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Transactions Between Child Social Wariness and Observed Structured Parenting: Evidence From a Prospective Adoption Study

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Abstract

This investigation examined the mutual influences between structured parenting and child social wariness during toddlerhood using a longitudinal adoption design. The sample consisted of 361 adoption-linked families, each including an adopted child, adoptive parents, and a birth mother. Heightened social wariness in children at age 18 months predicted reduced levels of observed structured parenting (i.e., less directive parenting with fewer commands and requests) in adoptive mothers at age 27 months. Adoptive fathers' lower structured parenting at age 18 months predicted subsequent elevation in child social wariness. Birth mothers' history of fear-related anxiety disorders was not associated with child social wariness. Findings highlight the role of dynamic family transactions in the development of social wariness during toddlerhood.

Keywords

child social wariness; structured parenting; transactional models; genetic influences; adoption; toddler

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Childhood anxiety symptoms, including socially-oriented anxiety, have been associated with parenting, and specifically with parenting strategies that reflect greater activity and involvement with the child (McLeod, Wood, & Weisz, 2007). For instance, mothers of socially wary children (i.e., children showing shyness, social withdrawal, and reticence in social settings) tend to practice intrusive and overprotective parenting strategies (Rubin, Coplan, Bowker, & Menzer, 2011). However, the mechanisms underlying the observed associations between parenting and child social wariness are likely complex, potentially explained by parents and children sharing genes, by parental socialization effects (i.e., the

direct effects of parenting on child behavior), by child-evoked effects (i.e., certain parental reactions elicited by child's behavior), or, most likely, by a combination of these mechanisms. The primary aim of this study was to apply a developmental transactional model (Sameroff & MacKenzie, 2003) to a sample of parents and children participating in a prospective adoption study to further elucidate the associations between parenting and child social wariness in toddlerhood. The use of an adoption sample provides a unique opportunity to disentangle the complex set of transactions described above. Given that socially wary children have heightened risk for later anxiety-related psychopathology (Biederman et al., 1990; Chronis-Tuscano et al., 2009; Degnan, Almas, & Fox, 2010; Feng, Shaw, & Silk, 2008; Prior, Smart, Sanson, & Oberklaid, 2000; Rubin, Coplan, & Bowker, 2009; Sanson, Pedlow, Cann, Prior, & Oberklaid, 1996) and social wariness is only moderately stable during early childhood (Rubin, Hymel, & Mills, 1989; Sanson et al., 1996), the examination of how social wariness develops over time warrants attention. Further, transactions in the family context involve all family members, including fathers. The vast majority of work on the role of parents in child development, however, has focused on maternal influences with much less attention given to the role of paternal influences. In the current study, we examine both child-mother and child-father transactions in the association between social wariness and parenting.

We use the term social wariness to refer to a child's wary behavior in interpersonal situations. The literature has used the terms social wariness, withdrawal, reticence, inhibition, and shyness interchangeably (Rubin et al., 2009; Rubin et al., 2011). To reconcile the confusion, Rubin et al. (2009) proposed a developmental model in which social wariness in toddlerhood probabilistically develops into social reticence in preschool, then into social withdrawal in elementary school, which eventually is linked to social anxiety and internalizing-oriented psychopathology such as social anxiety and social phobia. Given that this investigation focused on toddlerhood, we use the term social wariness to be consistent with the nomenclature used in the study by Rubin et al. (1999).

From Structured Parenting to Child Social Wariness: Parental Socialization Processes

An increasing body of research suggests associations between parenting behaviors and the development of child social wariness (McLeod et al., 2007). One component of parenting behavior at the center of research in this area is parental control, defined as the pressure that parents impose on children in an attempt to manage children's behavior, thinking, and feeling (van den Bruggen, Stams, & Bogels, 2008). A recent meta-analytic review confirmed these findings, demonstrating a reliable direct association between childhood social wariness/anxiety and parental control during early and middle childhood with an effect size (d) of .76 (van den Bruggen et al., 2008).

In prior research in the area of social wariness, one distinct form of parental control has been a focus: psychological control. Parental *psychological* control has been defined as patterns of parent behaviors that impede the development of the child's individuation by regulating the child's emotions and behaviors (Barber, 1996). Excessive parental psychological control is theorized to exacerbate children's social wariness by permeating and eroding children's sense of autonomy and independence, which may lead to heightened feelings of helplessness (Chorpita & Barlow, 1998) and undermine children's intrinsic motivation to actively explore the environment (Deci & Ryan, 1987). Consistent with theoretical predictions, accumulating evidence suggests that intrusive, psychologically controlling parenting behaviors and parental overprotection increase child social wariness (see Rubin et al., 2011 for a review), especially in already inhibited children (Rubin, Burgess, & Hastings, 2002).

Parental *behavioral* control, on the other hand, has received little attention in the field of child social wariness, especially in the early childhood literature. Behavioral control, which is independent from psychological control, refers to parental management of children's behaviors and activities by setting rules and restrictions (Barber, 1996), and has typically been studied in the parenting of children with externalizing problems (e.g., Campbell, Shaw, & Gilliom, 2000; Patterson, 1982). Parental behavioral control has shown facilitative effects on early child development because such parenting, when implemented at a moderate level, provides guidance and scaffolding, especially for children who are facing challenging situations (e.g., Barber, 1996; Pomerantz & Eaton, 2001). One of the defining features of parental behavioral control is the extent to which parents use structured strategies, such as limit setting, clear instructions, and explicit commands and requests. For instance, parents may regulate children's behaviors by providing specific instructions on completing tasks (e.g., putting toys away, finishing a meal) in socially unfamiliar situations. Such proactive parenting behavior is referred to as *structured parenting* in the present study. Providing a structured environment for children is theorized to be separable from emotion (e.g., happiness, anger) and valence (positive and negative parenting) attached to parenting behavior (Denham et al., 2000). Structured parenting has been shown to be associated with beneficial effects on young children's problem behaviors (Denham et al., 2000; Gardner, Sonuga-Barke, & Sayal, 1999; Lecuyer & Houck, 2006; Leve et al., 2009). The present investigation specifically focused on structured parenting.

Little is known, however, about how structured parenting (an aspect of behavioral control) is associated with the development of children's social wariness in early childhood. In one of the few existing studies focused on younger children (i.e., kindergarten and grades 2 and 4), Mills and Rubin (1998) found that mothers of socially wary children showed higher levels of behavioral control than mothers of children with the average level of social wariness. However, the operationalization of behavioral control in their study consisted of not only commands and requests but also punishment/threats, criticism, reward, and monitoring. Therefore, the specific effects of parental commands and requests (i.e., structured parenting) are unknown. Given the beneficial effects of behavioral control in managing children's behaviors (e.g., Barber, 1996; Pomerantz & Eaton, 2001), it is plausible that parental explicit instructions and commands can also guide socially wary children to be proactive with the social world. Furthermore, no study to our knowledge has sought to disentangle environmental and genetic influences on the association between structured parenting (or other aspects of behavioral control) and child social wariness. As reviewed below, genetic influences may play a role in linking parenting behaviors with child social wariness behaviors. To better understand how structured parenting affects the development of social wariness in children, a longitudinal genetically-sensitive study would permit a disaggregation of genetic from environmental influences and permit a greater understanding of how child behavior unfolds over time.

Following the extant literature showing benefits of behavioral control (e.g., Barber, 1996; Pomerantz & Eaton, 2001), we expected structured parenting to be helpful in reducing child social wariness. Directive parental behavior is considered to be effective in modulating children's socially wary behaviors because it sends a clear message to children that they need to be more proactive with the social world (Park, Belsky, Putnam, & Crnic, 1997). Notably, this prediction is consonant with the literature on parental responsiveness; parents who provide active contingency and assistance to their socially wary children demonstrate beneficial child outcomes, particularly when children are genetically predisposed to social anxiety (Natsuaki et al., in press). Evidence from a randomized intervention study resonates with the aforementioned findings (Rapee, Kennedy, Ingram, Edwards, & Sweeney, 2010). At-risk children whose parents participated in a brief early childhood parenting intervention program were less likely to exhibit signs of anxiety at age 7 than similarly at-risk children

whose parents had not received the intervention. One component of the intervention targeted parent management techniques and control. Therefore, we hypothesized that mother's and father's parenting behaviors that are characterized by active assistance, clear commands, and directive instructions would be an effective socialization method for reducing children's social wariness. As a counterpart to this hypothesis, we expected that low levels of structured parenting from mothers and fathers would increase social wariness in children.

From Child Social Wariness to Structured Parenting: Child-Evoked Processes

Since the seminal work by Bell (1968), developmental psychologists have been increasingly aware of "child on parent" effects on parenting processes. That is, children evoke reactions and inputs from their environments. Much of the work that has considered child effects, however, has focused on aggressive children, leaving a dearth of research on socially wary children. With a few notable exceptions (e.g., Rubin, Nelson, Hastings, & Asendorpf, 1999), there are relatively few empirical examinations of the child-effect models in socially wary children. This small and circumscribed literature indicates that child social wariness can elicit specific reactions from parents. For example, parents tend to react to socially wary children with heightened psychological control and overinvolvement (Burgess, Rubin, Cheah, & Nelson, 2001; Rubin et al., 2011). Rubin and colleagues (1999) found that high levels of child social wariness at age 2 predicted diminished parental encouragement of independence when the children were preschoolers. A recent experimental study also supports the notion that wary, timid, and inhibited behaviors in children influence caregivers' reactions to them (Hudson, Doyle, & Gar, 2009); during interactions with children who were not their own, female adults tended to be more involved with clinically anxious children than with nonclinically anxious children (Hudson et al., 2009).

It is unknown, however, whether children's social wariness elicits structured parenting. When interacting with socially wary preschoolers, both mothers and fathers tend to believe that they should react to them with more low-power, non-directive socialization strategies than they would to aggressive children (Mills & Rubin, 1990). This cognitive reaction, in part, may be founded on the anticipation that less-directive parental practices can prevent anxious arousal from becoming overwhelming to children who are prone to fear and withdrawal (Kochanska, Aksan, & Joy, 2007). However, additional work is needed to examine whether this parental cognitive reaction translates into actual parenting behaviors. In the current study, we captured actual parenting behaviors using an observational approach. Based on the aforementioned work, we expected that socially wary children would elicit low levels of later structured parenting from mothers and fathers.

In the current investigation, we were also interested in whether genetic influences would serve as a factor that prompts the associations between child social wariness and parenting. As several scholars have argued (Neiderhiser, 2011; Plomin, DeFries, & Loehlin, 1977; Scarr & McCartney, 1983) and empirical evidence has shown (e.g., Narusyte et al., 2011), genetically-influenced child characteristics may elicit patterned responses from parents (i.e., evocative genotype-environment correlation). Given that social wariness is partially influenced by genes (Eley et al., 2003; Rapee & Spence, 2004), it is possible that genetic factors may influence child social wariness, which in turn, may influence the amount of structured parenting that a child receives. To explore this question, this study examined whether genetic influences on anxiety and fear (estimated from the birth mothers' clinical lifetime diagnoses) were associated with the link between child social wariness and structured parenting.

The Parenting of Fathers

Prompted by a series of urgent calls for research on fathers (Phares, 1992), an emerging body of recent research on child social wariness has begun to reveal the important role fathers play. In general, evidence supports the idea that fathers are as important as mothers in influencing social wariness in children. For instance, Rubin et al. (1999) found that child social wariness elicited similar reactions from both fathers and mothers, with reduced autonomy-granting parenting behavior. In some instances, fathers' social behavior has been found to be more influential than mothers' behavior in teaching social confidence to socially wary children (Bogels, Stevens, & Majdandzic, 2011). In this study, we focus on the roles of both maternal *and* paternal parenting behaviors. Based on the dearth of research in this area, we did not theorize differential effects of mothers' and fathers' structured parenting.

The Present Study

The aims of this investigation were: (a) to test the reciprocal transactions between structured parenting and child social wariness in early childhood (18 to 27 months of age), and (b) to explore the role of genetic influences in the transactional processes. We formulated the following hypotheses: (1) low levels of structured parenting at 18 months would be associated with subsequent increases in child social wariness at 27 months (the parental socialization effect); (2) socially wary children would elicit low levels of structured parenting at 27 months (the child-evoked effect); and (3) genetic influences on fear-related anxiety would be correlated with higher levels of child social wariness, which in turn, would evoke lower levels of structured parenting.

This study expands on previous research in several ways. First, this study uses an adoption design. Utilizing a design that links children who were placed with adoptive parents at birth and also collecting data from birth mothers is a conservative and effective approach to examining the interplay of nature and nurture (Rutter, 2006; Rutter, Pickles, Murray, & Eaves, 2001). Transactional theories of parenting and child social wariness assume reciprocal influences that are environmental in nature. However, this environmental assumption is untenable when behavioral patterns in the child (e.g., social wariness) and the parents (e.g., parenting behaviors) may be influenced by the same underlying genetic influences, which may inflate the strength of parent-child associations. In research involving only biological family members (i.e., a study of biological parents rearing their biological child), it is difficult to disentangle whether associations between parenting behaviors and child social wariness stem from environmental origins (as is often assumed) or from genetic commonalities. However, an adoption design can tease these two factors apart as the rearing parent and child do not share genes. Second, we applied a longitudinal approach to investigate the development of social wariness. Although longitudinal designs alone do not afford the testing of causal mechanisms, they can suggest the sequence of events in a given timeframe. The identification of temporal sequence is essential when investigating the reciprocal influences between two variables. Third, the current study attends to both maternal *and* paternal structured parenting. Fourth, we included observational measures of structured parenting, thus focusing on actual parenting behaviors.

Method

Participants

The sample in the current investigation included participants in the Early Growth and Development Study (EGDS), a prospective longitudinal adoption study of adopted children and adoptive and birth parents (Leve et al., 2007). The first cohort of the EGDS, used in the current analysis, consists of 361 families. Each participating family unit consisted of family

members who were linked through adoption, including the child who was adopted at birth, the adoptive parents, and the birth mother. Birth fathers participated in approximately 35% of the families. Although the contribution of birth fathers is not trivial by any means, the smaller sample size in contrast to the birth mother sample posed analytical challenges (e.g., only 28 birth fathers met the clinical diagnostic criteria used in the present study), which prevented the full evaluation of the study hypotheses. Therefore, the present study did not include birth fathers' data in analysis.

The EGDS drew its sample from 33 adoption agencies in 10 states from three regions in the United States: the Northwest, Southwest, and Mid-Atlantic. These agencies reflect the full range of U.S. adoption agencies, including public, private, religious, secular, those favoring open adoptions, and those favoring closed adoptions. An examination of regional differences in participants' demographic characteristics (i.e., age, income, education of both birth and adoptive parents) revealed that there were only two significant regional differences: adoptive fathers' education was slightly higher in the Northwest site than in the Southwest site and birth mothers' household income was slightly higher in the Mid-Atlantic site than the Southwest site. The median age of the child at the adoption placement was two days ($SD = 13$ days).

The current investigation was based on the first three waves of the project collected at child age 9-, 18-, and 27-months. The data substantive to the study hypotheses were collected at child age 18- and 27-months. A covariate used in this study, i.e., the adoption process, was assessed when the children were 9 months old. The EGDS collected additional data on children and their families when children were 9 months old. However, due to the young age of the children, the 9-month assessment did not include a measure of structured parenting and therefore only the 18- and 27-month assessments were included for the primary constructs in this study.

The sample included 20 pairs of adoptive parents who were same-sex couples (12 male-male couples and 8 female-female couples). Because these families are composed of two mothers or two fathers, the final total number of mothers and fathers was unequal. Therefore, the analysis examining maternal structured parenting was based on data from 349 families that included male-female and female-female couples. The investigation of paternal structured parenting was based on a sample of 353 families that included male-female and male-male couples.

Forty-three percent of the children in EGDS are female. Fifty-eight percent of the children are Caucasian, 21% are mixed race, 11% are African-American, and 11% are other or unknown. The mean ages of the adoptive mothers, adoptive fathers, and birth mothers at the birth of the child were 38 ($SD = 5.5$), 38 ($SD = 5.8$), and 24 ($SD = 5.9$), respectively. More than 90% of the adoptive mothers and fathers are Caucasian. The birth mother sample is slightly more ethnically diverse with 71% Caucasian, 11% African-American, 7% Hispanic-American, and 11% other or unknown. Adoptive parents are predominantly college-educated and middle-class. Birth mothers typically had household annual incomes less than \$25,000 with less than a college education.

Procedure

The assessments consisted of a 2 ½–3 ½ hr interview in the participants' home. For some birth mothers, the interviews took place in other locations if they identified another location as convenient for them. For both the birth- and adoptive-parent assessments, interviewers asked participants computer-assisted interview questions, and each participant independently completed a set of questionnaires. Adoptive families also participated in tasks in which their

behavioral responses were observed and recorded onto digital media. Participants were paid for volunteering their time to the study.

Separate teams of interviewers conducted assessments of birth parents and adoptive families; within each birth parent-adoptive family unit, the interviewer was completely blind to data collected by the other interviewer. Interviewers completed a minimum of 40 hrs of training prior to actual interviews with study participants. All interviews were audio or video recorded, and 15% of the interviews were randomly selected to receive feedback by a trained evaluator to ensure adherence to the study's standardized interview protocols. Further information regarding the EGDS study recruitment procedures, sample, and assessment methods is available in Leve et al. (2007).

Measures

Children's social wariness—Each child's social wariness was assessed when the child was 18- and 27-months old via a 19-item social fear subscale of the Toddler Behavior Assessment Questionnaire (TBAQ; Goldsmith, 1996). The TBAQ social fear subscale has been used in previous work to measure social wariness in children (Chronis-Tuscano et al., 2009; Rubin et al., 1999). Previous research has shown that toddlers who have high scores on the TBAQ social fear subscale continue to show high levels of shyness at ages 4 and 7, and those children who are consistently socially wary in early childhood are likely to show signs of social phobia in adolescence (Chronis-Tuscano et al., 2009). Using a seven-point Likert-type scale ranging from 1 (*never*) to 7 (*always*), adoptive mothers and fathers individually described their child's social wariness, distress, withdrawal, or signs of shyness in socially novel situations. The alpha coefficients for this measure ranged from .86 to .89 for both parents across two waves. The correlation between mothers and fathers was relatively high and consistent over time ($r = .56$ for age 18 months; $r = .62$ for age 27 months). We created a composite by averaging maternal and paternal reports of child social wariness at each timepoint.

Structured parenting—At the 18- and 27-month assessments, parent-child dyads participated in a 3-min clean-up task. In this task, interviewers laid a number of toys (e.g., a shape sorter, a hide-inside soft box, a set of stacking rings) on the floor and asked the parent to guide the child to put the toys away in a separate box. Adoptive parents were instructed to have only the child clean up the toys. The interaction was recorded for later coding purposes. Both mother-child and father-child dyads participated in this task, allowing independent observation of maternal and paternal structured parenting. The mother-child clean-up task was completed before the father-child clean-up task. This task is similar to the task used in the Rubin et al. (2002) study, except that parents in the current study were instructed not to clean up the toys themselves.

Data were coded with a microsocial coding system based on the Child Free Play and Compliance Task Coding Manual (Pears & Ayers, 2000). Various parenting behaviors were coded from the task, including threatening, ignoring, reasoning, bargaining, offering help, positive reinforcement, and issuing commands and requests. Only one parenting behavior could be coded at a given time. In this study, we focus on structured parenting, which was defined as parental verbal commands and requests that implicitly or explicitly encourage a behavior change. The examples of structured parenting include parents' comments such as "Where does this ring go?", "Let's put the duck in this box", and "Put all of the cups in here." In this report, we analyzed the duration of time (in seconds) parents spent implementing structured parenting. Duration of structured parenting during the clean-up task has been linked to early child behavior problems, as indexed by the Child Behavior Checklist at 18-months of age (Leve et al., 2009). Fifteen percent of the tapes were coded by

two independent coders; the average intercoder agreement on the behavior content code was 88% (overall $\kappa = 0.71$).

Birth mothers' lifetime diagnoses of fear disorders—Birth mothers' lifetime fear-related disorders served as an index for genetic liability to social wariness. In previous EGDS studies of children's socially wary behaviors, we have exclusively focused on birth mothers' diagnosis for social phobia as a proxy of genetic influences (Brooker et al., 2011; Natsuaki et al., in press). We found no specific association between birth mothers' social phobia and child socially wary behaviors. In the present study, we refined the measure of genetic influences by combining the birth mothers' lifetime history of diagnoses with social phobia, specific phobia, separation anxiety, and panic disorder. This modification reflects two lines of research findings, suggesting that these four disorders, along with obsessive-compulsive disorders, may index a latent factor of fear disorder (Krueger, 1999; Seeley, Kosty, Framer, & Lewinsohn, 2011; Watson, 2005), and that various types of internalizing disorders, which are highly comorbid, likely share the same genetic roots (Kendler, Prescott, Myers, & Neale, 2003; Lahey, Van Hulle, Singh, Waldman, & Rathouz, 2011).

Birth mothers' mental health was assessed via the Composite International Diagnostic Interview (CIDI: Andrews & Peters, 1998; Kessler & Ustun, 2004) at two time points (at child age 18 and 48 months). If a birth mother has met the clinical criteria for a given disorder any time during her lifetime (at or before the assessments), we coded her case as "having had a disorder in her lifetime." The CIDI is a highly structured, standardized interview that assesses 17 major diagnostic mental disorders according to the definitions and criteria of the fourth edition of the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders (DSM-IV: American Psychiatric Association, 1994). Validity and reliability of the CIDI has been tested and found adequate (Andrews & Peters, 1998). The present study used a computer-assisted version of the program. Data were processed by a SAS program distributed by the CIDI training group.

We coded "one" for fear disorder if a birth mother met the DSM-IV criteria for any of the aforementioned four disorders (i.e., social phobia, specific phobia, separation anxiety, and panic disorder) at either the 18- or 48-month assessment. If she had no history of any of the four disorders by the last assessment she had, we coded her as "zero." Fifty-one percent of the birth mothers met the diagnosis criteria for lifetime fear disorders and 49% reported never having a history of fear disorder.

Covariates—Post-adoption exchanges between birth parents and adoptive families, if any, may confound estimates of genetic and environmental influences. We therefore included *openness in adoption* as a covariate in the analysis. Birth mothers, adoptive mothers, and adoptive fathers individually reported their perception of openness in their adoption experience using a seven-point scale ranging from 1 (*very closed*) to 7 (*very open*). Because the inter-rater convergence was high (r range = 0.66–0.88; Ge et al., 2008), we standardized each informant's scores and computed an average of the three reporters to construct a composite index of perceived openness in adoption during the first year post-placement. In addition, we also considered perinatal complications – potential intrauterine events that can confound estimates of genetic influences – as well as the adoptive family's household income as potential covariates. However, the perinatal complications and adoptive family household income variables were not significantly correlated with any study variables (r range = –0.08–0.06, all *ns*), and were therefore omitted in the subsequent analyses.

Attrition Analysis

Retention rates across the current study were high (89% and 94% for birth mothers and adoptive families, respectively). Attrition analysis revealed some differences between those who participated at the 27-month assessment and those who did not. When educational attainment was coded into a 7-point scale that reflected the number of years spent and the degree obtained in the educational system (1 = *less than high school*, 7 = *graduate school*), adoptive fathers who did not participate at the 27-month assessment reported slightly lower levels of educational attainment than those who participated, $t(344) = -3.18, p < .01$ (Cohen's $d = 0.57$). Birth mothers who did not participate at the 18-month assessment also had slightly lower educational attainment than those who participated in the assessment, $t(357) = -2.00, p < .05$ (Cohen's $d = 0.43$).

Analysis Plan

Results are organized into three sections. First, descriptive statistics of the study variables are provided. Second, latent difference score (LDS) models (Ferrer & McArdle, 2003, 2010; McArdle, 2009; McArdle & Hamagami, 2001) were performed to capture the reciprocal transactions between structured parenting and child social wariness over time. Models were fitted using the Mplus Version 6.1 (Muthen & Muthen, 1998–2010) with full information maximum likelihood (FIML) to handle missing data. As mentioned above, we included adoption openness as a covariate in all analyses to statistically adjust for the post-adoption exchange between adoptive and birth families. Finally, to eliminate alternative explanations of the findings generated from LDS models, a series of subsidiary analyses were performed.

The present investigation employed LDS to examine the bidirectional influences between structured parenting and child social wariness across time. Under the LDS framework, the change in the observed variable(s) for a person at any given time (t) is defined as a function of an unobserved true score captured in the previous assessment ($t-1$), a change (or difference) score (also latent), and estimated residuals. Unlike other models that are often used to examine reciprocal influences between two variables (e.g., cross-lagged models), the LDS allows an explicit test of growth and decline in the variables of interest via specifications of the change scores, thus providing researchers an opportunity to capture the dynamic transaction between two variables over time (Ferrer & McArdle, 2010). The LDS approach is useful in the analysis of two-wave data because it explicitly models difference scores between two occasions (McArdle, 2009).

To examine how structured parenting and child social wariness mutually influence each other over time, we applied a bivariate LDS model (Ferrer & McArdle, 2010; see also Kouros & Cummings, 2011, for application of LDS; McArdle & Hamagami, 2001). A path diagram of the bivariate LDS model is presented in Figure 1. Conceptually, each latent difference score (Δ) includes two major components: the scores on the same variable at the previous assessment (β), and the scores on the other variable at the previous assessment (γ). Two important paths of this model, which are most relevant to the substantive interests of this study, should be highlighted. First, the additive proportional changes, represented as $\beta_{\text{parenting}}$ and $\beta_{\text{social wariness}}$, are the estimates of change predicted by the scores on the same variable at the previous assessment. Second, $\gamma_{\text{parenting}}$ and $\gamma_{\text{social wariness}}$, known as coupling parameters, represent the estimates of how much one variable assessed at the previous occasion (e.g., structured parenting at child age of 18 months) would influence the latent change of the other variable (e.g., $\Delta_{\text{social wariness}}$). Therefore, coupling parameters are the direct tests of transactions between socialization and evocative processes with regard to child social wariness and structured parenting.

Results

Descriptive Analyses

Table 1 presents the means, standard deviations, and bivariate correlations among the study variables. The stability of child social wariness across age 18- and 27-months was .66 ($p < .01$), showing moderate stability across the 9-month study period. Structured parenting was modestly stable over time for both mothers and fathers ($r = .26$, $p < .01$, for both parents). When the child was 18 months old, child social wariness was not concurrently associated with either maternal or paternal structured parenting. However, negative concurrent correlations emerged at age 27 months for both mother-child and father-child associations, indicating that at age 27 months, more socially wary children tended to have parents who engaged in lower levels of structured parenting (for mothers, $r = -0.13$, $p < .05$; for fathers, $r = -0.19$, $p < .01$). Inspection of cross-lagged bivariate correlations revealed that child social wariness at age 18 months was prospectively and negatively, albeit modestly, associated with both maternal ($r = -0.17$, $p < .01$) and paternal ($r = -0.13$, $p < .05$) structured parenting. Structured parenting at age 18 months was prospectively and negatively associated with child social wariness for fathers ($r = -0.12$, $p < .05$), but not for mothers. Fathers' structured parenting was lower than mothers' structured parenting at age 18 months, $t(315) = 5.08$, $p < .01$ (Cohen's $d = 0.29$), but no father-mother difference was observed at age 27 months. Birth mothers' history of fear disorder was not significantly associated with child social wariness. Also, it was not significantly associated with structured parenting. Adoption openness was negatively associated with child social wariness at age 18 months ($r = -0.14$, $p < .01$).

Primary Analysis

We fitted a bivariate LDS model (see Figure 1) to examine the transactional relationship between structured parenting and child social wariness. Results are presented in Table 2. Coefficients presented in Table 2 are unstandardized estimates, indicating the amount of increase or decrease in the outcome variable with one unit change in the predictor; standardized coefficients are presented in the text below. To maintain simplicity of the figure, adoption openness is not shown, although it was included as a covariate of social wariness. Two models were fitted: one testing maternal structured parenting, and one testing paternal structured parenting. For the model testing the transactions between maternal structured parenting and child social wariness, the fit of the model was excellent, $\chi^2(4) = 2.71$, CFI = 1.00, RMSEA = 0.00. There was a negative coefficient for proportional change in parenting ($\beta_{parenting} = -0.70$ [standardized coefficient = -0.47], $p < .01$), indicating that mothers who initially engaged in high levels of structured parenting tended to reduce the levels of structured parenting at the subsequent assessment. Similarly, the proportional change parameter for social wariness was negative ($\beta_{social\ wariness} = -0.42$ [standardized coefficient = -0.52], $p < .01$), indicating that compared to children who were not socially wary at age 18 months, children who were more socially wary likely decelerated (slowed down) their growth in social wariness. The cross-lagged parameter, known as the coupling parameter, from maternal structured parenting to changes in child social wariness was not significant ($\gamma_{parenting} = 0.001$, *ns*). Interestingly, however, the coupling effect from child social wariness to changes in mothers' parenting was negative and significant ($\gamma_{social\ wariness} = -5.63$ [standardized coefficient = -0.14], $p < .01$), such that children who were initially high in social wariness tended to experience less structured parenting from mothers at the subsequent assessment. Therefore, the findings appear to support the child-evoked processes whereby mothers react to socially wary children with reduced levels of structured parenting.

The fit of the adoptive fathers' model was also excellent, $\chi^2(4) = 1.52$, CFI = 1.00, RMSEA = 0.00. The proportional change parameters for both paternal structured parenting and child

social wariness were negative and significant ($\beta_{parenting} = -0.67$ [standardized coefficient = -0.48], and $\beta_{social\ wariness} = -0.43$ [standardized coefficient = -0.53], $ps < .01$). These findings suggest that fathers whose parenting was initially highly structured tended to reduce the levels of structure in the subsequent parenting assessment. Similarly, children who were initially socially fearful tended to show declines in social wariness by age 27 months. Most relevant for this study are the coupling effects, illustrated as the prospective cross-lagged paths. A unique finding that emerged in the fathers' model is the cross-lagged parameter from parenting to changes in child social wariness ($\gamma_{parenting} = -0.004$ [standardized coefficient = -0.13], $p < .01$). The coupling parameter was negative, indicating that fathers' engagement in more structured parenting was associated with a subsequent decline in child social wariness. The coupling parameter from child social wariness to changes in paternal parenting was marginally significant in a negative direction ($\gamma_{social\ wariness} = -3.53$ [standardized coefficient = -0.09], $p < .10$).

Subsidiary Analysis

The aforementioned findings indicate that structured parenting, particularly from mothers, is associated with subsequent child social wariness, suggesting the child-evoked effect. However, an alternative interpretation of this child-evoked effect remains; one may wonder if child disruptive behavior, rather than child social wariness, elicits subsequent structured parenting. For instance, non-disruptive children, who may also be socially timid and wary, may elicit less structured parenting because they tend to be obedient, making parents feel less of a need to provide additional commands. Is child disruptive behavior an alternative explanation for the child-evoked effect? To examine the possibility of child disruptiveness as a "third" variable, we examined the bivariate correlation between the scores on the TBAQ anger proneness subscale ($\alpha s = .86 \sim .88$ across waves) and structured parenting. No statistically significant association was detected in either adoptive mothers or fathers for either wave ($rs = -.03 \sim -.11$, all *ns*).

As noted earlier, here we define structured parenting as parenting behaviors that aim to regulate children's behaviors by providing specific instructions on completing tasks (Leve et al., 2009). To facilitate a clear operationalization of structured parenting, we conducted a series of supplementary analyses to answer the following questions:

- a. *Is low structured parenting equivalent to highly permissive, lax parenting?* Using the lax parenting subscale of the Parenting Scale (Arnold, O'Leary, Wolf, & Acker, 1993), we examined the bivariate correlation between lax parenting and structured parenting. No significant association was detected in either adoptive mothers or fathers for either wave ($rs = -.01 \sim -.08$, *ns*). Therefore, we did not find any evidence that parents who engaged in low levels of structured parenting were necessarily permissive parents.
- b. *Is structured parenting a proxy of psychologically controlling parenting behavior that interferes with children's autonomous exploration of the world?* At the end of each interview with adoptive parents, interviewers responded to a single item assessing whether they observed the parent restricting the child's spontaneous behaviors more than three times during the visit. Their response was coded "yes" or "no." According to the interviewers' observation, less than 18% of parents interfered with the child's activities more than three times during the visit. We conducted a *t*-test to examine whether there was any difference in the levels of structured parenting between the parents who hindered child's autonomous behaviors frequently and those who did so infrequently. We found no difference between the two groups of parents. Thus, parents who engaged in high levels of

structured parenting were not necessarily restrictive of children's spontaneous, autonomous behaviors.

c. *Is structured parenting equivalent to involved parenting or responsive parenting?*

To investigate whether parents who are low on structured parenting are also withdrawing from parenting in general, we examined the correlation between structured parenting and parental involvement with the child (i.e., involved parenting and responsive parenting). At the 18 and 27 month assessments, the interviewers rated mothers' and fathers' involvement with the child using the six-item parental involvement subscale ($\alpha s = .56 \sim .70$ across waves) and the 10-item parental responsiveness subscale ($\alpha s = .59 \sim .81$ across waves) from the infant and toddler version of the Home Observation for Measurement of the Environment (HOME) Inventory (Caldwell & Bradley, 1984). The HOME Inventory was designed to measure the quantity and quality of social, emotional, and cognitive support available to young children of up to three years of age in their homes (Caldwell & Bradley, 1984). The sample items for the involved parenting scale included: *mother/father tends to keep child within visual range and to look at him/her often*; and *mother/father talks to the child while doing her/his work*. The examples of items in the parental responsiveness scale included are: *mother/father responds to the child's vocalizations with verbal or vocal response; when speaking of or to the child, mother's/father's voice conveys positive feeling*; and *mother/father shows some positive emotional response to praise of the child offered by interviewer*. No significant concurrent or longitudinal association between structured parenting and involved parenting was found for mothers or fathers ($r s = -0.06 \sim 0.06$, *ns*). In addition, parental responsiveness was not significantly associated with structured parenting either ($r s = -0.001 \sim 0.05$), with one exception: adoptive fathers who engaged in high levels of structured parenting tend to show high levels of responsiveness at age 18 months ($r = .14$, $p < .05$). However, adoptive fathers' structured parenting and responsiveness were no longer associated significantly at age 27 months, failing to provide a consistent pattern. These results, though suggestive, indicated that parents who are low on structured parenting do not necessarily withdraw from the child or lack attentiveness to the child's needs; they simply used fewer commands and direct instructions as a mean to manage child behavior. Similarly, parents with high structured parenting are not necessarily highly responsive, attentive, and involved.

The aforementioned findings from the supplementary analyses suggest the specificity of structured parenting that is not captured by intrusive, permissive, involved, or responsive parenting.

Discussion

The present investigation aimed to examine the reciprocal associations between structured parenting and child social wariness. Results underscore the importance of transactional processes within a family context: child social wariness reported by parents at age 18 months was related to lower levels of observed structured parenting from parents (particularly mothers) at 27 months, and lower levels of fathers' structured parenting predicted increases in child social wariness.

First, results indicated that child social wariness was associated with subsequent declines in structured parenting such that parents of socially wary children decreased their level of structured parenting between ages 18- and 27-months. Evidence for this child-evoked process in the parent-child transactions was observed for adoptive mothers, and was suggestive for fathers. The finding that parents of socially wary children come to use less

directive parenting behaviors is consistent with earlier work indicating that parents believe that socially timid children should be treated with more sensitive and less directive parenting strategies (Mills & Rubin, 1990).

One may propose an alternative interpretation of the child-evoked effect in that child disruptive behavior, rather than child social wariness, may influence structured parenting. Theoretically, it is quite possible that children who are less disruptive – some of whom may also be socially wary – may elicit less structured parenting because they tend to be obedient and not cause trouble. Our results from the subsidiary analysis demonstrated that children's anger-prone temperament (e.g., crying, protesting) was not associated with structured parenting in either adoptive parent. Therefore, socially wary children seem to elicit unique reactions (i.e., reduced structured parenting) from parents that disruptive children do not. However, our findings do not permit a rigorous examination of the distinctive roles of children's socially wary behaviors and disruptive behaviors in eliciting structured parenting. Future research is needed to further investigate this topic.

In contrast to our expectations, fear-related disorders in birth mothers (an index of genetic influences) were not significantly related to the child-evoked effects. A recent study of a nationally representative sample of U.S. adolescents suggests that the construct of shyness, which is often conceptualized interchangeably with the term social wariness (Rubin et al., 2011), is distinct from that of social phobia (Burstein, Ameli-Grillon, & Merikangas, 2011); only 12% of self-identified shy youth met the criteria for lifetime social phobia. Therefore, the absence of the significant path from birth mothers' phenotypic fear disorders (which included social phobia) and toddler social wariness may not be surprising, given that the association between shyness/social wariness and disorders identified via clinical diagnosis is likely complex. Alternatively, as children were assessed between 18 to 27 months of age, it is possible that genetic influences may not be detectable until children are old enough to show the socially wary behaviors that are phenotypically equivalent to adult anxiety. Future work is encouraged to further elucidate how childhood social wariness and fear-related disorders are connected (or disconnected) and how genes might play a role in this association.

Second, our results provided evidence for parental socialization effects, at least in the father-child transaction. We found that fathers' structured parenting was negatively associated with subsequent changes in child social wariness. Compared to how they were rated at 18 months, children were rated as more socially wary at age 27 months if fathers engaged in less structured parenting at age 18 months. This finding is consistent with a view that increasing rates of structured parenting may assist in reducing levels of socially wary behaviors in children (e.g., Park et al., 1997). Parental management behaviors, such as setting clear goals, providing clear instructions, and directly teaching various behavioral repertoires, may represent an effective parenting strategy for socially wary children because direct commands and requests from parents may push otherwise socially inhibited children to be more proactive in their social world (Park et al., 1997).

Interestingly, the influence of structured parenting on child social wariness was unique to father-child transactions. We did not obtain similar findings in mother-child transactions. Whether or not these findings reflect the differential effects of mothers and fathers on social wariness requires further investigation; the present study was not designed to test for differences between mothers and fathers. Recently, Bogels et al. (2011) highlighted the special role fathers play in child social wariness. Their findings indicated that fathers' socially confident behavior was more effective in decreasing highly anxious children's social anxiety relative to mothers' socially confident behavior. They theorized, based in part on evolutionary perspectives, that children give more weight to fathers than to mothers when

dealing with anxiety in social situations because children assume that fathers (or male figures) have more expertise in the genre of social dominance (Bogels & Perotti, 2011; Bogels et al., 2011). The present results underscore the importance of the fathers' role in the development of young children's social wariness, but future studies are needed to compare transactional parent-child processes across mothers and fathers.

The interpretation of the present findings is clarified by testing the operationalization of structured parenting. For example, one may propose that low levels of structured parenting are similar to highly permissive parenting or withdrawal from the child. Notably, results from a supplementary analysis indicated that structured parenting was not significantly associated with either permissive parenting or involved parenting. Further, structured parenting was not associated with parental interference of child autonomous behaviors either. Due to the nature of null findings, these findings are tentative and could be considered as preliminary evidence that parents who engage in low levels of structured parenting are not necessarily permissive, less restrictive, or less engaging to child rearing. Plausibly, therefore, structured parenting has a unique role in the development of child social wariness. In this regard, readers are reminded that structured parenting as assessed in this study included commands and requests parents made to the child to manage the child's behavior, not the valence ("positive" or "negative") of parenting. Future parenting research may focus on how different dimensions of parenting behaviors (e.g., structured parenting, psychological control, permissive/restrictive parenting, involved parenting) are integrated into everyday parenting practices and how these components influence child development jointly and uniquely.

Furthermore, the aforementioned findings need to be interpreted within the context of how structured parenting was assessed. Structured parenting is typically carried out across various contexts. However, the present study assessed structured parenting solely during a short clean-up task in an attempt to capture parents' engagement during a common challenging situation that occurs frequently at home for parents with toddlers. A next step would be to observe structured parenting in a broader set of social situations with others. For instance, future research may examine how parents guide and encourage socially wary children to play with other children, how parents directly teach social skills, and how parents manage children's lifestyle and schedule to promote social interactions with the outer world. Such investigations will be fruitful and help further unravel the specific mechanisms that link structured parenting to children's socially wary behavior.

In addition, the concept of structured parenting needs to be considered within a developmental framework. While parental active guidance appears to be a protective factor for child social wariness during toddlerhood, the same parenting behavior may appear overtly solicitous and psychologically intrusive to older, autonomous children who are equipped with more advanced physical, emotional, and cognitive capabilities. For instance, a parent giving an instruction about what to wear to school may be viewed as psychologically intrusive to an older child, while the same parental behavior may appear supportive and helpful in the eyes of a younger child. The present investigation was based on only two time points in toddlerhood; future studies are encouraged to deepen the understanding of how parents adjust their levels of structured parenting to match the needs of their developing child using a long-term longitudinal design.

Taken together, these results underscore the importance of considering mutual influences between structured parenting and child social wariness. Particularly concerning is an emerging portrait of a cycle of transactions; that is, socially wary children may elicit low levels of structured parenting, which in turn, may exacerbate their social wariness. Given that socially fearful, inhibited behaviors in early childhood are predictive of later anxiety-

related psychopathology (Biederman et al., 1990; Chronis-Tuscano et al., 2009; Degnan et al., 2010; Feng et al., 2008; Prior et al., 2000), it would be important to disrupt this cycle early in development. Future research efforts should examine whether parenting interventions that aim to teach parents not to be too reactive to child social wariness may help to prevent further exacerbation of social wariness in toddlers who are already socially wary and inhibited.

Several methodological strengths of the current investigation bolster the credence of the findings in this report. First, the application of an adoption design allowed us to rule out the possibility that the associations between structured parenting and child social wariness were attributable to shared genetic influences. Because the adoptive parents provide the caregiving environment, but are not biologically related to the child, the observed associations between structured parenting and child social wariness likely represent transactions that are environmental in origin. Additional strategies that were implemented in the present study to maximally distinguish genetic from environmental influences include (a) the recruitment of adoptees who were placed at birth and (b) the inclusion of adoption openness as a covariate to statistically adjust for post-adoption contact between adoptive and birth parents. Furthermore, we used four different sources of information (birth mother, adoptive mother, adoptive father, and observation) to reduce the shared method variance so that no informant reported both on the criterion and the predictor variables of substantive interest. Finally, although the longitudinal design alone does not provide evidence for causality, it provides more definitive logical basis for the event sequences. These methodological features permitted us to test family processes. However, because of the paucity of extant research on how genes, structured parenting, and child social wariness are reciprocally associated, replication studies are strongly recommended.

Limitations and Future Directions

Several limitations inherent to findings derived from the present study merit consideration. First, there are limitations with the use of birth mothers' phenotype to infer the child's genotype. Most importantly, this estimation approach potentially underestimates genetic influences because it does not contain the genetic influences from birth fathers. In the present study, only 35% of families had a participating birth father. The small sample size posed analytical challenges and prevented a more extensive evaluation of the study hypotheses. Second, the present study estimated genetic influences using lifetime diagnostic history, which disproportionately weighed older birth mothers compared to younger counterparts. Third, we conceptualized that genetic risks for fear-related disorder are manifested in the form of social wariness in toddlerhood, but this assumption requires additional investigation. Fourth, our study design did not permit to test the ordering effect of mother-child and father-child clean-up tasks. Readers are reminded that different patterns of results were observed between maternal and paternal structuring, and that these may have been confounded with the ordering effect for the task. Fifth, the clean-up task used in this study was 3-mins long. Although we saw significant variation in parental responses to the task, a longer task or series of tasks, including structured and less structured tasks (e.g., preparing a meal) may allow parents to display more heterogeneous behaviors. Finally, it is noteworthy that rigorous statistical testing of transactional processes requires demonstration of two parties influencing and amplifying each other's responses through multiple exchanges (Sameroff, 2009). Thus, further longitudinal work is needed to examine whether the bidirectional influences between structured parenting and child social wariness found in this study evolves into a long-term transactional process over time.

These limitations notwithstanding, this study underscores the importance of dynamic transactions between the child and parents in the development of social wariness across toddlerhood. The transactions likely involve two processes within a family context: parental

socialization processes (i.e., low levels of structured parenting exacerbate child social wariness) and child-evoked processes (i.e., socially wary children elicit low levels of structured parenting). This intricate reciprocity between the child, mother, and father likely explains, at least partially, how social wariness develops over time during early childhood via everyday exchanges among family members.

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Figure 1.

A bivariate latent difference score model examining transactions between structured parenting, child social wariness, and birth mothers' fear disorder during early childhood (from 18 to 27 months of age). AP = adoptive parents. BM = birth mothers. Contemporaneous associations between latent constructs were included (not shown). Openness in adoption was used as a covariate of child social wariness (not shown).

Table 1

Means, Standard Deviations, and Bivariate Correlations of the Study Variables

Variable	Reporter	M (SD)	1	2	3	4	5	6	7	8
<u>Child outcomes</u>										
1. Social wariness (18 months)	AM, AF	3.68 (0.83)	–							
2. Social wariness (27 months)	AM, AF	3.66 (0.75)	0.66	–						
<u>Environment</u>										
3. AM structured parenting ^a (18 months)	Observation	64.20 (22.12)	–0.06	–0.04	–					
4. AF structured parenting (18 months)	Observation	56.56 (22.35)	–0.01	–0.12 [*]	0.14 ^{**}	–				
5. AM structured parenting (27 months)	Observation	79.21 (30.37)	–0.17 ^{**}	–0.13 [*]	0.26 ^{**}	0.23 ^{**}	–			
6. AF structured parenting (27 months)	Observation	80.63 (28.16)	–0.13 [*]	–0.19 ^{**}	0.12 [*]	0.26 ^{**}	0.24 ^{**}	–		
<u>Genetic influences</u>										
7. BM fear disorders	BM	–	0.08	0.05	0.05	0.02	–0.08	–0.05	–	
<u>Covariate</u>										
8. Openness in adoption	AM, AF, BM	0.04 (0.93)	–0.14 ^{**}	–0.05	0.01	0.01	0.02	0.08	0.06	–

Note. AM = adoptive mother; AF = adoptive father; BM = birth mother.

^aTime (in seconds) spent in structured parenting.^{*} $p < .05$;^{**} $p < .01$.

Table 2

Results From Bivariate Latent Difference Score Models for Structured Parenting and Child's Social Wariness

Parameter estimates	Adoptive Mother		Adoptive Father	
	Structured parenting (duration in seconds)	Child social wariness	Structured parenting (duration in seconds)	Child social wariness
<i>Initial status</i>				
M	63.43 (1.23) **	3.62 (0.07) *	56.36 (1.30) **	3.62 (0.06) **
variance	468.08 (37.76) **	0.66 (0.05) **	501.13 (41.22) **	0.65 (0.05) **
<i>Additive coefficient</i>				
M	79.91 (9.58) **	1.54 (0.19) **	75.08 (8.73) **	1.79 (0.18) **
variance	813.98 (70.71) **	0.33 (0.03) **	742.10 (64.75) **	0.33 (0.03) **
<i>Proportional change</i>				
$\beta_{\text{parenting}}$		-0.70 (0.08) **		-0.67 (0.08) **
$\beta_{\text{social wariness}}$		-0.42 (0.04) **		-0.43 (0.04) **
<i>Cross-lagged parameters</i>				
$\gamma_{\text{parenting}}$		0.001 (0.002)		-0.004 (0.002) **
$\gamma_{\text{social wariness}}$		-5.63 (2.05) **		-3.53 (2.03) +
<i>Genetic influences</i>				
$\beta_{\text{genetic influences at 18 months}}$		-0.15 (0.09)		-0.13 (0.09)
$\beta_{\text{genetic influences at 27 months}}$		-0.03 (0.07)		0.05 (0.07)
<i>Goodness-of-fit</i>				
χ^2	2.71		1.52	
df	4		4	
RMSEA	.00 (90% CI = 0.00 – 0.07)		.00 (90% CI = 0.00 – 0.05)	

Note. RMSEA = root mean square error of approximation. Unstandardized parameter estimates presented with standard error in parentheses.

+ $p < .10$;* $p < .05$;** $p < .01$.