Development of Shyness: Relations With Children's Fearfulness, Sex, and Maternal Behavior

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Abstract

The relations of childhood fearfulness (observed and adult reported) and adult-reported shyness at 18 (n = 256) and 30 (n = 230) months of age were assessed. Fear was positively related to shyness concurrently and longitudinally, but slightly more consistently at 18 months. The moderating roles of observed maternal sensitivity and children's sex in the relation between 18-month fearfulness and 30-month shyness, and between 18- and 30-month shyness, were tested. The positive relation between mother-reported fearfulness and shyness was strongest for sons of insensitive mothers but was not significant for daughters of sensitive, average, or insensitive mothers. The positive relation between mother-reported 18- and 30-month shyness was strongest for sons of insensitive mothers and for daughters of sensitive mothers. Moreover, when using scores of fear or shyness that were independent of each other, 18-month mother-reported fearfulness continued to interact with sex and sensitivity to predict 30-month shyness; however, the positive relation between Time 1 and Time 2 shyness was consistent across sex and levels of sensitivity.

Parent-reported shyness has been found to be moderately stable in early childhood (e.g., Sanson, Pedlow, Cann, Prior, & Oberklaid, 1996), although it is also at least somewhat malleable. Because shyness has been related to problems with peers and with adjustment problems such as internalizing (e.g., Coplan, Prakash, O'Neil, & Armer, 2004; Eisenberg, Shepard, Fabes, Murphy, & Guthrie, 1998), it is important to identify variables that contribute to its development. Children are exposed to a wide variety of environmental influences as they age, such as parenting behavior and peers at day care, and these experiences could have implications for the development of shyness. For example, positive exchanges with peers or parents might lead to the development of social or coping skills and

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might extinguish negative expectancies for social situations (Derryberry & Rothbart, 1997), which could result in less shyness over time.

Furthermore, children experience broad changes in many domains of functioning (e.g., sociocognitive) that can contribute to the development of shyness. For example, the development of an objective sense of self during the second year of life allows children to experience self-conscious emotions (e.g., Lewis, 1991). In addition, children begin to understand social standards for behavior and physical appearance by 18 months of age (e.g., Kagan, 1981), and this growth in social awareness leads some children to feel anxiety over evaluations (Cherny et al., 2001).

Early developing shyness is thought to result from conflicting approach and avoidance motivations (Asendorpf, 1990a) that manifest as inhibited approach in social situations (Rothbart, Ahadi, Hershey, & Fisher, 2001). Thus, one might intuitively conjecture that shyness is associated with temperamental fearfulness. Children who are prone to reacting negatively or cautiously toward potentially threatening nonsocial stimuli might be likely to react in the same manner toward potentially threatening social stimuli (e.g., strangers). In addition, researchers have argued that parents influence the development of shyness (e.g., Rubin, Burgess, & Hastings, 2002). In this study, children's fearfulness and shyness at 18 months of age were examined in relation to shyness at 30 months of age, and children's sex and maternal sensitivity at 18 months of age were examined as moderators of these relations.

CHILDREN'S FEARFULNESS AND SHYNESS

In this study, shyness was defined as inhibited approach in a social context, whereas fear was conceptualized as negative affect in response to perceived threat or in anticipation of pain or distress. Fear and shyness are conceptually similar, in that both can promote inhibition or withdrawal. However, shy children possess high avoidance and high approach tendencies (Asendorpf, 1990a). Shy children desire to play with others, but their social fear inhibits approach (see Coplan et al., 2004). Fear is broader than shyness because it often is elicited by nonsocial situations or objects (e.g., the dark).

Fear might influence early appearing shyness. Excessive fear can lead to an overcontrol of approach behavior that could thwart social engagement, stifle development of coping skills, and impair social relationships (Derryberry & Rothbart, 1997). In addition, frequently displaying negative emotion in the company of others might lead to shyness by negatively affecting children's social expectancies and confidence in their social efficacy (Rothbart & Mauro, 1990).

Analyses of adult-reported child temperament produce a changing picture of the relation between fear and shyness with age. Researchers have successfully differentiated the two constructs beginning in toddlerhood (e.g., Putnam, Ellis, & Rothbart, 2001). During the development of the Revised Infant Behavior Questionnaire (Gartstein & Rothbart, 2003), separate scales were proposed for social fear and fear, but the scales were combined after item analysis. In contrast, items assessing nonsocial and social fears did not correlate during construction of the Toddler Behavior Assessment Questionnaire (Goldsmith, 1996). Item analysis during construction of the Early Childhood Behavior Questionnaire (ECBQ; Putnam, Gartstein, & Rothbart, 2006) resulted in separate scales for shyness and fear; however, the primary loadings of shyness and fear were on the same factor (Putnam et al., 2006). Thus, shyness and fear could be assessed as separate but related constructs. In contrast, the primary loading of preschool-aged children's shyness did not load on the same factor with fear using the Children's Behavior Questionnaire (Rothbart et al., 2001). The results suggest that fear and shyness are closely related in infancy, but begin to differentiate

in toddlerhood and could be more clearly differentiated by preschool. To our knowledge, the relation between children's fear and shyness has not been examined longitudinally.

MATERNAL BEHAVIOR AND CHILDREN'S SHYNESS

Researchers have examined aspects of parenting, such as sensitivity, as potential predictors of children's shyness. Sensitivity is characterized by warm, child-centered, developmentally appropriate interaction, as well as contingent responding to the child's affect, interests, arousal, and capabilities (Fish & Stifter, 1995). A mother might be classified as insensitive by being underresponsive to her child (e.g., by missing or ignoring the child's cues or emotions), or by being intrusive (e.g., adhering to her own agenda rather than the child's). Sensitive interactions allow children to develop autonomy, self-efficacy, and self-regulatory skills (Kochanska, Murray, & Harlan, 2000; Rubin, Cheah, & Fox, 2001). Low sensitivity can be detrimental to children's social functioning by undermining these skills. Furthermore, researchers have hypothesized that insensitive caregiving contributes to insecure attachments that are not conducive to forming social relationships (e.g., Mills & Rubin, 1993).

Rubin's research group has examined maternal behavior and shyness-related constructs using a composite, oversolicitousness, which includes intrusive control, unresponsiveness, positive affect, and unsolicited interventions (e.g., Rubin, Hastings, Stewart, Henderson, & Chen, 1997). Thus, it contains aspects of low sensitivity (intrusiveness, low responsiveness) but also contains positive affect, which can tap affection between a mother and child, as opposed to mothers' control over the interaction. The measure used in this study might be a purer measure of a child-centered interaction by focusing solely on the mothers' behavior and not affect.

Consistent first-order relations between maternal behaviors involving sensitivity and shyness-related constructs have been difficult to obtain. For example, Rubin et al. (1997) were unable to find a significant correlation between maternal oversolicitous behavior and peer-social inhibition. However, mothers of toddlers exhibiting inhibition in both of the contexts examined (toward an unfamiliar adult with novel objects and with unfamiliar peers) displayed more oversolicitous behavior than mothers of children who displayed inhibition in only one type of context. In addition, Rubin et al. (2001) found significant relations between maternal oversolicitous behavior and shyness, but the relation was positive when oversolicitousness was exhibited during free play and negative when displayed during a goal-oriented task.

Although first-order relations between parenting and shyness-related constructs have been absent or contradictory, parenting might moderate relations between children's temperamental tendencies and later shyness. Indeed, developmental psychopathologists maintain that early characteristics of the child and environment interact and influence developmental outcomes (Schmidt, Polak, & Spooner, 2001). The following studies did not include constructs identical to those in this study, but support the idea that maternal sensitivity can modify temperament. Rubin et al. (1997) found that 2-year-olds' social fearfulness was positively related to concurrent observed peer-social inhibition only for toddlers whose mothers exhibited oversolicitous behavior. Similarly, Rubin et al. (2002) found that toddlers' inhibition with an unfamiliar peer at age 2 was positively related to reticence at age 4 only if their mothers were intrusive and overprotective or derisive at age 2. Reticence is not identical to, but has been positively associated with, shyness (e.g., Coplan, Rubin, Fox, Calkins, & Stewart, 1994). In addition, for children exhibiting shyness toward a female stranger at 15 months, maternal sensitivity at 15 months predicted less inhibition when beginning kindergarten (Early et al., 2002). Distress to novelty, in concert with low

attentional control, at 6 months has predicted anxious behaviors at 2.5 years for children of insensitive mothers (Crockenberg & Leerkes, 2006). Thus, parenting has been found to moderate the prediction of shyness-related behavior from early temperament.

Findings have not always been consistent with those just discussed. Arcus, Gardner, and Anderson (1992) found that for highly reactive infants, less maternal responsiveness to infant distress (low sensitivity) predicted lower levels of behavioral inhibition in their second year of life. Behavioral inhibition is similar to shyness, but also includes inhibition to novel objects and situations. Park and colleagues reported that for boys (girls were not included in the sample) high in negative emotionality in infancy, maternal intrusiveness was negatively related to toddler-hood inhibition. Fathers' intrusiveness also negatively related to toddler-hood inhibition, but for infants exhibiting either high or low negative emotionality. Furthermore, fathers' sensitivity positively related to toddlerhood inhibition for boys high in negative emotionality in infancy (Park, Belsky, Putnam, & Crnic, 1997).

Inconsistencies in findings that relate parenting to outcomes for fearful children have been interpreted as suggesting that optimal sensitivity is needed for fearful children. Too much protection from or encouragement to explore novel situations might promote fearful temperament. Whereas overprotection might not challenge the child to overcome fear, excessive encouragement could overwhelm the child and lead to withdrawal (e.g., Rothbart & Bates, 2006).

In this study, fearfulness was expected to be positively related to shyness, particularly for children of insensitive mothers. Continuity of shyness also was expected to be strongest for children of insensitive mothers. Although exceptions exist, results from several previously reviewed studies support the notion that maternal sensitivity might modify negative temperaments such that maladjustment is avoided.

There are several reasons that low maternal sensitivity might be particularly harmful for fearful or shy children. First, Kochanska (1995) demonstrated that anxiety- and fear-prone children are particularly influenced by parental socialization practices eliciting optimal arousal levels. Although bold children also can benefit from sensitive parenting (due to its link with secure attachment; see Kochanska, 1995), sensitivity might be especially important for emotion regulation in fearful or shy children. Second and related, children who are fearful or shy are likely in need of well-developed regulatory skills to successfully manage arousal. Insensitive maternal behaviors can stymie the development of self-regulation (e.g., Calkins & Johnson, 1998; NICHD Early Child Care Research Network, 2004) and lead to increased negative emotion when the child faces challenges in the future (Spinrad, Stifter, Donelan-McCall, & Turner, 2004). Unregulated negative affect or arousal in social situations is likely to lead to withdrawal (Eisenberg et al., 1998). Third, maternal intrusiveness can overarouse fearful or shy children, leading to withdrawal during mother–child interactions. Researchers have argued that the relief of negative arousal resulting from withdrawal is reinforcing and encourages withdrawal in the future (e.g., Kerr, 2000). Fourth, fear activates the attachment system; thus, sensitivity, which fosters secure attachment, might be particularly important for fear-prone children (e.g., Ainsworth, 1979).

SEX DIFFERENCES

Parental reactions to children's fear and shyness might differ by the child's sex (e.g., Mills & Rubin, 1990). A potential reason for this is that fear and shyness are more compatible with feminine than masculine gender roles. Mothers have been found to be less accepting of their shy boys and more affectionate toward their shy daughters (e.g., Radke-Yarrow, Richters, & Wilson, 1988). For example, shy girls have more positive or sensitive interactions with their mothers than shy boys (Engfer, 1993; Stevenson-Hinde, 1989). In

contrast, Stevenson-Hinde and Glover (1996) found that mothers had more positive interactions with extremely, as opposed to moderately, shy boys than girls, perhaps due to maternal protectiveness. Shyness has been related to maternal overprotectiveness for boys, but not girls (Coplan et al., 2004).

It also is possible that the relation between early fearfulness or shyness and later shyness differs by child sex. In a study in which constructs similar to those in this study were examined, Henderson, Fox, and Rubin (2001) found that mother-reported negative reactivity (a composite of temperamental fearfulness and distress to limitations) at 9 months positively predicted social wariness (a composite of observed reticence and maternally rated shyness) at age 4 for boys, but not girls. They suggested that a potential mechanism by which this occurs is differential maternal treatment toward sons versus daughters.

THIS STUDY

In this study, we examined the relations of children's shyness, children's fearfulness, and maternal sensitivity. Shyness was expected to be moderately stable. We hypothesized that fearfulness would be positively associated with shyness, but would become less associated with age. Theoretical reasons for maternal sensitivity and sex moderating the relation between fear and later shyness also often hold for moderation of the continuity of shyness. Thus, we predicted the positive relation of 18-month fearfulness, as well as 18-month shyness, with 30-month shyness would be stronger for children of insensitive than sensitive mothers. Moreover, mothers might respond more negatively to boys' fearful or shy behavior compared to girls' (e.g., Stevenson-Hinde, 1989). Thus, children's sex was examined as a moderator in the prediction of 30-month shyness from the interaction of 18-month fearfulness and sensitivity, as well as from the interaction of 18-month shyness and sensitivity. Finally, due to conceptual overlap in fearfulness and shyness, we examined prediction of 30-month shyness from residual scores of 18-month fearfulness and shyness in which overlapping variance was removed. These analyses allowed us to test whether fear or shyness, when examined independent of each other (e.g., the part of 18-month fear that was unrelated to 18-month shyness), related to later shyness, and whether potential relations were moderated by sensitivity or sex.

Caregivers' reports of children's temperament supplemented mothers' reports. Caregivers and mothers might observe children in somewhat differing contexts (e.g., at day care with many other children or with family members in the home). Children's behavior, including shyness, has been found to differ in meaningful ways across contexts (e.g., Asendorpf, 1990b).

METHOD

Sample

Families were recruited from three hospitals in a metropolitan area. To be eligible, the following criteria had to be met: The baby was full term with no serious medical conditions, parents were over 18, and the family expected to live in the area for at least 2 years. Assenting parents were asked to complete questionnaires and to bring their child to a laboratory visit when the child was 18 and 30 months old (Time 1 and Time 2). In addition, parents were asked at Time 1 and Time 2 to provide the name of a person who cared for the child in any capacity and who knew the child well. The amount of time spent with the child was allowed to vary. If the child did not have a nonrelated caregiver, a relative who was a caregiver was used.

At Time 1, most children were Caucasian (73%) or Hispanic (13%). African American (3%), Asian (1%), and Native American (2%) children were represented. The median education completed by parents was some college or 2-year degree (range: eighth grade to PhD, JD, or MD). Median reported income was $45,000 to $65,000 per year (range: < $15,000 to $100,000+).

At Time 1, 256 families (55% boys) participated in the lab visit ($n = 247$; M age = 17.79 months, $SD = .52$, range = 16.83–19.97) or by mail ($n = 9$). At Time 2, 230 families (56% boys) participated in the lab visit ($n = 216$; M age = 29.77 months, $SD = .65$, range = 27.20–31.97) or by mail ($n = 14$). Nonparental caregivers completed questionnaires ($n = 176$ for Time 1 and 153 for Time 2). Maternal behaviors were observed during lab visits; thus, families who did not participate in at least one visit were excluded from analyses ($n = 252$; 56% boys).

Thirty-three families participating at Time 1 did not participate at Time 2. In assessing differences between continuing and attrited families, a conservative alpha level was employed ($p < .20$). Parents of attrited families were younger at the time of the child's birth (Ms in years = 25.71 for mothers, 27.25 for fathers) than parents participating at Time 1 and Time 2 (Ms in years = 29.61 and 31.57), $ts(243, 236) = 3.55$ and 3.85, $ps < .01$, for mothers and fathers. Mothers participating at Time 1, but not Time 2, were less educated ($M = 3.68$, reported as 1 = *grade school completion,* 2 = *some high school,* 3 = *high school graduate,* 4 = *some college,* 5 = *4-year college graduate,* 6 = *master's degree,* and 7 = *PhD, JD, or MD*) than mothers participating in both Time 1 and Time 2 ($M = 4.36$), $t(238) = 3.25$, $p < .01$. Attrited families had lower incomes ($M = 3.44$, reported as 1 = *less than $15,000,* 2 = *$15,000–$42,000,* 3 = *$42,000–$45,000,* 4 = *$45,000–$60,000,* 5 = *$60,000–$75,000,* 6 = *$75,000–$100,000,* and 7 = *over $100,000*) than families participating at both Time 1 and Time 2 ($M = 4.16$), $t(226) = 1.98$, $p < .05$. No other differences were found in demographics or study constructs between families who did or did not remain in the study at Time 2.

Procedure

An undergraduate experimenter escorted the mother and child into the testing room and began the first task. A second undergraduate was the experimenter for subsequent tasks. During tasks that did not require her participation, the mother was encouraged to fill out questionnaires and remained in the testing room. Lab visits lasted approximately 1.5 hr. With parental consent, caregivers were mailed questionnaires. Families received payment for the lab visit and for completion of questionnaires. Caregivers were paid for completing questionnaires.

Measures

At Time 1 and Time 2, mothers and caregivers rated children's shyness (1 = *never* to 7 = *always* or *does not apply*) on the 12-item ECBQ shyness scale (e.g., When approaching unfamiliar children playing, how often did your child watch rather than join in?; Putnam et al., 2006; αs for mothers and caregivers = .88 and .83 at Time 1; .89 and .87 at Time 2). We did not combine mother- and caregiver-reported shyness because numerous children did not have caregiver reports and mothers and caregivers observe children in different contexts.

At Time 1 and Time 2, mothers and caregivers also rated (1 = *never* to 7 = *always* or *does not apply*) children's fearfulness on the 11-item ECBQ fear scale (Time 1 αs = .74 and .83; Time 2 αs = .74 and .80, respectively). Items tap negative affect in response to nonsocial stimuli (e.g., While at home, how often did your child show fear at a loud sound [blender, vacuum cleaner, etc.]).

For observed data of fearfulness and maternal behaviors, a main coder coded all, and a reliability coder coded at least 20%, of the participants from a task. Coders were trained undergraduate or graduate students who were blind to other data. Pearson correlations or kappas were calculated weekly to assess interrater reliability and prevent drift.

Fearfulness also was observed during a "jumping" spider task at Time 1 and Time 2 (Goldsmith, Reilly, Lemery, Longley, & Prescott, 1993). The experimenter coaxed the child to approach and touch a toy spider and made the spider jump when the child's hand was close to the spider (maximum of four trials). The child's proximity to mother was rated every 5 sec (1 = *not close to mother;* 2 = *moved toward mother;* 3 = *touched mother*), interrater rs(71, 67) = .95 at Time 1 and .98 at Time 2. Approach behaviors (moving, pointing, or reaching toward spider) were coded as absent or present every 5 sec, κ = .82 at Time 1 and κ = .77 at Time 2. The total number of times the child touched the spider was coded (0 = *none,* 1 = *1 or 2,* 2 = *3 or 4*), interrater rs(71, 67) = .96 at Time 1 and .95 at Time 2. Latency to touch the spider was coded in seconds, interrater rs(71, 67) = .99 at Time 1 and 1.00 at Time 2. Fearful behaviors (proximity to mother, approach [reversed], frequency of touching the spider [reversed], and latency to touch) were correlated, range of rs(243, 243) = .45 to .83, ps < .01 at Time 1, and rs(213, 214) = .30 to .78, ps < .01 at Time 2. Ratings were standardized and averaged (αs = .86 for Time 1 and .81 for Time 2) to form composites of observed fear.

Mothers' behavior was assessed during a 3-min task at Time 1 and Time 2 when mothers taught their children how to assemble puzzles (adapted from Calkins & Johnson, 1998). Mothers' intrusiveness (e.g., not allowing the child to pace the play, intrusive physical manipulations) was rated from 1 (*no intrusive behavior*) to 4 (*extreme intrusive behaviors*) every 30 sec, interrater rs(57, 52) = .82 at Time 1 and .78 at Time 2. In addition, maternal sensitivity (e.g., providing an appropriate level of stimulation, pacing timing to infant's interest and arousal level, acknowledging and responding to child's affect, and contingent vocalizations) was rated ranging from 1 (*no evidence of sensitivity*) to 4 (*mother is very aware of the infant and contingently responsive to his or her interests and affect*) every 30 sec, interrater rs(57, 52) = .82 at Time 1 and .81 at Time 2.

Intrusiveness (reversed) and sensitivity were related, rs(244, 214) = .76 at Time 1 and .77 at Time 2, ps < .01, and were averaged to form composites of sensitivity (αs = .86 at Time 1 and .84 at Time 2). The Time 2 composite had excessive skew and kurtosis, and was reflected (i.e., each score was subtracted from the largest score in the distribution plus 1), square-root transformed, and multiplied by −1 (Tabachnick & Fidell, 2007). The resulting skew = −2.26 and kurtosis = 5.51.

RESULTS

Means, standard deviations, and sex differences are presented in Table 1. Mothers rated children as more fearful than did caregivers, ts(126, 113) = 2.04 and 3.81, ps < .05 and .01, at Time 1 and Time 2.

Shyness Across Time and Its Correlations With Fearfulness

Correlations between Time 1 and Time 2 shyness were rs(189, 86) = .47 and .43, ps < .01, for mothers' and caregivers' reports, respectively (Table 2). Correlations between fear and shyness, and sex differences in the relations, are presented in Table 3. Fear was positively related with shyness, but more consistently at Time 1 (5 of 6 relations were significant) than Time 2 (3 of 6 relations were significant, all among adults' reports). From Time 1 to Time 2, 8 of 12 relations were significant.

Moderated Relations for Fearfulness or Shyness, Sensitivity, and Sex Predicting Shyness

Correlations between maternal sensitivity and shyness were examined, but are not reported. The number of significant correlations was fewer than expected by chance.

Regressions were used to examine the moderating role of maternal sensitivity and children's sex in the relation of children's Time 1 fearfulness to Time 2 shyness. In a separate set of regressions, the moderating role of maternal sensitivity and sex was examined in the relation of Time 1 and Time 2 shyness. Shyness and fear were from the same reporter within a given regression to reduce the number of analyses. Continuous predictors of shyness were mean centered and sex was weighted as a function of group size (Cohen, Cohen, West, & Aiken, 2003). Covariates (Time 1 shyness or fear, depending on the regression) and predictors of Time 2 shyness (Time 1 fear or shyness [depending on the regression], sex, maternal sensitivity, and their two- and three-way interactions; thus, Time 1 shyness and fear were always in regressions) were entered into hierarchical regressions (see Table 4; note that analogous regressions were computed for caregivers' reports).

Significant three-way interactions were probed by computing simple slopes of Time 2 shyness regressed on either Time 1 fear or Time 1 shyness 1 *SD* above the mean, at the mean, and 1 *SD* below the mean of sensitivity for boys and also for girls (Cohen et al., 2003). Unstandardized betas are reported for simple slopes to facilitate comparison between sexes.

Both regressions computed for Time 2 mother-reported shyness contained a significant three-way interaction term (see Table 4). Within Regression 1, the three-way interaction of Time 1 Mother-Reported Fearfulness × Time 1 Sensitivity × Sex was significant. Simple slope analyses suggested that Time 1 fear was unrelated to Time 2 shyness for sons of sensitive mothers. However, boys' fear was positively related to shyness when mothers exhibited average or low sensitivity, *b*s = .30 and .52, *p*s < .05 and .01, respectively. Simple slope analyses suggested girls' fear and shyness were not significantly related when mothers were sensitive, average, or insensitive (see Figure 1).

Within Regression 2, the three-way interaction of Time 1 Mother-Reported Shyness × Time 1 Sensitivity × Sex was significant. In simple slope analyses, Time 1 shyness was positively related to Time 2 shyness for sons of sensitive, average, or insensitive mothers, *b*s = .33, .47, and .62, *p*s < .05, .01, and .01, respectively. Time 1 shyness was related positively to Time 2 shyness for daughters of sensitive or average mothers, *b*s = .54 and .29, *p*s < .01 and .05, respectively. Time 1 shyness was not significantly related to Time 2 shyness for daughters of insensitive mothers (Figure 2).

Thus, the positive association between mother-reported Time 1 fearfulness or shyness and Time 2 shyness was largest in magnitude for sons of insensitive mothers and somewhat weaker for sons of mothers who were average in sensitivity. Time 1 and Time 2 shyness, but not Time 1 fear and Time 2 shyness, were positively related for sons of sensitive mothers, but the relation was weaker than that for sons of average or insensitive mothers. The association between mother-reported fearfulness and shyness was not significant for daughters of sensitive, average, or insensitive mothers, but the positive relation between Time 1 and Time 2 shyness was significant for daughters of sensitive mothers.

In contrast to regressions in which mother-reported shyness was predicted, neither of the regressions for Time 2 caregiver-reported shyness contained a significant three-way interaction term. We refer to these regressions as Regressions 3 and 4 for clarity, although composition and results of the regressions are not presented in a table. In the regression in which the first-order and interactive effects of Time 1 caregiver-reported fearfulness, Time 1

sensitivity, and sex (Time 1 shyness was covaried) were examined (Regression 3), only Step 1 was significant, R^2 change = .19, F change $(1, 76) = 18.04$, $p < .01$. Within this step, Time 1 caregiver-reported shyness (the covariate) predicted Time 2 shyness, unstandardized $b = .42$, standardized $B = .44$, $p < .01$. In the regression in which the first-order and interactive effects of Time 1 caregiver-reported shyness, Time 1 sensitivity, and sex (Time 1 fearfulness was covaried) were examined (Regression 4), Steps 1 and 2 were significant. Within Step 2, R^2 change = .13, F change $(3, 73) = 4.10$, $p < .01$, only Time 1 caregiver-reported shyness (unstandardized $b = .34$, standardized $B = .36$, $p < .01$) predicted Time 2 shyness. Thus, Time 1 shyness appeared to be the primary predictor of Time 2 shyness for caregivers' reports.

Mother-reported fearfulness and shyness at Time 1 were correlated, $r(216) = .47$, $p < .01$. Given this correlation, the conceptual overlap in fearfulness and shyness, and the similar patterns obtained when examining the prediction of Time 2 shyness from the three-way interactions of Time 1 Fearfulness × Time 1 Sensitivity × Sex and Time 1 Shyness × Time 1 Sensitivity × Sex, it is informative to establish if sensitivity and sex interacted with fearfulness because fear was correlated with shyness. In other words, we examined whether fear interacted with sensitivity and sex when the portion of variance that is related to Time 1 shyness was removed from Time 1 fearfulness. In a similar manner, it is informative to examine if shyness interacts with sensitivity and sex to predict later shyness when using the part of Time 1 shyness that is not related to Time 1 fearfulness. Thus, four additional regressions were conducted. Two residual fearfulness scores (one for mothers' and one for caregivers' reports) were computed by predicting Time 1 fear from Time 1 shyness and saving the residual scores; in a similar manner, two residual Time 1 shyness scores were computed to provide an index of shyness that was independent of Time 1 fear. Regressions involving residual scores were computed in the same manner as the previous regressions; however, residual fearfulness was used in place of fearfulness and residual shyness was used in place of shyness as predictors.

When Time 2 mother-reported shyness was regressed on Time 1 mother-reported residual fear, Time 1 sensitivity, sex, and corresponding two- and three-way interactions (using residual fear to compute the interactions; Regression 5), Time 1 mother-reported residual fearfulness continued to interact with sex and maternal sensitivity when Time 1 shyness was covaried (unstandardized $b = -1.03$, standardized $B = -.14$, $p = .05$), Step 4 R^2 change = .02, F change $(1, 177) = 3.81$, $p = .05$. Simple slope analyses suggested that Time 1 residual fear was unrelated to Time 2 shyness for sons of sensitive mothers. However, boys' residual fear was positively related to Time 2 shyness when mothers exhibited average or low sensitivity, bs = .31 and .52, ps < .05 and .01, respectively. Simple slope analyses suggested girls' residual fear and Time 2 shyness were not significantly related when mothers were sensitive, average, or insensitive (no figure is provided because the pattern was very similar to that obtained when fear, rather than residual fear, was used; Figure 1). When Time 1 shyness was not covaried, results from the overall analyses were very similar (unstandardized $b = -1.23$, standardized $B = -.17$, $p < .05$), Step 3 R^2 change = .02, F change $(1, 178) = 4.28$, $p < .05$, and simple slope analyses suggested the same pattern as when Time 1 shyness was covaried.

When Time 2 caregiver-reported shyness was regressed on Time 1 caregiver-reported residual fear, Time 1 sensitivity, sex, and corresponding two- and three-way interactions (Regression 6), only Step 1 was significant, R^2 change = .19, F change $(1, 76) = 18.04$, $p < .01$. Time 1 covaried caregiver-reported shyness positively predicted Time 2 shyness, unstandardized $b = .42$, standardized $B = .44$, $p < .01$. When T1 shyness was not covaried, none of the three steps was significant.

It also was of interest to determine if the part of Time 1 shyness that was independent of Time 1 fear would predict Time 2 shyness. When Time 2 mother-reported shyness was regressed on Time 1 mother-reported residual shyness, Time 1 sensitivity, sex, and corresponding two- and three-way interactions (Regression 7), only Step 1 was significant, R^2 change = .16, F change (3, 182) = 11.13, $p < .01$. Time 1 mother-reported residual shyness (unstandardized $b = .40$, standardized $B = .34$, $p < .01$), and child's sex (unstandardized $b = -.34$, standardized $B = -.17$, $p < .05$) predicted Time 2 shyness. When Time 2 caregiver-reported shyness was regressed on Time 1 caregiver-reported residual shyness, Time 1 sensitivity, sex, and corresponding two- and three-way interactions (Regression 8), only Step 1 was significant, R^2 change = .15, F change (3, 74) = 4.35, $p < .01$. Time 1 caregiver-reported residual shyness (unstandardized $b = .35$, standardized $B = .30$, $p < .01$) significantly predicted Time 2 shyness. In sum, the portion of Time 1 mother- and caregiver-reported shyness that was independent of Time 1 fearfulness was positively related to Time 2 mother- and caregiver-reported shyness, respectively. In addition, girls were higher in Time 2 mother-reported shyness.

DISCUSSION

Aims of this study included examining the relations of fearfulness and shyness within and across 18 and 30 months of age, as well as the stability of shyness. In addition, we tested the moderating role of maternal sensitivity at 18 months and sex in the relation between 18-month fearfulness and 30-month shyness, as well as in the relation between 18- and 30-month shyness.

Previous research might suggest that fear and shyness begin to differentiate in toddlerhood (e.g., Putnam et al., 2006; Rothbart et al., 2001). In earlier studies, this was not longitudinally examined. We hypothesized that fearfulness would positively relate to shyness within and across time, and that the strength of the correlation would decrease with age. The pattern of correlations generally supported this hypothesis. Nearly all of the possible relations between indexes of fear and shyness were significant within 18 months, but some relations were no longer significant within 30 months. Specifically, observed fear was not related to shyness at 30 months. This result can be taken as evidence for differentiation over time.

Normative developmental processes (e.g., physiology, cognition) might play a role in distinguishing fear and shyness. For example, effortful control, which emerges in infancy and continues to develop through the preschool years and beyond (e.g., Kochanska et al., 2000), enables attention to be voluntarily directed away from threatening stimuli and toward nonthreatening stimuli, which should reduce fear (Derryberry & Rothbart, 1997). Thus, toddlers have a new resource to deal with fear in social situations other than withdrawal.

In addition, it is possible that external factors influence shyness. For example, children might have negative social experiences, which could produce ambivalence toward approaching others. Social failure has predicted shyness in the classroom (Asendorpf, 1990b). Conversely, positive social experiences can diminish shyness. For instance, as children age and have additional exposure to strangers, children might learn that strangers are not dangerous and do not warrant fear. However, it is possible that the weaker association between fear and shyness at 30 months when compared to 18 months was a function of measurement. The spider task might not be as powerful an index of fear at 30 compared to 18 months of age.

Similar to previous reports (e.g., Sanson et al., 1996), shyness was modestly to moderately stable. This was true despite the fact that caregivers often were not the same across time (83

children had the same caregiver reporter at 18 and 30 months). Moreover, early shyness predicted later shyness even when early shyness was differentiated from early fear (residual scores). Thus, the continuity in shyness was not primarily based on continuity of fearfulness.

Consistent with some prior work, the number of correlations between maternal behavior and shyness was not greater than would be expected by chance (e.g., Rubin et al., 1997). However, sensitivity was involved in some moderated effects. We predicted that the positive relations between 18-month fearfulness and shyness with 30-month shyness would be the strongest for children of insensitive mothers. Sensitivity is thought to foster regulatory skills, independence, and secure attachment (e.g., Kochanska et al., 2000; Mills & Rubin, 1993), which might be particularly important for fearful and shy children. For mothers' reports, the prediction regarding fearfulness and shyness was true for boys. In contrast, fear and shyness were not significantly related for daughters of sensitive, average, or insensitive mothers; however, girls' mother-reported 18-month fear and 30-month shyness were modestly but significantly related in the correlations. In addition, shyness was most stable for sons of insensitive mothers. For girls, however, shyness was most stable when mothers were sensitive.

Some researchers have argued that sensitive parenting does not challenge children prone to shyness or negative reactivity, and have found that low sensitivity related to less inhibition for emotionally negative infants (Park et al., 1997) and that highly reactive infants were less inhibited if mothers were unresponsive to their distress (Arcus et al., 1992). This explanation is somewhat consistent with the finding that shyness demonstrated stability for daughters of sensitive mothers; however, Park and colleagues' (1997) sample was comprised of boys. Mothers have been found to be more supportive of girls' than boys' shy behavior (e.g., Stevenson-Hinde, 1989). In this study, shy girls had mothers with significantly higher sensitivity than shy boys at 30 months. Thus, mothers might be particularly unlikely to challenge their girls to overcome shyness.

We do not know why our findings differed from those of Park et al. (1997) and Arcus et al. (1992) in regard to sex-related findings. A potential reason for this is that our measures differed. For instance, Arcus et al. measured parenting in response to infant distress, unlike this study. In addition, parenting was observed in the home in Park et al.'s study.

An important contribution of the study was examining the utility and limits of fear as a predictor of shyness, particularly because the conceptual and empirical boundaries between fear and shyness often have been blurred in the literature. When the part of 18-month fearfulness that was related to 18-month shyness was removed, sex and sensitivity continued to moderate the relation between mother-reported 18-month fear and 30-month shyness. This suggests that mothers react to children's fearfulness or to children possessing fearful shyness, and react more negatively when boys exhibit this behavior. Alternatively, boys who were fearful or fearfully shy might have been especially reactive to mothers' insensitivity. Indeed, Kochanska (e.g., 1995) has found anxiety- and fear-prone children to be susceptible to socialization.

In contrast, moderation did not occur for the prediction of 30-month shyness from 18-month shyness that was independent of 18-month fear. Thus, mothers' interactions with their children did not differ when mothers observed shyness that was unrelated to fear; nonetheless, 18-month (residual) shyness positively related to 30-month shyness when examining mothers' and caregivers' reports. It is possible that the shyness independent of fear might be akin to social disinterest (e.g., Coplan et al., 2004). The children are hesitant to interact with others; however, this hesitancy is due to lack of interest or motivation to interact. Shyness independent of fear also might tap self-conscious shyness. The children in

the sample were young, but 18-month-olds appear to understand social rules for appearance and express self-conscious emotions (e.g., Kagan, 1981; Lewis, 1991). It is possible that children who were rated as shy at 18 months developed stronger shyness or a different kind of shyness by 30 months of age.

Relations between caregiver-reported 18-month shyness or fear and 30-month shyness were not moderated by sex or sensitivity. This could have been due to care-givers being a heterogeneous group of people (e.g., grandmothers, day care providers) who observed the children in potentially differing contexts and for differing periods of time. In addition, the power to detect interactions was lower because fewer caregiver reports were obtained than mother reports.

It should be noted that zero-order correlations between fearfulness and shyness occasionally differed significantly by sex, such that relations were stronger for boys than girls (8% of the time; 2 of 24 correlations). Although the sex differences rarely occurred, they were consistent with previous research in which mothers' reports of children's negative reactivity positively predicted social wariness for boys, but not girls (Henderson et al., 2001). Henderson and colleagues surmised that the sex difference might have been due to differing treatment from caregivers toward withdrawn and highly reactive boys and girls. In this study, mothers exhibited lower, albeit not significantly lower, mean-level sensitivity toward boys than girls with high (at least 1 SD above their respective sex's mean) mother-reported fearfulness at each time point. In addition, mothers were significantly less sensitive with boys ($M = 2.46$) than girls ($M = 2.56$) with high (at least 1 SD above the mean) 30-month mother-reported shyness, $t(32) = -2.23$, $p < .05$. Thus, mothers tended to respond more negatively to shy boys than shy girls and slightly (not significantly) more negatively to fearful boys than fearful girls.

In conclusion, the data allowed for a more accurate depiction of the development of shyness than cross-sectional data provide; however, the study was constrained by several limitations. The sample was moderately homogeneous with respect to socioeconomic status. This might limit the generalizability of results. Moreover, the sample was not selected for shyness, which can be viewed as a strength or weakness. Including children from the middle of the shyness distribution might accurately depict shyness if one views it as a continuum. On the other hand, if one views shyness as categorical, including moderately shy children is of little utility for understanding shyness. In addition, the study could have benefited from observation of maternal reactions to shy or fearful behavior. Parent behaviors occurring in shyness- or fear-evoking situations (e.g., encouraging a child to greet a stranger) might have a stronger influence on shyness or the relation between fearfulness and shyness than general parenting.

This was the first study to assess the relations of fearfulness and shyness longitudinally and to examine the interaction of 18-month fear or shyness, 18-month sensitivity, and sex when predicting shyness at 30 months of age. The study contributed to the literature by examining the relation of fearfulness and shyness within a longitudinal design in which earlier levels of shyness were controlled. Earlier fear or shyness and later shyness appear to be positively associated, especially for sons of insensitive mothers, although earlier and later shyness were positively related for boys of sensitive mothers. For girls, continuity of shyness was strongest when mothers were sensitive. When 18-month fear was examined independent of concurrent shyness, fear continued to interact with sex and sensitivity in the prediction of later shyness. In contrast, when 18-month shyness was examined independent of concurrent fear, 18-month shyness positively predicted 30-month shyness, but did not interact with sex and sensitivity. Thus, it appeared that it was fearfulness or fearful shyness that interacted with maternal sensitivity when predicting shyness over time.

Acknowledgments

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FIGURE 1.
Simple slopes for Time 1 Mother-Reported Fear × Time 1 Maternal Sensitivity predicting
Time 2 mother-reported shyness for boys (left panel) and girls (right panel).
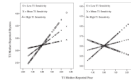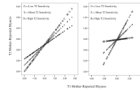
FIGURE 2.
Simple slopes for Time 1 Mother-Reported Shyness × Time 1 Maternal Sensitivity
predicting Time 2 mother-reported shyness for boys (left panel) and girls (right panel).

TABLE 1

Means and Standard Deviations of Study Variables

Study Variable	Time 1		Time 2	
	M	*SD*	*M*	*SD*
Mother-reported shyness	3.30	1.03	3.31[b]	1.03
Caregiver-reported shyness	3.19	1.10	3.21[c]	1.09
Mother-reported fear	2.44[a]	.84	2.61	.84
Caregiver-reported fear	2.28	.86	2.19	.81
Spider proximity to mother	1.52	.63	1.30	.51
Spider approach	.27	.22	.29	.28
Spider number of touches	1.18	.83	1.36	.70
Spider latency to first touch	46.73	48.53	24.26	39.71
Maternal intrusiveness	1.19	.31	1.10	.22
Maternal sensitivity	3.59	.47	3.77[d]	.36
Composite sensitivity	2.39	.37	2.44	.27

[a] Sex difference: $t(226) = -2.29$, $p < .05$, $M = 2.32$ for boys and $M = 2.57$ for girls.

[b] Sex difference: $t(213) = -3.15$, $p < .01$, $M = 3.10$ for boys and $M = 3.54$ for girls.

[c] Sex difference: $t(119) = -2.40$, $p < .05$, $M = 2.99$ for boys and $M = 3.45$ for girls.

[d] Sex difference: $t(213.96) = -2.14$, $p < .05$, $M = 3.73$ for boys and $M = 3.83$ for girls.

TABLE 2

Correlations Within Measures of Children's Shyness and Fearfulness

	Time 1 M	Time 1 C	Time 1 O	Time 2 M	Time 2 C
Time 1 M	—	.25***	—	.47***	.19**
Time 1 C	.20**	—	—	.26***	.43***
Time 1 O	.05	.13	—	—	—
Time 2 M	.63***	.22**	.09	—	.34***
Time 2 C	.13	.56***	.16*	.23**	—
Time 2 O	.22***	.07	.06	.18***	.10

Note. Correlations among indexes of shyness are presented on the upper diagonal and correlations among indexes of fearfulness are presented on the lower diagonal. Degrees of freedom ranged from 85 to 217. M = mother-reported; C = caregiver-reported; O = observed.

*
$p < .10$.

**
$p < .05$.

***
$p < .01$.

TABLE 3

Correlations Among Measures of Children's Fear and Shyness

Fear	Shyness			
	Time 1 M	**Time 1 C**	**Time 2 M**	**Time 2 C**
Time 1 M	.47***	.28***	.38***a	.14
Time 1 C	.12	.55***	.23**	.33***
Time 1 O	.19***	.21**	.20***	−.07
Time 2 M	.32***	.26***	.43***	.16*
Time 2 C	.10	.34***	.26***	.44***b
Time 2 O	.19***	−.02	−.01	−.04

Note. Degrees of freedom ranged from 82 to 223. M = mother-reported; C = caregiver-reported; O = observed.

[a]Sex difference: $z = 2.02$, $p < .05$, $r(100) = .48$, $p < .01$ for boys and $r(85) = .22$, $p < .05$ for girls.

[b]Sex difference: $z = 2.40$, $p < .05$, $r(55) = .61$, $p < .01$ for boys and $r(46) = .22$, $p = ns$ for girls.

[*]$p < .10$.

[**]$p < .05$.

[***]$p < .01$.

TABLE 4

Time 2 Mother-Reported Shyness Regressed on Time 1 Fear or Shyness, Time 1 Sensitivity, and Sex

	Regression 1		Regression 2	
	Time 1 Predictor	Un. b/Std. B	Time 1 Predictor	Un. b/Std. B
Step 1 (covariate)	M shy	.50/.49***	M fear	.44/.37***
Step 2	M shy	.40/.39***	M fear	.19/.16**
	M fear	.19/.16**	M shy	.40/.39***
	Sensitivity	.13/.05	Sensitivity	.13/.05
	Sex	−.27/−.13**	Sex	−.27/−.13**
Step 3	M shy	.39/.38***	M fear	.19/.16**
	M fear	.21/.17**	M shy	.40/.40***
	Sensitivity	.13/.05	Sensitivity	.15/.05
	Sex	−.27/−.13**	Sex	−.27/−.13**
	M Fear × Sensitivity	.05/.02	M Shy × Sensitivity	.003/.001
	M Fear × Sex	.30/.13**	M Shy × Sex	.22/.11*
	Sex × Sensitivity	.12/.02	Sex × Sensitivity	.04/.01
Step 4	M shy	.38/.38***	M fear	.18/.15**
	M fear	.21/.18**	M shy	.40/.40***
	Sensitivity	.07/.03	Sensitivity	.13/.05
	Sex	−.29/−.14**	Sex	−.24/−.12*
	M Fear × Sensitivity	−.14/−.04	M Shy × Sensitivity	.04/.01
	M Fear × Sex	.30/.13**	M Shy × Sex	.28/.13**
	Sex × Sensitivity	.12/.02	Sex × Sensitivity	−.14/−.02
	M Fear × Sensitivity × Sex	−1.08/−.16**	M Shy × Sensitivity × Sex	−1.10/−.15**

Note. M = mother-reported; Un = unstandardized; Std. = standardized. Regression 1: Step 1 $R^2\Delta = .24$, $F\Delta(1, 184) = 58.87$***; Step 2 $R^2\Delta = .04$, $F\Delta(3, 181) = 3.40$**; Step 3 $R^2\Delta = .02$, $F\Delta(3, 178) = 1.39$; Step 4 $R^2\Delta = .02$, $F\Delta(1,177) = 5.89$**. Regression 2: Step 1 $R^2\Delta = .14$, $F\Delta(1, 184) = 29.89$***; Step 2 $R^2\Delta = .14$, $F\Delta(3, 181) = 12.04$***; Step 3 $R^2\Delta = .01$, $F\Delta(3, 178) = .99$; Step 4 $R^2\Delta = .02$, $F\Delta(1, 177) = 5.62$**.

*
$p < .10$.

**
$p < .05$.

***
$p < .01$.