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Child Temperament, Maternal Parenting Behavior, and Child Social Functioning

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Abstract

We examined child temperament, maternal parenting, and the effects of their interactions with each other on child social functioning. A total of 355 children aged 5–18 years old (54% male; mean age=10.8) were evaluated. Regression equations were used to test models of the main and interactive effects of temperament and maternal parenting behavior on the Social Problems and Social Competence Subscales of the Child Behavior Checklist (CBCL), a questionnaire assessing internalizing and externalizing behavior problems in children ages 4 to 18. Higher levels of child Novelty Seeking and Harm Avoidance and lower levels of Persistence were significantly associated with poorer social functioning. When accounting for child temperament, neither

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maternal parenting nor the interaction between maternal parenting and child temperament were significantly associated with social functioning. However, the interaction between maternal positive involvement and harm avoidance trended toward significance, such that at higher levels of harm avoidance, more extreme levels of maternal positive involvement were related to lower levels of social functioning. Further research on the interplay between child temperament and parenting across different stages of development is warranted.

Keywords

temperament; parenting; social functioning; Child Behavior Checklist; development

Children's social functioning is increasingly recognized as vital to their overall development in a number of areas, such as school enjoyment, academic achievement, and the development and/or maintenance of internalizing and externalizing behavior problems (Buhs & Ladd, 2001; Henricsson & Rydell, 2006; Ladd, Kochenderfer, & Coleman, 1997). Given the importance of social functioning for children's development, it is crucial to understand risk factors associated with poor social functioning. Although there have been several investigations aimed at understanding how temperament and parenting each contribute to child social functioning defined as internalizing and externalizing behaviors, little research exists exploring the relation of the interactive effects of child temperament and maternal parenting with direct measures of social functioning in children (Diener & Kim, 2004; Miller & Coll, 2007; Rubin, et al., 2009; Sanson, et al., 2002). Addressing the interaction of these risk factors may lead to targeted health promotion, prevention, and intervention strategies.

One promising line of research has focused on the role of child temperament in social versus non-social (withdrawn, solitary, or aggressive) behavior with peers (Blair, Denham, Kochanoff, & Whipple, 2004; Kagan & Snidman, 1999; Van Hecke et al., 2007). Much of the research examining the contribution of temperament to child social functioning has broadly defined social functioning to include externalizing and internalizing behavior problems (Sanson, Hemphill, & Smart, 2004). The temperamental dimensions that have been implicated in the development of externalizing behaviors include low effortful control, high negative emotionality, high reactivity, low attention regulation, and a "difficult" temperament profile (Guerin, Gottfried, & Thomas, 1997; Lagacé-Séguin & d'Entremont, 2006; Zhou, Main, & Wang, 2010). In children and adolescents, high novelty seeking has been associated with externalizing problems, including aggression and rule-breaking (Kuo, Chih, Soong, Yang, & Chen, 2004). Measures of low persistence have been linked to disruptive behavior and attention problems (Schmeck & Poustka, 2001).

Harm avoidance, a temperamental trait defined by shyness, fatigability, anticipatory worry, and behavioral inhibition, has been linked to the development of internalizing behavior problems. Longitudinal studies indicate that early temperamental inhibition and harm avoidance are associated with later internalizing problems, such as anxiety (Kagan & Snidman, 1999; Prior, Smart, Sanson, & Oberklaid, 2000). Research also shows an

association between harm avoidance and disruptive behavior disorders, but only when comorbid with internalizing disorders (Rettew, Copeland, Stanger, & Hudziak, 2004).

The temperamental dimension that has received the most support for affecting social outcomes is effortful control, which includes components of attention regulation, emotion regulation, and inhibitory control. Effortful control has been shown to have a positive association with children's constructive social interactions with peers, social skills, and popularity (Eisenberg et al., 2000; Fabes et al., 1999; Spinrad et al., 2006); whereas high activity, distractibility, and low persistence have been found to predict peer rejection (Walker, Berthelsen, & Irving, 2001).

Although most of the research examining the contribution of temperament to child social functioning has broadly defined social functioning to include externalizing and internalizing behavior problems, some research has looked at more direct measures of social outcomes. Rettew, Althoff, Ayer, Dumenci, and Hudziak (2008) found that poor social competency was related to a child temperament profile characterized by high novelty seeking and harm avoidance combined with low reward dependence and persistence. Degnan et al. (2011) investigated the relation between exuberant temperament at age 36 months and specific measures of social functioning at 5 years of age assessed through a series of free-play, cleanup, and social problem solving tasks. These measures included Social Reticence (i.e., Wariness, Unfocused, Proportion of Time Unoccupied, and Passive Strategies), Disruptive Behavior (i.e., Negative Affect, Aggression, Active Strategies, and Verbal Strategies (reverse-scored)), and Social Competence (i.e., Social Interest, Positive Affect, Activity Level, Proportion of Object-Acquisition Goals). Analyses revealed that the toddlers with a greater probability of having a high Exuberance profile exhibited a lower frequency of Social Reticence behavior during the 5-year dyad assessment. In addition, results indicated a significant interaction between the Exuberance profile and frontal EEG asymmetry, such that a high Exuberance profile was positively associated with 5-year Social Competence scores, Surgency scores, and externalizing problems, but only when children exhibited left frontal asymmetry (Degnan et al, 2011).

Bohlin et al. (2009) also explored the relation of temperament on specific measures of social competence defined by social initiative, popularity, and pro-social orientation and found that, while high activity in preschool-age children was associated with high externalizing behaviors in both 4- and 8–9- year olds, it was also positively related to high social competence, extraversion, and openness in 8–9-year olds (Bohlin, Hagekull, & Andersson, 2005). In addition, high shyness and inhibition in preschoolers was associated with internalizing behaviors, at ages 4 and 8–9, and low social competence in middle childhood (Bohlin and Hagekull, 2009; Bohlin, Hagekull, and Andersson, 2005). The relation between temperament and direct measures of social functioning has also been explored in an adolescent population. Murphy, Shepard, Eisenberg, and Fabes (2004) investigated the relation between social functioning and negative emotionality in 64 young adolescents. Results showed that social functioning in young adolescents was inversely related to negative emotionality. Additionally, negative emotionality during early adolescence, and at earlier time points, uniquely predicted social functioning during early adolescence after controlling for past social functioning (Murphy, Shepard, Eisenberg, & Fabes, 2004).

Child development is increasingly understood as being the product of multiple factors, including not only temperament but environmental factors such as parenting behavior (Belsky, Jaffee, & Belsky, 2006; Collins, Maccoby, Steinberg, Hetherington, & Bornstein, 2000; Lollis & Kuczynski, 1997). Most research linking parenting characteristics with children's social development has focused on the level and type of discipline and the expression of positive and negative affect. Insensitive responding to children's behavior and intrusive, harsh, negative, and controlling discipline have been associated with elevated levels of externalizing behaviors and poor social skills (Anthony, et al., 2005; Brenner & Fox, 1998; Carlson, 1998; Chang, Schwartz, Dodge, & McBride-Chang, 2003; Diener & Kim, 2004; Haskett & Willoughby, 2007; Hinshaw et al., 2000) van Aken et al., 2007).

Another parenting dimension that has received attention for its contribution to child social functioning is parental warmth, which includes aspects of physical affection, communication, involvement, and positive discipline techniques. High levels of warmth, parental support, and monitoring have been associated with children and adolescents' social competence, self esteem, and low risk behaviors (Parker & Benson, 2004; Puttallaz & Heflin, 1990). Alternatively, high levels of warmth and restriction of behavior in situations that present no actual danger leads to social withdrawal (Kiel and Buss, 2011). In addition, Chorpita and Barlow (1998) and Dadds and Roth (2001) suggest that protective parenting may perpetuate fearfulness and anxiety and encourage children to remain dependent on their parents (as cited in Kiel and Buss, 2011, pg. 3).

In addition to the direct effects of parenting style on social outcomes, recent research has examined the indirect, or moderated, effects of parenting and temperament on social functioning. Moderated effects are similar to Thomas and Chess' (1977) "goodness of fit" theory, in which temperament affects development through the match of temperament and the environment. High compatibility between temperament capacities and contextual requirements facilitates healthy development, whereas a mismatch compromises development. Although a significant body of research has identified ways in which both temperament and parenting make independent contributions to the development of pro-social behavior, only in recent years have investigators begun examining how parenting and temperament may interact with one another to affect social development outcomes. As noted above, much of the literature in this area has defined social functioning broadly as externalizing and internalizing behavior, rather than looking at specific social outcomes. The most consistent finding across research is that children with temperamental traits associated with externalizing behavior exhibit more behavior problems when they receive parenting that is high in restrictive negative discipline and low in warmth (Campbell, 1997; Lengua, Wolchik, Sandler, & West, 2000; Rubin, Hastings, Chen, Stewart, & McNichol, 1998). Furthermore, in several prospective studies, child temperament at baseline has been found to predict externalizing behavior problems at follow up, but only in the presence of dysfunctional parenting (Hemphill & Sanson, 2001; Maziade et al., 1990).

Less research has examined the interaction of child temperament and parenting on specific indicators of social functioning. In a study of multiple social developmental outcomes, including behavior problems and social skills, Paterson and Sanson (1999) investigated the direct and interactive effects of child temperament, parenting style, and "goodness of fit"

between the characteristics of 5- to 6-year-old children and their parents' behavioral expectations. Results indicated that for combined parent and teacher reports of social skills, greater attention regulation, higher levels of parental warmth, and better "fit" predicted higher levels of social skills. In a subsequent longitudinal study, Smart and Sanson (2001) found that social skills were directly related to both temperamental difficulty and poor parent–child fit from toddlerhood through 7 to 8 years. In addition, the group with both problematic temperament and poor fit had significantly lower social skills at 11 to 12 years than the groups with only one or neither of these problems. Others, however, have failed to find interactive effects of parenting and temperament on social functioning-related outcomes. Lyons-Ruth, Easterbrooks, and Cibelli (1997), found no interaction between parental characteristics and child characteristics assessed at 18 months to account for additional variance in internalizing or externalizing behavior problems at age 7 years, over and above that accounted for by these variables separately.

Some research has focused on the interaction of parenting and temperament on more direct measurements of social outcomes. For example, Kiel and Buss (2011) investigated the effect of fearful temperament and protective parenting on social withdrawal in toddlerhood. They found that the association between fearful temperament and protective parenting strengthened as mothers' accuracy in predicting their children's responses to conflict increased. In addition, protective parenting served as a partial mediator of the relation between fearful temperament and social withdrawal, but only when maternal accuracy reached a value of 1.85 SD above its mean (Kiel & Buss, 2011). Perez and Cumsille (2012) explored the relation between temperamental traits, parental control, and adolescent decision making. Results indicated that adolescents' fearfulness moderated the relation between parental behavioral control and adolescent decision making with regards to prudential behaviors, such that at low levels of fearfulness, perceived parental control was inversely related to adolescent decision making in the prudential domain; whereas, at high levels of fearfulness, no significant relation was observed (Perez & Cumsille, 2012).

The concept of equifinality, which proposes that the same psychopathological phenotype may result from different developmental processes, has been studied across disorders (Cicchetti & Rogosch, 1996). For example, Frick and Viding (2009) investigated antisocial behavior from a developmental perspective and indicated that callous unemotional (CU) traits, after controlling for other risk factors (i.e., past criminal offenses, drug use, delinquent peers), continued to predict later antisocial behavior. In the same way, the interaction between temperamental traits and maternal parenting styles may affect social functioning, independent of externalizing and internalizing behaviors. Moreover, different processes and risk factors of the same developmental outcome may reveal information about subtypes and in turn facilitate more effective treatment (Frick & Viding, 2009). Therefore, investigating the interactive effects of temperament and parenting on measures of social functioning, outside of internalizing and externalizing problem behaviors, will further develop this area of research.

Our first aim was to examine the direct relation of both child temperament and maternal parenting behavior on two specific indicators of social functioning, measured by the Social Problems and the Social Competence scales of the Child Behavior Checklist (CBCL;

Achenbach, 1991). Specifically, we predicted that high levels of Novelty Seeking, low levels of Persistence, and high levels of Harm Avoidance would be related to higher Social Problems Subscale scores and lower Social Competence Subscale scores. With regard to parenting, we hypothesized that high maternal Negative Discipline and low maternal Positive Involvement would be associated with increased Social Problems Subscale scores and decreased Social Competence Subscale scores. Our second aim was to investigate whether child temperament and maternal parenting interact to affect social functioning. In the absence of clear guidance from the literature it was anticipated that a child temperamentally predisposed to being impulsive and sensation-seeking (i.e., high in Novelty Seeking) and exposed to high Negative Discipline would be more likely to develop social problems. We further anticipated that a temperamentally inhibited child (i.e., Harm Avoidant), who was shy and socially anxious, may be helped in the area of social functioning by mothers who schedule playdates or enroll him or her in sports or other group activities (e.g., high Positive Involvement) and harmed in the presence of overly harsh and punitive parenting (e.g., high Negative Discipline). Lastly, we hypothesized that a child who was predisposed to become frustrated and give up easily (i.e., low Persistence) would do better socially with mothers who were highly involved (i.e., high Positive Involvement) in his/her life and encouraged him/her to persevere despite social setbacks compared to children of mothers who were less involved.

Method

Subjects

Participants came from a family study conducted in the northeastern United States that was designed to examine the genetic and environmental contributions to attention and aggression. Potential families were recruited from local pediatricians and psychiatrists in a university-based outpatient clinic based on a review of clinical records. Local newspaper advertisements and posters were also used. Families were initially screened over the telephone for the following demographic inclusion criteria: (1) proband child between the ages of 5 and 18 years; (2) proband child living with at least one biological parent; and (3) proband child with at least one sibling between the ages of 5 and 18 years. In addition to parents and probands, biological siblings were originally recruited to explore genetic and environmental influences of attention and aggression. A total of 474 children from 207 families participated in the study. All parents provided informed consent for the participation of themselves and their children and all children over the age of 10 gave assent. The Institutional Review Board of the University of Vermont approved this project.

Assessments of child mental health were collected from multiple informants including mother, father, and teacher. For the present investigation we chose to examine only mother-reported data in order to maximize the power of the analyses, since substantially more mother-reported data was available compared to any other informant. Complete data on child social functioning and temperament were available for 355 children (190 boys and 165 girls). The mean age of the children in this sample was 10.8 years. Socioeconomic status (SES) was evaluated using the Hollingshead Four Factor Index of Socioeconomic Status measuring social status of a child's parent based on a likert scale of four domains: marital

status, retired/employed status, educational attainment, and occupational prestige (Hollingshead, 1975). SES (M= 64.7, SD=21.3) did not differ between those individuals with and without complete data (p=.08). Demographic information for the sample is shown in Table 1.

Measures

Assessment of child social functioning—The Child Behavior Checklist (CBCL) was used to obtain mothers' reports of their children's behavioral and emotional problems. This 118-item measure provides a standardized assessment of internalizing and externalizing behavior problems in children between the ages of 4 and 18 years. The CBCL also includes assessments of Social Competence and Social Problems. The Social Competence (SocCom) Subscale is comprised of items related to the amount and quality of participation in organizations and social relationships. The Social Problems (SocProb) Subscale assesses behaviors related to poor social functioning, such as complaining of loneliness, clinging to adults, peer rejection, getting teased, and not getting along with other children. The Social Problems Subscale is only moderately correlated with both the Internalizing (r=.57) and Externalizing (r=.56) scales, indicating that the majority of the variance accounted for in the Social Problems Subscale cannot be explained by internalizing and externalizing behaviors. There is less information on the discriminant validity of the Social Competence Subscale.

Assessment of child temperament—Child temperament was assessed using the Junior Temperament and Character Inventory (JTCI), a child and adolescent version of the Temperament and Character Inventory (TCI), an adult temperament and character assessment with good psychometric properties demonstrated across cultures (Cloninger, Svrakic, & Przybeck, 1993; Cloninger, 1994; Kuo, et al., 2004; Luby, Svrakic, McCallum, Przybeck, & Cloninger, 1999; Tremblay, Pihl, Vitaro, & Dobkin, 1994). The JTCI has received validation from several studies (Kuo, et al., 2004; Lyoo et al., 2004) and consists of 108 statements that the respondent rates as true or false based on how the person usually acts and feels.

This study examined the mother-rated version of the JTCI assessing four temperament factors: Novelty Seeking (NS), Harm Avoidance (HA), Persistence (P), and Reward Dependence (RD) and three character dimensions: Self-directedness, Self-transcendence, and Cooperativeness. NS describes a tendency to seek out stimulating experiences and contains elements of impulsivity, extravagance, and disorderliness. HA refers to inhibitory behavior and is characterized by shyness, worry and fatigability. P reflects the ability of a child to persevere despite frustration, fatigue, and intermittent reinforcement. RD measures the inclination to maintain behaviors in response to social cues and is observed as sentimentality, attachment, and dependence. In an effort to keep the analyses in this study focused on specific hypotheses, RD and the three character dimensions of the JTCI were not used in our analyses.

Assessment of parenting behaviors—Maternal parenting behavior was assessed using the Alabama Parenting Questionnaire (APQ; Frick, 1991). Mothers were asked to report on their parenting behavior specifically with regard to each of their participating children. The

APQ is a 42-item questionnaire that consists of five subscales, each measuring a different parenting behavior (Frick, 1991; Shelton, Frick, & Wootton, 1996). Respondents rate each statement using a five-point scale ("1=never" to "5=always"). The five subscales exhibit good internal consistency: Inconsistent Discipline (α = .67), Poor Monitoring (α = .67), Corporal Punishment (α = .46), Involvement (α = .80), and Positive Parenting (α = .80) (Shelton, et al., 1996).

Since the original validation of this measure, Hinshaw and colleagues (2000) have conducted a factor analysis of the 42 items of the APQ and revealed a 3-factor structure. The three factors are Positive Involvement (PI), Negative/Ineffective Discipline (ND), and Deficient Monitoring (DM). We applied this 3-factor structure to our data. Based on our specific hypotheses, only the PI and ND subscales were used in this study. The ND scale is a measure of the parent's use of inconsistent and overly harsh discipline strategies. Higher scores on this scale indicate less consistent discipline and more frequent use of physical discipline. PI measures the extent to which parents are involved in their children's day-to-day lives, including school, friends, and extracurricular activities. It also assesses the amount of warmth and physical affection that parents display towards their children, as well as use of praise, affection, and positive reinforcement. Higher scores on this scale indicate more frequent use of the aforementioned positive parenting behaviors. Mothers were asked to report on their parenting behaviors with regard to each of their participating children.

Data Analysis

Linear Mixed Models (LMM) is a statistical technique that accounts for the non-independence of data (e.g., children nested within families) by correlating error terms that result from non-independent observations (Hox, 1995). Therefore, for the current study, regression equations using LMM analysis were conducted in SPSS. LMM using the variance components covariance structure were fit to these data. Family number was used as the random effects variable to account for the correlated errors of subjects within the same family. The SocProb or SocCom Subscale raw scores were the dependent variables in each LMM. All continuous covariates were mean centered.

Prior to running the LMM analyses, we first ran exploratory analyses to determine whether the random family effect needed to be included to improve model fit. We created a model with effects for age, SES, gender, three temperament dimensions (NS, HA, P), one parenting factor (either PI or ND), the interactions between each temperament factor and the parenting factor, and a random effect associated with the family number.

The likelihood ratio test comparing this model with a simplified model excluding the random effect family number revealed that the more comprehensive model was a better fit to the data as indicated by a significantly lower -2 Restricted Log Likelihood [(1, N = 355) = 7.36, $p < 0.01$]. Therefore, the random effect family number was retained in all LMM analyses presented in this study.

The analyses for this study began with an LMM including all aforementioned covariates and the interactions between temperament variables and parenting factor, accounting for the correlation within family. Specific models omitted interaction terms that were not driven by

a priori hypotheses (detailed below). Model 1 focused on the association between SocProb and PI and included gender, age, SES, NS, HA, P, PI, HA*PI ('*' denotes an interaction), and P*PI. Model 2 focused on the association between SocProb and ND and included gender, age, SES, NS, HA, P, ND, NS*ND, and HA*ND. The outcome of SocCom replaced SocProb for Models 3 and 4, retaining the same covariates and interaction terms.

Results

Three hundred fifty-five individuals ages 5 through 18 years (M=10.8, SD=3.0, 53.5% male) were recruited for the current study. Socioeconomic scores ranged from 10 to 90 (M= 64.7, SD= 21.3). As expected, NS, P, and HA were all significantly correlated with both measures of social functioning (Table 2). Specifically, children whose mothers rated them as having higher levels of NS or HA were also reported to have experienced more social problems and to be less socially competent than children scoring lower on these traits. Likewise, children who scored lower on P had more social problems and lower social competence. Maternal parenting variables were also significantly correlated with measures of social functioning, with the exception of PI and SocProb. More frequent use of ND practices was related to poorer social functioning, and increased maternal PI was related to better social competence. A negative relation between PI and SocProb approached significance, but was not statistically significant.

Social Problems

Contrary to the hypotheses, the interaction terms did not significantly predict SocProb in this sample. Therefore, these terms were removed and simplified models that included only the main effects of temperament and PI (Model 1) and temperament and ND (Model 2) were examined. Model diagnostics of both Models 1 and 2 indicated that the residuals were not normally distributed, violating the assumption of normality for the conditional residuals.

In Models 1 and 2, both NS and HA were significantly related to increased SocProb in children (Table 3). These results indicate that for every one point increase in NS, children have a .28 (Model 1) or .26 (Model 2) point increase in average SocProb Subscale scores and that for every one point increase in HA children have a 0.18 (Models 1 and 2) point increase in their average SocProb Subscale scores. In other words, both increased levels of a child's tendency to seek out new experiences and greater levels of a child's inhibitory behavior were each associated with greater levels of social problems. When accounting for age, gender, and child temperament variables, P, PI, and ND were not significantly associated with SocProb in this sample. In order to examine whether multicollinearity between NS and P explained the non-significant effect of P in both models, comparison models with NS omitted were tested. With NS omitted, the effect of P became significant (Model 1: beta (b) = −.38, $p < .001$; Model 2: b = −.34, $p < .001$), indicating a high level of multicollinearity between these two variables. This suggests that both NS and P play an important role in child social problems, but that their measurement overlap makes it difficult to include both in the same model.

Social Competence

The hypothesized interactions did not significantly predict SocCom in this sample. However, the interaction between HA and maternal PI approached significance (b = −.005, *p* = .086), suggesting that at varying levels of a child's harm avoidance the relation between maternal positive involvement and social competence changes. Next, we created two additional models looking at the main effects of temperament and ND (Model 3) and the main and interactive effects of temperament and PI (Model 4). Both of these models converged and residuals were normally distributed.

In both models, the effects of NS, HA, and P were significantly related to SocCom (Table 4). Neither PI nor ND parenting practices or the interaction between HA and PI reached statistical significance. Therefore, when accounting for all variables in the regression analyses, child temperament appears to be directly related to social functioning; whereas, maternal parenting does not. However, the interaction between HA and maternal PI approached significance, suggesting that child temperament moderates the relation between parenting and social functioning. In order to determine the nature and direction of the interaction, we plotted the simple slopes of the regression lines for PI on SocCom at high, medium, and low levels of HA following procedures recommended by Aiken and West (1991) (Figure 1). This revealed that the extent to which maternal PI predicted child SocCom was contingent upon child HA. However, contrary to what we expected, for those children high in HA, increased, rather than decreased maternal PI was associated with lower SocCom.

Discussion

This study examined the roles of parenting behavior and child temperament on children’s social functioning as measured by the Social Problems and Social Competence Subscales of the Child Behavior Checklist (CBCL). We found that although child temperament and maternal parenting both are associated with social functioning in models that did not account for their shared variance, only child temperament remained significantly associated with social functioning after accounting for maternal parenting. Therefore, maternal parenting, alone, might be neither necessary nor sufficient to guarantee child’s social competence. Furthermore, this study provides preliminary evidence that the relation between maternal positive involvement and child social competence may vary at different levels of harm avoidance.

Previous research has demonstrated that both temperament and parenting make independent contributions to behavioral problems commonly associated with poor social outcomes (e.g., externalizing and withdrawn behavior) and specific measures of social functioning including peer ratings and observed prosocial behavior (Diener & Kim, 2004; Sanson, et al., 2004; Eisenberg, et al., 2000; Walker, et al., 2001). Other studies have examined the independent roles of temperament and parenting on children’s externalizing and internalizing behavior, as measured by the CBCL, but have not examined social outcomes specifically (Bayer, Hiscock, Ukoumunne, Price, & Wake, 2008). Recently, research has begun to examine how temperament and parenting may interact to affect children’s development, including social outcomes (Paterson & Sanson, 1999; Smart & Sanson, 2001). However, to the best of our

knowledge, this is the first study to look specifically at the direct and interactive effects of child temperament and maternal parenting on social functioning as measured by the CBCL. These results demonstrate that temperament is associated with social functioning in children. Specifically, children who are highly impulsive and disinhibited have more social problems and are less socially competent than children who have greater self-control and behavioral regulation skills. Similarly, children who tend to withdraw in novel situations, who are anxious, shy, and emotionally reactive tend to be less socially competent and exhibit higher rates of social problems. To the contrary, children who have good attention regulation abilities and tend to stick with things despite setbacks have fewer social problems and greater social competence.

These data did not support the hypothesis that maternal parenting (both ND and PI) is related to child social functioning. Although both ND and PI were significantly correlated with at least one measure of social functioning, they were not found to significantly relate to either SocProb or SocCom Subscale scores after accounting for child temperament. This suggests that maternal parenting does not contribute to child social development above and beyond the role of child temperament. One possible explanation for the loss of significance of parenting after accounting for child temperament is the evocative effect of child temperament on the style of parenting they receive (Fish & Crockenberg, 1986; Lee & Bates, 1985). For instance, children who are naturally very impulsive and uninhibited may elicit a parenting style that is more inconsistent because they are more difficult to parent. There is evidence for this in the significant correlations between NS, P, and both maternal parenting behaviors. Therefore, maternal parenting may be only indirectly related to child social functioning through its relation with child temperament.

Subsequent to analyses, we sought an explanation for the contradictory finding (at the trend level) that high child HA was associated with reduced social competence in the presence of increased, rather than decreased, maternal PI. First, we explored the possibility that maternal temperament was confounding the relation between child HA and maternal PI. We speculated that high levels of maternal HA might be associated with an over-involved/over-accommodating style of parenting that was being captured in the extreme range of PI. For instance, highly anxious mothers may be more likely get overly involved with their children's activities, ask about their plans, and praise them unnecessarily than mothers who are not anxious. If this were the case, then the mothers of high HA children, who are more likely to be high in HA themselves because of the heritability of temperament, may be showing up as high PI when in fact this represents a maladaptive form of involvement better characterized as "over-involvement/overaccommodation" or "protective parenting" (Kiel & Buss, 20l1; Rettew & McKee, 2005; Rubin et al., 2002;. This might result in a highly harm-avoidant child whose harm-avoidant mother accommodates for her child's anxiety by becoming over-involved, preventing him/her from developing social competence. We tested this theory by exploring the association between maternal HA and PI. The results of our analyses did not support the hypothesis that high maternal HA was associated with higher levels of PI. Maternal HA scores were evenly distributed across the range of scores for PI and maternal HA was negatively correlated with PI ($r = -.14$, $p < .01$).

In reviewing the literature, one well-replicated finding is that children rated as temperamentally inhibited or socially withdrawn in infancy or toddlerhood display a more stable continuation of these temperament traits, as well as have worse social outcomes, into middle childhood in the presence of high parental negativity and intrusiveness (Degnan, Henderson, Fox, & Rubin, 2008; Hane, Cheah, Rubin, & Fox, 2008; Rubin, Burgess, & Hastings, 2002). In addition, results from Kiel and Buss (2011) suggest that, independent of maternal inhibition, temperamentally fearful children may elicit protective parenting styles, especially when parents accurately anticipate their children's' fearful responses, which, in turn, may lead to social withdrawal (Kiel & Buss, 2011). These results, therefore, are suggestive of a possible interaction between child Harm Avoidance and parenting characterized by parental over-involvement and intrusiveness (the extreme end of high PI) that is independent of parental temperament. We may have observed a significant interaction if we had directly measured parental negativity, intrusiveness, and maternal accuracy.

This study has several limitations that should be noted. First, the age of our sample ranged greatly from young children (5 years) to young adults (18 years). Second, our sample consisted of mostly Caucasian children and therefore the results are not fully generalizable to a more diverse population. Third, all variables were measured using mother-report data, which may have biased the results. Fourth, results yielded small effects; therefore, replication studies with larger sample sizes are indicated, and conclusions should be interpreted with caution. Lastly, this study used a cross-sectional design and therefore no assumptions of causality can be made. Future studies should attempt to gather data from multiple informants as well as more objective data, such as observational ratings of the parent–child relationship and performance on laboratory tasks assessing temperament.

In summary, this study demonstrated a strong relation between the temperament traits of Novelty Seeking, Harm Avoidance, and Persistence with two measures of child social functioning, the Social Problems and Social Competence Subscale of the Child Behavior Checklist. Maternal Positive Involvement and maternal Negative Discipline were not associated with social outcomes after accounting for child temperament. Although maternal parenting was not found to predict child social functioning in this sample, this result does not mean that mothers do not influence their children's social development. It is possible that our measure of maternal parenting behavior does not fully capture those parenting characteristics that most directly impact children's social outcomes. Maternal parenting which promotes the development of behavioral- and emotional-regulation through the modeling and direct coaching of emotional awareness, self-regulation, and problem solving may likely contribute to improved social functioning. Nevertheless, our non-finding of maternal parenting on social outcomes reinforces the importance of equifinality in conceptualizing outcomes. Investigating maternal parenting alone may not yield change in social outcomes, but rather exploring maternal parenting style within the context of child temperament and age may elucidate individual differences in child social functioning. Future studies examining the effects of temperament-specific parenting interventions for deficits in social functioning, across different stages of development, would provide valuable insight into how parents can promote their child's social development in the presence of temperamental risk traits.

Implications for Research, Policy, and Practice

Though these findings are preliminary in nature and in need of replication, they shed light on some possible areas in which prevention and intervention strategies could be developed for children at risk for, or struggling with, social difficulties. Ratings of child temperament may serve as indicators of early risk for the development of social problems. Children identified as “high-risk” based on their temperament profile could be provided with intervention services aimed at the development of pro-social behaviors. Alternatively, children who are referred for treatment of social issues could potentially benefit from an assessment of their temperament in order to gain a better understanding of how individual characteristics may be contributing to their social functioning.

References

Achenbach, TM. Manual for the child behavior checklist/4-18. Burlington, VT: Department of Psychiatry, University of Vermont; 1991.

Anthony L, Anthony B, Glanville D, Naiman D, Waanders C, Shaffer S. The relationship between parenting stress, parenting behavior and pre-schoolers' social competence and behaviour problems in the classroom. Infant and Child Development. 2005; 14:133–154.

Bayer JK, Hiscock H, Ukoumunne OC, Price A, Wake M. Early childhood aetiology of mental health problems: a longitudinal population-based study. Journal of Child Psychology and Psychiatry. 2008; 49:1166–1174. [PubMed: 18665879]

Belsky, J.; Jaffee, SR.; Belsky, J.; Jaffee, SR. The multiple determinants of parenting. In: Cicchetti, D.; Cohen, DJ., editors. Developmental psychopathology. 2nd ed. Vol. Vol. 3. Hoboken, NJ: US: John Wiley & Sons Inc.; 2006. p. 38-85.

Blair KA, Denham SA, Kochanoff A, Whipple B. Playing it cool: Temperament, emotion regulation, and social behavior in preschoolers. Journal of School Psychology. 2004; 42(6):419–443.

Brenner V, Fox RA. Parental discipline and behavior problems in young children. Journal Genetic Psychology. 1998; 159:251–256.

Buhs ES, Ladd GW. Peer rejection as an antecedent of young children's school adjustment: an examination of mediating processes. Developmental Psychology. 2001; 37:550–560. [PubMed: 11444490]

Campbell SB. Behavior problems in preschool children: Developmental and family issues. Advances in Clinical Child Psychology. 1997; 19:1–26.

Carlson EA. A prospective longitudinal study of attachment disorganization/disorientation. Child Development. 1998; 69:1107–1128. [PubMed: 9768489]

Chang L, Schwartz D, Dodge KA, McBride-Chang C. Harsh Parenting in Relation to Child Emotion Regulation and Aggression. Journal of Family Psychology. 2003; 17:598–606. [PubMed: 14640808]

Cicchetti D, Rogosch FA. Equifinality and multifinality in developmental psychopathology. Development and Psycopathology. 1996; 8:597–600.

Cloninger CR. The genetic structure of personality and learning: a phylogenetic model. Clinical Genetics. 1994; 46:124–137. [PubMed: 7988069]

Cloninger CR, Svrakic DM, Przybeck TR. A psychobiological model of temperament and character. Archives of General Psychiatry. 1993; 50:975–990. [PubMed: 8250684]

Collins WA, Maccoby EE, Steinberg L, Hetherington EM, Bornstein MH. Contemporary research on parenting: The case for nature and nurture. American Psychologist. 2000; 55:218–232. [PubMed: 10717969]

Degnan KA, Henderson HA, Fox NA, Rubin KH. Predicting social wariness in middle childhood: The moderating roles of childcare history, maternal personality and maternal behavior. Social Development. 2008; 17:471–487. [PubMed: 20463856]

Diener ML, Kim D-Y. Maternal and child predictors of preschool children's social competence. Journal of Applied Developmental Psychology. 2004; 25:3–24.

Eisenberg N, Guthrie IK, Fabes RA, Shepard S, Losoya S, Murphy BC, et al. Prediction of elementary school children's externalizing problem behaviors from attentional and behavioral regulation and negative emotionality. Child Development. 2000; 71:1367–1382. [PubMed: 11108101]

Fabes RA, Eisenberg N, Jones S, Smith M, Guthrie I, Poulin R, et al. Regulation, emotionality, and preschoolers' socially competent peer interactions. Child Development. 1999; 70(2):432–442. [PubMed: 10218264]

Fish M, Crockenberg S. Correlates and antecedents of nine-month infant behavior and motherinfant interaction. Infant Behavior and Development. 1986; 4:69–81.

Frick, PJ. The Alabama Parenting Questionnaire. Birmingham, AL: University of Alabama; 1991.

Guerin DW, Gottfried AW, Thomas CW. Difficult temperament and behaviour problems: A longitudinal study from 1.5 to 12 years. International Journal of Behavioral Development. 1997; 21:71–90.

Hane AA, Cheah C, Rubin KH, Fox NA. The role of maternal behavior in the relation between shyness and social reticence in early childhood and social withdrawal in middle childhood. Social Development. 2008; 17:795–811.

Haskett ME, Willoughby M. Paths to child social adjustment: parenting quality and children's processing of social information. Child: Care, Health & Development. 2007; 33:67–77.

Hemphill S, Sanson A. Matching parenting to child temperament. Family Matters. 2001; 59:42–47.

Henricsson L, Rydell A-M. Children with Behaviour Problems: The Influence of Social Competence and Social Relations on Problem Stability, School Achievement and Peer Acceptance Across the First Six Years of School. Infant and Child Development. 2006; 15:347–366.

Hinshaw SP, Owens EB, Wells KC, Kraemer HC, Abikoff HB, Arnold LE, et al. Family processes and treatment outcome in the MTA: negative/ineffective parenting practices in relation to multimodal treatment. Journal of Abnormal Child Psychology. 2000; 28:555–568. [PubMed: 11104317]

Hollingshead, AB. Four factor index of social status. New Haven, CT: Department of Sociology, Yale University; 1975.

Hox, JJ. Applied multi-level analysis. 2nd ed.. Amsterdam: TT-Publikaties; 1995.

Kagan J, Snidman N. Early childhood predictors of adult anxiety disorders. Biological Psychiatry. 1999; 46:1536–1541. [PubMed: 10599481]

Kuo PH, Chih YC, Soong WT, Yang HJ, Chen WJ. Assessing personality features and their relations with behavioral problems in adolescents: tridimensional personality questionnaire and junior Eysenck personality questionnaire. Comprehensive Psychiatry. 2004; 45:20–28. [PubMed: 14671733]

Ladd GW, Kochenderfer BJ, Coleman CC. Classroom peer acceptance, friendship, and victimization: distinct relational systems that contribute uniquely to children's school adjustment? Child Development. 1997; 68:1181–1197. [PubMed: 9418233]

Lagacé-Séguin DG, d' Entremont ML. The role of child negative affect in the relations between parenting styles and play. Early Child Development and Care. 2006; 176:461–477.

Lee CL, Bates JE. Mother-child interaction at age two years and perceived difficult temperament. Child Development. 1985; 56:1314–1325. [PubMed: 4053745]

Lengua LJ, Wolchik SA, Sandler IN, West SG. The additive and interactive effects of parenting and temperament in predicting adjustment problems of children of divorce. Journal of Clinical Child Psychology. 2000; 29:232–244. [PubMed: 10802832]

Lollis S, Kuczynski L. Beyond one hand clapping: Seeing bidirectionality in parent, child relations. Journal of Social and Personal Relationships. 1997; 14:441–461.

Luby JL, Svrakic DM, McCallum K, Przybeck TR, Cloninger CR. The Junior Temperament and Character Inventory: preliminary validation of a child self-report measure. Psychological Report. 1999; 84:1127–1138.

Lyons-Ruth K, Easterbrooks MA, Cibelli CD. Infant attachment strategies, infant mental lag, and maternal depressive symptoms: predictors of internalizing and externalizing problems at age 7. Developmental Psychology. 1997; 33:681–692. [PubMed: 9232383]

Lyoo IK, Han CH, Lee SJ, Yune SK, Ha JH, Chung SJ, et al. The reliability and validity of the junior temperament and character inventory. Comprehensive Psychiatry. 2004; 45:121–128. [PubMed: 14999663]

Maziade M, Caron C, Cote R, Merette C, Bernier H, Laplante B, et al. Psychiatric status of adolescents who had extreme temperaments at age 7. American Journal of Psychiatry. 1990; 147:1531–1536. [PubMed: 2221169]

Murphy BC, Shepard SA, Eisenberg N, Fabes Ra. Concurrent and Across Time Prediction of Young Adolescents' Social Functioning: The Role of Emotionality and Regulation. Social Development. 2004; 13(1):56–86.

Parker JS, Benson MJ. Parent-adolescent relations and adolescent functioning: self-esteem, substance abuse, and delinquency. Adolescence. 2004; 39 (155):519–30. [PubMed: 15673227]

Paterson G, Sanson A. The association of behavioural adjustment to temperament, parenting and family characteristics among 5-year-old children. Social Development. 1999; 8:293–309.

Pérez JC, Cumsille P. Adolescent temperament and parental control in the development of the adolescent decision making in a Chilean sample. Journal of Adolescence. 2012; 35(3):659–669. [PubMed: 21951646]

Prior M, Smart D, Sanson A, Oberklaid F. Does shy-inhibited temperament in childhood lead to anxiety problems in adolescence? Journal of the American Academy of Child & Adolescent Psychiatry. 2000; 39:461–468. [PubMed: 10761348]

Puttallaz, M.; Heflin, AH. Parent-child interaction. In: Asher, SR., editor. Peer rejection in childhood. Vol. Vol. xii. New York, NY: Cambridge University Press; 1990. p. 189-216.

Rettew DC, Copeland W, Stanger C, Hudziak JJ. Associations Between Temperament and DSM-IV Externalizing Disorders in Children and Adolescents. Journal of Developmental & Behavioral Pediatrics. 2004; 25:383–391. [PubMed: 15613986]

Rettew DC, McKee L. Temperament and Its Role in Developmental Psychopathology. Harvard Review of Psychiatry. 2005; 13:14–27. [PubMed: 15804931]

Rettew DC, Althoff RR, Ayer L, Dumenci L, Hudziak JJ. Latent profiles analysis of child temperament and their relations with wellness and psychopathology. Journal of the American Academy of Child & Adolescent Psychiatry. 2008; 47:273–281. [PubMed: 18216734]

Rubin KH, Burgess KB, Hastings PD. Stability and social-behavioral consequences of toddlers' inhibited temperament and parenting behaviors. Child Development. 2002; 73:483–495. [PubMed: 11949904]

Rubin KH, Hastings P, Chen X, Stewart S, McNichol K. Intrapersonal and maternal correlates of aggression, conflict, and externalizing problems in toddlers. Child Development. 1998; 69:1614–1629. [PubMed: 9914642]

Sanson A, Hemphill SA, Smart D. Connections between temperament and social development: A review. Social Development. 2004; 13:142–170.

Schmeck K, Poustka F. Temperament and disruptive behavior disorders. Psychopathology. 2001; 34:159–163. [PubMed: 11316963]

Shelton KK, Frick PJ, Wootton J. Assessment of parenting practices in families of elementary school-age children. Journal of Clinical Child Psychology. 1996; 25:317–329.

Smart D, Sanson A. Children's Social Competence: The Role of Temperament and Behaviour, and Their "Fit" with Parents' Expectations. Family Matters. 2001; 15

Spinrad TL, Eisenberg N, Cumberland A, Fabes RA, Valiente C, Shepard SA, et al. Relation of emotion-related regulation to children's social competence: a longitudinal study. Emotion. 2006; 6:498–510. [PubMed: 16938090]

Thomas, A.; Chess, S. Temperament and Development. New York: Brunner/Mazel; 1977.

Tremblay RE, Pihl RO, Vitaro F, Dobkin PL. Predicting early onset of male antisocial behavior from preschool behavior. Archives of General Psychiatry. 1994; 51:732–739. [PubMed: 8080350]

van Aken C, Junger M, Verhoeven M, van Aken MAG, Dekovifá M, Denissen JJA. Parental personality, parenting and toddlers' externalising behaviours. European Journal of Personality. 2007; 21:993–1015.

Van Hecke AV, Mundy PC, Acra CFo, Block JJ, Delgado CEF, Parlade MV, et al. Infant Joint Attention, Temperament, and Social Competence in Preschool Children. Child Development. 2007; 78:53–69. [PubMed: 17328693]

Walker S, Berthelsen D, Irving K. Temperament and peer acceptance in early childhood: Sex and social status differences. Child Study Journal. 2001; 31:177–192.

Zhou Q, Main A, Wang Y. The relations of temperamental effortful control and anger/frustration to Chinese children's academic achievement and social adjustment: A longitudinal study. Journal of Educational Psychology. 2010; 102:180–196.

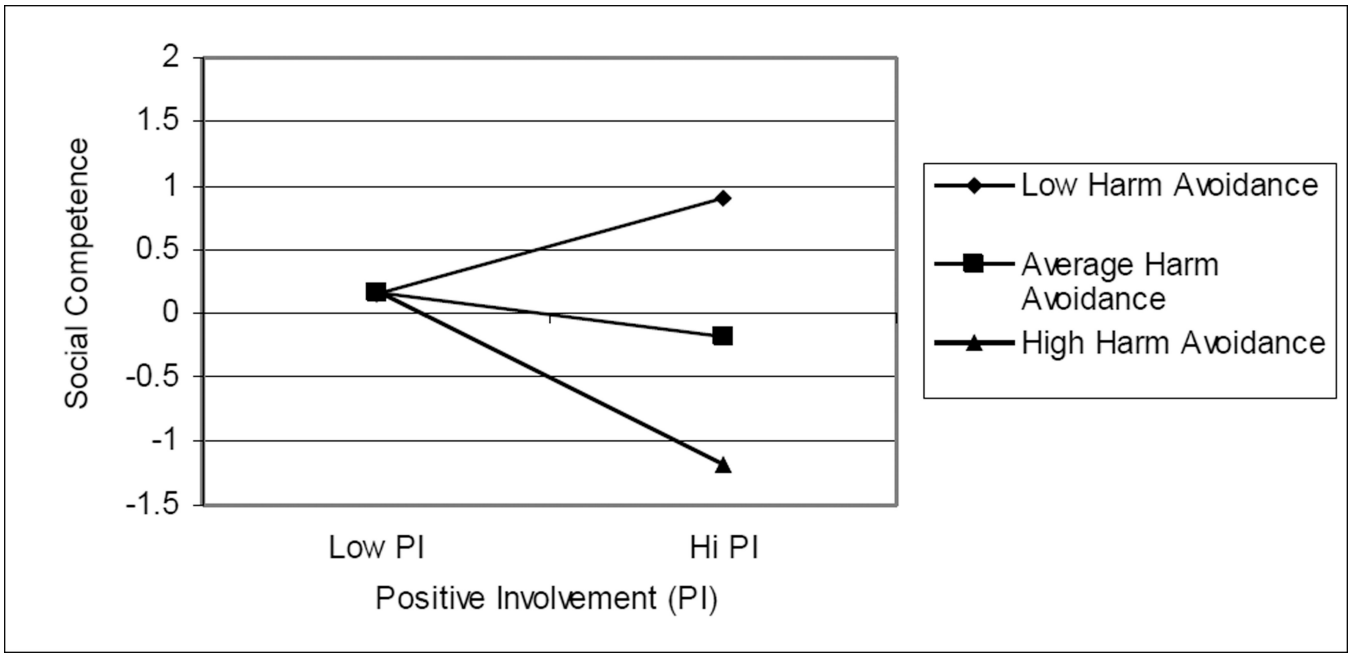

Figure 1.
Interaction between child Harm Avoidance and maternal Positive Involvement in relation to child Social Competence

Table 1

Descriptive Statistics for Demographic Information

Variable	*M*	*SD*	Range
Child Age	10.8	3.0	5–18
Family Socioeconomic Status	64.7	21.3	10–90
Child Gender	N	%	
Boys	190	53.5%	
Girls	165	46.5%	
Total	355		

Table 2

Correlations for demographic, Child Temperament, Maternal Parenting, and Social Functioning variables

Variables	Age	Gender	SES	Novelty Seeking	Harm Avoidance	Persistence	Positive Involvement	Negative/ Ineffective Discipline	Social Problems
Gender	−.04	--							
SES	.04	.02	--						
Novelty Seeking	−.01	−.17**	−.24**	--					
Harm Avoidance	.01	.08	−.06	−.22**	--				
Persistence	−.02	.18**	.14**	−.54**	−.03	--			
Positive Involvement	−.24**	.02	.11*	−.28**	−.01	.27**	--		
Negative/Ineffective Discipline	.10*	−.05	−.19**	.35**	.05	−.27**	−.40**	--	
Social Problems	−.04	−.15**	−.17**	.36**	.24**	−.28**	−.09	.21**	--
Social Competence	.13*	.08	.29**	−.36**	.26**	.37**	.12*	−.18**	−.41**

* $p < .05$.

** $p < .01$.

Table 3

Linear Mixed Modeling Coefficients of Demographic, Child Temperament, and Maternal Parenting variables for Models 1 and 2

	Model 1[a]			Model 2[b]		
Variables	***Beta***	***SE***	***p***	***Beta***	***SE***	***p***
Gender (male)	−.49	.28	.09	−.49	.28	.08
Age	−.05	.05	.33	−.06	.05	.20
SES	.01	.01	.36	−.01	.01	.46
Novelty Seeking	.28	.04	<.001	.26	.05	<.001
Harm Avoidance	.18	.03	<.001	.18	.03	<.001
Persistence	−.12	.09	.16	−.11	.09	.21
Positive Involvement	.01	.02	.74	--	--	--
Negative/Ineffective Discipline	--	--	--	.05	.04	.19

[a] Main effects of temperament and Positive Involvement predicting Social Problems.

[b] Main effects of temperament and Negative/Ineffective Discipline predicting Social Problems.

Table 4

Linear Mixed Modeling Coefficients of Demographic, Child Temperament, and Maternal Parenting variables for Model 3 and Model 4

	Model 3[a]			Model 4[b]		
Variables	***Beta***	***SE***	***p***	***Beta***	***SE***	***p***
Gender (male)	.06	.20	.77	.04	.20	.88
Age	.08	.04	.03	.08	.04	.04
SES	.02	.01	.01	.02	.01	.01
Novelty Seeking	−.16	.03	<.001	−.16	.03	<.001
Harm Avoidance	−.12	.02	<.001	−.12	.02	<.001
Persistence	.25	.06	<.001	.26	.06	<.001
Positive Involvement	--	--	--	−.08	.02	.70
Negative/Ineffective Discipline	−.00	.03	.90	--	--	--
Harm Avoidance X Positive Involvement	--	--	--	−.01	.00	.09

[a] Main effects of temperament and Positive Involvement predicting Social Competence.

[b] Main effects of temperament and Negative/Ineffective Discipline predicting Social Competence.