parenting practices. *Archives of Pediatrics & Adolescent Medicine, 160*, 279-284.
- Mensah, F., & Kiernan, K. (2009). Gender differences in educational attainment: Influences of family environment. *British Educational Research Journal, 36*, 239-260.
- Muthén, L., & Muthén, B. (1998-2011). *Mplus user's guide*. Los Angeles, CA: Muthén & Muthén.
- National Center for Education Statistics. (2000). *Early Childhood Longitudinal Study-Kindergarten (ECLS-K)*. Washington, DC: Department of Education.
- Patterson, G., DeBaryshe, B., & Ramsey, E. (1989). A developmental perspective on antisocial behavior. *American Psychologist, 44*, 329-335.
- Paulson, J., & Bazemore, S. (2010). Prenatal and postpartum depression in fathers and its association with maternal depression. *Journal of the American Medical Association, 303*, 1961-1969.
- Paulson, J., Dauber, S., & Leiferman, J. (2006). Individual and combined effects of postpartum depression in mothers and fathers on parenting behavior. *Pediatrics, 118*, 659-668.
- Paulson, J., Keefe, H., & Leiferman, J. (2009). Early parental depression and child language development. *Journal of Child Psychology and Psychiatry, 50*, 254-262.
- Ramchandani, P., Stein, A., Evans, J., & O'Connor, T. (2005). Paternal depression in the postnatal period and child development: A prospective population study. *Lancet, 365*, 2201-2205.
- Ramchandani, P., Stein, A., O'Connor, T., Heron, J., Murray, L., & Evans, J. (2008). Depression in men in the postnatal period and later child psychopathology: A population cohort study. *Journal of the American Academy of Child & Adolescent Psychiatry, 47*, 390-398.
- Sanson, A. (1995). *Child Rearing Practices Questionnaire* (Unpublished Measure). University of Melbourne, Victoria, Australia.
- Schafer, J., & Graham, J. (2002). Missing data: Our view of the state of the art. *Psychological Methods, 7*, 147-177.
- Soloff, C., Lawrence, D., & Johnstone, R. (2005). *Sample design* (LSAC Technical Paper No. 1). Melbourne: Australian Institute of Family Studies, Commonwealth of Australia.
- Turney, K. (2011). Maternal depression and childhood health inequalities. *Journal of Health and Social Behavior, 52*, 314-332.
- Waylen, A., & Stewart-Brown, S. (2009). Factors influencing parenting in early childhood: A prospective longitudinal study focusing on change. *Child: Care, Health and Development, 36*, 198-207.