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Relations over Time among Children's Shyness, Emotionality, and Internalizing Problems

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Abstract

Data regarding children's shyness and emotionality were collected at three time points, two years apart (T1: $N = 214$, $M = 6.12$ years; T2: $N = 185$, $M = 7.67$ years; T3: $N = 185$, $M = 9.70$ years), and internalizing data were collected at T1 and T3. Relations among parent-rated shyness, emotionality (parent- and teacher-rated anger, sadness, and positive emotional intensity [EI]), and mother-rated internalizing were examined in panel models. In some cases, shyness predicted emotionality two years later (teacher-rated anger, parent-rated sadness, teacher-rated positive EI) and emotionality sometimes predicted shyness two years later (teacher-rated sadness, parent-rated positive EI, teacher-rated positive EI). Parent-rated shyness and/or emotionality (parent-rated anger and parent-rated sadness) predicted internalizing at T3. Results shed light on developmental relations between emotionality and shyness, as well as processes of risk for, or protection against, the development of internalizing problems.

Keywords

shyness; emotionality; social interaction; internalizing

Children's shyness and withdrawal have been associated with negative outcomes (see Rubin, Coplan, & Bowker, 2009), underscoring the need to understand processes involving shyness that lead to maladjustment. The purpose of this study was to examine how shyness (i.e., inhibited approach/discomfort in social contexts) and emotionality related to children's internalizing problems, and how shyness and emotionality were related over three time points. Investigating how shyness or emotionality relate to one another and, in turn, relate to internalizing (mediated relations), and how shyness and emotionality uniquely relate to internalizing, may illuminate risk processes for internalizing problems. This study also contributes to the literature by exploring shyness as a predictor of later emotionality and vice versa, controlling for earlier levels of the outcome. Although shyness has been related positively to negative emotionality and negatively to positive emotionality (e.g., Eisenberg, Shepard, Fabes, Murphy, & Guthrie, 1998), longitudinal relations are poorly understood.

Theoretical Relations between Shyness and Emotionality

Shyness may predict later emotionality for multiple reasons. First, shyness has been associated with poor treatment from peers (e.g., Gazelle & Ladd, 2003), and poor peer treatment (rejection, exclusion) may result in increased negative affect for shy children (Gazelle & Druhen, 2009). Peer treatment was not examined in this study, but it is a likely mediator through which shyness affects emotion or vice versa. Second, conflicting approach and avoidance motivations underlie shyness (Asendorpf, 1990). Conflicting motivations may be distressing and cause sadness and/or anger. Some shy children may get frustrated/angry because they want to socialize but their anxiety prevents it. Anxiety may lead some shy children to relinquish their goal of socializing, which may prompt negative self-regard and sadness.

Shyness also may relate negatively to positive emotionality. Shy children's anxiety might preclude enjoyment of social situations and reduce positive emotional intensity (EI). Their attention may be focused on self-defeating thoughts and social-evaluative concerns during interactions (e.g., Asendorpf, 1993), which make intense positive expression unlikely.

It is also conceivable that emotionality predicts later shyness. Rothbart and Mauro (1990) suggested that negative emotionality might foster cognitive styles related to self-conscious shyness because frequent negative expression in the company of others might cultivate negative expectancies regarding social interaction and low social self-efficacy beliefs. This notion might be especially true if others react poorly to one's negative affect. Negative expectancies or low social self-efficacy could lead to anxiety regarding socializing and, hence, shyness.

Positive EI may influence later shyness. Children who express positive emotion may have more pleasurable social experiences and be more liked by their peers (e.g., Denham, McKinley, Couchoud, & Holt, 1990) than children prone to negative emotion. If positive EI is attractive to peers, positive social experiences might disconfirm shy children's negative social expectancies and help them overcome their avoidant tendencies (Asendorpf, 1993). Rewarding social exchanges may reinforce the desire to socialize and positive expectancies about social interactions.

Empirical Relations between Shyness and Emotionality

Before discussing empirical relations, it is important to note that shyness is not synonymous with social withdrawal. Withdrawal can occur for reasons other than shyness (e.g., disinterest). Correlates of different forms of withdrawal have been found to differ (e.g., Coplan & Weeks, 2010).

Consistent with expectations, shyness has been positively associated with children's negative emotionality (Coplan, Prakash, O'Neil, & Armer, 2004; Findlay, Coplan, & Bowker, 2009), but longitudinal prediction rarely has been examined. As an exception, Eisenberg et al. (1998) found that teacher-rated internalizing negative emotionality positively related to teacher-rated shyness 2, 4, and 6 years later, but earlier shyness was not controlled.

In terms of shyness and specific negative emotions, the relation between shyness or withdrawal and anger is not clear. Studies in which this relation has been examined have differed with regard to sample characteristics (age, culture), methodology (conceptual definitions, method of measurement), and results (direction of relations). Differences make it difficult to draw conclusions regarding the relation between shyness or withdrawal and anger. For example, in Indonesian third graders, parent-rated shyness was negatively related to peer-rated anger (Eisenberg, Pidada, & Liew, 2001). Three years later, teacher-rated shyness was concurrently negatively related to girls' peer-rated anger (Eisenberg, Liew, & Pidada, 2004). Shy children who are concerned with peers' negative reactions may mask anger when with peers. In contrast, anger sometimes has been related positively to withdrawal. In response to a vignette involving a negative event and an unfamiliar peer, socially withdrawn fifth- and sixth-grader boys reported more anger than boys in the control group (Burgess, Wojslawowicz, Rubin, Rose-Krasnor, & Booth-LaForce, 2006). Eisenberg et al. (2005) suggested that peer rejection and social demands (e.g., speaking up in class), which increase with age, may result in anger for withdrawn or shy children.

Researchers have examined the relation between sadness and social withdrawal more frequently than the relation between sadness and shyness. In another manuscript based on the sample used in the present study, *Authors* found that withdrawn children were rated as higher in sadness than control children around 6 years of age. Second graders' social withdrawal also has been related to depressed mood in fifth grade (Rubin & Mills, 1988). Relations similar to these may exist for shy children.

Shyness has been associated with low positive emotionality/EI within and sometimes across time (Caspi et al., 2003; Eisenberg et al., 1998; Findlay et al., 2009). However, it is unclear if shyness predicts later positive EI (or vice versa) when controlling for earlier levels of the constructs because, to our knowledge, this has not been examined.

Relations between Shyness and Internalizing

Theoretically, shyness is related to internalizing. When maladaptive feelings or cognitions associated with shyness are extreme, they may prompt depression or withdrawal—internalizing problems. Anxiety in social situations is a defining component of shyness. Some individuals prone to social anxiety may be prone to more general anxiety—another internalizing problem. For some shy children, conflicting motivations, failed social overtures, or negative peer treatment may contribute to negative emotionality. In turn, emotionality may influence internalizing problems.

Shyness and inhibition have been positively related to children's internalizing problems within and across time (Leve, Kim, & Pears, 2005; Karevold, Coplan, Stoolmiller, & Mathiesen, in press; Mathiesen, Sanson, Stoolmiller, & Karevold, 2009; Prior, Smart, Sanson, & Oberklaid, 2000; van Brakel, Muris, & Bögels, 2004). In addition, preadolescents with internalizing problems have been found to be shyer than preadolescents without internalizing or externalizing problems (Oldehinkel, Hartman, De Winter, Veenstra, & Ormel, 2004).

Researchers have struggled with assessment of relations between internalizing and temperament because measures assessing adjustment and temperament often have

conceptual overlap. One approach (taken in this study) is to remove items judged by experts to be overlapping from the temperament and/or adjustment measures (Eisenberg, Spinrad, et al., 2004; Lengua, West, & Sandler, 1998).

Relations between Emotionality and Internalizing

Psychopathology is associated with dysregulated emotion. Intense sadness and anxiety, as well as arousing attempts to suppress negative emotionality, are associated with internalizing problems (see Zahn-Waxler, Klimes-Dougan, & Slattery, 2000). Clark, Watson, and Mineka (1994) suggested that dispositional negative affectivity makes one vulnerable to depression and anxiety, whereas lack of positive affectivity relates to depression but not anxiety (also see Lonigan, Phillips, & Hooe, 2003). In a study based on Time 1 data from the sample used in the present manuscript, 6-year olds with internalizing (not co-occurring with externalizing) problems often had higher anger or sadness than controls (*Authors*; also see Eisenberg et al., 2007; Lengua, 2006; Oldehinkel et al., 2004).

Internalizing has been negatively associated with positive emotionality. Zhou, Lengua, and Wang (2009) found that smiling/laughter was lower for children with teacher-, but not parent-, rated internalizing problems relative to children without internalizing or externalizing problems. Lengua et al. (1999) found that positive emotionality related negatively to depression in children whose parents had recently divorced.

However, emotionality has not been consistently related to internalizing. In an all-male sample, adolescents with internalizing problems did not have higher fear or sadness than non-disordered boys (Keltner, Moffitt, & Stouthamer-Loeber, 1995). Rydell, Berlin, and Bohlin (2003) found that fear and anger were positively related to internalizing problems at home, but not school, and positive emotionality-exuberance was unrelated to internalizing at home or school. Zhou et al. (2009) did not find anger to differ between children with internalizing versus without adjustment problems.

In at least one previous study, both emotionality and shyness were examined as predictors of internalizing. Karevold, Røysamb, Ystrom, and Mathiesen (2009) found that shyness and emotionality (at 1.5, 2.5, 4.5, and 8-9 years) often were positively correlated with anxiety and depression at 12-13 years. Shyness had indirect (mediated) effects via later emotionality, and emotionality had indirect effects via later shyness, on internalizing at 12-13 years. Additional research is necessary because 1) earlier levels of internalizing were not controlled; 2) attempts to remove overlap between temperament and internalizing were not made; and 3) emotionality was not parsed into different forms of emotion.

Moderation of Relations among Shyness, Emotionality, and Internalizing by Sex

Sex may moderate relations among shyness, emotionality, and internalizing problems. Shy boys seem to be at greater risk for maladjustment and negative outcomes than shy girls (Coplan & Weeks, 2009; see Coplan & Armer, 2007), perhaps because boys' shyness leads to higher social rejection than girls' (Radke-Yarrow, Richters, & Wilson, 1988). Furthermore, sex differences in the relation between emotionality and internalizing problems have been found. Lengua et al. (1999) found that the relation between negative emotionality and depression was stronger for boys than girls. Sex differences in relations between shyness and positive or negative emotionality are not found consistently (Lonigan et al., 2003; Oldehinkel et al., 2004).

The Present Study

At three times (T1, T2, and T3, with two years between assessments), parents and teachers rated school-aged children's shyness, anger, sadness, and positive EI. Mothers rated

children's internalizing at T1 and T3. This was an interesting age to study the interrelations of shyness, emotionality, and internalizing because many children were beginning formal schooling at T1. We expected moderate stability in shyness, emotionality, and internalizing as we anticipated the increasing demands of the classroom would prompt some changes in individual differences (e.g., Eisenberg et al., 2005).

We expected bi-directional relations between shyness and emotionality because, as discussed above, there are reasons to believe that shyness predicts later emotionality and vice versa. We hypothesized that shyness and sadness would be positively related, and shyness and positive EI would be negatively related. Although previous findings have been mixed, we expected shyness to positively relate to anger. Our sample consisted of U.S. school-aged children who have higher social demands and greater involvement with peers than younger children (Eisenberg et al., 2005). Thus, we based prediction on U.S. studies in which school-aged children's withdrawal has been associated with anger.

We expected anger, sadness, and shyness to be positively, and positive EI to be negatively, related to internalizing. We expected to find unique relations and mediated effects (shyness→emotionality→internalizing, or emotionality→shyness→internalizing). We believed associations between shyness and negative emotions or internalizing might be stronger for boys.

The study contributes to the field by revealing potential temperamental pathways to internalizing problems. Results shed light on developmental relations between emotionality and shyness, as well as processes of risk for, or protection against, the development of internalizing problems. The design of the study permitted control of earlier levels of shyness, emotionality, and internalizing, and correlations among these variables at T1. This approach provides a strong test of longitudinal relations and yields estimates that are much less biased than if predicting across time without these controls (see MacCallum & Austin, 2000).

Method

Participants

Participants were recruited through schools, newspaper ads, and flyers posted at schools in a large, U.S. suburban area. A sample in which problem behavior was well represented was recruited because a goal of the larger project was to determine how children with and without adjustment problems differed on a number of variables. The Child Behavior Checklist (CBCL; Achenbach, 1991a) was administered over the phone to 315 parents (mostly mothers). Children with *T*-scores ≥ 60 (Achenbach; 1991b) on the internalizing and/or externalizing scale were selected for participation. Children highest on internalizing, highest on externalizing, and children without internalizing or externalizing problems were demographically matched as closely as possible (see *Authors*). Sometimes exact demographic match across the three groups was not possible or children selected for participation did not participate. The selection process resulted in a range of problem behaviors. At T1, 65% of the sample had borderline or clinical adjustment problems.

The T1 sample of 214 children (118 boys; *M* age = 6.12 years, *SD* = .80) and primary caregivers came to the laboratory. Primary caregivers, henceforth called parents, (*n* = 209 mothers, *n* = 5 fathers), completed shyness and emotion questionnaires, 209 mothers completed the internalizing questionnaire, and teachers completed all questionnaires for 195 children. Most of the children were non-Hispanic Caucasians (71.0%), but Hispanics (15.9%), Native Americans (4.2%), African Americans (3.7%), Asians (.9%), and children of mixed origin (4.2%) were represented. Race/ethnicity percentages slightly differ from

previous publications using these data (*Authors*) due to obtaining missing data. The majority (68%) of the children came from two-parent homes. On average, mothers and fathers reported some college (but not completion), and education ranged from less than high school to professional degrees. Annual family income ranged from <\$20,000 to >\$100,000 (*Mdn* = \$20,000-40,000).

Approximately 2 and 4 years later (T2 and T3), 193 and 185 children and their parents participated. At T2, 8 children with only CBCL data were dropped. Thus, 185 children participated at T2 and T3 (100 and 103 boys; *M* ages = 7.67 and 9.70 years, *SDs* = .84 and .84, respectively). Families participated in a laboratory visit (*ns* = 175 for T2, 159 for T3). Parent-rated data for the remaining children were obtained by mail. Mothers (*ns* = 174, 158), fathers (*ns* = 8, 7), and grandmothers (*ns* = 3, 2) completed shyness and emotion questionnaires, and teachers completed all questionnaires (*ns* = 180, 164). Mothers (*n* = 174) reported on children's internalizing at T3. Most children came from two-parent homes (69% at T2, 70% at T3). T2 and T3 parental education were very similar to T1 parental education. T2 and T3 family income ranged from <\$20,000 to >\$100,000 (*Mdn* = \$40,000-60,000 at T2, \$60,000-80,000 at T3).

Attrition—Some families participated at T1 but not T2 (*n* = 29; 14% attrited) or at T1 but not T3 (*n* = 29; 14% attrited). Race, sex, income, children's age, mothers' education, fathers' education, and shyness, emotion, and internalizing variables at T1 were examined for differences between attrited and non-attrited families. Pearson chi-square tests were used for categorical variables. *T*-tests were used for continuous variables. Race was recoded so that non-Hispanic Caucasians were compared to all others combined to prevent too few cases per cell. Children with data at T1 but not T2 had higher T1 teacher-rated anger than children with data at T1 and T2, $t(193) = -2.11, p < .05$ (*M* for attrited = 4.09, *SD* = 1.39, and *M* for non-attrited = 3.53, *SD* = 1.28). No differences in demographic or other study variables were found between families who continued to participate and families who attrited from T1 to T2 or T3.

Procedure

Children and parents provided assent and consent. Parents completed questionnaires and children completed tasks unrelated to this study. Participants were compensated and asked for permission to obtain data from the child's teacher near the end of the semester.

Measures

Children's shyness, anger, sadness, positive EI, and internalizing were assessed.

Shyness—Adults (parents and teachers) rated children's shyness (1 = *Extremely untrue* to 7 = *Extremely true*) on the Children's Behavior Questionnaire Short Form (CBQ Short Form; Putnam & Rothbart, 2006). One item, *Sometimes seems nervous when talking to adults (s)he has just met*, was removed to reduce conceptual overlap and inflated relations among measures of shyness, negative emotionality, and internalizing.¹ The remaining 5 items (e.g., *Is shy even around people (s)he has known for a long time*) were averaged within reporter to form shyness composites at each assessment (parent-report *as* = .82, .74, and .82; teacher-report *as* = .86, .87, and .87). Parent- and teacher-rated shyness were correlated within time, $r(149) = .35$ to $r(167) = .40, ps < .01$.

¹We examined differences in correlations with emotionality and internalizing for the full versus reduced shyness scale. No differences involved changes in *p* values from $p < .05$ to $p > .10$ or vice versa, with one exception (of 120 potential differences). T2 teacher-rated shyness was related to T2 parent-rated sadness when the confounded item was included but not when it was excluded, $r_s(168, 166) = .15$ and $.13, ps < .05$ and $= .11$, respectively.

Anger—Adults rated children's anger/frustration (1 = *Extremely untrue* to 7 = *Extremely true*) on the CBQ (Rothbart, Ahadi, Hershey, & Fisher, 2001). Three items deemed inappropriate for teachers were dropped from teachers' reports (e.g., *Irritable about having to eat food (s)he doesn't like; Gets angry when told she has to go to bed; Rarely gets upset when told s/he has to go to bed*). Items (e.g., *Gets mad when provoked by others*) were averaged within reporter to form anger composites at each assessment (parent-report $as = .84, .84, \text{ and } .82$, 13 items; teacher-report $as = .91, .92, \text{ and } .88$, 10 items). Within time, parents' and teachers' ratings correlated only at T1, $r(191) = .26, p < .01$.

Sadness—Adults rated children's sadness (1 = *Extremely untrue* to 7 = *Extremely true*) on the CBQ. Two items were omitted for teachers as they appeared inappropriate (e.g., *Becomes upset when loved relatives or friends are getting ready to leave*). Two items that were expert-judged as indicative of internalizing symptoms were omitted from parent- and teacher-rated composites (e.g., *Sometimes appears downcast for no reason*; see *Authors*). Items such as, *Becomes sad when told to do something (s)he does not want to do*, were averaged within reporter to form sadness composites at each assessment (parent-report $as = .67, .69, \text{ and } .65$, 11 items; teacher-report $as = .77, .78, \text{ and } .75$, 9 items). Parent- and teacher-ratings did not significantly correlate.

Positive EI—Adults rated (1 = *Never* to 7 = *Always*) positive EI on an adaptation (Eisenberg, Fabes, et al., 1996) of the Emotional Intensity Questionnaire (Larsen & Diener, 1987). Six items (e.g., *When my child accomplishes something difficult, (s)he feels delighted or elated*) were averaged within reporter to form positive EI composites at each assessment (parent-report $as = .79, .80, \text{ and } .80$; teacher-report $as = .88, .91, \text{ and } .87$). Parents' and teachers' reports were positively correlated within time, range of $rs(159-190) = .19 \text{ to } .30, ps < .01$.

Internalizing—Mothers rated children's internalizing using the CBCL (Achenbach, 1991a). Based on experts' judgments (see *Authors*), 4 items (e.g., *Would rather be alone than with others*) were excluded because they overlapped with measures of shyness or emotion. The remaining 27 items (e.g., *complains of loneliness; feels worthless or inferior*) were averaged at T1 and T3 ($as = .83 \text{ and } .87$).

Analysis

In addition to descriptive analyses and zero-order correlations, longitudinal prediction of parent-rated shyness from parent- and teacher-rated emotionality, and vice versa, and prediction of internalizing from shyness and emotionality, was examined with panel models. Six path-analysis panel models (Figures 1 to 6) were computed using parent-rated shyness, parent- and teacher-rated emotionality variables, and mother-rated internalizing using *Mplus* 5.1. Based on the Missing At Random assumption, models were estimated using Full Information Maximum Likelihood. Methods are not currently available to directly test the MAR assumption, but it was believed to be reasonable for these data.

All models contained parent-rated shyness and mother-rated internalizing. Models differed in terms of the emotion they included (parent-rated anger [model 1], teacher-rated anger [model 2], parent-rated sadness [model 3], teacher-rated sadness [model 4], parent-rated positive EI [model 5] and teacher-rated positive EI [model 6]). Models contained autoregressive paths for shyness and emotion (T1 to T2, T2 to T3). Cross-lagged paths were included from shyness to later emotion and from emotion to later shyness. T1 mother-rated internalizing, T3 shyness, and T3 emotion were used to predict T3 mother-rated internalizing (Figures 1 to 6). Mediated effects were tested using the “model indirect” command in all models in conjunction with bias-corrected standard errors and confidence

intervals for the indirect effects (the mediated effect) to take into account the non-normality of the parameter estimate distribution (see MacKinnon, 2008, p. 335).

Parent-, rather than teacher-, rated shyness was used in models for theoretical and empirical reasons. Parents' ratings of shyness using the CBQ may reflect temperamental shyness to a greater degree than teachers' ratings, which may be more indicative of social status or quality of peer relationships (Eisenberg et al., 1998). Although teachers are good raters of shyness exhibited in the classroom, the CBQ mostly assessed shyness with strangers (3 of 5 items). Relative to parents, teachers likely have observed children in situations with strangers less frequently. For these reasons, and to reduce the number of analyses, we focused on parent-rated shyness. Parent- and teacher-rated emotion variables were not included in the same models because correlations between them often were low. Path-analysis panel models were computed in which pseudo latent constructs were indicated by a single observed variable. The factor loading for each variable was 1.0 and measurement error for each variable was set to 0.0 (pseudo latent constructs are not represented in the figures for clarity). In addition, moderation by children's sex was examined using multiple-group models.

Results

Descriptive Analyses

Descriptive statistics and sex differences in mean levels of variables, as indicated by *t*-tests, are presented in Table 1. Parents rated girls as higher than boys in T2 and T3 shyness, T2 sadness, and T3 positive EI. Teachers rated girls as higher in T3 sadness than boys.

Children's age at each laboratory visit correlated with three variables. Parents rated older children as higher in shyness at T2, $r(181) = .15, p < .05$, and mothers rated older children as higher in internalizing at T1 and T3, $r_s(207, 172) = .15$ and $.16, p_s < .05$.

Rank-order Stability and Correlations

Mother-rated internalizing, parent- and teacher-rated shyness, and parent- and teacher-rated emotionality usually were modestly to moderately stable. Teacher-rated sadness at T1 and T3 did not correlate (see Table 2).

Correlations of shyness with emotionality and internalizing are presented in Table 3. Correlations are not discussed because these relations were examined with more sophisticated analyses. The full correlation matrix is available from the first author.

Path-Analysis Panel Models

Model fit was evaluated with guidelines discussed in Hu and Bentler (1999). CFI, SRMR, and RMSEA values close to .95, .08, and .06, respectively, indicated good fit between the model and data. Fit indices are presented in figures. All models had good fit, but the models in which parent-rated anger and parent-rated sadness were examined had RMSEAs that were slightly higher than desired, despite the CFI and SRMR indicating good fit.

In each model, all autoregressive paths were positive and significant. Internalizing problems demonstrated stability from T1 to T3 (β s in the .40s to .50s). The models indicated stability for parent-rated shyness (β s in the .60s), parent-rated emotion (β s in the .50s to .70s), and somewhat lower stability for teacher-rated emotion (β s in the .20s to .40s).

Shyness and anger—In model 1 (parent-rated anger), none of the cross-lagged paths between shyness and anger was significant. T3 shyness and anger both positively predicted T3 internalizing. T1 anger, shyness, and internalizing were positively correlated (Figure 1).

In model 2 (teacher-rated anger), T2 shyness negatively predicted T3 anger. T3 shyness positively predicted T3 internalizing. Shyness and anger were not correlated within time, and both correlated positively with internalizing at T1 (marginally significant for anger; Figure 2).

Shyness and sadness—In model 3 (parent-rated sadness), T1 shyness positively predicted T2 sadness. T3 sadness, but not shyness, positively predicted T3 internalizing. Marginally significant mediation (indirect effect $b = .004$, $p = .08$, bias-corrected bootstrapped 95% CI: $LL = .001$, $UL = .009$) was found in which there was an indirect effect of shyness on internalizing through sadness (T1 shyness → T2 sadness → T3 sadness → T3 internalizing). Shyness and sadness were positively correlated within T1 and T3, but not T2. Shyness and sadness were positively related to internalizing within T1 (Figure 3).

In model 4 (teacher-rated sadness), T1 shyness negatively predicted T2 sadness (marginally significant). T1 sadness positively predicted T2 shyness. T3 shyness positively predicted T3 internalizing. Shyness and sadness were not significantly correlated within time. T1 shyness and internalizing were positively related (Figure 4).

Shyness and positive EI—In model 5 (parent-rated positive EI), T1 shyness negatively predicted T2 positive EI (marginally significant). T2 positive EI negatively predicted T3 shyness. T3 shyness positively predicted T3 internalizing. Shyness and positive EI correlated negatively at T1 and T3. T1 shyness and internalizing were positively correlated (Figure 5).

In model 6 (teacher-rated positive EI), T1 shyness negatively predicted T2 positive EI. T1 and T2 positive EI negatively predicted T2 and T3 shyness, respectively. T3 shyness positively predicted internalizing. Mediation from T1 positive EI → T2 shyness → T3 shyness → T3 internalizing (indirect effect $b = -.003$, $p = .10$, bias-corrected bootstrapped 95% CI: $LL = -.008$, $UL = .000$) was marginally significant. Shyness and positive EI correlated negatively at T1 and T2 (marginally significant at T3). T1 shyness and internalizing were positively related (Figure 6).²

Moderation by sex—Each model was examined for moderation by sex using multiple-group models in which paths were tested for invariance between boys and girls. Chi-square difference testing did not support moderation (details available from the first author).³

²Positive affect when children were being hooked to physiological equipment (typically taking 2-3 minutes) was rated from videotapes with a global score at T1 and T2 (1 = *no positive affect* to 5 = *laughing/smiling majority of time*, $ICCs(48, 51) = .83$ and $.73$, $ps < .01$) and with similar ratings every 30 seconds at T3, averaged across time, $ICC(50) = .84$, $p < .01$. Observed positive affect, parent-rated shyness, and mother-rated internalizing were examined in a panel model which had good fit to the data, $\chi^2(12) = 20.09$, $p = .07$, CFI = .98, RMSEA = .06, and SRMR = .04. Observed positive affect and shyness were negatively correlated within T1, $r = -.20$, $p < .01$, and shyness and internalizing were positively correlated within T1, $r = .24$, $p < .01$. T3 shyness positively predicted T3 internalizing, $B = .17$, $p < .01$. T1 parent-rated shyness negatively predicted positive affect at T2, $B = -.32$, $p < .01$.

³All panel models were rerun using T1 age as a covariate of T1 shyness, emotion, and internalizing because age was correlated with some of the study variables. Age predicted T1 internalizing, $\beta = .15$, $p < .05$, in each model. The correlations and B s were nearly identical to the models in which age was not a covariate with two exceptions. Inclusion of age caused the T1 correlation between internalizing and teacher-rated anger to become significant (from marginally significant), $\beta = .14$, $p < .05$. The prediction of T2 shyness from T1 teacher-rated sadness became marginally significant (from significant), $\beta = .11$, $p = .06$.

Discussion

We examined the relations among shyness, emotionality, and internalizing across three times during the school years (on average 6, 8, and 10 years of age) using panel models. Unique contributions of shyness and emotionality, as well as mediated relations, were examined with regard to internalizing problems. The study allowed for control of earlier levels of shyness, emotion, and internalizing, and accounted for concurrent relations at T1, providing a strong test of longitudinal prediction. We used purified scales with items removed to reduce measurement confounding among shyness, emotion, and internalizing. Furthermore, we separately examined anger and sadness, allowing a more fine-grained examination of negative emotionality than typically done.

Shyness and Internalizing Problems

Our findings are consistent with previous research in which shyness was related to internalizing problems (e.g., Leve et al., 2005; Oldehinkel et al., 2004). In our study, shyness nearly always predicted internalizing over-and-above emotionality (although emotionality did not always predict internalizing when shyness was controlled). In addition to replicating results from previous work, our use of purified scales and panel models points to the robustness of the relation between shyness and internalizing. The results extend the literature by suggesting potential mediated pathways in which shyness influences emotion or vice versa, which in turn, relates to internalizing problems.

Shyness, Anger, and Internalizing Problems

We found some support for unique, but not mediated, relations in which anger and shyness predicted internalizing. Parent-rated anger and shyness (but not teacher-rated anger) uniquely and positively predicted internalizing. Findings were consistent with some previous research. For example, children with internalizing problems have been found to have elevated anger relative to control children (e.g., *Authors*; Oldehinkel et al., 2004). One can speculate that increases in anger contribute to internalizing, for example, if anger eventually is turned inward and undermines one's self-concept or self-efficacy. In addition, inappropriate displays of anger might harm relationships, which may lead to dissatisfaction, regret, or anxiety. Furthermore, negative experiences (e.g., maltreatment) may underlie both anger and internalizing for some children.

We did not find mediated relations in which anger related to internalizing via shyness or shyness related to internalizing via anger. Indeed, when accounting for the stability in anger and/or shyness and concurrent relations, anger and shyness were seldom related across time. As an exception and contrary to hypotheses, T2 parent-rated shyness predicted lower T3 teacher-rated anger when controlling for earlier anger. This cross-reporter relation also was negative in direction in the zero-order correlation, but within-reporter zero-order correlations between shyness and concurrent anger often were positive (Table 3). As discussed, relevant research has yielded mixed results (e.g., Burgess et al., 2006; Eisenberg, Pidada, et al., 2001). Given that relations differed depending upon reporter in the present study, it is important to consider the source or context of information regarding anger and shyness in future studies.

Shyness, Sadness, and Internalizing Problems

Sadness previously has been associated with internalizing problems (e.g., Lemery, Essex, & Smider, 2002). In our study, T3 parent-rated sadness, but not shyness, positively predicted internalizing. This finding is notable in that stability of internalizing was controlled, and items confounding sadness and internalizing problems were removed. In addition, although parent-rated shyness did not uniquely predict internalizing, there was weak support for a

mediated relation involving shyness. There was a marginally significant indirect effect of shyness on internalizing through sadness (T1 shyness→T2 sadness→T3 sadness→T3 internalizing). This result is similar to Karevold et al.'s (2009) finding in which shyness indirectly influenced later internalizing through emotionality. However, earlier internalizing was controlled in the present study and sadness, as opposed to general emotionality, was examined. Taken together, these findings suggest a pathway through which shyness relates to internalizing problems. If replicated, these findings could inform interventions to prevent internalizing problems.

In contrast to the finding for parent-reported sadness, teacher-rated sadness did not relate to internalizing problems in the path model. The lack of association did not appear to be due to issues of stability. Teacher-rated sadness did not relate to mother-reported internalizing, even in the zero-order correlations. Perhaps teachers did not detect students' sadness as well as parents did, given the heavy demands on teachers' attention. This may be especially true if children's sadness did not disrupt the classroom. Later in childhood, when children's regulatory abilities are more developed and emotions are more easily masked, students' sadness may have been more difficult for teachers to discern.

Although teacher-rated sadness did not predict internalizing, T1 teacher-rated sadness was related to higher shyness two years later (T2), controlling for T1 shyness. Frequent expression of sadness in the classroom may lead to negative interactions with classmates and, thus, apprehension or anxiety about interacting with others. Although speculative, the same negative interactions with others may not result when sadness is expressed at home. It also is possible that if reactions to children's expression of sadness at home were negative and affected shyness, the effect may have occurred prior to T1.

Shyness, Positive Emotional Intensity, and Internalizing Problems

In both models involving positive EI, T3 parent-rated shyness positively predicted internalizing, whereas positive EI did not. Low positive affect has been implicated in depression, but not anxiety (Clark et al., 1994). Still, this finding was surprising. Perhaps the lack of prediction was because we assessed relatively intense positive emotion. Lack of intense positive emotion (e.g., exuberance) may be less important than lack of positive emotionality more generally (e.g., happiness, contentment) in the development of internalizing problems such as depression.

Furthermore, a marginally significant mediated effect of teacher-rated positive EI on internalizing through shyness was found (T1 positive EI→T2 shyness→T3 shyness→T3 internalizing), even when accounting for stability of variables and relations among T1 positive EI, shyness, and internalizing. Although this finding was not significant at a conventional level, these results are encouraging in that they suggest that determining ways to boost children's positive EI may lead to a reduction in shyness and, in turn, reduce internalizing problems.

In both models, there also were negative relations between positive EI and later shyness. The negative associations between positive EI and shyness are consistent with prior work with school-aged children (Eisenberg et al., 1998). Mechanisms underlying the relation are not understood, but positive EI may improve social interactions or acceptance, which in turn, reduces shyness.

Furthermore, T1 parent-rated shyness predicted lower positive EI two years later (T2) after controlling for stability in positive EI and within-time associations in both models. This relation was marginally significant for parent-rated positive EI, perhaps due to its stability. It also is possible that shyness has a slightly stronger dampening effect on positive EI at school

relative to home because the social demands at school are greater (e.g., being with many peers, writing on the blackboard, reading aloud). For example, a shy child might be anxious about being called on to answer a question. Rather than enjoying class, social anxiety might promote uncomfortable vigilance in anticipation of being requested to speak.

The consistency in results between models and in the zero-order correlations suggests that the connection between shyness and low positive EI is robust. Shy children tended to exhibit relatively low levels of positive EI even around their parents, indicating that the depressed positive emotionality is not simply tied to contexts that elicit shyness. Findings from the models extend previous work in that positive EI often related to parent-rated shyness over time and that, in some cases, parent-rated shyness related to later positive EI.

Moderation of Relations among Shyness, Emotion, and Internalizing by Sex

We expected, but did not find, that relations between shyness and negative emotions or internalizing might be stronger for boys based on research suggesting shy boys are more at risk for poor outcomes than shy girls (e.g., Coplan et al., 2004; Coplan & Weeks, 2009; Gazelle & Ladd, 2003). It is possible that weak sex differences existed but were not detected in the due to insufficient statistical power.

Conclusions

The study is not without limitations. Transactional relations between shyness and emotion would be more accurately modeled with a greater number of data measurements occurring in closer temporal proximity to each other. In addition, parents' and teachers' reports of negative emotionality were modestly correlated or uncorrelated. Other researchers have found low or modest agreement among reporters of children's negative emotionality (e.g., Goldsmith, Rieser-Danner, & Briggs, 1991). The low correspondence may have indicated children's context-specific expression of emotion or children regulating their emotion to a greater extent when at school than at home. It also is possible that teachers are poorer raters of sadness or anger relative to parents. Perhaps teachers are less "in tune" with their students' emotion if it is not disruptive to the classroom, or because they observe children in a limited number of contexts. Another potential limitation was use of mothers' reports of internalizing problems. Some researchers have argued that self-reports are more accurate reports of internalizing than reports from others (Yule, 1993). Also, our sample was not representative of the general population because we selected a sample in which problem behavior was well-represented. Results may not generalize to unselected samples.

In the future, it would be interesting to explicitly examine the role of adverse or supportive relationships with peers, parents, and teachers in relations among shyness, emotionality, and internalizing problems (e.g., Arbeau, Coplan & Weeks, 2010; Rubin & Coplan, 2004). For example, it is possible that shyness predicts poor peer relationships, which predict sadness, which in turn predicts internalizing problems.

The present study contributes to the understanding of relations among shyness, emotionality, and internalizing over time. The results suggest not only that shyness and emotionality are related, but shyness sometimes predicts later emotionality and vice versa. Results from this study taken together with Karevold et al.'s (2009) study suggest that shyness may relate to subsequent emotionality (for sadness) or vice versa (for positive EI) which, in turn, may influence internalizing problems. The mediated findings were marginally significant and should be replicated. Nonetheless, the results are interesting in that they illuminate potential pathways leading to internalizing problems and may indicate points of intervention. For instance, shyness may influence sadness which predicts internalizing, or positive EI may influence shyness which predicts internalizing problems.

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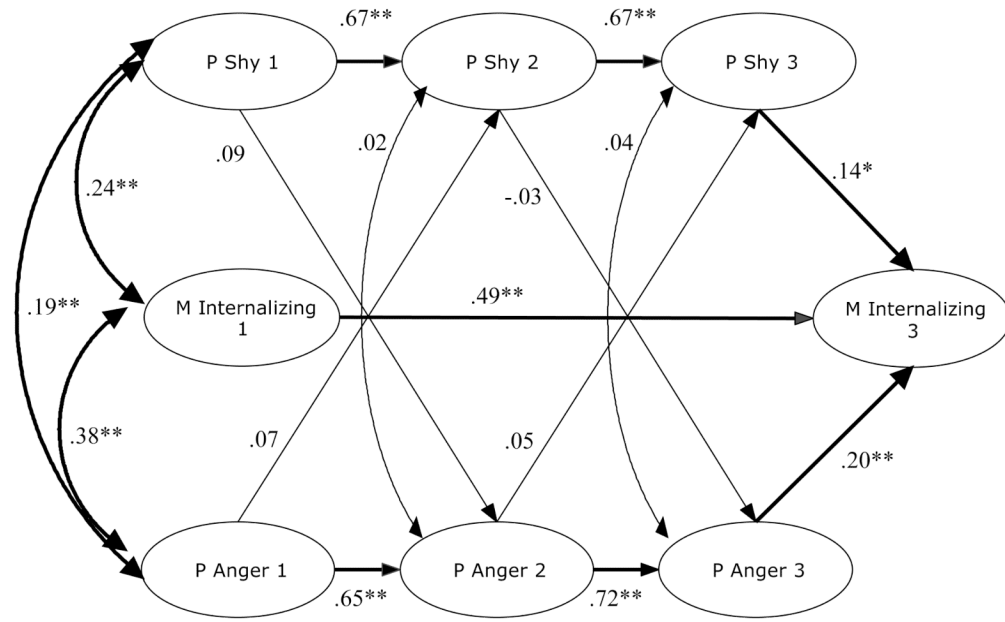


Figure 1.

Panel model of parent-rated shyness, parent-rated anger, and mother-rated internalizing. P = parent-rated, M = mother-rated. Correlations and completely standardized beta estimates are reported. $\chi^2(12) = 27.29, p = .01, CFI = .97, RMSEA = .08, SRMR = .04$ $^+p < .10$ or $t > 1.645$, $*p < .05$ or $t > 1.96$, and $**p < .01$ or $t > 2.58$. Bold line = $p < .05$.

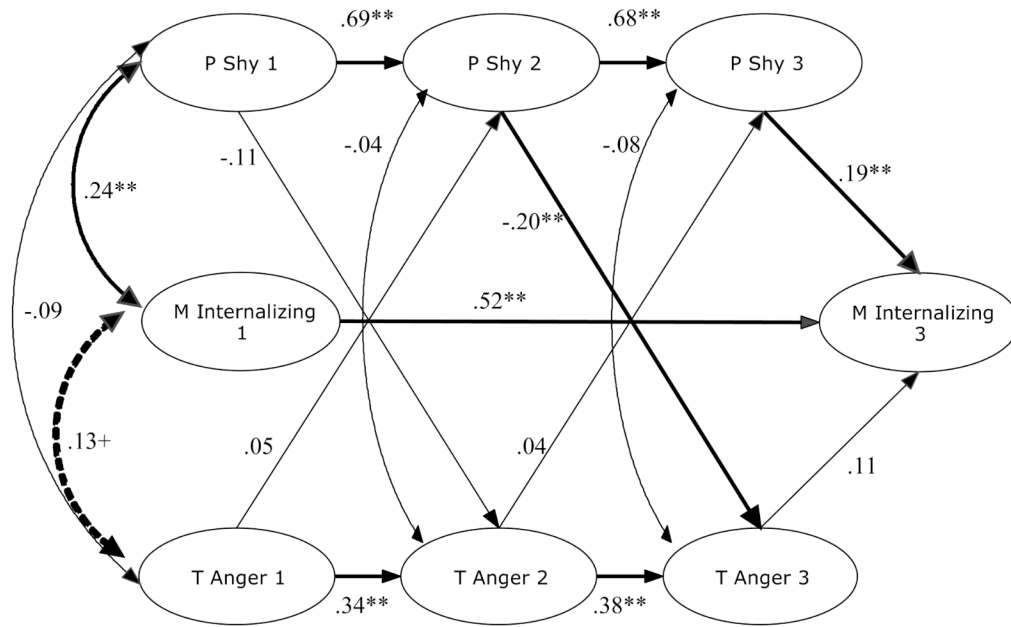


Figure 2.

Panel model of parent-rated shyness, teacher-rated anger, and mother-rated internalizing. P = parent-rated, M = mother-rated, T = teacher-rated. Correlations and completely standardized beta estimates are reported. $\chi^2(12) = 15.36, p = .22, CFI = .99, RMSEA = .04, SRMR = .04 + p < .10$ or $t > 1.645, * p < .05$ or $t > 1.96$, and ****** $p < .01$ or $t > 2.58$. **Bold line** = $p < .05$ and **dashed line** = $p < .10$.

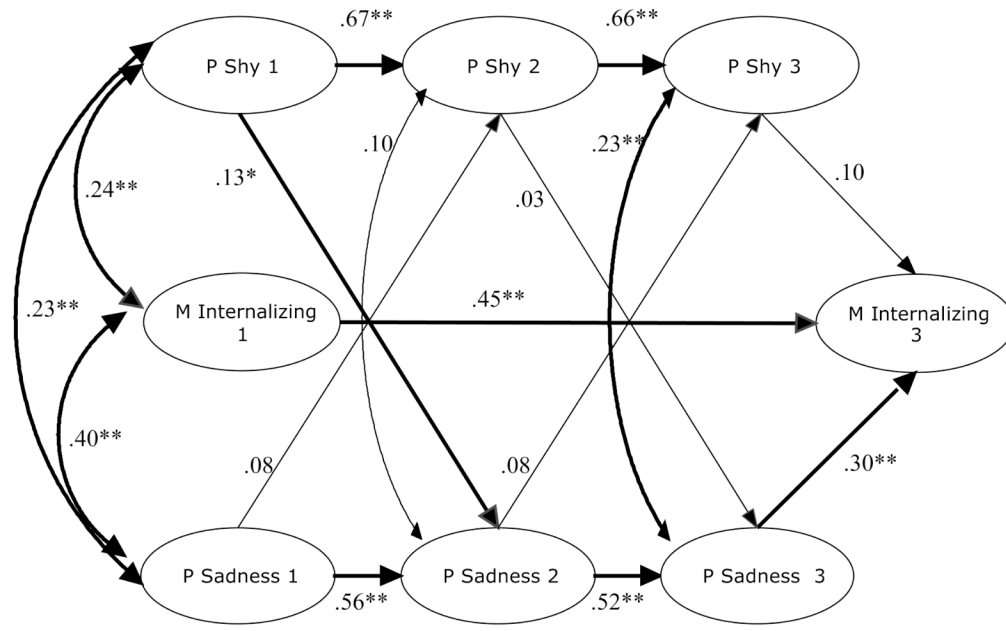


Figure 3.

Panel model of parent-rated shyness, parent-rated sadness, and mother-rated internalizing. P = parent-rated, M = mother-rated. Correlations and completely standardized beta estimates are reported. $\chi^2(12) = 26.38, p < .01, CFI = .97, RMSEA = .08, SRMR = .05 + p < .10$ or $t > 1.645, * p < .05$ or $t > 1.96$, and ****** $p < .01$ or $t > 2.58$. Bold line = $p < .05$.

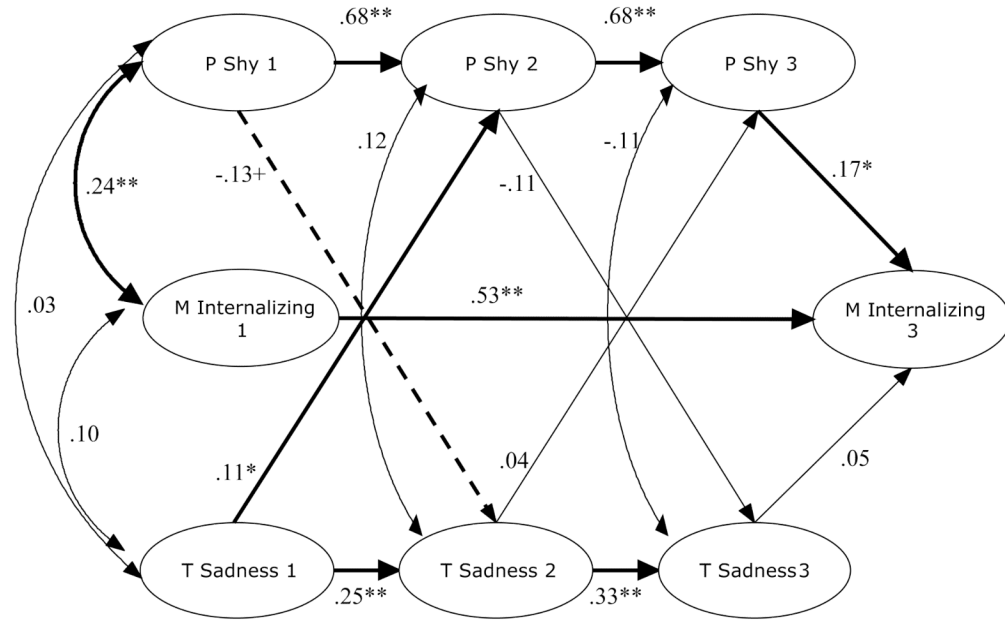


Figure 4.

Panel model of parent-rated shyness, teacher-rated sadness, and mother-rated internalizing. P = parent-rated, M = mother-rated, T = teacher-rated. Correlations and completely standardized beta estimates are reported. $\chi^2(12) = 13.14, p = .36, CFI = 1.00, RMSEA = .02, SRMR = .03$ + $p < .10$ or $t > 1.645$, * $p < .05$ or $t > 1.96$, and ** $p < .01$ or $t > 2.58$. Bold line = $p < .05$ and dashed line = $p < .10$.

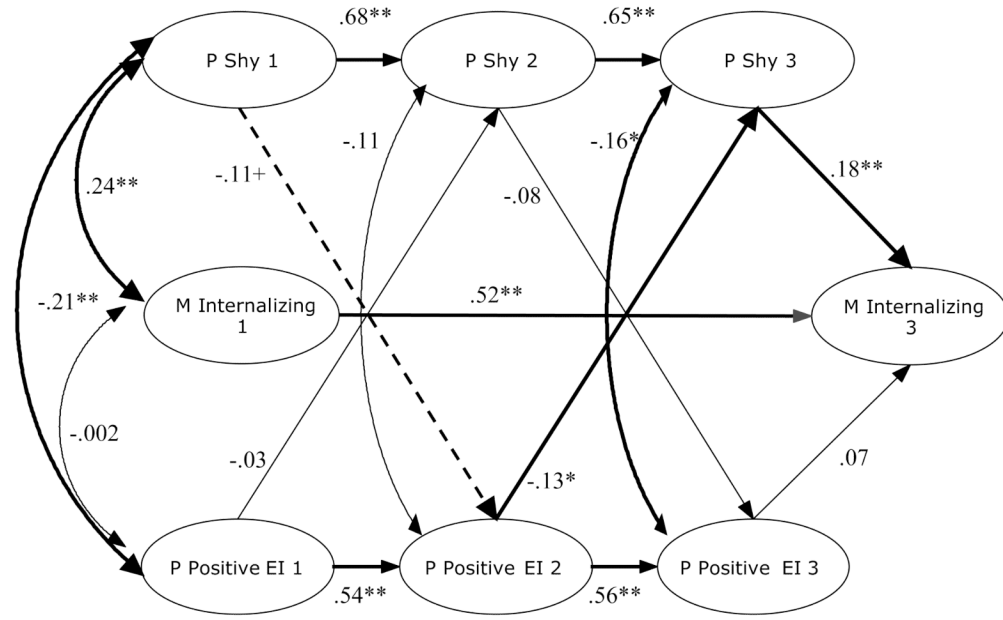


Figure 5.

Panel model of parent-rated shyness, parent-rated positive emotional intensity, and mother-rated internalizing. P = parent-rated, M = mother-rated, EI = emotional intensity.

Correlations and completely standardized beta estimates are reported. $\chi^2(12) = 21.92, p = .04, CFI = .98, RMSEA = .06, SRMR = .04$ + $p < .10$ or $t > 1.645$, * $p < .05$ or $t > 1.96$, and ** $p < .01$ or $t > 2.58$. Bold line = $p < .05$ and dashed line = $p < .10$.

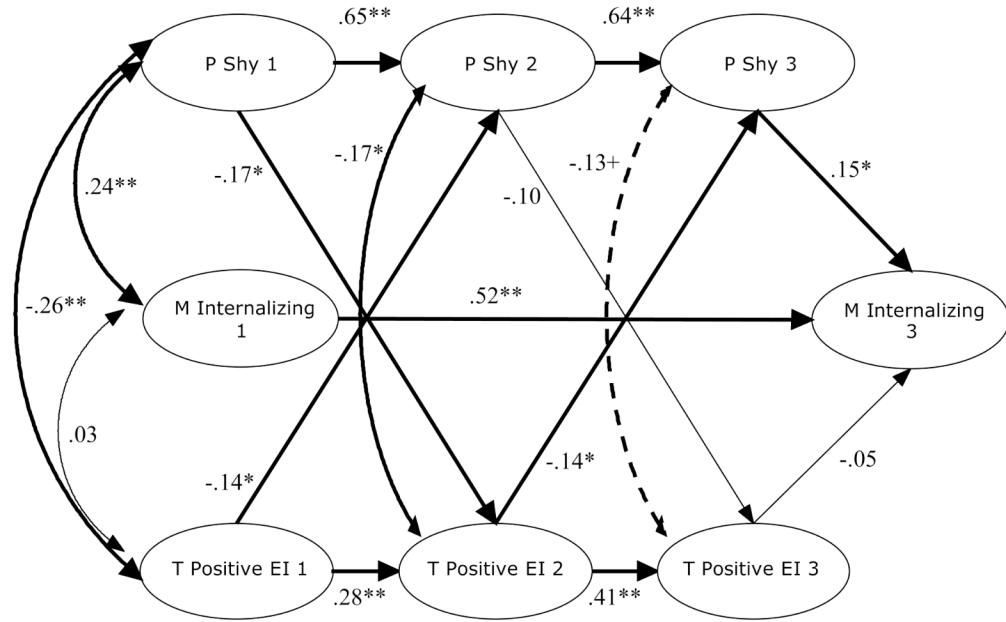


Figure 6.

Panel model of parent-rated shyness, teacher-rated positive emotional intensity, and mother-rated internalizing. P = parent-rated, M = mother-rated, T = teacher-rated, EI = emotional intensity. Correlations and completely standardized beta estimates are reported. $\chi^2(12) = 16.05, p = .19, CFI = .99, RMSEA = .04, SRMR = .04$ $^+p < .10$ or $t > 1.645$, $*p < .05$ or $t > 1.96$, and $**p < .01$ or $t > 2.58$. Bold line = $p < .05$ and dashed line = $p < .10$.

Table 1
Means and Standard Deviations of Shyness, Emotionality, and Internalizing

	T1		T2		T3	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Parent-rated Shyness	3.59	1.34	3.35 ^a	1.32	3.10 ^b	1.36
Teacher-rated Shyness	3.38	1.34	3.37	1.40	3.25	1.25
Parent-rated Anger	4.71	.92	4.48	.95	4.25	.87
Teacher-rated Anger	3.61	1.30	3.48	1.35	3.30	1.10
Parent-rated Sadness	4.39	.76	4.31 ^c	.80	4.14	.73
Teacher-rated Sadness	3.58	.93	3.69	1.02	3.55 ^d	.84
Parent-rated Positive EI	5.17	.87	5.04	.93	4.87 ^e	.89
Teacher-rated Positive EI	4.26	1.20	4.14	1.38	3.88	1.21
Mother-rated Internalizing	.36	.25	-	-	.34	.26

Notes. EI = emotional intensity

^a Sex difference: $t(181) = 3.45, p < .01, Ms = 3.70$ for girls, 3.05 for boys

^b Sex difference: $t(181) = 2.63, p < .01, Ms = 3.40$ for girls, 2.86 for boys

^c Sex difference: $t(180) = 2.82, p < .01, Ms = 4.49$ for girls, 4.15 for boys

^d Sex difference: $t(109.32) = 2.62, p < .05, Ms = 3.76$ for girls, 3.38 for boys

^e Sex difference: $t(167) = 2.04, p < .05, Ms = 5.02$ for girls, 4.78 for boys

Table 2
The Rank-order Stability of Shyness, Emotionality, and Internalizing Problems

	T1-T2	T2-T3	T1-T3
Parent-rated Shyness	.69**	.69**	.52**
Teacher-rated Shyness	.44**	.38**	.26**
Parent-rated Anger	.69**	.70**	.55**
Teacher-rated Anger	.35**	.37**	.18*
Parent-rated Sadness	.59**	.52**	.45**
Teacher-rated Sadness	.26**	.32**	.12
Parent-rated Positive EI	.55**	.57**	.41**
Teacher-rated Positive EI	.30**	.42**	.29**
Mother-rated Internalizing	N/A	N/A	.54**

Note. Degrees of freedom for correlations ranged from 116 to 180. EI = Emotional Intensity

⁺
 $p < .10$.

^{*}
 $p < .05$.

^{**}
 $p < .01$.

Table 3
Zero-order Correlations between Shyness and Emotionality, and Shyness and Emotionality with Internalizing Problems

	1 P Shy	2 P Shy	3 P Shy	1 T Shy	2 T Shy	3 T Shy	1 M Int	3 M Int
1 P Ang	.19**	.21**	.09	.08	.05	.02	.38**	.32**
2 P Ang	.22**	.21**	.19*	.04	.03	.05	.29**	.43**
3 P Ang	.09	.11	.13+	-.09	.05	.02	.18*	.30**
1 T Ang	-.10	-.04	.03	.03	.00	.02	.14+	.14+
2 T Ang	-.15+	-.11	-.02	-.08	.17*	.16+	-.10	-.04
3 T Ang	-.15+	-.25**	-.20*	.01	-.03	.23**	.04	.10
1 P Sad	.23**	.23**	.25**	.09	.14+	.05	.40**	.32**
2 P Sad	.26**	.27**	.22**	.11	.13	.13	.38**	.37**
3 P Sad	.12	.14+	.28**	-.07	.04	-.05	.32**	.46**
1 T Sad	.01	.12	.04	.24**	.18*	.02	.09	.11
2 T Sad	-.12	.03	.07	-.06	.29**	.14	-.04	-.05
3 T Sad	-.10	-.10	-.13	.06	.05	.30**	-.10	-.02
1 P PEI	-.22**	-.17*	-.25**	-.13+	-.06	-.02	-.01	-.14+
2 P PEI	-.21**	-.22**	-.27**	-.19*	-.23**	-.18*	-.06	-.10
3 P PEI	-.22**	-.19*	-.29**	-.07	-.14	-.05	-.02	.02
1 T PEI	-.24**	-.28**	-.21**	-.53**	-.28**	-.34**	.04	.07
2 T PEI	-.25**	-.31**	-.32**	-.36**	-.48**	-.17*	-.12	-.09
3 T PEI	-.14+	-.23**	-.28**	-.19*	-.32**	-.39**	-.11	-.15+
1 M Int	.24**	.20**	.15+	-.02	.14+	.09	-	-
3 M Int	.12	.12	.25**	.04	-.02	.06	-	-

Note. P = parent-rated, T = teacher-rated, M = mother-rated, Ang = anger, PEI = positive emotional intensity, and Int = internalizing. Degrees of freedom range = 120 to 205.

+ $p < .10$.

* $p < .05$.

** $p < .01$.