Effect of Maternal Depression on Child Behavior: A Sensitive Period?

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Objective: The purpose of this study was to examine the effect of maternal depression during the child's first year of life (i.e., sensitive period) on subsequent behavior problems. **Method:** Participants were 175 mothers participating in the Oregon Adolescent Depression Project (OADP) who met lifetime diagnostic criteria for major depressive disorder (MDD) and completed the child behavior checklist (CBCL) for their first child at some point during the child's first 12 years (mean = 4.91 years). **Results:** Regression analyses indicated that MDD in the sensitive period was a significant predictor of internalizing and total behavior problems on the CBCL while controlling for several demographic variables (e.g., child and mother age, child gender). Maternal depression before pregnancy and during the prenatal period did not significantly predict later child behavior problems, suggesting that the effect was not driven by the presence of previous MDD and was specific to the first year of life. **Conclusions:** Presence of maternal MDD during a child's first year of life represents a sensitive period and increases the risk of adverse child outcome. The findings suggest the importance of identification, prevention, and early intervention. Future studies should examine these findings in more diverse, heterogeneous samples. J. Am. Acad. Child Adolesc. Psychiatry, 2010;49(7): 699–707. **Key Words:** child behavior problems, maternal depression, sensitive period.

Depression among mothers of childbearing age is highly prevalent and represents a significant public health concern. A recent estimate suggests as many as 17% of women with young children have elevated levels of depressive symptoms,[1] and that these symptoms are likely to persist throughout the child's preschool years.[2] Women diagnosed with postpartum depression were six times more likely to display recurrent depressive symptoms, as well as other physical and mental illnesses after 4 years compared with women without postpartum depressive symptoms.[3]

In addition to the effects of depression on the mother, there has been substantial research demonstrating negative child behavioral outcomes across a wide age range. Maternal depression has been shown to be related to infant avoidant and disorganized attachment patterns[4] and negative mother–infant interactions,[5] which have been linked to externalizing behavior problems during toddlerhood.[6] By the preschool years, children exposed to chronic maternal depression had higher levels of parent-reported internalizing and externalizing behavior problems.[7] A meta-analysis demonstrated that the relation between maternal depression and conduct problems extends to adolescence.[8] In addition, maternal depression has been shown to mediate the relationship between exposure to community violence and adolescent behavior problems,[9] highlighting its powerful effect on long-term child outcomes.

Despite the substantial evidence that maternal depression affects child behavior, findings with respect to the timing of the depressive episodes have been conflicted. A significant history of maternal depression has been shown to have a cumulative effect on the current report of child behavior problems.[10] However these findings were not consistent among mothers currently depressed, suggesting that the report of child behavior problems may be more dependent on a history of depression than on current maternal depressive status. Similarly, postpartum depression during the first 2 months of the child's life was shown to predict later maternal depression, which in turn led to higher rates of child behavior problems.[11] Another study found that although

previous or current maternal depression was unrelated to child problems at 14 months, maternal depression when children were 14 months old predicted child behavior problems at 27 and 42 months.[12] Similarly, Cambell and Cohn[13] found that maternal depression in the early postpartum period did not predict later child behavior problems unless the depressive episode lasted longer than 6 months or unless there were additional risk factors.

On the other hand, Murray et al.[14] demonstrated that maternal depression in the early postpartum months was the best predictor of child behavior problems, which was not influenced by current maternal depression. Other research illustrated a model with an additive affect on child behavior problems accounting for both early and concurrent maternal depression.[15] A recent study suggested maternal depression during pregnancy was the strongest predictor of adolescent depression at 16 years, which was mediated by periods of maternal depression during the child's lifetime.[16] Finally, a longitudinal analysis conducted in Finland suggested that prenatal maternal depression was associated with higher levels of child behavior problems, and that prenatal and recurrent maternal depressive symptoms led to the most negative child outcomes.[17]

The conflicting findings with respect to the timing of maternal depression and its effect on child behavior illustrate the need for further research in this area. The relationship between maternal depressive episodes and important child developmental stages has been proposed to be significant,[18] but few have studies examined whether there are any stages in early childhood that are particularly susceptible to the negative effects of maternal depression.[17] Therefore the purpose of the current study was to examine the effect of timing of maternal depression on later child behavior and determine whether the first year of life, between the child's birth and first birthday, is a critical or sensitive period[19] with regard to the effects of maternal depression.

It is important to explore the effect of timing of maternal depression on a child's later behavioral and emotional functioning for several reasons. First, it may help explain the mechanism by which risk is conferred from mother to child. For example, evidence demonstrating a more harmful effect for maternal depression occurring very early in a child's life may indicate that the disruption of the maternal-infant relationship mediates the relationship between maternal depression and later child behavior problems. Alternatively, a failure to find a timing effect may suggest that the mechanisms of transmission are temporally stable, such as genetic loading or enduring psychosocial stressors. In addition, genes may interact with other environmental variables (e.g., parenting, psychosocial stressors) that could impact the timing effect of maternal depression. Finally, evidence for the effects of timing of maternal depression can help identify children at highest risk for subsequent behavior problems. These children can be targeted for preventive intervention programs aimed at promoting positive parenting practices and decreasing child behavior problems.

The present study extends previous research by examining the issue of Major Depressive Disorder (MDD) timing effects among a relatively large sample of mothers with positive lifetime histories of MDD and their children, compared to heterogeneous samples (i.e., mothers with and without depression). By focusing only on mothers with positive lifetime histories of MDD, our emphasis was not *whether* maternal MDD predicts child behavior problems (a question that has been sufficiently answered, in our view), but *when* maternal MDD is likely to have the greatest impact on child behavior. The sample was drawn from the larger Oregon Adolescent Depression Project (OADP).

The first aim of this report was to examine the effect of MDD in mothers during the sensitive period on subsequent offspring behavior problems. Development may be viewed as a hierarchically organized series of tasks that become increasingly differentiated over time.[20,21] Each developmental task incorporates prior developmental structures, with the implication that challenges introduced earlier in development are likely to have a broader impact on multiple systems and later tasks. For example, during the first year of a child's life, emotion regulation and cognitive systems develop rapidly and lay the foundation for subsequent development.[22] Maternal depression during this time may hinder a mother's ability to regulate her infant's emotions and establish secure attachment relationships, leading to future behavioral and emotional difficulties.[23] Therefore, we expected that the presence of maternal MDD during the first year of the child's life would associate with more child be-