

## Early parenting beliefs and academic achievement: the mediating role of language

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Studies have demonstrated the association between parenting style and children's academic achievement, but the specific mechanisms underlying this relationship remain unclear. The development of skills that lay the foundation for academic success might be found in early parent–child interactions that foster language competence. Early negative parenting beliefs, characterised by a lack of reciprocal parent–child interactions may put a child's developing language at risk, which then compromises a child's subsequent academic success. The present study investigated this idea by using longitudinal data and structural equation modelling on a sample of 1364 children at 1 month and 36 months and in kindergarten and grade 1 (National Institute of Child Health and Human Development study of Early Child Care and Youth Development). Authoritarian beliefs were measured at 1 month and in grade 1. Language competence was measured at 36 months and in kindergarten, and academic achievement in kindergarten and grade 1. We found that children's language functioning at 36 months fully mediates the association between early negative parenting beliefs and children's subsequent academic achievement.

**Keywords:** early negative parenting beliefs; language; academic achievement; early childhood; mediation modelling

Parenting is a multidimensional construct composed of factors such as parental responsiveness, control (child adherence to authority), and beliefs (general cognitions about child rearing). It is well documented that these different aspects of parenting are related to a child's academic achievement (Bradley, Corwyn, Burchinal, Pipes McAdoo, & Garcia Coll, 2001; Joussemet, Koestner, Lokes, & Landry, 2005; Mattanah, Pratt, Cowan, & Cowan, 2005; Spera, 2005; Vitaro, Brendgen, Larose, & Tremblay, 2005), but the dynamics underlying this relationship might be quite different, depending on the aspect of parenting being investigated. Negative or authoritarian parenting beliefs characterised by low responsiveness and expectations that children should strictly adhere to adult directives (Baumrind, 1971) may discourage communication and verbal exploration. This may put the child's developing language competence at risk, which then increases the risk of problems with later academic achievement.

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As a child's language competence has been shown to be related to parenting beliefs (Burchinal, Peisner-Feinberg, Pianta, & Howes, 2002; Mattanah et al., 2005; Spera, 2005) and also is closely related to academic achievement (Hohm, Jennen-Steinmetz, Schmidt, & Laucht, 2007), it is tenable that language competence actually mediates the association of negative parenting beliefs on a child's poor progress in school. This, however, has yet to be examined empirically using early negative parenting beliefs as a risk factor for academic achievement. The present study investigated this idea by using structural equation modelling (SEM) on a sample of 1364 children assessed at 1 month and 36 months and in kindergarten and grade 1 (from the National Institute of Child Health and Human Development study of Early Child Care and Youth Development [NICHD ECCYD, 2002]).

### **Authoritarian parenting beliefs and academic achievement**

Research has demonstrated an association between parenting beliefs and academic achievement, with authoritarian beliefs relating to poorer academic outcomes in comparison to authoritative beliefs (Aunola, Nurmi, Niemi, Lerkkanen, & Rasku-Puttonen, 2002; Burchinal et al., 2002; Davis-Kean, 2005; García & Gracia, 2009; Shumow, Vandell, & Posner, 1998; Tazouti, Malarde, & Michea, 2010). This finding has been shown even after controlling for such variables as race, socioeconomic status (SES), and level of maternal education (Shumow et al., 1998). This means that a home that is authoritarian in nature is less likely to be conducive to the development of academic skills.

Despite the interest in understanding the nature of the relationship between parenting beliefs and academic achievement, most have measured parenting beliefs just before the child began formal schooling or after the child was already in school (Aunola et al., 2002; Davis-Kean, 2005; García & Gracia, 2009; Tazouti et al., 2010). An exception is a longitudinal study conducted by Burchinal et al. (2002), which showed that early progressive (authoritative-like) parenting beliefs were related to higher academic achievement (reading, math) in grade 2. The association of very early parenting beliefs (i.e., during infancy) has not yet been investigated. This is important because early beliefs shape parenting styles (Grolnick & Slowiaczek, 1994; Steinberg, Lamborn, Dornbusch, & Darling, 1992), and there is evidence that earlier parenting beliefs may be more influential with respect to child development than later ones (Schaeffer & Edgerton, 1985). Moreover, focusing on very early parenting beliefs allows for the identification of at-risk children and effective early intervention (Bartkowiak & Goupil, 1992). In the current study, we investigated the relationship between authoritarian parenting beliefs when the child was 1 month old and academic achievement when the child was in kindergarten.

That there is a relationship between parenting beliefs and academic achievement is clear; however, the mechanisms underlying this relationship are not. Several investigators have proposed moving beyond simple relationships and considering possible mediating factors in the parenting-academic achievement relation (Aunola et al., 2002; Downer & Pianta, 2006; Morrison, 2009). Social competence and positive student-teacher relationships have each been shown to be partial mediators of the parenting-academic achievement relationship (Downer & Pianta, 2006; Li, Lerner, & Lerner, 2010; Topor, Keane, Shelton, & Calkins, 2010). However, a child's social competence is related to their language abilities (Longoria, Page, Hubbs-Tait, & Kennison, 2009; Wang, 2009), and social competence and communicative competence

overlap significantly (Fujiki & Brinton, 1994; Prutting, 1982). Moreover, the positive quality of student–teacher relationships also is related to a student’s language capabilities (Becker, Place, Tenzer, & Frueh, 1991; Li et al., 2010; Vallance & Wintre, 1997). It is possible that the underlying mechanism of these partial mediators of the parenting–academic achievement relationship is language competence.

### **Early parenting beliefs and language functioning**

Early parenting beliefs are an aspect of parenting that can be measured before parenting fully comes to action (NICHD ECCRN, 2004) and have been shown to be stable over several years (Burchinal, Campbell, Bryant, Wasik, & Ramey, 1997; NICHD ECCRN, 2004; Shumow et al., 1998). Considering the role of early parenting beliefs in later language development has important implications for both parent education and best start initiatives. This is especially important because we know that the quality of early parent–child interactions (i.e., when a child is prelinguistic) can be related to a child’s developing language skill in significant ways (Boyce et al., 2004; Newland, Roggman, & Boyce, 2001; Newland, Roggman, Boyce, & Cook, 1998). Parental input is associated with not only structural aspects of a child’s language, such as vocabulary and syntax (Barnes, Gutfreund, Satterly, & Wells, 1983; Huttenlocher, Haight, Bryk, Seltzer, & Lyons, 1991), but also the social-communicative aspects (Ely & Gleason, 1995).

A number of studies have shown a significant association between parenting and language in early childhood (Burchinal et al., 2002; NICHD ECCRN, 2004; Raviv, Kessenich, & Morrison, 2004; Tazouti et al., 2010; Topor et al., 2010), but these studies failed to clarify the predictive role of parenting beliefs on later language development. Parenting beliefs could be associated with a child’s language development as a consequence of the different patterns of parent–child interactions a parenting style encourages. Pratt, Kerig, Cowan, and Cowan (1992) have shown that directives and negations of child responses in verbal interactions by mothers or fathers and their children were consistently related to authoritarian parenting styles. Likewise, Guajardo, Snyder, and Petersen (2009) showed that parents who are more authoritarian are more likely to command and interfere and be less encouraging of verbal expression from their children. Taken together, this suggests that authoritarian mothers and fathers elicit less interactive communication in their children, putting them at risk for lower language functioning, which in turn puts them at risk for lower academic achievement.

### **Language functioning and academic achievement**

Language competence has consistently been shown to be related to academic achievement (Downer & Pianta, 2006; Hindman, Skibbe, Miller, & Zimmerman, 2010; Hohm et al., 2007; Murray, Jones, Kuh, & Richards, 2007; Taanila, Murray, Jokelainen, Isohanni, & Rantakallio, 2005). Very early language development (i.e., in infancy) has been linked to several later outcomes such as academic achievement, level of eventual academic attainment, and potential learning disabilities (Taanila et al., 2005). Children need adequate language development in order to gain a foundation of skills in the early grades in order to make further academic gains in the later grades. Research consistently shows that children with less-advanced language skills are less likely to do well in school (Hindman et al., 2010; Hohm et al., 2007; Murray et al., 2007;

Schoon, Parsons, Rush, & Law, 2010; Taanila et al., 2005). However, the significance of the studies by Hohm et al. (2007) and Taanila et al. (2005) is that they provide evidence of a relationship between very early communicative competence, before structural language abilities such as syntax and morphology have emerged, and later academic skills. These results suggest that since parents are usually a child's first communicative partner, early parent-child interactions may be crucial for many aspects of subsequent child development.

### **The present study**

The present study investigated the extent to which children's language (at 36 months) mediates the association between early authoritarian parenting beliefs (when the child is 1 month) and children's subsequent academic functioning (in kindergarten) after controlling for parental level of education. As the focus of this study is to examine the impact of early authoritarian parenting beliefs as a risk factor, we have only included a measure of this aspect of parenting. Moreover, we focus on this particular aspect of parenting to clarify the relationship between parenting style and academic achievement, which is lacking in many studies in this area (see Tazouti et al., 2010, for a review). We test this mediation model using longitudinal data from NICHD ECCYD (2002) and SEM.

### **Method**

#### ***Participants***

The NICHD ECCRN (2002) conducted a multi-site, longitudinal study of 1364 infants born in 1991 and their families. Data collection for the first phase of the study ended in November 1991. The families were followed over the ensuing years. This large scale longitudinal database was used because of its potential for modelling the longitudinal association of parenting on a child's academic functioning. Multiple imputations, as one of the best procedures to deal with missing data points (Allison, 2003; Collins, Schafer, & Kam, 2001; Schafer & Graham, 2002), were used to estimate missing values for children for whom partial data points were missing. We used LISREL 8.72 (Jöreskog & Sörböm, 2001) to multiply impute the missing data applying an expected maximisation algorithm procedure. Data imputation resulted in a large sample size ( $N = 1364$ ), which makes it possible to use SEM techniques for testing the fit of the mediation and direct-effect model.

The participants in the NICHD ECCYD (2002) database come from multi-ethnic backgrounds, with varying SES and included single-parent households, and families with various levels of formal parental education. The children, all born in 1991, were followed from birth to first grade. At birth, they were chosen from 24 specially selected hospitals scattered across 10 data collection spots in the USA. During the sampling period, a total of 8986 mothers gave birth, of whom 5416 (60%) agreed to be contacted. The mothers were willing participants who were screened for eligibility. Eligibility included single-birth status and not offering for adoption, mother lived in a safe neighbourhood and was within a one-hour radius of the research site, was English-speaking, and above 18 years of age.

The participants were ethnically diverse: 76.4% were White, non-Hispanic, 12.7% were Black, non-Hispanic, 6.1% were White, and 4.8% were Asian, Native American,

and others. Of the children, 51.7% were male and 48.3% were female. Of the 1364 participants, 10.2% of the mothers did not finish with a high school diploma while another 14.5% were single mothers.

## **Measures**

### *Measures at 1 month*

Both mother's and father's level of education were used as indicators of *parental education*. The level of education was scored as a continuous measure of years of education. *Authoritarian parenting beliefs* were measured using the *Traditional Beliefs for Raising Children Subscale* from the *Ideas about Raising Children Scale* (Schaeffer & Edgerton, 1985). This subscale consists of 30 items designed to measure traditional authoritarian beliefs and reflects attitudes that indicate the child should follow adult directives without question (e.g., 'The most important thing to teach children is absolute obedience to parents'), which was completed by mothers. A higher score reflects more authoritarian values. Cronbach's alpha is 0.89 and the scale shows good test-retest reliability ( $r = 0.84$ ) (Schaeffer & Edgerton, 1985).

### *Measures at 36 months*

The *Reynell Developmental Language Scale* (Reynell, 1990) was used to measure *language*. This standardised scale measures both receptive language (Verbal Comprehension scale: 67 items;  $\alpha = 0.93$  and test-retest reliability coefficients ranging from 0.89 to 0.90) and expressive language (Expressive Language scale: 67 items;  $\alpha = 0.86$  and test-retest reliability coefficients ranging from 0.82 to 0.90) and provides standard scores for each.

### *Measures at kindergarten*

The *Preschool Language Scale-3* (Zimmerman, Steiner, & Pond, 1992), a test widely used by Speech-Language Pathologists, was used to measure *language*. It provides standard scores for both receptive language (Auditory Comprehension subscale;  $\alpha = 0.81$  and test-retest reliability coefficients of 0.90) and expressive language (Expressive Communication subscale;  $\alpha = 0.90$  and test-retest reliability coefficients of 0.92) as well as a Total Language score ( $\alpha = 0.92$  and test-retest reliability coefficients of 0.94). *Academic achievement* was measured using two subtests (Letter-Word Identification and Applied Problems) from the *Woodcock-Johnson Psycho-Educational Battery-Revised-Tests of Achievement (WJ-R-Ach: Woodcock & Johnson, 1989)*. The Letter-Word Identification subtest consists of 22 items that assess the ability to identify letters and words. The Applied Problems subtest consists of 25 items that test the ability to analyse and solve practical problems in mathematics, which involve relatively simple calculations. Internal-consistency reliability for the *WJ-R-Ach* ranges from 0.94 to 0.98, with test-retest reliability ranging from 0.80 to 0.87.

### *Measures at grade 1*

Two subtests (Letter-Word Identification and Applied Problems) from the *WJ-R-Ach* (Woodcock & Johnson, 1989) were used to assess *academic achievement* in the

Spring of grade 1. *Authoritarian parenting beliefs* were measured using the *Traditional Beliefs for Raising Children Subscale* from the *Ideas about Raising Children Scale* (Schaeffer & Edgerton, 1985).

**Results**

*Preliminary analyses*

The first step for examining a mediational model is to establish the univariate association between each pair of variables (Baron & Kenny, 1986). Significant correlations between early authoritarian parenting beliefs and language, early authoritarian parenting beliefs and academic achievement, and between language and academic achievement indicate the univariate associations. Table 1 presents correlation coefficients between all the variables.

*Model testing*

LISREL 8.72 was used for conducting SEM. The proposed mediation model (see Figure 1) was tested in two steps.

*Measurement model*

First, confirmatory factor analysis was used to test the measurement model and to define the latent variables. The factor loadings for all the measures were significant and above 0.65. The measurement model was significant ( $\chi^2(33) = 47.40$ ; root mean square error of approximation (RMSEA) = 0.02; goodness of fit (GFI) = 0.99; and adjusted goodness of fit (AGFI) = 0.99). Chi-square, degrees of freedom, and the ratio between the chi-square and the degrees of freedom (1.44) were among the fit indices used to assess the model. When this ratio is less than 3 (Cole, 1987), it is considered a good fit. Other indicators of a good fit include low RMSEA ( $\leq 0.05$  indicates a close fit; Browne & Cudeck, 1993), and GFI and AGFI, which are independent of sample size, higher

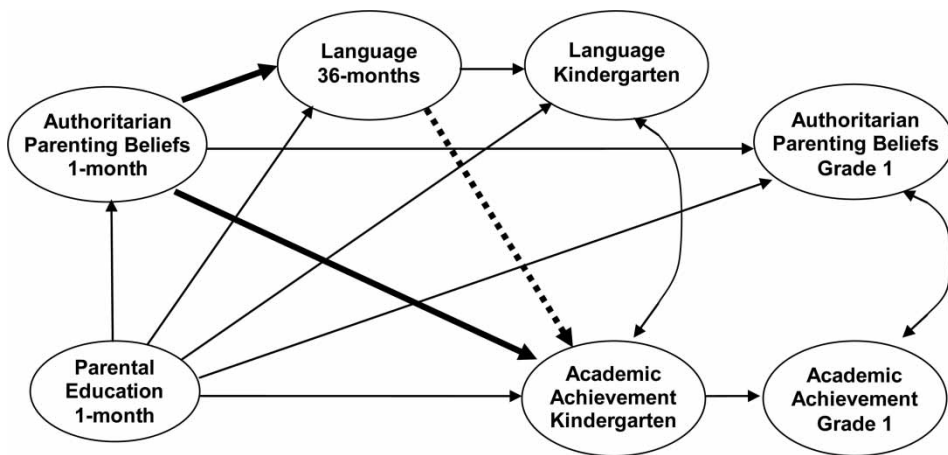


Figure 1. Proposed direct-effect model (benchmark) and mediation model (dotted line is added for mediation model).

Table 1. Bivariate Pearson correlations among all variables.

	1	2	3	4	5	6	7	8	9	10	11	12
(1) Mother's education	–											
(2) Father's education	0.71	–										
(3) Authoritarian parenting beliefs – 1 month	–0.57	–0.55	–									
(4) Verbal Comprehension – 36 months	0.48	0.47	–0.45	–								
(5) Expressive Language – 36 months	0.35	0.22	–0.29	0.61	–							
(6) Auditory Comprehension Kindergarten	0.47	0.45	–0.45	0.77	.51	–						
(7) Expressive Communication Kindergarten	0.47	0.46	–0.42	0.73	0.54	0.74	–					
(8) <i>WJ-R-Ach</i> : Letter-Word Identification Kindergarten	0.45	0.23	–0.35	0.54	0.37	0.57	0.51	–				
(9) <i>WJ-R-Ach</i> : Applied Problems Kindergarten	0.46	0.46	–0.43	0.70	0.50	0.72	0.67	0.63	–			
(10) <i>WJ-R-Ach</i> : Letter-Word Identification Grade 1	0.34	0.42	–0.27	0.43	0.31	0.46	0.41	0.61	0.51	–		
(11) <i>WJ-R-Ach</i> : Applied Problems Grade 1	0.42	0.42	–0.39	0.61	0.46	0.62	0.58	0.58	0.69	0.60	–	
(12) Authoritarian Parenting Beliefs Grade 1	–0.52	–0.52	0.80	–0.47	–0.33	–0.47	–0.46	–0.37	–0.44	–0.28	–0.38	–

Note: All the correlation coefficients are significant at  $p < 0.001$ .



than 0.90. Figure 2 depicts the measurement model and the factor loadings associated with the measures. Based on the fit indices examined, the measurement model is acceptable as a fit model and allowed us to proceed to the next step of testing the full model.

**Model features**

Both the direct-effect and mediation models include the following path coefficients.

*Covariate effect*

Parental level of education is one of the factors that has been shown to affect parenting beliefs ( $r = -0.55$  and  $-0.52$ ), children’s language functioning ( $r = 0.47$  and  $0.45$ ),

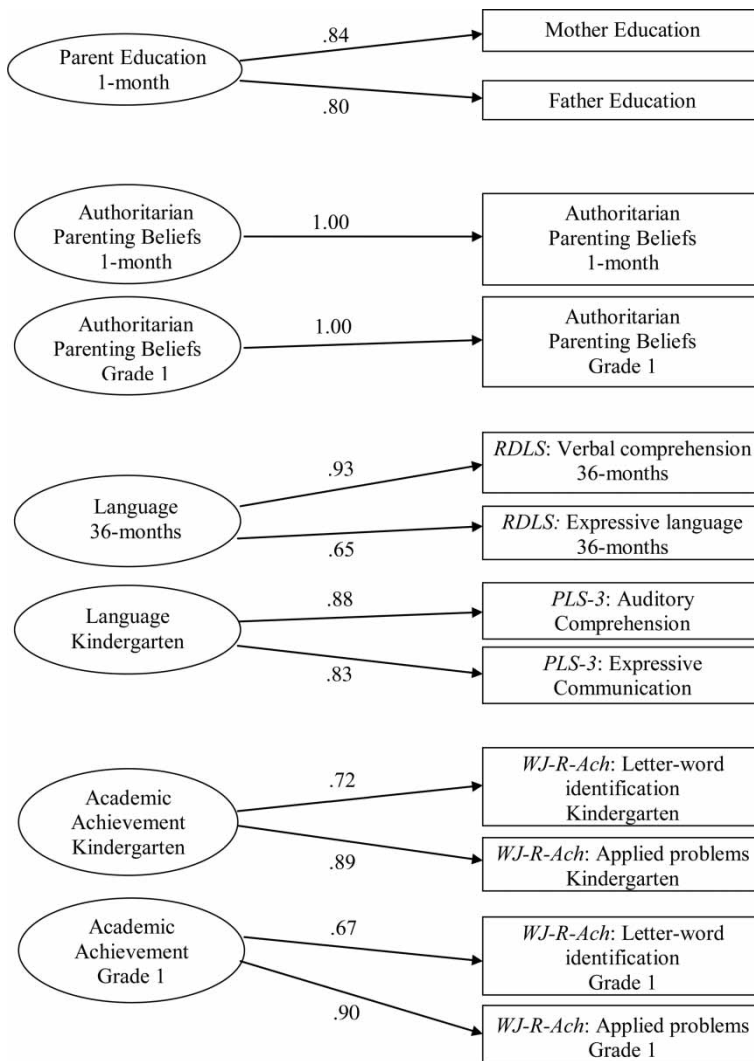


Figure 2. Measurement model.



and children's academic performance ( $r = 0.43$  and  $0.44$ ), for mother's and father's level of education, respectively. Therefore, we have covaried parental level of education measured when children were 1 month in both models (see Figure 1).

### *Continuity*

We have hypothesised continuity in all the constructs and significant path coefficients are expected from: (i) authoritarian parenting beliefs when children are 1 month old to grade 1, (ii) children's language functioning at 36 months to kindergarten; and (iii) academic achievement in kindergarten to grade 1. This is important because including autoregressors in the model tests the further effect of predictors on the outcome measures.

### *Concurrent association*

The relationship between contemporaneous measures/constructs is hypothesised to be correlational as no direction of effect could be hypothesised. Therefore, two-way arrows indicate that a significant correlation is expected between the following pairs of concurrent constructs: (1) language and academic achievement measured in kindergarten and (2) authoritarian parenting beliefs and academic achievement measured when the child was in grade 1. Concurrent paths are shown with black double arrows. It is important to note that inclusion of authoritarian parenting beliefs at grade 1 allows us to determine whether authoritarian parenting beliefs show stability over time, and show that language and academic achievement is predicted by early rather than concurrent authoritarian parenting beliefs.

To examine whether language mediates the association between authoritarian parenting beliefs and child academic achievement, first we fitted a direct-effect model and a mediation model to the data. We then compared the two models to determine which of the alternative theoretical models best fit the data. The model with significantly lower chi-square would be the one that best fits the data.

### *Direct-effect model*

In the next step, we fit the direct-effect model. Figure 3 demonstrates the structural model for the direct-effect model including the estimated coefficients for all the significant paths.

When considering fit indices, they indicate that the full model fits the data well ( $\chi^2(41) = 65.87$ ; RMSEA = 0.02, GFI = 0.99, and AGFI = 0.99). The fit model revealed that authoritarian parenting beliefs when the child is 1 month old significantly contributes to the child's language functioning at 36 months and the child's academic achievement in kindergarten. All the path coefficients indicating continuity of the language, academic achievement, and authoritarian parenting beliefs are significant. More specifically, earlier language predicts later language, earlier academic achievement predicts later academic achievement and early authoritarian parent beliefs predict later authoritarian beliefs. It should be highlighted that this provides evidence for stability of authoritarian parenting beliefs (when there is no intervention). As hypothesised, all the concurrent associations are modest but significant. To examine whether the fit for the mediation model is better than the fit for the direct-effect model, we tested the mediation path.

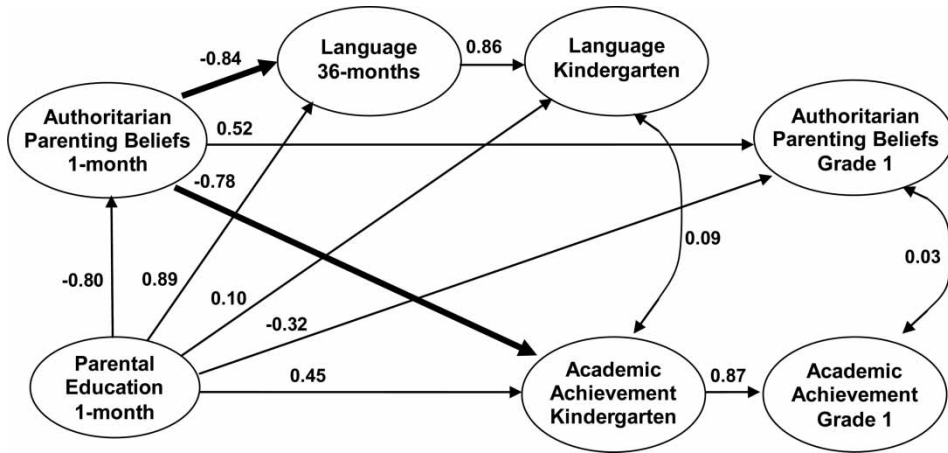


Figure 3. Direct-effect model with standardised path coefficients; significant paths indicated by solid lines.

**Mediation model**

In the final step, the mediation model was tested (Figure 4). The only path added to the model was the path from language functioning measured at 36 months to academic achievement measured in kindergarten. To demonstrate that language functioning fully mediates the association of early authoritarian parenting beliefs on academic achievement in kindergarten: (a) the path from language at 36 months to academic achievement in kindergarten should be significant and (b) the path from authoritarian parenting beliefs at 1 month to academic achievement at kindergarten should become non-significant. Language functioning partially mediates the association of early authoritarian parenting beliefs on later academic achievement if the path

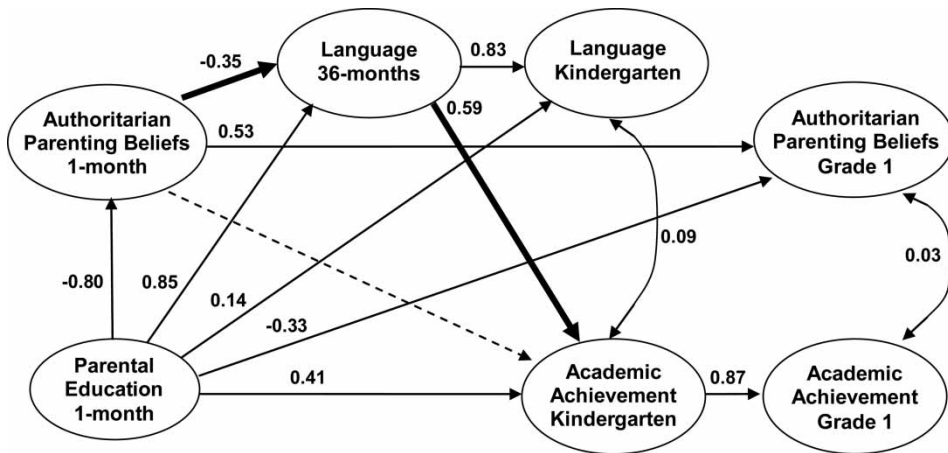


Figure 4. Mediation model with standardised path coefficients; significant paths indicated by solid lines.

coefficient from authoritarian parenting at 1 month to academic achievement at kindergarten remains significant but reduces significantly.

Figure 4 indicates the mediation model including the path coefficient values. The fit indices show that the model fits well into the data ( $\chi^2(40) = 56.94$ ; RMSEA = 0.018, GFI = 0.99, and AGFI = 0.99) and that the ratio between the chi-square and degrees of freedom (1.42) indicate a very good fit. All other fit indices (RMSEA, GFI, and AGFI) are indicators of a very good fit.

The path from language at 36 months to academic achievement in kindergarten is significant, whereas the path from authoritarian parenting beliefs at 1 month to academic achievement in kindergarten becomes non-significant, indicating that the association between early authoritarian parenting beliefs and later academic achievement is fully mediated by language at 36 months of age.

To assess whether the mediation model or the direct-effect model fit the data better, we compared the two models. This comparison indicates that the mediation model fit the data better than the direct-effect model ( $\Delta\chi^2(1) = 8.93$ ;  $p < 0.005$ ).

## Discussion

The primary purpose of this study was to model the dynamics of association between early authoritarian parenting beliefs and a child's subsequent language and academic functioning in a longitudinal design. Our results indicate that parents who hold authoritarian beliefs (e.g., a child should unquestioningly comply with adult directives) when their child is 1 month tend to have children with lower levels of language competence at 36 months, which is then related to lower levels of academic achievement in kindergarten and subsequently when they are in grade 1.

These findings are important for a number of reasons. First, they show that very early negative parenting beliefs can be damaging to later child development, both in the language and academic domain. Second, the awareness of early negative parenting beliefs as a risk factor for later achievement (i.e., kindergarten and grade 1) makes early intervention of parenting beliefs and practices important and may enable practitioners to intervene before potential negative developmental effects can occur. Third, we demonstrate that language is a mediator of the relationship between early negative parenting beliefs and later academic achievement.

### *Early parenting beliefs*

Few studies have focused specifically on the effects of very early parenting beliefs (shortly after the child is born) on later cognitive outcomes. Our results suggest that prospective parents may already hold certain parenting beliefs prior to the birth of their child, which can have long-range developmental ramifications. If these beliefs are more authoritarian, they may place the child at-risk for subsequent problems with language and academic achievement. In order for a child to reap the benefits of a more authoritative style of parenting, intervention that targets negative parenting beliefs should occur during early infancy, or even prenatally, particularly if they are to positively influence early parent-child interactions. This idea is supported by the work of Roggman, Boyce, and Cook (2009), which showed that Early Head Start parenting programmes conducted with at-risk children during infancy provided benefits to the parent-child relationship and to the child's cognitive development several years later.

Although parenting beliefs and parenting practices are not necessarily synonymous, parents often translate their beliefs into practices (Georgiou & Tourva, 2007). When children are very young (1 month old), using parenting beliefs as an indicator of later parenting practices makes sense. Moreover, our results indicate that early negative parenting beliefs held shortly after a child is born (i.e., at 1 month) endures into early childhood (i.e., when children are in grade 1) providing evidence for the stability of early authoritarian parenting beliefs.

It is worth noting that parental education was negatively related to parenting beliefs, suggesting that parents with lower education tend to have more controlling parenting practices (i.e., more authoritarian). This further emphasises the need for prevention and early intervention programmes for families with multiple risk factors, including low parental (especially maternal) education and low SES (Cowen, 2001). This is particularly important when we consider that parents with a higher level of education are more likely to have better access to evolving theories of parenting and child development compared to parents with a lower level of education.

### ***The mediating role of language***

Parenting beliefs inform parenting behaviours and parental expectations, which may influence how responsive a parent is to their child's language competencies. As the first significant source of language interaction, a parent provides both structural and social-pragmatic language experience for the infant as well as an available partner with whom to practice emerging communicative competencies. The prototypical characteristics of authoritarian parenting beliefs may manifest as parental behaviours that are highly controlling, lacking in warmth and reciprocity, and discouraging of pre-verbal communicative attempts on the part of the child. This could have a significant effect not only on the evolving interactions between parent and child, but also on the child's developing language skills. Over time, fewer opportunities for interactive communication between parent and child could result in decreased opportunity for the practice of language skills that would benefit the child in a school environment, both academically and socially (i.e., interactions with teachers and peers).

### ***The importance of language for academic competence***

Many would find it hard-pressed to deny the importance of language for academic competence and success. A child who struggles with language is bound to find it harder to navigate our educational systems, which place a heavy emphasis on language for instruction and learning regardless of curricula. It is widely acknowledged that oral language skills are important predictors of literacy (Scarborough, 2005) and mathematical achievement (Fuchs et al., 2005; Jordan, Levine, & Huttenlocher, 1995). Although our results show the continuity of language skill from 36 months to kindergarten, it is noteworthy that language skill at 36 months, rather than at kindergarten, predicts academic achievement in kindergarten, supporting our argument that early language competence is important for later learning in school.

### ***Limitations and future research***

The focus of the present study was to examine the degree to which language mediates the association between early authoritarian parenting beliefs as a risk factor for later

child academic achievement. However, other variables, not included in the current study, may be relevant in this association. For example, the mediating role of language may change when we use other measures/aspects of parenting. Moreover, it would be important to examine other mediating factors measured at different time points and in different developmental domains (e.g., social, emotional, and behavioural) in order to fully explicate the dynamic associations that exist between early parenting beliefs and later child language development and academic achievement. Although we controlled for parental education, an important indicator of SES, there are other indicators of SES (e.g., parental income) and other demographic indicators that we did not account for, such as ethnicity. Further research should examine the extent to which this model holds with samples from different ethnic, language, or SES backgrounds.

We acknowledge that only experimental studies have the potential to examine causal relationships and although SEM is an advanced methodology for modelling relationships among multiple factors, it only investigates the association between these factors. At the same time, by using the NICHD ECCYD database and SEM, we were able to examine longitudinal associations which provide more compelling information regarding relationships across time than studies looking at simple and concurrent relationships. We also acknowledge that using a secondary database has its own limitations such as less control over the measures used to tap different constructs. For example, other studies may use different or multiple measures of negative parenting beliefs to test the same model.

As mentioned above, the current study focused specifically on early authoritarian parenting beliefs as a risk factor which was measured using a self-report filled out by mothers (typically the primary caregivers in infancy and early childhood). Further research could use more comprehensive measures of parenting that incorporate separate dimensions (such as responsiveness, sensitivity, and discipline) and that is filled out by both mothers and fathers to help to tease apart several critical considerations: (1) better specificity regarding the aspect(s) of parenting that are associated with different child outcomes, (2) whether the degree to which mother's and father's parenting beliefs coincide has a relation to child outcomes, and (3) the relative influence of maternal versus paternal parenting beliefs on child outcomes.

Although the sample in the current study included multi-ethnic families, we have to be cautious about extending these findings to ethnic minority groups. Baumrind's (1971) parenting dimensions were constructed in Western cultures and may not capture important features from more collectivist cultures such as China and Korea, where the authoritarian parenting style is traditionally viewed as being prominent since child obedience to parental authority is considered to be culturally desirable. However, it is highly unlikely that, in general, parents in these cultures lack warmth and are emotionally unresponsive.

In summary, our results show that parents who endorse negative (authoritarian) parenting beliefs when their child is 1 month old tend to have children with lower language competence at three years of age, which is then associated with lower levels of academic achievement in kindergarten and subsequently in grade 1. Our findings highlight the extent to which very early negative parenting beliefs may be detrimental to later child development, both in the language and academic domain and the enduring effects that early negative parenting beliefs can have on later child achievement.

### Notes on contributors

Nancie Im-Bolter is an associate professor in the Department of Psychology at Trent University and an adjunct professor in the Department of Psychology at Queen's University. She received her MA and PhD at York University. Her research focuses on language and its relationship to other domains of functioning in a diverse population of children and adolescents, including those with typical and atypical development.

Zohreh Yaghoub Zadeh is a principal research scientist with the Directions Evidence and Research Policy Group. She holds a PhD degree in applied developmental psychology from the University of Toronto. Following completion of her PhD, she pursued post-doctoral studies in applied developmental psychopathology of children and adolescents at the University of Toronto and York University.

Daphne Ling recently graduated with her BSc in psychology from Trent University and is currently working as a research assistant/technician in the Developmental Cognitive Neuroscience Lab at the University of British Columbia. The work on this manuscript was undertaken during her time as an undergraduate in Trent University in the research lab of Dr Nancie Im-Bolter.

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