

**Children's Shyness Moderates the Associations Between  
Parenting Behavior and the Development of Children's Pro-Social Behaviors**

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**Abstract**

Shyness, feelings of uneasiness or hesitation when faced with a novel or unfamiliar social situation, in early childhood has been found to be a risk factor for social difficulties later in life. When combined with fitting parenting, however, outcomes of shyness can be less detrimental. The present study examined the joint effects of children's shyness and mothers' and fathers' parenting on the development of children's pro-social behaviors during early schooling years. A total of 200 children were rated by their parents on their shyness at age 3 and on their pro-social behaviors at ages 4, 5, 6, 8, and 9. The children's mothers (n = 185) and fathers (n = 175) completed questionnaires measuring their levels of affection and behavioral control when the children were four years old. The results of the Latent Growth Curve modeling showed that, although maternal and parental affection were related to high levels of pro-social behavior for both shy and non-shy children, shy children, in particular, benefitted from parental affection in terms of their subsequent development of pro-social behaviors. The results further showed that paternal behavioral control was positively associated with pro-social behavioral levels among non-shy children only.

**Keywords** Parenting · Affection · Behavioral control · Shyness · Pro-social behaviors

## Introduction

Shyness, a temperamental trait characterized by a consistent display of wariness and feelings of unease in the face of social novelty and perceived social evaluation (Rubin, Coplan, & Bowker, 2009), has been shown to increase children's risks of social difficulties later in life (Rubin, Coplan, Bowker, & Menzer, 2011). It has been suggested that shy children benefit from a different kind of parenting than other children (Gallagher, 2002) and that the stability and outcome of a children's temperamental shyness depends on their family environment (Rubin et al., 2009, 2011). Furthermore, compared to other children, temperamentally vulnerable children have been found to be more affected by their mothers' and fathers' socialization (Belsky & Pluess, 2009). Although some studies have explored the joint effects of shyness (or nearly related but different constructions, such as behavioral inhibition) and parenting behavior on children's developmental outcomes (e.g., Baer et al., 2015; Hane, Cheah, Rubin, & Fox, 2008; Hastings, Rubin, & DeRose, 2005; Kienbaum, Volland, & Ulich, 2001; Lewis-Morrarty et al., 2012; Vreeke, Muris, Mayer, Huijding, & Rapee, 2013; Zarra-Nezhad et al., 2014; Zarra-Nezhad, Aunola, Kiuru, Mollola, & Moazami-Goodarzi, 2015), few longitudinal studies have focused on the development of children's pro-social behaviors (Hastings et al., 2005; Russell, Hart, Robinson, & Olsen, 2003; Zarra-Nezhad et al., 2014). Moreover, the vast majority of previous studies have focused on children younger than school age; thus, little is known about the joint effects of shyness and parenting on the development of children's pro-social behaviors during their critical transition to primary school (Zarra-Nezhad et al., 2014).

Shyness has been characterized as an approach-avoidance conflict, in which the desire for social interaction with peers (i.e., high social approach motivation) is instantaneously inhibited by social fear and anxiety (i.e., high social avoidance motivation) (Coplan, Prakash, O'Neil, & Armer, 2004). A closely similar although conceptually different concept of shyness is *behavioral inhibition*. Behavioral inhibition has been defined as a temperamental trait characterized by being highly reactive in stressful situations, for instance, in response to unfamiliar people or objects, and to become easily overstimulated (e.g., Feng et al., 2008). Although behavioral inhibition overlaps with the concept of shyness, the difference between these two concepts is that shyness includes fear and wariness in social contexts in particular, whereas inhibition includes fear and wariness in novel social as well as non-social contexts (Dyson, Klein, Olino, Dougherty, & Durbin, 2011). *Social withdrawal*, i.e., a consistent display of solitary behavior when encountering familiar or unfamiliar peers across situations and over time (Rubin & Coplan, 2010), shares some

common features with shyness. However, whereas shy children often desire social interaction but are inhibited by fear induced social avoidance socially withdrawn children choose, for some reason or another, not to interact with the peer group (Coplan et al., 2004). A variety of other terms have also been used to refer to shyness, such as *reticence*, i.e. wariness and anxiety in the face of social novelty or evaluation (Rubin et al., 2009), or in social contexts overall (Coplan, DeBow, Schneider, & Graham, 2009), and *anxious solitude*, i.e. social wariness displayed specifically in familiar peer contexts (Gazelle & Ladd, 2003).

Shyness has been described as one of the most stable temperamental and personality characteristics (for a review, see Rapee & Coplan, 2010). Shy children have been found to be at a higher risk of internalizing problem behaviors, i.e. showing symptoms of anxiety or depression, in childhood (e.g., Eggum et al., 2012; Fang & Gagne, 2017; Janson & Mathiesen, 2008) and adolescence (e.g., Barstead et al., 2017; Lonigan, Phillips, & Hooe, 2003), than non-shy children. Shyness has also been found to predict various kinds of problems in social development (for reviews, see Rubin & Coplan, 2010; Lane & Song, 2015). For example, shy school-aged children have been shown to be rejected and victimized by peers, leading to feelings of loneliness and negative perceptions of own social skills and relationships (for a review, see Rubin, Burgess, & Hastings, 2002), as well as social avoidance and depression in the context of high exclusion (Gazelle & Rudolph, 2004).

Pro-social behaviors, which comprise a range of supportive, helpful, and affiliative responses (Eisenberg & Fabes, 1998), as well as the formation and maintenance of quality relationships in social groups (for a review, see Siu, Shek, & Law, 2012), begin to develop early in infancy (Warneken & Tomasello, 2007) and continue to develop throughout childhood (Eisenberg & Fabes, 1998). Longitudinal research has found that earlier shyness or inhibition in children predicts poorer pro-social behaviors (e.g., Hay & Pawlby, 2003), as well as increased levels of anxiety, in adolescence and adulthood (e.g., Tang et al., 2017). It has been suggested that the reason shyness is related to poorer pro-social behaviors is that it may lead to internalized behavior—which, in turn, inhibits social interaction skills (Cheek & Krasnoperova, 1999) and increases social fear and anxiety (Coplan et al., 2004). Tendencies toward pro-social responses appear to be moderately stable from the preschool period through adolescence and early adulthood (Degnan, Henderson, Fox, & Rubin, 2008). Consequently, shyness in early childhood may have long-lasting consequences for the development of pro-social behaviors. Not all studies, however, have found link between temperamental shyness and pro-social behavior (e.g., Liew et al., 2006).

In additional to temperamental characteristics, family also plays an important contextual role in children's social

and emotional development (Hart, Newell, & Olsen, 2003). One of the most often investigated aspects regarding family is parenting behaviors. Parental affection, i.e. warm, responsive and supportive parental behaviors, and parental behavioral control, i.e. setting of limits, consistent discipline, and demands for maturity, are associated with children's subsequent development of pro-social behaviors. For example, maternal affection has been shown to predict children's higher pro-social behaviors (e.g., Daniel, Madigan, & Jenkins, 2016; Day, & Padilla-Walker, 2009; Hart et al., 2003; Li et al., 2015; Zhou et al., 2002; Huntsinger & Jose, 2009; Suchman, Rounsaville, DeCoste, & Luthar, 2007). This has been suggested to be due to the fact that parental warmth and affection provides children with feelings of security and trust in the environment, which in turn, decrease self-concern and increase children's empathy (Zhou et al., 2002). Furthermore, parental affection plays a significant role in the development of a secure parent-child attachment (Bowlby, 1982), which in turn has been associated with children's positive social functioning (Kestenbaum, Farber, & Sroufe, 1989). Similarly, maternal behavioral control has been shown to be associated with high levels of pro-social behaviors among children (e.g., Hart et al., 2003, Farrant, Devine, Maybery, & Fletcher, 2012; Knafo & Plomin, 2006). Disciplinary practices that involve reasoning have been suggested to increase children's awareness of the consequences of their behavior, promote their adaptive behavior, and raise their attention to parental messages and empathize with people in need (Hastings, Miller, & Troxel, 2015; Eisenberg, Spinrad, & Knafo-Noam, 2015; Hoffman, 1970; Zhou et al., 2002). Maternal intrusive control (i.e., harsh punishment, demandingness and intrusiveness) has, by contrast, been associated with maladaptive behaviors and weaker pro-social development in children (e.g., Knafo & Plomin, 2006; Russell & Russell, 1996, Zhou et al., 2002). This has been suggested to be due to the fact that the fear associated with harsh punishment may interfere with learning social behaviors, as well as induce compliance to imposed rules rather than internalization of moral standards (Hoffman, 1970; see also Zhou et al., 2002).

Although there has been less research on the links between fathers' parenting behaviors and children's pro-social behaviors, there is some evidence that fathers also make unique contributions to their children's social development (for a review, see Cabrera, Volling, & Barr, 2018; Lamb & Lewis, 2010). For example, some researchers have reported positive relations between fathers' positive parenting (i.e., warmth, affection, and positive involvement with children) and children's improved social skills (e.g., Daniel, Madigan, & Jenkins, 2016; Russell & Russell, 1996), social achievement (Chen, Liu, & Li, 2000), and peer relationship quality (for a review, see Parke, 2002). Fathers' intrusive control, in turn, has been found to be related to decreased future social skills among

children (Stevenson & Crnic, 2013), decreased peer acceptance, and increased aggression and internalizing and externalizing problems (Marsiglio, Amato, Day & Lamb, 2000). However, results for fathers have not been as consistent as those for mothers (for a review, see Fagan, Day, Lamb, & Cabrera, 2014).

According to Thomas and Chess (1977), optimal child development can be achieved when there is a match between an individual's temperament and the environment. Child–environment model of adaptation (Nigg, 2006) also suggests that various characteristics of children determine the kind of environmental support that is most beneficial for them and the kind of environmental risks to which they might be particularly vulnerable. It has also been suggested that, depending on their particular characteristics, some children are generally more susceptible than others to parental socialization (Belsky & Pluess, 2009). Moreover, according to differential susceptibility model (Belsky & Pluess, 2009), the individuals who are the most vulnerable to negative environmental impacts also gain the most from positive environments and experiences.

Shyness is a child characteristic that has been shown to make children particularly susceptible to parental influence (Belsky & Pluess, 2009; Gallagher, 2002). It has been shown, for example, that preschoolers' shyness is negatively related to pro-social behaviors only among boys with mothers who had low levels of sympathy and caring behaviors (Kienbaum et al., 2001). Similar results regarding the positive developmental effects of parental affection on related construct to shyness such as inhibition and social withdrawal have also been found. For example, Zarra-Nezhad et al. (2014), found that particularly those children who showed signs of social withdrawal were vulnerable to the negative effects of low maternal affection in terms of externalizing behavior. In another study Zarra-Nezhad et al. (2015), reported that high maternal affection predicted subsequently low levels of negative emotions among inhibited children, but not among non-inhibited children, during the first grade. Baer et al. (2015) also found that more extreme levels of maternal positive involvement were related to lower levels of social functioning among children with higher levels of harm avoidance (i.e. a temperamental trait defined by shyness, fatigability, anticipatory worry, and behavioral inhibition).

Inconsistently with these results, however, Hastings et al. (2005) found that temperamentally inhibited girls were more pro-social at the age of four if their mothers were more authoritarian (i.e., high levels of parental behavioral control, combined with low affection), but less pro-social if their mothers were authoritative (i.e., high levels of both affection and behavioral control), whereas the opposite pattern was found for less inhibited girls. In a study by Hane et al. (2008), maternal positivity (i.e., maternal positive effects and positive control) was associated with better social

outcomes for temperamentally shy preschoolers. Moreover, Russell et al. (2003) found that, with children aged four to five years old, authoritarian maternal parenting (i.e., a high level of parental behavioral control combined with low affection) was negatively associated with children's social behavior among unsociable children, but not among children who were more sociable.

Though much is known about the roles both of shyness (or inhibition) and parenting behaviors in the development of children's pro-social behaviors, less is known about their joint effects on children's social development. Furthermore, follow-up studies in the field are rare. Particularly little is known about the joint effects of shyness and parenting during children's transitions to primary school (Zarra-Nezhad et al., 2015). This transition period (i.e., from preschool to elementary school) can be assumed to be an important period for children's social development because, during this period, children enter a new social environment, begin to have to get along with peers, make new friends and form new relationships with teachers. Consequently, the present study examined whether children's shyness moderates the longitudinal associations between mothers' and fathers' parenting behaviors and children's social development in terms of pro-social behaviors during the transitional period from preschool to primary school. We expected that parental affection and behavioral control will be positively associated with children's levels and development of pro-social behaviors (Hart et al., 2003). However, we expected that these associations would be stronger among children exhibiting shy behaviors than among other children (Belsky & Pluess, 2009; Pluess & Belsky, 2013).

## **Method**

### **Participants**

The data used in the present study are part of the Jyväskylä Longitudinal Study of Dyslexia (JLD) (Lyytinen & Ahonen, 2016), in which 200 children (47% girls, 53% boys) were selected from among 9368 newborns born in the province of Central Finland between April 1993 and July 1996. The children were originally selected for one of two groups: children with or without familial risk for dyslexia. All of the children spoke Finnish as their native language and had no mental, physical, or sensory impairments. From the parents of these 200 children, 185 mothers (92.5%) and 175 fathers (87.5%) participated in the study.

## Procedure

Parents were asked to answer the posted questionnaires. Most of the participating mothers had a lower university degree or a polytechnic degree as their highest degree, whereas most of the participating fathers had a vocational school degree as their highest degree. The children's shyness was evaluated by their parents when the children were three years old (Time 1). Then, the children's pro-social behaviors were measured via parent-rated questionnaires when the children were 4 (Time 2), 5 (Time 3), 6 (Time 4), 8 (Time 5), and 9 (Time 6) years old. The mothers' and fathers' parenting styles were measured via questionnaires at Time 2.

## Measures

### *The Children's Behavior Questionnaire (CBQ)—Shyness subscale*

Children's temperament at the age of 3 years was rated by their mothers (70.3 %), fathers (3.4 %), or by both parents together (26.3 %) depending on parents' choice using a Finnish version of the Children's Behavior Questionnaire (CBQ; Rothbart et al., 2001). The CBQ consists of 195 items to which the parents are asked to respond on a 7-point scale (1 = *extremely untrue of your child*; 7 = *extremely true of your child*). The items cover a total of 15 temperamental scales, of which the Shyness scale score was used in this study. Shyness subscale was chosen to the study because the focus was on social inhibition and conceptually related constructs. The scale Shyness consists of 13 items measuring slow and inhibited approach in novel or uncertain social situations (e.g. *Gets embarrassed when strangers pay a lot of attention to her/him*; *Acts shy around new people*). The shyness scale composites created by taking a mean of the item scores. The Cronbach's alpha reliability for Shyness scale score was .92.

### *Behavior Assessment System for Children (BASC)—Social skills and Adaptability scales*

Pro-social behavior was measured using items from a Finnish version of the Parent Rating Scale (PRS) of the Behavior Assessment System for Children (BASC; Reynolds & Kamphaus, 1992). Mother (on average in 79.3 % of the cases), father (14.1%) or both parents together (6.6%) filled out the questionnaire when children were 4, 5, 6, 8, and 9 years old. The BASC incorporates a multidimensional perspective of the child's behavior, including both adaptive and maladaptive aspects. Items are rated on a 4- point scale ranging from "Never" to "Almost Always". The



parental rating scale for pre-schoolers (PRS-P; 126 items) was used between ages 4 to 6 years, whereas the parental rating scale for children (PRS-C; 138 items) was used at ages of 8 and 9. Pro-social behaviors –score was calculated at all ages as an arithmetic mean from the 16 identical items belonging to Social skills and Adaptability scales both in the PRS-P and PRS-C of the BASC. Social skills were operationalized as advantageous social behaviors in the peer context requiring interactional skills (e.g., showing interest in others' ideas, complimenting others, offering assistance, and encouraging others to do their best). Adaptability was conceptualized as awareness of social expectations and the ability to adjust one's behavior according to social expectations (e.g., adapting to changes in routines and sharing of objects and materials with others) (see Aro, Eklund, and Poikkeus, 2012). Selected items included such items as *Shares toys/possessions with other children* (Adaptability); *Congratulates others when good things happen to them* (Social skills). Cronbach's alpha reliabilities for the pro-social behaviors scale at the ages of 4, 5, 6, 8, and 9 years were .80, .82, .81, .81, and .86, respectively.

#### *Block's Child Rearing Practices Report (CRPR)— Parental affection and behavioral control subscales*

Parental affection and behavioral control were measured with a Finnish version (Aunola & Nurmi, 2004) of the Block's Child Rearing Practices Report (CRPR; Roberts, Block, & Block, 1984). The mothers and fathers were asked to rate 14 items on a 5-point scale (1 = *not like me at all*; 5 = *very much like me*). These items were intended to measure two aspects of parenting behavior: *affection* (9 items; e.g., "I often tell my child that I appreciate what he/she tries out or achieves"; "I often show my child that I love him/her"), and *behavioral control* (5 items; e.g., "My child should learn that we have rules in our family"; "My child should learn how to behave properly toward his/her parents"). The parenting behavior composites were created by calculating a mean of the item scores. The respective Cronbach's alpha reliabilities regarding these dimensions were, respectively, .76 and .56 for mothers and .82 and .60 for fathers.

## **Data Analyses**

To examine the impact of parenting behaviors on changes in children's pro-social behavioral trajectories and to determine the extent to which these associations vary for shy and non-shy children, we employed latent growth curve modeling (LGCM) for the data analysis. To build the LGCM, we adopted the recommended two-step process

(Bollen & Curran, 2006). First, we tested the unconditional latent growth curve model for pro-social behaviors to determine the trajectory type that would best describe the development of pro-social behaviors across time and to identify the existence of any statistically significant individual variation that could be predicted from the intercept (level) and slope of pro-social behaviors. Second, given that the unconditional model demonstrated adequate model fit and significant variability in both intercept and slope, we built a conditional growth model by incorporating parenting variables as predictors of inter-individual differences in the levels and changes of pro-social behaviors. Separate models were tested for mothers and fathers. We first tested the main effects of the parenting variables; then, multi-group analyses were conducted to test the different effects of parenting on the intercepts and slopes of the pro-social behaviors of shy vs. non-shy children. Sociodemographic characteristics including the child's gender, family's socioeconomic status, the parental status (single parent or non-single parent) and the parents' education, were controlled for.

Several complementary fit indices were used to examine the overall quality and fit of the hypothesized and alternative models. The indices utilized included the Normed Fit Index (NFI), the Comparative Fit Index (CFI), and the Root Mean Square Error of Approximation (RMSEA). For the NFI and the CFI, values between 0.90 and 1.0 indicate a good fit between the model and the data. An RMSEA value of 0.05 or less indicates a good fit, while values up to 0.08 indicate a reasonable error of approximation. The fits of the nested models were compared by examining the significant changes in the chi-square values and degrees of freedom. We conducted all analyses using AMOS 22.0. All analyses were carried out using AMOS 22.0 statistical package. The data was imputed thus the sample sizes for all the models were the same. The parameters of the models were estimated using maximum-likelihood estimator. The means, standard deviations, and correlations for the study variables are presented in Table 1.

--Insert Table 1 here--

## **Results**

In the first step, we tested the unconditional latent growth curve for the longitudinal pro-social behavior variable. We compared alternative growth models for pro-social behaviors that vary with respect to (1) the functional form and (2) the residual structure of the growth curve. The results of the corresponding nested model comparisons are shown in

Table 2. First, we tested whether the change in pro-social behaviors over time was strictly linear or non-linear by comparing the linear model (slope factor loadings at different time points 0, 1, 2, 4 and 5) to the model with the free slope factor estimation (slope factor loadings at T2, T3, and T4 allowed a free estimation). The results showed that the model with the free slope factor estimation fit the data statistically better than the linear growth model (see Table 2). Second, we tested the assumption that the error variability would remain constant for the repeated pro-social behavior measurements. Allowing time-specific residual variances to differ across time points resulted in a significantly better model fit than that of the model with a single residual variance. Thus, we concluded that Model 3 (see Table 2) represented the sample data appropriately.

--Insert Table 2 here--

The resulting latent growth model for pro-social behaviors showed good fit with the data ( $\chi^2(7) = 13.62$ ; NFI = .956; CFI = .985; RMSEA = .069). Table 3 reports the estimated values for the means and variances of the intercept and slope factors in the final unconditional model. The results showed that, at the mean level, pro-social behaviors increased statistically significantly across time. The significant variances in the intercept and slope further indicated that there were inter-individual differences in both the initial levels of the pro-social behaviors and their changes over time from T1 to T5. Such evidence justifies the incorporation of predictor variables in the subsequent conditional LGCM analysis.

--Insert Table 3 here--

In the second analytical step, we added parenting variables as predictors for the LGCM to determine whether these predictor variables would explain the various pro-social behavior growth trajectories. Separate models were tested for mothers and fathers. The results of the models are shown in Figure 1.

--Insert Figure 1 here--

The results for mothers' model indicated an adequate fit ( $\chi^2(13) = 17.86$ ; NFI = .965; CFI = .990; RMSEA = .043). Mothers' affection was positively related to the intercept of child pro-social behaviors ( $\beta = .41$ ,  $p < .001$ ), indicating that high levels of maternal affection are related to high initial levels of pro-social behaviors among children. Mothers' affection was not related to the slope of pro-social behaviors ( $\beta = .06$ ,  $p > .05$ ). Moreover, mothers' behavioral control was not related to the intercept or the slope of pro-social behaviors ( $\beta = .06$ ,  $p > .05$ ;  $\beta = .06$ ,  $p > .05$ , respectively).

The results for the fathers' model also indicated an adequate fit ( $\chi^2(13) = 20.95$ ; NFI = .958; CFI = .983;

RMSEA = .055). Fathers' affection was positively related to the intercept of children's pro-social behaviors ( $\beta = .23$ ,  $p < .01$ ), indicating that high levels of paternal affection are related to high initial levels of pro-social behaviors among children. Fathers' affection was not related to the slope of pro-social behaviors ( $\beta = .03$ ,  $p > .05$ ).

Furthermore, fathers' behavioral control was not related to the intercept ( $\beta = .12$ ,  $p > .05$ ) or slope of pro-social behaviors ( $\beta = .12$ ,  $p > .05$ ).

To test our hypotheses concerning the differential effects of parenting dependent on children's levels of shyness, we next estimated a multiple-group LGCM. Multiple-group analysis is a well-established and commonly accepted method for detecting moderating effects in structural equation models. By applying this research method, we assessed the moderating influence of shyness and compared the relationships between mothers' and fathers' affection and behavior control with the levels and slopes of pro-social behaviors for two sub-groups of children: low-shy and high-shy. Children were divided into these groups using a median split. Table 4 summarizes the results of our multiple-group analysis.

The chi-square difference test comparing the freely estimated model for shy and not-shy children (i.e., with no model constraints requiring the structural paths to be equal for shy and non-shy children) revealed a significant difference ( $\Delta\chi^2_{\text{Mothers}(6)} = 32.08$ ,  $p < .001$ ;  $\Delta\chi^2_{\text{Fathers}(6)} = 32.41$ ,  $p < .001$ ), indicating that the effects of parenting behavior differ significantly between shy and non-shy children. The results showed that mothers' and fathers' affection was related to high levels of pro-social behaviors for both shy and non-shy children. However, among shy children, high levels of maternal affection were also positively related to an increased slope of pro-social behaviors—an effect that was not found among non-shy children. Similarly, high levels of paternal affection were related to an increased slope of pro-social behaviors only if the children were shy. The results further showed that paternal behavioral control was related to high levels of pro-social behaviors among non-shy children only. To test whether the results are similar for boys and girls, further multigroup analyses were carried out. The results of these analyses showed, however, that the same model hold for both boys and girls.

Finally, since part of the sample was impacted by a risk of dyslexia, we ran analyses controlling for children's dyslexia risk status. The results showed that a risk of dyslexia did not impact the intercept or slope of pro-social behaviors, parental behaviors, or shyness.

--Insert Table 4 here--

To check out whether the results would remain the same if including mothers and fathers to the same model,

model including both mothers and fathers were also tested. The results for affection showed that only mothers' affection was positively related to the intercept of child pro-social behaviors ( $\beta = .34, p < .000$ ), indicating that high levels of maternal affection are related to high initial levels of pro-social behaviors among children. Fathers' affection was not related to the intercept or the slope of pro-social behaviors. Furthermore, the results for behavioral control showed that mothers' and fathers' behavioral control were not related to the intercept or the slope of pro-social behaviors.

## **Discussion**

This study aimed to examine the joint effects of parenting behaviors and children's shyness on the development of children's pro-social behaviors between age four and age nine. The results revealed that mothers' and fathers' affection was related to high levels of pro-social behaviors among both shy and non-shy children. However, mothers' and fathers' affection predicted an increase in pro-social behaviors over time among shy children only. The results further showed that paternal behavioral control was positively related to levels of pro-social behaviors among non-shy children only.

The primary aim of this study was to examine the extent to which the longitudinal associations between mothers' and fathers' parenting behaviors and their offspring's pro-social behavior differ depending on children's shyness levels. The results showed that although maternal and paternal affection was positively related with a high level of pro-social behaviors among both shy and non-shy children, maternal and paternal high level of affection predicted an increase in pro-social behaviors over time among shy children only. Overall, these results are in line with our assumption that parental affection is positively associated with children's development of pro-social behaviors, particularly among shy children. This result is also in accordance with the differential susceptibility model (Belsky & Pluess, 2009), which suggest that shy children are particularly prone to parental impacts. Our result is also in accordance with the findings of Zarra-Nezhad et al. (2015) and Kienbaum et al. (2001), whose results showed that maternal affection has positive effects on the social development of shy or inhibited children only. Previous research has shown that shy children are more passive in regulation behaviors (e.g., Feng et al., 2008) and are often rejected by their peers (Booth, 1994). Consequently, one explanation for the results found in the present study is that shy children –due to their passivity in regulation behaviors– are more dependent on external sources of support, such as

parental affection, for effective regulation and the development of pro-social behaviors (Rubin & Coplan, 2010). Another explanation is that parents showing high affection may be more likely to encourage their children and provide opportunities for peer interactions (Davidov & Grusec, 2006), thus helping the children to develop pro-social behaviors. This kind of encouragement may be particularly important for shy children.

Furthermore, the results of the present study suggest that, although maternal behavioral control does not predict the pro-social behaviors of either shy or non-shy children, paternal behavioral control is related to higher levels of pro-social behaviors among non-shy children. In other words, the higher fathers' behavioral control levels are, the higher the levels of pro-social behaviors among their non-shy children will be. Although this result is somewhat consistent with our assumption that parental behavioral control is positively associated with children's levels of pro-social behaviors, it is inconsistent with our assumption that parental behavioral control is positively associated with children's pro-social behaviors, particularly for shy children. In the study by Blandon, Calkins, and Keane (2010), maternal parenting behavior was not directly associated with children's social competence. While some earlier literature has found that parental controlling behavior has a negative impact on children's social acceptance (e.g., Isley, O'Neil, Clatfelter, & Parke, 1999), other research suggests that parental behavioral control, within the context of a sensitive and warm relationship, is positively related with more adaptive social functioning and social adjustment (Suchman et al., 2007; Zhou et al., 2002). Our result concerning the positive effects of behavioral control for non-shy rather than shy children may stem from the fact that, among shy children, behavioral control is interpreted as over-control, implying negative effects that may undermine the positive ones. Rubin et al. (1997) found that mothers of shy children have a tendency to use an over-solicitous style of parenting (i.e., high affection combined with over-controlling or overprotective behaviors). Thus, it might be that shy children do not benefit from behavioral control as much as non-shy children. One explanation for this finding may be that shy children benefit more from gentle styles of parental discipline (i.e., encouragement rather than threats), while non-shy children find this kind of parenting less effective (Kochanska, 1997). When interpreting the results of this study, however, it should be noted that the utilized measure for parental behavioral control was not as reliable as it could have been. Thus, it is possible that using different methods to assess behavioral control could lead to different results.

### **Limitations**

This study had some limitations that must be taken into account. First, the children's shyness levels were measured

only at age three. This was because we assumed shyness to be a stable (i.e., innate) temperament-related characteristic. However, it is possible that changes in this characteristic took place over time (Booth-Laforce & Oxford, 2008). Second, all of the measures were based on parental reports, with the parents describing their children's shyness and pro-social behaviors, as well as their own parenting styles. This may raise the possibility of reporting bias. Consequently, the data are subject to common-method variance, implying a need to replicate the reported results using different informants when measuring the constructs of interest. Third, the reliability of the behavioral control in the present study was relatively low. Fourth, parenting behavior was measured only once, making it impossible to examine the bidirectional relationship between parenting styles and children's pro-social development. It has been suggested that children's behaviors and parenting behaviors may have a bi-directional relationship over time (e.g., Lansford et al., 2011). Thus, it is possible that the children's shyness levels and their levels of pro-social behaviors influenced their parents' parenting behaviors.

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### **Author Contributions**

M.Z.N.: designed the study and wrote major part of the manuscript. A.M.G.: collaborated with data analyses, writing of the Methods and Results. J.E.N.: collaborated with the design of the larger registry where data were derived and provided feedback on writing and editing of manuscript. K.E.: Involved in data design. T.A.: Involved in data design and collection of the large data set and provided feedback on writing. K.A.: Collaborated with data design, assisted with data analyses, and provided feedback on writing and editing of manuscript. assisted with data analyses, in writing Methods and editing the manuscript. T.M.M.: collaborated with data analyses, writing of the Methods and Results and editing the manuscript. T.D.B.: collaborated with the design of the larger registry where data were derived and provided feedback on writing and editing of manuscript.

### **Compliance with Ethical Standards**

**Conflict of Interest** The authors declare that they have no competing interests.

**Ethical Approval** This study involved human participants and all procedures performed were in accordance with the ethical standards and guidelines on research ethics given by University of Jyväskylä, the national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

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**Table 1** Means, Standard deviations (SDs), and Correlations for the Study Variables

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Pro-social T <sub>1</sub>	1.00									
2. Pro-social T <sub>2</sub>	.55**	1.00								
3. Pro-social T <sub>3</sub>	.56**	.71**	1.00							
4. Pro-social T <sub>4</sub>	.52**	.57**	.65**	1.00						
5. Pro-social T <sub>5</sub>	.44**	.55**	.61**	.70**	1.00					
6. Mothers' Affection	.36**	.30**	.31**	.36**	.31**	1.00				
7. Mothers' Behavioral control	.15*	.16*	.10	.11	.15*	.26**	1.00			
8. Fathers' Affection	.25**	.12	.18*	.22**	.13	.28**	.03	1.00		
9. Fathers' Behavioral control	.15*	.09	.00	.05	-.04	.07	.25**	.29**	1.00	
10. Shyness	-.36**	-.19**	-.21**	-.25**	-.19*	-.15	-.08	-.17*	-.09	1.00
11. Mean	1.80	1.93	1.94	2.03	2.04	3.34	3.07	3.03	3.00	3.24
12. SD	.34	.32	.33	.36	.39	.35	.43	.44	.47	1.21

Note: \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ ; T<sub>1</sub> = Time 1, age 4; T<sub>2</sub> = Time 2, age 5; T<sub>3</sub> = Time 3, age 6; T<sub>4</sub> = Time 4, age 8; T<sub>5</sub> = Time 5, age 9

**Table 2** Model specification and nested model comparison

Model specification	$\chi^2$	df	Model comparison	$\Delta\chi^2$	$\Delta$ df	NFI	CFI	RMSEA
Model 1(linear growth; homoscedastic residual structure)	33.55	14				.927	.956	.084
Model M2 (optimal growth; homoscedastic residual structure)	20.00	11	M1 vs. M2	13.55**	3	.956	.980	.064
Model M3 (linear growth; heteroscedastic residual structure)	13.62	7	M1 vs. M3	19.93*	2	.997	.985	.069

**Table 3** Parameter estimates for unconditional latent growth model

	Estimate	<sup>a</sup> z Value
Factor means		
Intercept	1.80	75.29
Slope	.24	8.65
Factor variances		
Intercept	.063	5.73
Slope	.044	2.76
Intercept/slope	-.13	-.633

Note: <sup>a</sup> z Values > 1.96 indicate statistical significance ( $p < .05$ )



**Table 4** Moderating effects of shyness

Path tested	Path coefficient		Pairwise comparison
	Shy	not shy	z value
Mothers' affection → Pro-social behaviors Intercept	.40**	.29*	-.03
Mothers' affection → Pro-social behaviors Slope	.20*	.17	.02
Mothers' behavioral control → Pro-social behaviors Intercept	-.07	.18	1.87
Mothers' behavioral control → Pro-social behaviors Slope	.07	.02	-.32
(Mothers) Intercept → Slope	-.62**	-.69**	.52
Fathers' affection → Pro-social behaviors Intercept	.20*	.26*	.96
Fathers' affection → Pro-social behaviors Slope	.25*	-.12	-2.36*
Fathers' behavioral control → Pro-social behaviors Intercept	-.06	.22*	-1.98*
Fathers' behavioral control → Pro-social behaviors Slope	-.09	-.09	-.05
(Fathers) Intercept → Slope	-.53**	-.56**	.00

Note: \*  $p < .05$ , \*\*  $p < .01$

