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Shyness trajectories in slow-to-warm-up infants: Relations with child sex and maternal parenting

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ABSTRACT

Little is known about slow-to-warm-up temperament in infancy. This study examined the trajectory of shyness in children who were slow-to-warm-up in infancy in comparison to children with other temperament profiles in infancy. Participants were 996 mothers and children in the NICHD SECC studied from 6 months to first grade. Latent growth curve modeling showed that children who were slow-to-warm-up in infancy tended to be shy in early childhood, but with increasing age these children became indistinguishable from children who were easy or intermediate. In comparison, children who were difficult in infancy remained more shy than children with other temperament profiles. Maternal sensitive and stimulating/supportive parenting was associated with less shyness in early childhood for boys who were slow-to-warm-up in infancy. Findings support the distinctiveness of the slow-to-warm-up temperament in comparison to other temperament profiles as well as its potential usefulness for predicting later child outcomes.

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From birth, infants demonstrate an inherited, consistent behavioral style, or temperament, in their responses to their environment. This characteristic behavioral style is believed to influence parent–child relationships and the child's social development. Much of what we know about the social and behavioral correlates of infant temperament stems from the early research of Thomas and Chess and their colleagues (Thomas, Chess, & Birch, 1970; Thomas, Chess, Birch, Hertzig, & Korn, 1963). Thomas et al. (1963) outlined nine dimensions that describe infant temperament: activity level, approach/withdrawal, adaptability, mood, threshold of responsiveness, intensity, distractibility, rhythmicity, and attention span/persistence. They then defined three broad profiles of infant temperament: easy, difficult, and slow-to-warm-up (Chess & Thomas, 1999; Thomas et al., 1970). Each profile is defined by a specific constellation of dimensions. The difficult infant (about 10% of Thomas et al.'s sample) is low in rhythmicity, approach, and adaptability, high in intensity, and negative in mood. The easy infant (about 40% of Thomas et al.'s sample) is high in rhythmicity, approach, and adaptability, mild in intensity, and positive in mood. The slow-to-warm-up infant (about 15% of Thomas et al.'s sample) is low in adaptability and approach, low to moderate in activity, mild in intensity, variable in rhythmicity and distractibility, and slightly negative in mood. The remainder of Thomas et al.'s sample (35%) did not fit into one of the three profiles and was labeled intermediate.

Subsequent temperament theoretical work has expanded upon the Thomas and Chess (e.g., Chess & Thomas, 1999) conceptualization of temperament, but research has typically focused on children who display behaviors consistent with the Thomas and Chess difficult temperament profile. For example, the dimensions of poor self-regulation and high reactivity that are the focus of Rothbart's research (Putnam & Stifter, 2008) are similar to those included in the Thomas and Chess difficult temperament category. Bates (e.g., Lee & Bates, 1985) has also focused on temperamental difficulty in his research, although he defines it predominately in terms of negative emotionality and fussiness (i.e., social demandingness), which is only one part of Thomas and Chess's definition of difficult temperament. Kagan and Fox (2006) and their colleagues (e.g., Fox, Henderson, Rubin, Calkins, & Schmidt, 2001; Fox et al., 2005; Hane, Fox, Henderson, & Marshall, 2008; Kagan, Snidman, & Arcus, 1998; Kagan, Snidman, Kahn, & Towsley, 2007) have focused on physiological and neurological substrates and specific gene–environment combinations as predictors of behavioral inhibition, shyness, and exuberance in childhood. Unlike other researchers, Kagan and Fox and their colleagues (e.g., Fox et al., 2005; Kagan et al., 1998) have examined some of the behavioral traits (i.e., high motor and emotional reactivity to novelty) that may distinguish the slow-to-warm-up profile from the difficult profile. However, in general, the slow-to-warm-up temperament profile has not been explicitly studied, despite its similarity to difficult temperament and its conceptual link to social inhibition or shyness.

Although researchers have defined and studied temperament somewhat differently, they generally agree that infants characterized by one set of temperament characteristics may be more susceptible to certain later behavior patterns than infants with another set of characteristics. Specifically, researchers have suggested that infants characterized by behaviors typical of both the classic slow-to-warm-up

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and difficult temperament profiles are at risk for poor parent–child fit (Carey & McDevitt, 1995) and for the development of poor social competence (Houck, 1999; Houck & LeCuyer-Maus, 2002) and high inhibition and shyness (Kagan et al., 1998). Most recent research has focused on the behavioral outcomes of difficult temperament (as summarized below). The primary purpose of the present study was to test the usefulness of slow-to-warm-up temperament, as conceptualized by Thomas and Chess, in predicting later child shyness. We also sought to test if maternal parenting and child sex combine with slow-to-warm-up temperament to modify the link between this early temperament and later shyness.

Difficult temperament

Much research has documented the poor developmental outcomes of infants who demonstrate behaviors consistent with the Thomas and Chess difficult temperament. For example, Thomas and Chess reported that individuals who were difficult in infancy accounted for the largest proportion of behavior problems in early childhood (Thomas et al., 1970). Moreover, whereas both stability and change in temperament were observed as children became older, children who were difficult in infancy consistently demonstrated poorer adaptation than children who were easy in infancy (Chess & Thomas, 1990). Overall, Thomas and Chess's (Chess & Thomas, 1990) findings suggest that the difficult temperament profile is a risk factor for poor developmental outcomes. More recent work has confirmed Thomas and Chess's conclusion, demonstrating associations between difficult temperament and similar temperament constructs (e.g., poor effortful control) in infancy and internalizing and externalizing behaviors in early childhood (Bates, Maslin, & Frankel, 1985; Crockenberg & Leerkes, 2006; Rothbart, 2007; Sanson, Oberklaid, Pedlow, & Prior, 1991; Warren & Simmens, 2005). Links have also been shown between difficult or dysregulated temperament and poor social competence (Houck, 1999) and high social withdrawal (Booth-LaForce & Oxford, 2008).

Slow-to-warm-up temperament

According to Thomas et al. (1970) slow-to-warm-up infants are typically less fussy than difficult babies but are more negative and less predictable than easy infants. Like difficult infants, slow-to-warm-up infants are hesitant to approach others and are slow to adapt to new situations, but in general they are less demanding than difficult infants. In contrast to the substantial and conclusive research findings concerning developmental outcomes for difficult infants, little is known about what happens to slow-to-warm-up infants in toddlerhood and childhood. However, it is important to investigate the usefulness of the slow-to-warm-up temperament in predicting later child behaviors for several reasons. First, slow-to-warm-up temperament is conceptually very similar in makeup to difficult temperament. The slow-to-warm-up infant and the difficult infant both withdraw from new situations, are slow to adapt, and are negative in mood. Thus, the established relation between difficult temperament and specific later child behaviors may also be evident with slow-to-warm-up temperament. Conceptually, both the slow-to-warm-up and difficult temperaments are associated with inhibition (Kagan, 1994; Kagan et al., 1998) and infant behaviors characteristic of difficult and slow-to-warm-up infants (i.e., high negativity and low positivity) have been linked to later child inhibition (Park, Belsky, Putnam, & Crnic, 1997). The term slow-to-warm-up has been equated with the construct of shyness, a form of inhibition specific to social situations (i.e., social inhibition; Schmidt & Buss, 2010), in previous literature (Coplan & Rubin, 2010). Even introductory psychology textbooks (e.g., Bernstein, Penner, Clarke-Stewart, & Roy, 2003; Kalat, 2002) and other publications directed toward parents and practitioners (e.g., Kristal, 2007) often assume that slow-to-warm-up temperament in infancy will lead to shyness and inhibition in childhood, but this link between early slow-to-warm-up temperament and later shyness (i.e., social inhibition) has yet to be empirically tested.

Moreover, Carey and McDevitt (1995) proposed that, along with difficult temperament, slow-to-warm-up temperament is a "temperament risk factor" (p. 13) for a poor parent–child fit as well as for later problem behaviors. In their report on the behavioral outcomes of children who were difficult and easy in infancy, Thomas et al. (1970) also noted that some of the children in their slow-to-warm-up group demonstrated behavior problems in childhood, but did not provide specific comparisons of children with slow-to-warm-up and other temperaments. Additional evidence supporting Carey and McDevitt's (1995) proposal is lacking.

Second, although slow-to-warm-up and difficult infants are similar on several dimensions of temperament, the dimensions that distinguish the two groups may lead to different risks and vulnerabilities. Specifically, the two temperament profiles differ on the dimensions of intensity, activity, and rhythmicity. Whereas difficult infants are high in intensity, vary in activity, and are low in rhythmicity, slow-to-warm-up infants are mild in intensity, are low to moderate in activity, and vary in rhythmicity. Because of these differences, slow-to-warm-up infants may be at even higher risk for shyness than difficult infants. For example, research suggests that young children with low activity levels adapt to novel social situations, such as attending preschool for the first time, more slowly than young children with high activity levels (Fox & Field, 1989). Slow-to-warm-up temperament is often considered to be simply a more moderate variant of difficult temperament. Although slow-to-warm-up children may demonstrate more mild behavioral tendencies in infancy and less severe behavioral problems in childhood than difficult children, they also likely differ in their behavioral trajectory from easy and intermediate children, who typically experience positive outcomes. It is therefore important to understand differential outcomes in slow-to-warm-up infants as compared to difficult, easy, and intermediate infants.

A final rationale for studying the behavioral outcomes of slow-to-warm-up infants is that children who are slow-to-warm-up in infancy may be uniquely influenced by parenting, particularly because of the conceptual link between slow-to-warm-up temperament and shyness. Shyness is characterized by fearful or inhibited responses to social novelty, and recent research suggests that the trait of fear is more susceptible to maternal influence than are other traits. In a study by Braungart-Rieker, Hill-Soderlund, and Karrass (2010), all infants demonstrated an increase in fear between 4 and 16 months, but this increase was less for infants whose mothers were more sensitive compared to infants whose mothers were less sensitive. Conversely, maternal sensitivity was unrelated to the trajectory of anger across infancy (Braungart-Rieker et al., 2010). Other research (reviewed below) suggests that the behavioral outcomes of children who are more difficult in infancy are more affected by parenting behaviors than are the outcomes of children who are less difficult (e.g., Stright, Gallagher, & Kelley, 2008; Warren & Simmens, 2005). However, similar relations between early parenting and later child outcomes have not been tested among children who are slow-to-warm-up in infancy.

Parenting and temperament

Chess and Thomas (Chess & Thomas, 1999; Chess, Thomas, & Birch, 1965) proposed that child outcomes vary depending on whether there is a good or poor fit between parenting strategies and the child's temperament. For example, mothers of slow-to-warm-up children who attempt to force their initially hesitant child to quickly approach other children on the playground are pressuring their children to behave in a manner that is inconsistent with their temperament. Numerous unsuccessful attempts may result in the children avoiding the playground entirely. In contrast, mothers who avoid taking their slow-to-warm-up children to the grocery store because they know

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