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Gender Moderates the Progression from Fearful Temperament to Social Withdrawal through Protective Parenting

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Abstract

Child gender may exert its influence on development, not as a main effect, but as a moderator among predictors and outcomes. We examined this notion in relations among toddler fearful temperament, maternal protective parenting, maternal accuracy in predicting toddler distress to novelty, and child social withdrawal. In two multi-method, longitudinal studies of toddlers (24 months at Time 1; n s = 93 and 117, respectively) and their mothers, few main effect gender differences occurred. Moderation existed in both studies: only for highly accurate mothers of boys, fearful temperament related to protective parenting, which then predicted later social withdrawal. Thus, studying only main-effect gender differences may obscure important differences in how boys and girls develop from fearful temperament to later social withdrawal.

The literature provides consistent gender differences favoring girls in anxiety starting in adolescence and remaining into adulthood (Albano & Krain, 2005). However, the processes involved in this difference, and whether they are developmental, remain unknown. Clarifying processes involving gender differences is necessary for refining theories of development and psychopathology, the promotion of optimal development in both boys and girls, and the development of gender-sensitive intervention strategies (Bell, Foster, & Mash, 2005). This would be particularly beneficial early in development, when children at risk for anxiety may exhibit social withdrawal, in order to inform prevention efforts. Gender could exert its influence as a main effect on individual characteristics (e.g., fearful temperament or social withdrawal), environmental risk (e.g., protective parenting), or known moderators of their association (e.g., maternal accuracy in anticipating toddler distress to novelty). However, gender may have a more complex role, such as moderating inter-relations among temperament, accuracy, protective parenting, and social withdrawal (Figure 1). To this end, in two longitudinal, multi-method studies, we investigated gender differences as a main effect on these variables, as well as a moderator of both maternal accuracy's interaction with

fearful temperament in relation to protective parenting (i.e., a three-way interaction) and the relation between protective parenting and children's social withdrawal.

Toddler and Mother Characteristics Predicting Social Withdrawal

Fearful temperament (e.g., behavioral inhibition; Kagan, Reznick, Clarke, Snidman, & Garcia-Coll, 1984) is the biologically-based tendency to react to novelty with reluctance, avoidance, and withdrawal, emerging in early development. Rubin, Coplan, and Bowker (2009) have suggested that social withdrawal be considered a superordinate term that encapsulates shyness/social inhibition (wariness elicited by social unfamiliarity or subjective social evaluation; e.g., Asendorpf, 1991), social reticence (onlooking, hovering, and/or unoccupied behavior with unfamiliar peers; e.g., Coplan et al., 1994) and anxious solitude (wariness with familiar peers; e.g., Gazelle & Ladd, 2003). We use this umbrella term of social withdrawal to refer to these related constructs.

Fearful temperament and social withdrawal may be conceptualized as earlier and later, respectively, manifestations of a developmental progression of anxiety-based behavioral patterns, with both constructs predicting later anxiety (Rubin et al., 2009; Hudson, Dodd, & Bovopoulos, 2011). Children who appear to be most at risk for anxiety outcomes are those who display stability in these constructs across childhood (Prior, Smart, Sanson, & Oberklaid, 2000), suggesting the significance of understanding both how and when fearful temperament predicts social withdrawal.

Protection, or overprotection, has been associated with risk for social withdrawal and anxiety (e.g., Rubin, Burgess, & Hastings, 2002). Protective behaviors remove or shield children from stress and may also include high levels of warmth and comforting that prevent children from coping with their emotions directly and independently (see Kiel & Buss, 2010; "oversolicitousness" in Rubin et al., 2002). Although comforting and warmth typically relate to adaptive development, for children with higher levels of fearful temperament, protective behavior (including warmth and comforting) in situations in which children have the opportunity to develop regulation skills and mastery is linked to anxiety-spectrum outcomes (Edwards, Rapee, & Kennedy, 2010; Hudson & Rapee, 2004). For fearful children, protection shields children from stress, reinforces avoidance, and prevents learning that a feared stimulus is safe (Hudson & Rapee, 2004). This is particularly problematic for temperamentally fearful children, who may more readily incorporate messages of threat (Muris, Meesters, & Merckelbach, 1996). Temperamentally fearful toddlers may influence their own caregiving by evoking distress or anxiety from parents, particularly in novel situations (Hastings & Rubin, 1999; Rubin, Nelson, Hastings & Asendorpf, 1999). Indeed, fearful temperament has been shown to predict protection and related parenting behaviors, which then predict anxiety-spectrum outcomes like social withdrawal (Edwards et al., 2010; Kiel & Buss, 2012).

Certainly, not all mothers respond to their fearful children with protective behavior, and maternal characteristics may determine when this association occurs. Mothers' cognitive characteristics (e.g., perceptions of, beliefs about, and expectations for their children's temperament) strengthen the relation between temperament and mothers' behavioral

responses (Hastings & Rubin, 1999). Within this realm is the construct of maternal accuracy, or the extent to which mothers correctly anticipate their children's distress in impending situations (*citation blinded*). A mother's anticipation of her child's wariness may prime her to act protectively when encountering novel situations (Hastings & Rubin, 1999; Rubin & Burgess, 2001). Indeed, we have shown empirically that accuracy strengthens the relation between fearful temperament and protective behavior (*citation blinded*). Although accurate attunement to children's emotions may be generally considered adaptive, accuracy may function differently for fear (e.g., mothers have shown higher anticipatory accuracy for fear than other emotions; Kiel & Buss, 2006). Therefore, accuracy is distinct from other constructs like insightfulness, empathic understanding, and mind-mindedness, which do not focus on fear contexts. Although these latter constructs have been related to maternal sensitivity (Coyne, Low, Miller, Seifer, & Dickstein, 2007; Koren-Karie, Oppenheim, Dolev, Sher, & Etzion-Carasso, 2002; Laranjo, Bernier, & Meins, 2008), the behavioral correlates of accuracy for fearful distress have focused on protection and other behaviors that may play a role in an anxious-coercive process that occurs between inhibited/anxiety-prone children and their parents. Thus, maternal accuracy may be an important moderator to consider when examining how gender influences the development of social withdrawal.

The Influence of Gender

Gender differences in later anxiety may exist because boys and girls differ in fearful temperament, social withdrawal, and related variables (e.g., withdrawal, low approach, fear expressions). These differences tend to be small (Sanson, Hemphill, Yagmurlu, & McClowry, 2011) but suggest that girls are more fearful and withdrawn than boys. Girls have been found to be less likely to approach novel stimuli and more likely to exhibit shyness, fearfulness, and inhibition than boys (Gartstein & Rothbart, 2003; Martin, Wisenbaker, Baker, & Huttunen, 1997), although other studies yield non-significant differences (Rubin et al., 2009). Female gender has been found to predict chronic inhibition in preschool to school age children (Essex, Klein, Slattery, Goldsmith, & Kalin, 2010). Kagan (1998) found that girls were more fearful and withdrawn across development than boys, and girls were more stably inhibited over time, although other studies by Kagan and colleagues (e.g., Kagan, Snidman, & Arcus, 1998) and others (Zhengyan, Huichang, & Xinyin, 2003) report similar continuity between genders over early childhood. Recent meta-analyses also indicate a small gender difference for fearfulness favoring girls, especially early in life (Chaplin & Aldao, 2013; Else-Quest, Hyde, Goldsmith, & Van Hulle, 2006).

Child gender may also influence parenting and maternal characteristics. Most studies have not found gender differences in maternal protective parenting or related constructs at the main effect level (McShane & Hastings, 2009; Rubin et al. 1997; 2001). In a study examining maternal accuracy, mothers more accurately predicted fear versus anger for girls but not boys (*citation blinded*), but a direct comparison of accuracy was not reported. Given that gender influences other cognitive characteristics like maternal expectations for and attitudes about fearfulness (Keenan & Shaw, 1997), gender differences in accuracy may occur. It may be expected that mothers are more accurate in predicting distress to novelty for their daughters than their sons, as mothers have been shown to maintain closer proximity to and talk about emotions more often with their daughters than their sons (Fivush, Brotman,

Bucker, & Goodman, 2000), providing increased opportunity for mothers to develop a nuanced understanding of their daughters' emotional reactions.

Gender may play a more complex role in relations among constructs over time. Indeed, focusing on mean-level differences may obscure gender's moderating in relations between predictors and outcomes (Crick & Zahn-Waxler, 2003). Specifically, gender may change the extent to which accuracy moderates the association between fearful temperament and protective parenting, perhaps because parents differentially interpret and respond to the same behavior in boys and girls (Keenan & Shaw, 1997; Rubin et al., 2009; Stevenson-Hinde, 1989). Accuracy may only matter for boys because, when mothers anticipate their boys' fearful behavior and interpret it as problematic (as opposed to finding it more acceptable in girls), they are primed to intervene to alleviate distress (Radke-Yarrow, Richters, & Wilson, 1988; Stevenson-Hinde, 1989). Although gender's influence on accuracy as a moderator (i.e., a three-way interaction among fearful temperament, accuracy, and gender) has not been explicitly tested, it has been found that child shyness and maternal report of overprotective behavior have been associated for boys but not girls (Coplan, Prakash, O'Neil, & Armer, 2004; Eggum et al., 2009). This study would be the first to assess the conjoint moderating influences of accuracy and gender.

Boys and girls may experience different responses to or consequences from protective parenting. In fact, protective parenting has been found to have negative outcomes for boys but positive outcomes for girls (McShane & Hastings, 2009). Relatedly, a lack of encouragement of independence may exacerbate feelings of social fear and anxiety in shy boys (Coplan et al., 2004). The majority of the available evidence, therefore, suggests that protective behavior may be related to social withdrawal outcomes more strongly for boys.

The literature reviewed this far has provided support for the predictive relation between fearful temperament and social withdrawal, further specifying that fearful temperament relates to protective parenting, which is in itself linked to social withdrawal. Given the moderating influence of gender supported for each of the paths of this putative mediation, gender would also be expected to influence this overall developmental model, warranting the examination of a conditional indirect effect.

The Current Studies

Given lack of clarity in the current literature, using two longitudinal studies, we sought to determine whether gender exerts its influence as a main effect or as a moderator among fearful temperament, social withdrawal, protective parenting, and maternal accuracy in a developmental model (Figure 1). We first examined main effects (i.e., mean-level gender differences), hypothesizing higher fearful temperament and social withdrawal in girls than boys, no difference in protective parenting, and higher maternal accuracy for girls than for boys. Second, we examined the three-way interaction among fearful temperament, maternal accuracy, and gender in relation to protective maternal behavior. We hypothesized that the relation between fearful temperament and protective parenting would be strengthened at higher levels of maternal accuracy, but only for boys. We hypothesized that fearful temperament would not relate to protective parenting at any level of maternal accuracy for

girls. Third, we hypothesized that protective behavior would predict social withdrawal more strongly for boys than for girls. In sum, we expected main effects (mean level gender differences) favoring girls and moderation effects favoring boys.

In addition to being longitudinal, the two studies offer other complementary strengths. Study 1 utilized a multi-method assessment of social withdrawal assessed 3 years after the initial assessment of fearful temperament and protective parenting. Study 2 offered the opportunity for replication and involved mothers' more natural behaviors with their toddlers to increase generalizability of results.

Study 1

Method

Participants—Ninety-three mothers and 2-year-old toddlers (42 female; $M_{\text{age}} = 24.76$ months, $SD_{\text{age}} = 0.42$ months) were recruited from birth announcements published in local newspapers for a laboratory visit at Time 1. Participants were 91% European American, 3% African American, 2% Hispanic, 3% Asian American, and 1% American Indian. Socioeconomic status (SES) was estimated using the Hollingshead Four-Factor Index (Hollingshead, 1975), which combines quantitatively indexed education and occupation levels. Scores can range from 8 to 66, with higher scores representing higher SES. Participants represented the range of SES and were, on average, middle class ($M = 47.57$ ["medium business, minor professional, technical"], $\text{Range} = 13$ ["unskilled laborers, service workers"] to 66 ["major business and professional"]). Seventy-two participants completed at least one portion of a multi-method assessment of social withdrawal when children entered kindergarten (Time 2).

Procedure—At a laboratory visit at Time 1, a primary experimenter (E1) told the mother that her toddler would participate in a variety of tasks that involved interaction with novel stimuli. Prior to the tasks, E1 verbally explained and showed pictures of the tasks.

A *Risk Room* paradigm was used for the observation of fearful temperament. In a room containing a tunnel, trampoline, small balance beam, large black box with eyes and a cut-out mouth, and gorilla mask on a pedestal, E1 instructed the toddler to play "however you like" and asked the mother to sit in a chair in the corner. After 3 minutes, E1 returned and asked the toddler to engage in each of the activities.

After explaining the novelty tasks described below, E1 asked the mother to answer five to seven questions about her toddler's expected emotional and behavioral reactions to each task (see *citations blinded* for further details). In *Stranger Approach*, the toddler played with several neutral toys for 30 s, after which an unfamiliar male experimenter wearing a baseball cap entered the room, approached the toddler, and asked the toddler several short questions (e.g., "Are you having fun today?"). In the *Stranger Working* episode, toddlers played with neutral toys for 30 s, after which a secondary experimenter (E2) entered the room, sat in a desk in the corner of the room, and pretended to work for 2 minutes. She did not interact unless initiated by the toddler. In *Robot*, once the toddler was seated in the mother's lap in one corner of the room, E1 left the room and a remote-controlled robot (controlled from

behind a one-way mirror) moved and made noises spontaneously for 1 minute on a small wooden platform. E1 then re-entered the room and asked the toddler to touch the robot with up to three prompts. In *Clown*, E2 came into the room dressed in a clown outfit, multi-color wig, and red nose. With a friendly demeanor, she invited the toddler to blow bubbles, play catch with beach balls, and play musical instruments (1 min each). In *Puppet Show*, E2 sat behind a small wooden stage and controlled two plush puppets, inviting the toddler to interact during catch and fishing games (1 min each). The puppets then gave the toddler a sticker. For *Spider*, the toddler began seated in the mother's lap, and then a large plush spider affixed to a remote-control truck moved across the room and back, twice, with 10 s pauses in between movements. E1 then re-entered and asked the child to touch the spider with up to three prompts.

Mothers were instructed to remain relatively uninvolved but that they could respond if their toddlers directed verbalizations or behaviors towards them. Episode order was counter-balanced. Previous reports analyzing this sample suggested no significant order effects (*blinded citation*). All episodes were recorded for later behavioral scoring.

At Time 2, families were invited to participate in a follow-up assessment involving parent and teacher questionnaire completion, an “individual visit” to the laboratory, and a “peer visit” to the laboratory coordinated for three or four same-sex children (see *citations blinded* for complete procedures). From the individual visit, the current study focuses on a *Stranger Approach* episode. In this task, the child was instructed to sit in a chair alone in a room. An unfamiliar male experimenter then entered the room, sat in another chair, and engaged the child in brief conversation (3 min). From the peer visit, the current study utilized a 15-minute free play (Rubin, 2001), in which the children were instructed to play “however you like” with a variety of toys.

Measures

For measures derived from behavioral scoring, trained coders received 15-20 hours of training and were required to achieve minimum reliability (kappa or % agreement > .80) with a graduate-level master coder and then maintain adequate reliability on 10-20% of cases throughout coding to prevent coder drift (see *blinded for review* for further scoring details). Inter-rater reliabilities for variables representing counts or categories were assessed with kappas. For behaviors scored in epochs, reliability was computed on an epoch-by-epoch basis. Percent-agreement reliability was computed due to the large number of zero-values for the epoch-by epoch coding, which can artificially decrease kappa values (see Lantz & Nebenzahl, 1996). In measure descriptions below, reliability estimates in parentheses represent percent-agreement except where noted.

Fearful temperament (Time 1)—Fearful temperament comprised behaviors from the Risk Room scored according to guidelines in the Laboratory Temperament Assessment Battery – Toddler Version (Buss & Goldsmith, 2000). Toddlers were scored for the extent to which they approached their mothers (.73), attempted to be held by their mothers (.94), and were tentative in their play (.83) on 0 (*none*) to 3 (*extreme*) scales in 10-second epochs across the episode. For each behavior, scores were averaged across epochs. Latency to touch

was scored as the number of seconds between the start of the episode and the first intentional contact with an activity (.90). Compliance to E1 ($\kappa = .75$) was scored as the number of activities completed when prompted by E1 (reverse scored). All behaviors ($r_s = .25$ to $.71$, all $p_s < .05$; in principal components analyses [PCA], all loaded on a single component explaining 60.24% of the variance with component loadings $> .65$) were standardized and given z -scores. The average of these z -scores yielded the final *fearful temperament* variable.

Maternal protective behavior (Time 1)—Mothers were scored for prototypical protective behaviors as well as comforting behaviors characteristic of overprotection and related constructs (e.g., Rubin's construct of "oversolicitousness") in previous work (e.g., Becker, 1964; Maccoby & Masters, 1970; Rubin et al., 2002). Because we were interested in the extent to which these behaviors were elicited by toddlers, only behaviors that appeared to occur after a direct solicitation by a toddler for comfort or help were included. Comforting behavior was scored on a 0 (*none*) to 3 (*prolonged/intense soothing*) scale each 10-second epoch of an episode. Protective behavior was similarly scored on a 0 (*none*) to 3 (*intense/prolonged protection*) scale. These behaviors were scored reliably (.93 to .96) across all novelty episodes. Each behavior was averaged across epochs and then across episodes. Protective and comforting behavior composites ($r = .84$) were then averaged (without protective behaviors from Clown and Stranger Working due to near-zero frequency) to yield the final *protective behavior* variable.

Maternal accuracy (Time 1)—Thirty-three questions (see *citations blinded* for complete list) from E1's interview with the mother assessed positive and approach behaviors (e.g., "Will your child play the games with the Clown?") as well as distress or withdrawal behaviors (e.g., "Will your child cry or fuss?"). Mothers were asked to respond to these questions as "Definitely yes," "Probably yes," "Probably no," or "Definitely no." These responses were coded so higher scores indicated higher predictions of distress to novelty. From the recorded episodes, toddlers were reliably (.70 to .98) scored for *distress behaviors* that corresponded directly to these predictions (see *citations blinded* for detailed scoring information). Distress behaviors were standardized and given z -scores.

Maternal accuracy was computed in a three-level multilevel model, with maternal predictions and toddler distress behaviors at Level 1, Level 2 representing the nesting of these values within episodes, and Level 3 representing the nesting of episodes within mother-toddler dyads (*citation blinded*). From this model, Empirical Bayes (EB) estimates of the slope parameter for the relation between maternal predictions and toddler distress behaviors were extracted for each mother-toddler dyad, representing how accurately each mother predicted her own toddler's distress behaviors.

Social withdrawal (Time 2)—Given that social withdrawal comprises wariness, inhibition, and reticence shown with both familiar and unfamiliar people, we used a multimethod assessment of social withdrawal in which high scores would indicate consistent social withdrawal across situations. This comprised parent- and teacher-report of social inhibition with children and adults, as well as observational coding of both shyness with an adult and reticence with same-aged peers.

Mothers and teachers completed the McArthur Health and Behavior Questionnaire (HBQ; Armstrong, Goldstein, & the McArthur Working Group on Outcome Assessment, 2003). Both parent- (140 items) and teacher-report (115 items) forms inquired about symptoms and impairments in functioning of 4-8 year-olds. Items are scored on a 0 (*rarely applies*) to 2 (*certainly applies*) scale. The current study focused on the Social Inhibition scale (3 items, e.g., “Shy with other children”). The mean of items (parents: $\alpha = .77$, teachers: $\alpha = .69$) comprised final parent- and teacher-reported social inhibition.

Observed adult-shyness was derived from children's behavior in the *Stranger Approach* episode of the individual visit. Trained coders reliably ($ICC = .71$ on 20% of cases) scored children on a Likert-style scale of Shyness/Inhibition from 1 (*no display*) to 5 (*extreme display*).

Observed peer reticence was derived from children's behavior in the 15-minute free play of the peer visit. Scoring for reticent behavior proceeded according to guidelines of the Play Observation Scale (POS; Rubin, 2001). Reticence was the proportion of 10-s epochs in which children were engaged in predominantly onlooking (i.e., watching peers' activities without joining) or unoccupied (e.g., staring blankly, wandering without purpose) behavior. There were a large number of epochs in which reticence was scored as absent, skewing marginal totals in a kappa table. Therefore, reliability was calculated as both kappa (.61), which was adequate but potentially artificially low, and percent-agreement (.93), which was high.

Results

Missing data—Several participants were missing parent-report ($n = 21$; 22.58%), teacher-report ($n = 46$; 49.46%), adult-shyness ($n = 29$; 31.18%), and peer reticence ($n = 33$; 35.48%). The pattern of missingness did not significantly differ from the Missing Completely at Random pattern (Little's MCAR test: $\chi^2[41] = 31.60$, $p > .05$). Participants who did versus did not complete any portion of the kindergarten assessment did not differ on SES or any of the primary study variables. Following current guidelines (Graham, 2009), missing data were imputed using multiple imputation (20 imputations). The imputation model included fearful temperament, accuracy, gender, protective behavior, and available values of the variables involved in the social withdrawal composite. Of note, age 2 variables had no missingness and so would not be influenced by imputation. To accommodate analyses that cannot use a multiple imputation file, we computed the average of variables across imputed data sets. Although this method does not allow parameter estimates to be weighted by their standard errors in creating a pooled composite, it minimizes the influence of extreme imputed values that might be problematic in single imputation.

Preliminary analyses—Variables for the social withdrawal composite were moderately correlated (range = .25 to .59, all $ps < .01$) and a PCA suggested they loaded on a single component explaining 54% of the variance (loadings = .67 to .84). Given adequate although moderate inter-correlation (similar to previous studies using a multimethod assessment of social withdrawal; Coplan et al., 2008), a mean of their standardized values was created.

Thus, children showing more consistently high scores across the different measures would have higher scores than children having a high score in only one or two measurements.

Descriptive statistics and correlations among variables are presented in Table 1. All variables reasonably adhered to a normal distribution.

Main effect gender differences in primary study variables—Main effect gender differences did not exist for fearful temperament, kindergarten social withdrawal, or protective behavior (all $ts[91] < 0.62$, all $ps > .50$). The difference for maternal accuracy was not significant ($t[91] = -0.91$, $p = .367$) but was in the expected directions of being higher for girls than boys.

Moderation of the relation between fearful temperament and protectiveness—Given our hypothesis of a three-way interaction among fearful temperament, maternal accuracy, and gender in relation to maternal protective behavior, analyses proceeded in a top-down manner, such that the initial model included the main effects, all two-way interactions, and the three-way interaction simultaneously. Gender was dummy-coded (males = 0). Fearful temperament and maternal accuracy were centered at their means prior to analyses. To probe interactions, gender was recoded with females = 0 and maternal accuracy was recentered at ± 1 SD.

The three-way interaction was significant in relation to protective behavior (Table 2, Figure 2). Probing revealed that the two-way interaction between fearful temperament and maternal accuracy was significant and positive for boys (Table 2), and there was a trend for it to be in the opposite direction for girls ($\beta = -0.39$, $t = -1.93$, $p < .06$, 95% CI $[-7.00, 0.10]$).

For boys, fearful temperament did not relate to maternal protective behavior at low ($\beta = -0.15$, $t = -0.81$, ns , 95% CI $[-0.14, 0.06]$) or mean (Table 2) maternal accuracy, but it did relate at high maternal accuracy ($\beta = 0.24$, $t = 2.01$, $p < .05$, 95% CI $[0.001, 0.12]$). For girls, fearful temperament did not relate to protective behavior at low ($\beta = 0.13$, $t = 0.79$, ns , 95% CI $[-0.05, 0.12]$) or mean ($\beta = -0.14$, $t = -1.08$, ns , 95% CI $[-0.11, 0.03]$) maternal accuracy, but it had a marginal negative relation at high maternal accuracy ($\beta = -0.42$, $t = -1.87$, $p < .07$, 95% CI $[-0.22, 0.01]$) and appeared to be increasingly strong when maternal accuracy was recentered at +2 SD ($\beta = -0.69$, $t = -1.98$, $p = .05$, 95% CI $[-0.36, 0.01]$). In addition to examining simple slopes, we also determined the region of significance of the moderation, which uses the Johnson-Neyman technique to determine the precise value(s) of the moderator where the predictor's slope shifts from non-significance to significance (Hayes, 2013). Fearful temperament shifted to a significant positive simple slope for boys at 0.98 SD above the mean of accuracy and shifted to a significant negative slope for girls at 2.22 SD above the mean of accuracy. Thus, as mothers increased in accuracy, increasingly fearful boys elicited stronger protective behavior, but increasingly fearful girls elicited less protective behavior.

Moderation of the relation between protectiveness and social withdrawal—Protective behavior, gender, and their interaction were investigated as predictors of kindergarten social withdrawal. In a regression model containing main effects and the

interaction term, the protective behavior X gender interaction was not significant (Table 3). When it was dropped from the model, protective behavior predicted social withdrawal ($\beta = 0.36$, $t = 3.70$, $p < .001$, 95% CI [0.60, 2.00]), but gender did not ($\beta = 0.04$, $t = 0.36$, ns , 95% CI [-0.24, 0.34]).

Summarizing across results, therefore, the effect of gender seems to be in determining the effect of fearful temperament on maternal behavior, not determining the effect of maternal behavior on later social withdrawal. Protective behavior did predict social withdrawal, so gender has long-term implications for developmental pathways. Given that mothers were asked to restrict their behavior during episodes from which protective behavior was scored, it remained unclear whether the same patterns would emerge when mothers were allowed to interact more naturally with their toddlers. Study 2 addresses this concern.

Study 2

Method

Participants—One hundred seventeen mothers and their 2-year-old toddlers ($M_{age} = 24.78$ months, $SD_{age} = 0.74$ months; 54 female) were recruited from birth announcements ($n = 100$) and meetings of the Women, Infants, and Children (WIC) program ($n = 17$) for a laboratory visit at Time 1. Toddlers were European American (81%), Asian American (8%), African American (7%), American Indian (1%), biracial (2%), and “other” race/ethnicity (2%). Participants represented the range of SES and were on average middle class (Hollingshead Index: $M = 49.74$, $SD = 11.93$, $range = 17 - 66$; numbers represent the same social strata indicated for Study 1). Seventy-six mothers completed follow-up questionnaires around their children's third birthdays (Time 2).

Procedure—The procedure for Study 2 was nearly identical to that of Study 1 with a few exceptions. Primarily, mothers were instructed to behave naturally in the Clown, Puppet Show, and Spider episodes. Similarly to Study 1, mothers were instructed to remain neutral in the Stranger Approach and Robot episodes. Stranger Working was dropped from procedures to accommodate other tasks not reported presently. Given the lack of order effects in Study 1 and an emphasis on individual differences rather than task effects, episodes were presented in a set order: Risk Room, Stranger Approach, Robot, Clown, Puppet Show, and Spider. Children were too young for teacher report and the typical observational measures of social withdrawal, so only maternal report was used.

Measures

Except where noted below, measures were identical to those in Study 1. Due to an advancement in scoring procedures between Study 1 and Study 2, intraclass correlation coefficients (ICCs) were used in place of percent-agreement for assessing inter-rater reliability. Reliable coding occurred for the toddler behaviors included in the fearful temperament composite (ICCs = .78 to .98) and those used for the creation of the accuracy variable (ICCs = .68 to .98; kappas = .71 to .99). Correlations among variables comprising the fearful temperament composite ranged from .20 to .82 (all $ps < .05$) and PCA yielded a single component explaining 62.47% of the variance with component loadings $> .63$. The

maternal protective behavior variable was comprised of comforting and protective behaviors ($r = .56$) scored reliably (ICCs = .91 to .92) from the Clown and Puppet Show episodes due to their specific relevance to fearful temperament and later social withdrawal (*citation blinded*). Protective behaviors were not taken from specific episodes in Study 1 because of the unilateral instruction to remain minimally involved. See *citation blinded* for specific details of the maternal accuracy variable.

Social withdrawal (Time 2)—Mothers completed the Infant-Toddler Social and Emotional Assessment – Revised (ITSEA; Carter & Briggs-Gowan, 2000), a 193-item questionnaire that asks parents to rate their children's feelings and behaviors from the last month on a 0 (*not true or rarely true*) to 2 (*very true or often true*) scale. Relevant to the current study was the Inhibition to Novelty scale (5 items, $\alpha = .75$; e.g., “Is shy with new adults,” “Is shy with new children”). The reliability and validity of the ITSEA has previously been established (Carter, Briggs-Gowan, Jones, & Little, 2003).

Mothers also completed the Child Social Preference Scale (CSPS; Coplan, Prakash, O'Neil, & Armer, 2004). Mothers indicated on a 1 (*not at all*) to 5 (*a lot*) scale how typical particular behaviors were for their children. The current study used the Shyness scale (7 items, $\alpha = .89$; e.g., “My child 'hovers' near where other children are playing, without joining in”). The CSPS has been shown to be reliable, and construct validity was established through relations to maternal report of temperament and observed peer interactions (Coplan et al., 2004).

Results

Missing data—Several participants were missing the ITSEA ($n = 41$; 35.04%) and CSPS ($n = 43$; 36.75%). The pattern of missing data was consistent with MCAR ($\chi^2[11] = 18.129$, $p > .05$). However, participants missing the Time 2 assessment reported lower SES ($M = 58.79$, $SD = -2.70$, $p < .01$) and were overrepresented by female toddlers ($\chi^2[1] = 3.89$, $p < .05$) and WIC-recruited participants ($\chi^2[1] = 15.00$, $p < .001$). The latter may explain the higher rate of attrition in Study 2 than Study 1. Given that SES was lower in participants recruited from WIC ($M = 36.26$, $SD = 12.10$) than from birth announcements ($M = 52.04$, $SD = 10.33$; $t[115] = 5.68$, $p < .001$; Cohen's $d = 1.40$), it would be redundant to consider both SES and recruitment method. Therefore, SES and gender were included in the imputation algorithm and all primary analyses (Graham, 2009). Multiple imputation was conducted similarly as in Study 1, with SES also included.

Data reduction and preliminary analyses—After imputation, ITSEA inhibition to novelty and CSPS Shyness demonstrated moderate correlation ($r = .47$, $p < .001$); they were standardized and averaged to compose age 3 *social withdrawal*. Descriptive statistics are presented in Table 1. Protective behavior demonstrated slight skew (2.85), so we added a constant and performed a square root transformation. Although this only reduced skew slightly (2.69), no other transformations yielded further improvement. All other variables reasonably adhered to a normal distribution. Positive interrelations existed among fearful temperament, accuracy, protective behavior, and social withdrawal (Table 1).

Main effect gender differences in primary study variables—Gender differences did not exist for fearful temperament ($d[115] = -0.62, p = .53$) or social withdrawal ($d[115] = -1.19, p = .24$). Mothers showed a trend ($d[102.78] = -1.87, p < .07$) towards responding with more protective behavior with daughters ($M = 1.03$) than sons ($M = 1.02$). Accuracy was significantly higher ($d[115] = -3.17, p < .01$) for girls ($M = 0.10$) than boys ($M = 0.07$). This difference is similar in direction to Study 1, but stronger (Cohen's $d = 0.19$ in Study 1 and 0.58 in Study 2).

Moderation of the relation between fearful temperament and protectiveness—Similarly to Study 1, the three-way interaction was significant in relation to maternal protective behavior (Table 2, Figure 2). Probing revealed that the fearful temperament X maternal accuracy interaction was significant for boys (Table 2). Although, as in Study 1, this interaction was in the negative direction for girls, it was not significant for Study 2 ($\beta = -0.15, t = -1.00, ns, 95\% \text{ CI } [-0.53, 0.17]$). Similarly to Study 1, for boys, fearful temperament had a stronger relation to protective behavior as maternal accuracy increased from low ($\beta = -0.34, t = -1.83, p < .07, 95\% \text{ CI } [-0.04, 0.002]$) to mean (Table 2) to high ($\beta = 0.46, t = 3.23, p < .01, 95\% \text{ CI } [0.01, 0.05]$) values. The boundary of the region of significance occurred when accuracy reached a value of 0.45 SD above the mean for boys and not within the range of the variable for girls. Consistent with Study 1, at higher maternal accuracy, as boys', but not girls', fearful temperament increased, the more protective behavior was elicited.

Moderation of the relation between protectiveness and social withdrawal—Protective behavior, gender, and their interaction were entered as predictors of Time 2 social withdrawal in a multiple regression model. Results resembled those in Study 1. The interaction term was not significant (Table 3). When it was dropped from the model, protective behavior predicted social withdrawal ($\beta = 0.29, t = 3.09, p < .01, 95\% \text{ CI } [1.87, 8.52]$), but gender did not ($\beta = 0.06, t = 0.64, ns, 95\% \text{ CI } [-0.21, 0.41]$).

Indirect effect with both samples—Given the consistency across samples of significant pathways from fearful temperament to protective parenting under the conditions of male gender and high maternal accuracy, and from protective parenting to social withdrawal, we combined samples to examine the resultant conditional indirect effect. Testing the conditional indirect effect allows for more mechanistic inferences about the developmental process of interest than relying on individual pathways. In recognition that the social withdrawal composite differed across studies in terms of composition and timing, we consider this analysis exploratory. Variables that were not already on a standardized scale were assigned z-scores. Using 1000 bootstrap samples for bias-corrected bootstrap confidence intervals, the PROCESS macro for SPSS (Hayes, 2013) yielded evidence for a significant, positive indirect effect at the 90th percentile of maternal accuracy for boys (indirect effect = $0.10, 95\% \text{ CI } [0.01, 0.20]$) but not girls (indirect effect = $-0.001, 95\% \text{ CI } [-0.07, 0.08]$). For both genders, the indirect effect was non-significant at lower values of maternal accuracy.

Notably, we repeated all analyses across both studies controlling for maternal disposition towards anxiety. We found the same pattern and significance of interactions, nearly identical

simple slopes, and the same results for the indirect effect. Further details about these analyses are available from the authors.

Discussion

We examined gender differences in constructs relevant to the trajectory from fearful temperament to social withdrawal in two longitudinal studies. Our conceptual model, in which fearful temperament predicts social withdrawal through protective parenting, accounted for both child-driven (i.e., solicited protective behavior) and parent-driven (i.e., prediction of social withdrawal from protective behavior) effects. Moreover, we examined a known moderator of the relation between fearful temperament and protective parenting: maternal accuracy in predicting toddlers' distress to novelty.

With one exception, mean-level gender differences did not occur. Broadly, main effects may not be how gender influences children's development (Crick & Zahn-Waxler, 2003). The primary difference in findings between the studies was that a gender difference emerged for maternal accuracy in Study 2 but not in Study 1. The direction of the difference was the same across studies, with mothers achieving higher accuracy for girls than for boys. Unlike in Study 1, mothers had the expectation that they would behave more naturally in several episodes in Study 2. Possibly, mothers' subsequent behaviors (protectiveness or more neutral involvement) changed their girls', but not their boys', behaviors in a manner that adhered to their predictions. For example, mothers may have been more interactive or spoke about the episode more with their girls, which could have changed the extent to which girls approached or withdrew from the stimulus. Indeed, mothers have been shown to engage in more emotional discussions with their girls (Fivush et al., 2000), which could change their interpretation of the stimulus. Future research should more closely examine the mechanisms of this difference, as it remains somewhat unclear whether and how the instructions affected the gender difference in accuracy. Alternatively, Study 2 had a slightly larger sample size than Study 1, so perhaps even a small increase in power allowed this gender difference to emerge.

Across the studies, we replicated a three-way interaction among fearful temperament, maternal accuracy, and gender in relation to protective parenting. Fearful temperament related to solicited protective behavior when mothers of boys were more highly accurate. This occurred despite Study 2's main effect gender difference in accuracy favoring girls. Attending only to the main effects could have led to the erroneous conclusion that these constructs are only relevant for girls. The interactive effect, suggesting specificity to boys, augments previous findings that mothers are more protective with their fearful boys than their fearful girls (Coplan et al., 2004; Eggum et al., 2009) and shows that gender additionally affects how maternal accuracy functions as a moderator. This study contributes to the literature generally demonstrating two-way interactions (temperament X gender) by suggesting that maternal accuracy should also be included when investigating associations among fearful temperament, gender, and protective parenting. Perhaps when mothers anticipate their boys' distress to novelty, they are primed to alleviate the distress because they are less approving of fearful, shy behaviors in boys and so are motivated to change it (Radke-Yarrow et al., 1988; Rubin et al., 2009). This result is inconsistent, therefore, with

mothers' reports of more warmth and affection with their shy girls than their shy boys (Rubin & Hastings, 1999). This could be due to using an observational measure of protective parenting. Indeed, other observational work shows that mothers' proximity is more contingent with their boys' distress (Buss et al., 2008). Mothers may not be accurate in reporting their behavior in this domain (but see McShane & Hastings, 2009). The negative association in Study 1 between fearful temperament and protective behavior for highly accurate mothers of girls may reflect mothers being more content with inhibited, shy behavior in girls. Potentially, girls' temperamental pattern of fearful behavior prompts mothers to interact less than they would if the inhibited responses were not dispositional, or this could represent a passive attempt to empower their fearful girls. Additional evidence would be required to substantiate these interpretations. The consistency of this complex interaction across the two studies is striking considering some slight differences in procedures, speaking to the robustness of this effect. Moreover, these results remained consistent when controlling for maternal disposition towards anxiety, which suggests that the importance of these mother-toddler behavioral interactions is not solely accounted for by shared risk for anxiety.

The impact of maternal accuracy on risk for social withdrawal may seem to contradict theory and research showing positive outcomes from putatively related constructs like maternal sensitivity and "mind-mindedness" (e.g., Laranjo, Bernier, & Meins, 2008). We do not suggest that our current findings contradict this literature, broadly. Rather, accuracy seems to contribute to a complex dynamic specific to fearful temperament and protective parenting that also differs by gender. Accuracy may not be the same as sensitivity, and it may function differently for girls and boys as well as children of different temperaments. Specifically, accuracy may heighten closeness for girls and for more outgoing toddlers in a manner that promotes, rather than prevents, independent coping. Optimal parenting may vary across children, as even "sensitivity" has been linked to anxiety for temperamentally fearful children (Mount, Crockenberg, Bárrig JÓ , & Wagar, 2010).

No gender differences existed in how protective behavior predicted later social withdrawal. This suggests that once protective responses emerge, child gender does not play a further role in the consequences of that protective behavior. Despite this, boys may still be at increased risk for social withdrawal. If mothers respond protectively to their temperamentally fearful boys' solicitations for help and comfort, this increased contingency in protective responses may then maintain risk for social withdrawal by reinforcing withdrawal and avoidance.

Relatedly, gender-specific pathways to withdrawal have clinical implications for prevention and early intervention work with families of anxiety-prone children. Specifically, it may be particularly important to work with parents of fearful boys to understand how their sons may be eliciting protective parenting and develop alternative behavioral responses that lower risk for subsequent anxiety. Potentially, this work should include identification of gender role expectations that may influence parenting responses.

Several limitations of the current studies should be considered. Both studies had samples that comprised primarily European American, middle class participants. Parenting behaviors

have been shown to function differently in other populations (Belsky & Jaffee, 2006; Chen et al., 1998), so it is important to replicate these results in other cultures. We also did not address the context in which early fearfulness is shown, which contributes both to parent behavior and children's risk for social withdrawal and related outcomes (Buss, 2011). Understanding the role of context in identifying gender-specific developmental pathways would certainly augment the model presented here. Moreover, protective behavior was only measured in mothers. Parenting by fathers and other caregivers undoubtedly contributes to the developmental consequences of early fearful temperament. Study 2 used maternal report measures of social withdrawal. The replication of results found in Study 1, which used a multi-method assessment of social withdrawal, may assuage concerns that results in Study 2 are limited to maternal perceptions of social withdrawal. Given that other primary variables were observational or a combination of maternal perceptions and observation, results cannot be attributed to shared method variance. Finally, different reliability estimates were used between studies, which limits comparison.

Overall, the current studies contributed to knowledge about the role of toddler gender in the parenting related to fearful temperament and social withdrawal. They also provided new clarification about gender differences in maternal accuracy in predicting toddlers' distress to novelty and how it moderates the relation between fearful temperament and protective behavior. These results augment theoretical models of the complex relations among fearful temperament, parenting, and adjustment.

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Figure 1.

A conceptual model of how gender may moderate the developmental progression from fearful temperament to social withdrawal through protective parenting. In the current study, these moderations will be tested in addition to examining main-effect gender differences in major constructs in the model.

Figure 2.

Three-way interaction among fearful temperament, maternal accuracy, and toddler gender in relation to protective maternal behavior in (a) Study 1 and (b) Study 2. In Study 2, protective maternal behavior was subjected to a square root transformation. * $p < .05$, ** $p < .01$.

Table 1

Descriptive Statistics for and Bivariate Correlations among Primary Variables

Variable	Study 1		Study 2		1	2	3	4
	Mean (SD)	Range	Mean (SD)	Range				
Social Withdrawal								
Parent-report SI	0.69 (0.50)	0.00 – 2.00						
Teacher-reported SI	0.29 (0.41)	0.00 – 1.67						
Observed adult-shyness	2.08 (0.88)	1.00 – 4.00						
Peer reticence	0.10 (0.12)	0.00 – 0.67						
Inhibition to novelty			0.88 (0.47)	0.00 – 2.00				
Shyness			2.05 (0.74)	1.00 – 4.74				
Primary Variables								
1. Fearful temperament	–0.01 (0.80)	–1.11 – 3.39	0.00 (0.78)	–1.02 – 2.76	--	.54**	.29**	.27**
2. Maternal accuracy	0.08 (0.02)	0.04 – 0.14	0.08 (0.04)	–0.01 – 0.18	.35**	--	.46***	.47**
3. Protective behavior	0.16 (0.21)	0.00 – 1.08	0.05 (0.11)	0.00 – 0.58	.31**	.55***	--	.29**
4. Social withdrawal	0.00 (0.74)	–1.39 – 2.73	0.00 (0.86)	–1.82 – 2.22	.41***	.31**	.36***	--

Note. SI = social inhibition. Fearful temperament and social withdrawal were constructed as the mean of z-scores. In Study 2, protective behavior was subjected to a square-root transformation prior to primary analyses; descriptive statistics were computed on the raw variable and correlations on the transformed variable. Correlations below the diagonal are from Study 1 ($n = 93$); those above the diagonal are from Study 2 ($n = 117$).

**
 $p < .01$

***
 $p < .001$

Table 2

Multiple Regression Analyses Predicting Protective Parenting

Variable	Study 1 $R^2 = .45, F_{7,85} = 9.91^{***}$				Study 2 $R^2 = .37, F_{8,108} = 7.78^{***}$			
	<i>b</i> (SE)	β	<i>t</i> -test	95 % CI	<i>b</i> (SE)	β	<i>t</i> -test	95 % CI
SES	--	--	--	--	0.01 (0.00)	0.21	2.59*	0.0002, 0.001
Fearful temperament (FT)	0.01 (0.04)	0.05	0.33	-0.06, 0.08	0.00 (0.01)	0.06	0.50	-0.01, 0.02
Maternal accuracy (MA)	5.89 (1.24)	0.58	4.74***	3.42, 8.36	0.27 (0.14)	0.24	1.87 [†]	-0.02, 0.55
Gender (GEN)	-0.01 (0.04)	-0.04	-0.42	-0.08, 0.05	0.02 (0.01)	0.20	2.11*	0.001, 0.04
FT × MA	2.49 (1.01)	0.28	2.47*	0.48, 4.51	0.56 (0.15)	0.47	3.67***	0.26, 0.87
FT × GEN	-0.05 (0.05)	-0.12	-1.00	-0.15, 0.05	0.01 (0.01)	0.10	0.66	-0.02, 0.04
MA × GEN	-3.03 (1.81)	-0.19	-1.68 [†]	-6.62, 0.56	0.24 (0.22)	0.15	1.12	-0.19, 0.67
FT × MA × GEN	-5.94 (2.05)	-0.29	-2.90**	-10.02, -1.86	-0.74 (0.23)	-0.51	-3.17**	-1.20, -0.28

Note. Fearful temperament and maternal accuracy were centered at their means prior to analysis. Gender was dummy-coded with males as the reference group. SES was included as a covariate in Study 2 because it related to the DV of protective behavior. Protective behavior underwent a square root transformation prior to analyses in Study 2.

[†] $p < .10$

* $p < .05$

** $p < .01$

*** $p < .001$.

Table 3

Multiple Regression Analyses Predicting Social Withdrawal

Variable	Study 1 $R^2 = .13, F_{3,89} = 4.37^{**}$				Study 2 $R^2 = .09, F_{4,112} = 2.81^*$			
	<i>b</i> (SE)	β	<i>t</i> -test	95 % CI	<i>b</i> (SE)	β	<i>t</i> -test	95 % CI
SES	--	--	--	--	-0.00 (0.01)	-0.03	-0.34	-0.02, 0.01
Protective parenting	1.28 (0.42)	0.36	3.05**	0.45, 2.12	5.49 (2.47)	0.31	2.23*	0.60, 10.37
Gender	0.05 (0.15)	0.03	0.34	-0.24, 0.34	0.10 (0.16)	0.06	0.64	-0.21, 0.41
Protective parenting $\times$ Gender	-0.01 (0.78)	-0.00	-0.01	-1.55, 1.54	-0.54 (3.28)	-0.02	-0.16	-7.03, 5.95

Note. Protective parenting was centered at its means prior to analysis. Gender was dummy-coded with males as the reference group. SES was included as a covariate. Protective parenting underwent a square root transformation prior to analyses in Study 2.

* $p < .05$

** $p < .01$.