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## Infant Behavior and Development



## Maternal and child correlates of anxiety in 2½-year-old children

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#### ABSTRACT

The goal of this study was to predict the development of anxiety in 2½ year olds as a function of maternal anxiety and child inhibited temperament, and to test the mediating, moderating, and curvilinear effects of maternal sensitivity. Participants were 83 mothers and their 2½-year-old children (32 females). Maternal anxiety, child inhibition, and child anxiety were assessed by maternal report. Maternal sensitivity was rated based on the appropriateness and timeliness of mothers' responses to children's fear observed during their exposure to novel events in the laboratory and from mothers' diaries documenting their responses to children's fear in everyday situations. Gender predicted child anxiety, with mothers reporting girls as more anxious, as did child inhibition, with more inhibited children exhibiting more anxiety. Maternal sensitivity predicted child anxiety as a main effect and, in addition, inhibition moderated the curvilinear association of maternal sensitivity and child anxiety. For highly inhibited children, maternal sensitivity predicted anxiety in both a negative linear and a curvilinear fashion; anxiety decreased as maternal sensitivity increased up to a moderately high level, then increased at very high levels of maternal sensitivity. For less inhibited children, maternal sensitivity showed only a significant negative linear association with child anxiety.

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#### 1. Introduction

Anxiety is defined as a normal reaction to stress that may help a person cope with difficult situations. However, when anxiety becomes excessive, it can be debilitating (American Psychiatric Association, 2005). The prevalence of anxiety disorders in children is 13%, making it the most common mental disorder in this age group (U.S. Department of Health and Human Services, 1999). For children under the age of five, anxiety generally presents as tantrums, crying, freezing, clinging, or timidity in social situations. Girls exhibit more anxiety symptoms than boys (Warren & Simmens, 2005; U.S. Department of Health and Human Services, 1999) and women report higher prevalence rates of every classification of anxiety disorder compared to men (Bijl, Ravelli, & van Zessen, 1998). Moreover, about half of the adults with an anxiety disorder report that it began during childhood (U.S. Department of Health and Human Services, 1999). Thus, understanding how anxiety develops should have far-reaching effects, aiding in early detection and intervention efforts, and lowering the prevalence of anxiety symptoms and disorders thereby.

The goal of this study was to test a model of the development of anxiety in  $2\frac{1}{2}$ -year-old children that included maternal anxiety, maternal sensitivity, and child inhibited temperament as predictors. More specifically, we tested the mediating effect of maternal sensitivity on the link between maternal and child anxiety, the moderating effect of maternal sensitivity on the association between child temperament and child anxiety, and the previously untested curvilinear effect of maternal sensitivity on child anxiety as moderated by child inhibition.

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#### 1.1. Maternal anxiety

Maternal anxiety has been widely studied as a risk factor for the development of child anxiety in an effort to understand the transmission process and the possible role of genes in the association between parental and child anxiety prevalence (Bögels & Brechman-Toussaint, 2006); as much as 50% of the anxiety disposition is believed to be genetic. However, the care anxious mothers provide appears to contribute to the development of anxiety in their children as well (Nichol-Harper, Harvey, & Stein, 2007; Shamir-Essakow, Ungerer, & Rapee, 2005), and may partially explain why only 30% of children with anxious dispositions develop an anxiety disorder (Shamir-Essakow et al., 2005).

It follows that maternal anxiety may be expected to influence the development of anxiety in children both through shared genes apparent in children's temperamental predispositions and by virtue of the caregiving anxious mothers provide their children.

#### 1.2. Inhibited temperament

Temperament refers to a set of biologically based qualitative tendencies that interact with environments to influence later personality (Rothbart & Bates, 2006). One such tendency is behavioral inhibition, characterized by irritable and active reactions to novelty in infancy and shy and fearful responses in toddlerhood, identified as a potential precursor of childhood anxiety disorders (Biederman et al., 2001; Degnan & Fox, 2007; Goldsmith, Bradshaw, & Rieser-Danner, 1986; Rapee, 2002; Shamir-Essakow et al., 2005). Kagan (1997) described inhibited children as having low thresholds to reaching the state of fear in novel situations or with unfamiliar people. Fear, which is activated by a threatening situation, is considered an adaptive emotional response, with maladaptive possibilities if it becomes excessive. Fear inhibits ongoing motor programs while initiating protective response systems, such as fleeing or freezing (Rothbart & Bates, 2006).

Beginning in the first and second years of life, behavioral inhibition predicts increased risk for anxiety in childhood and adolescence (Kagan, Snidman, Arcus, & Reznick, 1994; Rosenbaum et al., 1993; Schwartz, Snidman, & Kagan, 1999; Shamir-Essakow et al., 2005). Kagan, Snidman, Zentner, & Peterson (1999) reported further that negative reactivity at 4 months increased the risk for anxious symptoms at 7 years. However, only 10% of negatively reactive infants were *highly* inhibited at age 7, indicating that although early negative reactivity poses a risk for the emergence of anxiety in childhood, not all reactive infants are anxious later on. According to Shamir-Essakow et al. (2005), parenting is the primary environmental factor which, when combined with temperament, fosters or hinders the development of early inhibition into later anxiety.

#### 1.3. Inhibited temperament and maternal behavior

Some maternal behavior is thought to protect against the development of anxiety, whereas other behavior is thought to confer risk. Maternal sensitivity, characterized by responsive parenting that is well-matched to the child's needs and cues, rather than to the mother's own needs, has been identified as a protective factor that decreases the likelihood that temperamentally predisposed children will become highly anxious. In contrast, maternal overprotection or oversolicitousness, behavior that discourages exploration and autonomy, is thought to increase the likelihood that temperamentally predisposed children will become anxious or shy over time (Rapee, 2002; Rubin, Hastings, Stewart, Henderson, & Chen, 1997). Notably, both low sensitivity and high overprotection characterize the behavior of highly anxious mothers (Rapee, 1997).

#### 1.4. Maternal sensitivity

Sensitivity refers to a mother's ability to respond to her child in ways that are well-matched to the child's needs (Ainsworth, Blehar, Waters, & Wall, 1978). To be fully sensitive, a mother's own needs should not direct her actions, unless they coincide with those of her child (Ainsworth et al., 1978). A child's confidence in the mother as a source of support increases as the mother responds consistently and predictably in a reassuring manner (Ainsworth et al., 1978). In contrast, children whose mothers are less consistently sensitive are at increased risk for developing insecure attachments, which contribute in turn to the development of anxiety symptoms and disorders (Gar, Hudson, & Rapee, 2005). To the extent that maternal sensitivity influences child anxiety through attachment security, we would expect children of less sensitive mothers to be more anxious than children of more sensitive mothers because they are insecurely attached.

Maternal sensitivity may lower the risk of anxiety also by influencing how infants and young children regulate negative emotion (Crockenberg & Leerkes, 2006; Feldman, Greenbaum, & Yirmiya, 1999; Shamir-Essakow et al., 2005; Spinrad et al., 2007). A sensitive mother may gently encourage an inhibited child to engage in threatening situations with her support, through which the event may become less frightening to the child who also develops more adaptive ways of regulating distress. Conversely, a less sensitive mother may fail to notice her child's fear or choose to ignore it, either insisting that her child approach the frightening event or leaving the child to cope unaided. Spinrad et al. (2007) provide support for the thesis that maternal sensitivity reduces internalizing problems during late infancy by increasing adaptive emotion regulation. Maternal support (a latent variable on which maternal sensitivity loaded highly) was negatively associated with separation distress, an internalizing behavior, at 18 and 30 months and longitudinally, and effortful control mediated these associations. Children of less sensitive mothers exhibited less effortful control and experienced more separation distress than children of more sensitive mothers.

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