

Association between maternal behavior in infancy and adult mental health: A 30-year prospective study

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Abstract

Background: Existing theories suggest that the mother–infant relationship has a potentially significant effect on long-term adult mental health, but there are few empirical data to support this view. Even fewer prior studies have examined the specific dynamics of the mother–infant relationship and their association with adult mental health.

Methods: A total of 1752 inner-city infants born between 1960 and 1965 were followed prospectively as a part of the Collaborative Perinatal Project (CPP) and the Johns Hopkins Pathways to Adulthood Study. Multiple observations of development and an extensive adult interview were performed.

Maternal behavior was observed and systematically rated at the infant's 4-month pediatric neurological evaluation and at 8 months by a developmental psychologist. Factor analysis was used to organize the maternal behavior variables into different types of dysfunctional mother–infant relationships. Adult mental health was assessed at the follow-up interview, when the infant had reached the age of 27–33 years, by the General Health Questionnaire (GHQ) and self-perception of current mental health.

Results: There was a significant association between unsupportive maternal behavior at 8 months and subsequent poor adult mental health (Fisher's exact test, $p = 0.026$). There was no association between overly involved maternal behavior and poor mental health as an adult. After adjustment for potential confounding variables, the elevated rates of poor adult mental health in children of mothers who exhibited unsupportive maternal behavior at 8 months persisted (OR = 1.41 [95% CI = 1.00–1.97], $p < 0.05$).

Conclusion: Infants who experience unsupportive maternal behavior at 8 months have an increased risk for developing psychological sequelae later in life.

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Abbreviations: CPP, Collaborative Perinatal Project; GHQ, General Health Questionnaire; JHCPS, Johns Hopkins Collaborative Perinatal Study; NCPP, National Collaborative Perinatal Project; OR, odds ratio; PAS, The Pathways to Adulthood Study; PTSD, posttraumatic stress disorder.

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“What's Known on this Subject”: Existing theories suggest that the mother–infant relationship has a potentially significant effect on long-term adult mental health, but there are few empirical data to support this view. Even fewer prior studies have examined the specific dynamics of the mother–infant relationship and their impact on adult mental health.

“What This Study Adds”: This is a 30-year prospective cohort study that includes 1752 children and their mothers. Our findings suggest that children whose mothers exhibit unsupportive attachment behaviors when they are 8 months old are at a significantly increased risk for developing poor mental health as an adult.

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1. Introduction

Attachment, that is to say the secure bonding between infant and mother (or other regular caretaker) that takes place during the days, weeks, and months after birth, is believed to be an essential developmental step that lays the foundation for future social and emotional development [1,2]. According to many theoretical positions, when the mother responds lovingly and sensitively to the infant's needs, the infant develops a sense of basic trust that is essential for later learning and normative development [3]. Erikson [1] suggests that this basic trust is a vital aspect of personality development. Several researchers have provided support for the idea that warm and caring parent–infant interactions during the first few months of life, particularly in response to the infant's signals, is necessary for secure attachment, whereas a lack thereof may place the infant at risk for a range of negative psychological sequelae [3,4].

Weich et al. [5] in 2009 conducted a meta-analysis of 23 papers published between 1970 and 2008 examining the effects of poor parenting on adult mental disorders. They found that abusive relationships significantly increase the risk of depression, anxiety, and PTSD in the grown child, while maternal emotional unavailability significantly increases the risk of suicide in adolescents. Other researchers have shown that poor family interactions during childhood can negatively impact the mental health of youths [6]. These studies offer support to the conjectures that previous child psychologists have put forth, focusing on the mother as the cornerstone of a secure mother infant relationship. Certainly, there are a variety of factors that can contribute to a mother's inability to care for her infant as deeply as she might like.

Mothers who are depressed or who have many young children and may be preoccupied with responsibilities at home or in the workplace may lack the ability or energy to respond to their babies [7,8]. There is empirical evidence suggesting that mothers who experience high levels of stress, especially if their babies are premature or difficult to care for, are less able than mothers of normal babies to relate to their babies in a sensitive manner [9–11]. There is also research demonstrating that by 11 to 17 months of age, infants of depressed mothers exhibit reduced activity in the right frontal area of the brain [12]. These findings raise the possibility that maternal behavior not only influences an infant's developing psychosocial functioning but also the development of his/her central nervous system [13].

There are few previous studies that have examined the long-term association between atypical patterns of maternal behavior and the subsequent mental health of the grown child. Further, most of these previous studies have been retrospective, short term, based on clinical samples, and have relied on subjective reports [5]. In this paper, we present results from 1752 offspring born in the early 1960s to inner-city mothers enrolled in the Collaborative Perinatal Project (CPP), who were assessed prospectively in adulthood at age

27 to 33 years old as a part of the Pathways to Adulthood: A Three Generation Urban Study.

2. Methods

2.1. Sample

The Pathways to Adulthood Study (PAS) had its origin in the Johns Hopkins Collaborative Perinatal Study (JHCPS), a part of the national Collaborative Perinatal Project (CPP) of the National Institute of Neurologic and Communicative Disorders and Stroke. Prospective data on first-generation mothers and their second-generation children are available. The CPP was a multi-institutional, trans-disciplinary, collaborative project that attempted to identify factors operating during the prenatal, perinatal, and early childhood periods that adversely influence subsequent neurological and cognitive development. Twelve university–medical centers cooperated in a single study design, which called for the systematic collection of data by way of the prospective observation and examination of approximately 60,000 pregnancies from the prenatal period through the first seven (or, at some institutions eight) years of life. Reports from the CPP have been summarized by Niswander and Gordon [14], Hardy et al. [15], and Broman et al. [16].

The Pathways Study sample ($n = 2,694$) was randomly selected from the 3006 JHCPS children born between January 1st, 1960, and July 31, 1965, who successfully completed either the 7- and/or 8-year follow-up examinations that were part of the CPP (99% received both). From July 1992 to January 1994, both mothers and their children participated in extensive follow-up interviews, bridging the period of time from when the children were age 7 to 8 until they were 27 to 33, and providing current outcome data. This report concerns the 1752 offspring who completed the full adult mental health interviews.

The interview procedure, potential biases, missing data, and attrition from the sample have been discussed in detail elsewhere [17]. Some differences at birth were found between the offspring with complete adult interviews, those with partial data, and those not located [18]. Mothers of children who could not be located in adulthood were more often younger ($p < 0.001$), poorly educated ($p < 0.001$), unmarried ($p < 0.001$), and poor ($p < 0.001$) at the time of their children's birth than were mothers of those children who were interviewed. Children who were located but did not complete full interviews tended to have mothers with characteristics similar to mothers of those who were interviewed [18], but as the data are limited to surviving subjects, attrition is likely to have resulted in an underestimation of the effects of unsupportive maternal behavior, as it is those at greater risk of poorer outcomes who are preferentially lost to follow-up.

Eighteen percent of the mothers were white, and 82% were black. Twenty-eight percent had completed a high school education at the time their child was born. Among the

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