



**Universiteit Utrecht**

The relationship between parenting and the development of anxiety in toddlers moderated by  
gestational age

Master's Thesis

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# PARENTING AND ANXIETY IN PRETERM AND TERM BORN TODDLERS

## Abstract

Anxiety in early development has several negative consequences on the development in adolescence and adulthood. It is of importance to study factors associated with anxiety in toddlerhood in order to improve prevention and intervention programs. This study examined the relation between parenting (structure and psychological control) and anxiety in toddlerhood, and whether this relation was moderated by gestational age. Participants were 83 Dutch mothers of moderately preterm children (32-36 weeks' gestation) and 83 mothers of children born at term (>37 weeks' gestation). When their child was 4 years old, mothers completed the Comprehensive Early Childhood Parenting Questionnaire (CECPAQ) to measure parenting and the Child Behavior Checklist (CBCL) to measure anxiety in toddlers. Two multiple regression analysis were executed. Results demonstrated that compared to term born children, preterm born children showed higher levels of anxiety. Furthermore, parental structure predicted less anxiety in children. The relation between parental psychological control and anxiety in children was not found. Also, the expected moderating role of gestational age on the relation between parenting and anxiety was not found. Because moderately preterm toddlers in particular show higher levels of anxiety, this group should be targeted for the prevention of anxiety disorders. Interventions should focus on parental structure in ameliorating anxiety symptoms in toddlers.

*Keywords:* Parental structure, parental psychological control, anxiety, toddlerhood, gestational age

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The relationship between parenting and anxiety in toddlers moderated by gestational age

Already at toddler age, 10% of children display high levels of anxiety (Egger & Angold, 2006; Mian, Godoy, Briggs-Gowan, & Carter, 2012). Toddlers show many normal anxieties as part of typical development, such as anxiety for separation and specific environmental anxieties (Muris, Merckelbach, Mayer, & Meesters, 1998). However, anxieties become clinical when they are severe and interfere with normal functioning (Muris, Merckelbach, de Jong, & Ollendick, 2002). Child anxiety disorders negatively affect children's functioning. It is associated with poor social competence, victimization, loneliness and school avoidance (Weeks, Coplan, & Kingsbury, 2009; Rapee, Schniering, & Hudson, 2009). Furthermore, the presence of an anxiety disorder is associated with a variety of psychiatric disorders in adolescence and adulthood, such as anxiety disorders, externalizing disorders and depression (Bittner et al., 2007). More broadly, the consequences of anxiety in early childhood entail societal costs for health care expenditures as well as indirect costs due to impaired social functioning (Marciniak, Lage, Landbloom, Dunayevich, & Bowman, 2004).

The early onset of anxiety problems and its social and economic costs underline the importance of understanding factors associated with the development of anxiety across early childhood. However, most studies focused on anxiety in school aged children and few studies examined anxiety symptoms in preschool-and toddler-age children (Egger & Angold, 2006; Mian et al., 2012). It is of importance to study predictors of anxiety at this young age to detect at-risk populations early in development, which can help to improve prevention and intervention programs.

### **Influences on anxiety development in toddlers**

Many factors have been identified to influence the development of clinical anxiety in toddlers. Child risk factors and environmental factors jointly and interactively contribute to the development of anxiety in children (Holt et al., 2012; Thomas & Chess, 1977; Sameroff & Mackenzie, 2003; Murray, Creswell, & Cooper, 2009). The vulnerability model states that the environment triggers a 'vulnerability set' in children, including child factors (Beck, 1986; Holt et al., 2012). A child risk factor for developing anxiety is prematurity (Anderson & Doyle, 2003). Among environmental influences, research has highlighted parenting as an important predictor (Aunola & Nurmi, 2005). This may be especially true in toddlerhood, when the family environment plays an important role in children's life (Baumrind, 1966).

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Therefore, this study will focus on the role of both prematurity and parenting in developing anxiety.

### **Parenting as a predictor of anxiety**

Various parenting behaviors have found to be associated with the anxiety development in children. This study will focus on parental structure and parental psychological control in predicting anxiety. Parental structure is stated to be important in the attachment theory of the development of anxiety (Bowlby, 1982; Laurin, Joussemet, Tremblay, & Boivin, 2015). Especially mothers seem to be important in predicting anxiety in children, since mothers spend more time with their children in toddlerhood than fathers (Möller, Majdandžić, De Vente, & Bögels, 2013; Bonney, Kelley, & Levant, 1999). Parental structure refers to the application of clear and consistent guidelines, expectations and rules for children, as well as predictable consequences and clear feedback to the child's behavior (Farkas & Grolnick, 2010). Children with an insecure attachment develop perceptions of the environment as uncontrollable, based on frightening and unpredictable parent behavior (Bögels & Brechman-Toussaint, 2006; Chorpita & Barlow, 1998). This implies that parental structure leads to a belief in children that they have control over their environment, and this protects against the development of anxiety (Laurin et al., 2015). Empirical studies found that more limit-setting in parenting, which means establishing and following through on rules, was significantly correlated with less internalizing behavior, including anxiety (Mattanah, 2001). Considering young children, however, no effect of parental structure on anxiety was found (Laurin et al., 2015; Wichstrøm, Belsky, & Berg-Nielsen, 2013).

Second, in existing literature, various forms of controlling parenting behaviors are found to be predictors of anxiety in childhood (Laurin et al., 2015). Parental psychological control differs from parental structure and refers to the influence on children's behavior through the use of covert strategies, such as guilt induction, intrusive behavior and love withdrawal (Barber, 1996). Theoretical models state that parents using psychological control may deprive their children of opportunities to develop independency and autonomy (Chorpita & Barlow, 1998; Rubin & Mills, 1991; Pettit, Laird, Dodge, Bates, & Criss, 2001). Children develop the belief of themselves as incompetent and the belief that they have no internal control over their lives, since their parents are the ones who control everything, which can lead to the development of anxiety (Chorpita & Barlow, 1998).

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Empirical studies found that high levels of parental control by mothers predict anxiety in children (Hudson & Rapee, 2001; Feng, Shaw, & Silk, 2008; Duchesne, Larose, Vitaro, & Tremblay, 2010). Moreover, several meta-analyses found that controlling parenting behaviors are the strongest and most consistent parenting predictors of childhood anxiety (Laurin et al., 2015; McLeod et al., 2007; Van der Bruggen, Stams, & Bögels, 2008). However, few studies examined particularly psychological control in relation to anxiety in young children.

### **Prematurity and parenting**

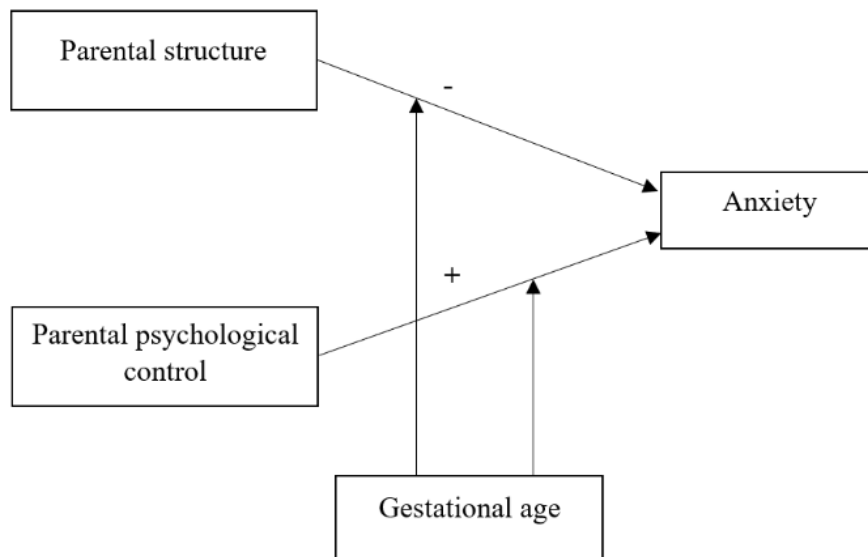
Parenting behaviors have stronger consequences on vulnerable children (Feng, Shaw, & Moilanen, 2011). Belsky's (2005) differential susceptibility theory states that children differ in their vulnerability to parenting, both positively and negatively (Gilissen, Bakermans-Kranenburg, Van IJzendoorn, & Van der Veer, 2008). Premature born children seem to be more vulnerable to parenting behaviors (Salerni, Suttora, & D'Odorico, 2007). A combination of this vulnerability in the child and certain parenting behavior would increase the risk to develop anxiety (Murray et al., 2009; Feng et al., 2011). This suggests that the gestational age, which refers to the number of weeks of pregnancy (moderately preterm born children have 32-36 weeks' gestation), would strengthen the relationship between parenting behaviors and anxiety in young children.

### **Prematurity and anxiety**

Besides the fact that premature born children are more vulnerable to parenting behaviors, premature birth is also a risk factor for developing anxiety (Anderson & Doyle, 2003; Aylward, 2005). Children born preterm have an altered brain development, which is associated with an increased risk of anxiety (Spittle et al., 2009; Loe, Lee, & Feldman, 2013; Beauchamp et al., 2008). Until recently, most studies focused on behavior problems in general and used broad screening scales, making it impossible to examine specific disorders (Arpi & Ferrari, 2013; Sømhøvd, Hansen, Brok, Esbjørn, & Greisen, 2012). However, recently, several studies have included subscales measuring anxiety (Arpi & Ferrari, 2013). These studies demonstrate that very preterm children show more anxious/depressed and or withdrawn behavior at a young age than children born at term (Stoelhorst et al., 2003; Månsson, Stjernqvist, & Bäckström, 2014). Although clear linkages have been demonstrated between very preterm birth (<32 weeks of pregnancy) and children's anxiety, much less is known about moderately preterm children (32-36 weeks of pregnancy) and anxiety in early childhood (Potijk, de Winter, Bos, Kerstjens, & Reijneveld, 2012).

### Current study

The main goal of the current study is to examine whether there is a relation between the parenting behaviors ‘structure’ and ‘psychological control’ as measured by mothers and anxiety in toddlers and whether this relationship is different for moderately preterm born children compared to term born children. First, it will be examined whether moderately preterm born children differ in anxiety symptoms from children born at term in the sample. It is expected that moderately preterm children have more anxiety symptoms than children born at term (hypothesis 1). Second, the relation of the parenting behaviors ‘structure’ and ‘psychological control’ on anxiety will be examined. It is expected that parental structure is negatively related to anxiety in toddlerhood (hypothesis 2). Parental psychological control is expected to be positively related to anxiety in toddlerhood (hypothesis 3). For both parenting behaviors, it is hypothesized that the relation between the parenting behaviors and anxiety will be stronger for children born moderately preterm compared to children born at term (see Figure 1).



*Figure 1. Schematic moderation model of the parenting behaviors as predictors to anxiety, moderated by gestational age.*

### Method

#### Participants

The sample is taken from a larger longitudinal project, the STAP Project (Study on Attention of Preterm children), which is a longitudinal project on the development of Dutch

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moderately preterm children. Children were born between March 2010 and April 2011 in hospitals in and around Utrecht. Exclusion criteria were antenatal alcohol or drug abuse by the mother, chronic antenatal use of psychiatric drugs by the mother, multiple birth and dysmaturity. Also, children born with severe congenital malformations and children admitted to a tertiary neonatal intensive care unit (NICU) were excluded from participation. Originally, 790 mothers were eligible for the STAP Project in the participating hospitals. However, only 230 mothers consented. The sample included 126 biological mothers of moderately preterm children (32-36 weeks' gestation) and 104 biological mothers of term born children (>37 weeks' gestation). Complete data was available for 83 mothers of moderately preterm children and 83 mothers of term born children. Table 1 represents demographic characteristics of the term born group compared to the moderately preterm group.

Table 1

*Demographic characteristics (n = 166)*

	Term born (n = 83)	Moderately preterm (n = 83)	<i>p</i>
Gestational age in weeks			
Mean (SD)	39.43 (1.00)	34.58 (1.35)	<.01
Range	37-41	32-36	
Gender child (% boys)	44.6	54.2	.76
Maternal age at birth			
Mean (SD)	32.63 (4.26)	30.80 (4.33)	.73
Range	20-43	21-41	
Maternal educational level (%)			.01
Low	2.4	7.2	
Medium	8.4	34.9	
High	89.2	57.8	
Maternal nationality (%)			.03
Dutch	95.2	97.6	
Dutch/ Romanian	1.2	-	
Dutch/ Iranian	-	1.2	
German	2.4	1.2	
Italian	1.2	-	

*Note.* *p*-values represent group differences

### Procedure

Mothers of moderately preterm and term born children were invited by letter by their midwife or paediatrician to participate in the study when their child was 10 months old.

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Mothers filled in questionnaires at different times when their child was between 1 and 4 years old. For the current study, mothers completed questionnaires when their child was 4 years old. Informed consent was given by parents. The STAP Project was approved by the Medical ethical committee of the Utrecht Medical Centre.

### Measures

**Anxiety in children.** Anxiety in children was assessed using the DSM-oriented subscale ‘anxiety problems’ of the Dutch version of the Child Behavior Checklist (CBCL) 1,5-5 (Achenbach & Rescorla, 2000; Verhulst & Van der Ende, 2000). The subscale ‘anxiety problems’ included 10 items and was measured with items like *‘Doesn’t want to sleep alone’*. The 10 items were measured on a three-point scale (0= ‘not/ never true’, 1= ‘somewhat/ sometimes true’, 2= ‘very/ often true’) and were averaged. The CBCL 1,5-5 had good reliability and validity (Achenbach & Rescorla, 2000). Internal consistency was measured using Cronbach’s alpha for the 10-item questionnaire and was poor ( $\alpha = .50$ ). One item did not seem to fit well with the other items, due to the different formulation of the question. This item was removed, after which Cronbach’s alpha improved to  $\alpha = .55$ . The maximum score on the subscale was 18. High scores indicated more anxiety problems.

**Parental structure.** Parental structure was assessed using the parenting dimension ‘structure’ of the Comprehensive Early Childhood Parenting Questionnaire (CECPAQ; Verhoeven, Deković, Bodden, & Van Baar, 2017). The subscales measuring ‘consistency’, ‘overreactivity’ and ‘laxness’ were averaged, which included 12 items. The subscale ‘overreactivity’ and ‘laxness’ were recoded so that higher scores indicated high degrees of parental structure. The dimension structure was measured with items like *‘The punishment I give to my child depends on my mood’*. Items were assessed on a 6-point Likert scale (1= ‘never’ to 6= ‘always’). For eight items, ratings were made on a 6-point scale that included effective response at one end and ineffective response to the presented parenting situation at the other end (1= effective response to 6= ineffective response). Internal consistency was measured using Cronbach’s alpha and was good ( $\alpha = .70$ ). The maximum score on the dimension structure was 72. Higher scores on the dimension structure indicated higher degrees of parental structure.

**Parental psychological control.** Parental psychological control was assessed using the domain ‘psychological control’ of the CECPAQ (Verhoeven et al., 2017). The domain psychological control included 6 items which were averaged. Psychological control was



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measured with items like '*When my child does something I don't like, I insult my child*'. All items were assessed on a 6-point Likert scale (1= 'never' to 6= 'always'). Internal consistency was measured using Cronbach's alpha and was poor ( $\alpha = .53$ ). The maximum score on the dimension psychological control was 36. Higher scores on the domain indicated higher degrees of parental psychological control.

**Gestational age.** Children with a gestation between 32 and 36 weeks were included in the moderately preterm group and children with 37 weeks or more gestation were included in the term born group. Complete data was available for 83 moderately preterm children ( $M = 34.58$ ) and 83 term born children ( $M = 39.43$ ).

### Missing data

The Missing Value Analysis showed that 7,2% of data was missing for the variable 'structure'. This was 4,2% for 'psychological control' and 1,8% for 'anxiety'. Results from the Little's Missing Completely at Random (MACR) test showed that data was randomly missing ( $p = .38$ ). Therefore, missing values have been imputed by granting the mean on this item using EM. In this way, all data was used in the current study.

### Analytic strategy

SPSS Windows version 24.0 was used to analyze the data. First, descriptive statistics and correlations of all variables were given. T tests were conducted to explore the difference between preterm and term born children among all variables. Next, the assumptions for multiple regression were evaluated. Hierarchical multiple regression analysis (HMRA) was used to test gestational age as a moderator on the relation between parenting and anxiety in children. An interaction term was computed from the predictor and the moderator. To assess the moderation effect, two multiple regression analysis have been executed using PROCESS for SPSS (Hayes, 2014). The first model examined the relation between parental structure (X1) and anxiety in children (Y), moderated by gestational age (M). The second model examined the relation between parental psychological control (X3) and anxiety in children (Y), moderated by gestational age (M). The next rules were applied for establishing effect sizes: for a small effect  $.02 < R^2 < .13$ , for a medium effect  $.13 < R^2 < .26$  and for a large  $R^2 \geq .26$  (Cohen, 1988).

## Results

### Differences in anxiety between groups

Descriptive statistics of the variables ‘anxiety’, ‘parental structure’ and ‘parental psychological control’ are presented in Table 2. It was expected that children born preterm had significant higher levels of anxiety compared to term born children. In line with this hypothesis, t tests showed that preterm born children were rated significantly higher on anxiety than term born children,  $t(164) = -1.79, p < .001$ . In contrast, the differences between the preterm group and the term born group for the variables ‘structure’ and ‘psychological control’ were not significant. Table 2 also presents the bivariate correlations among all study variables for the preterm group and the term born group. For the preterm group a negative and weak correlation was found between structure and anxiety and structure and psychological control.

Table 2

*Descriptive Statistics of all Study Variables and Pearson Correlations amongst all Study Variables, Calculated for Preterm Children (n = 83, below the diagonal) and Children Born at Term (n= 83, above the diagonal)*

	1	2	3	Preterm group M (SD)	Term born group M (SD)	Range
1. Anxiety	-	-.12	.01	.13 (.17)	.09 (.10)	0-2
2. Structure	-.23*	-	-.15	4.80 (.41)	4.75 (.36)	1-6
3. Psychological control	.13	-.22*	-	1.47 (.37)	1.44 (.37)	1-6

*Note.* \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

### Assumptions

Prior to performing the multiple regression analyses, several assumptions were checked for both groups. First, normality was checked by the Shapiro-Wilk test and by examination of boxplots. For the preterm group, the variables ‘anxiety’, ‘structure’ and ‘psychological control’ were not normally distributed ( $p < .05$ ), but the multiple regression analysis is reasonably resistant to violations of this assumption (Field, 2018). For the term born group, the variable ‘parental structure’ met the assumption of normality and the variables ‘anxiety’ and ‘parental psychological control’ did not ( $p < .05$ ).

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Second, no extreme outliers were found for the preterm group. For the term born group, one extreme outlier was found for the variable ‘anxiety’, which was changed into the value of the largest non-outlier for this group, by means of the winsorizing technique. In this way, the outlier was not deleted, but was equated to a lower limit. Table 2 showed descriptive statistics after changing this outlier.

Third, multicollinearity was tested by a linear regression analysis of the variables and indicated that correlations between predictors were not too high. For the preterm group collinearity statistics revealed that Tolerance was  $> .1$  for all predictors [range: .83 to .84]. Variance Inflation Factor (VIF) was  $< 10$  for all predictors [range: 1.19 to 1.20]. For the term born group, collinearity statistics revealed that Tolerance was  $> .1$  for all predictors [range: .89 to .91] and Variance Inflation Factor (VIF) was  $< 10$  for all predictors [range: 1.10 to 1.13].

Fourth, the normality, linearity and homoscedasticity of the residuals were checked by the normal probability plot of standardized residuals and the scatterplot. This indicated that all three assumptions regarding the residuals were met for the preterm group and the term born group.

### **Analysis**

#### **Effect of parental structure on anxiety**

A linear regression analysis was executed to examine whether parental structure was associated with anxiety in children. It was hypothesized that parental structure would predict less anxiety in children. In line with the hypothesis, parental structure was negatively related to anxiety in children and accounted for 3% of the variance in anxiety in children,  $R^2 = .03$ ,  $F(1,164) = 5.64$ ,  $p < .001$ . The beta coefficient of  $\beta = -.18$  indicated that with every increase of one standard deviation in parental structure, anxiety in children declined with .18 standard deviation.

#### **Moderation by gestational age**

A hierarchical multiple regression analysis with interaction effect was executed to investigate the moderating role of gestational age on the relation between parental structure and anxiety in children. It was hypothesized that the relation between parental structure and anxiety in children would be stronger for children born preterm compared to term born

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children. The results in Table 3 demonstrated that no significant interaction effect was found,  $\beta = -.06$ ,  $SE = .05$ ,  $p = .27$ . In contrast with the hypothesis, gestational age did not moderate the relation between parental structure and anxiety in children. In the model, gestational age was found to be a predictor of anxiety in children,  $\beta = .04$ ,  $SE = .02$ ,  $p < .05$ . This means that in this model, preterm born children and term born children differ in anxiety symptoms. The analysis showed that preterm born children had a higher level of anxiety than term born children.

Table 3

*Hierarchical Multiple Regression Analysis predicting Anxiety (n = 166)*

	$\beta$	SE	t	95% CI	
				LL	UL
Constant	.09***	.01	5.86	.06	.12
Structure	-.03	.04	-.82	-.12	.05
Gestational age	.04*	.02	1.94	<.01	.08
Interaction	-.06	.05	-1.10	-.17	.05

*Note.*  $R^2 = .06$ ,  $\beta$  = beta; SE= standard error; CI= confidence interval; LL lower limit; UL= upper limit. \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

### **Effect of parental psychological control on anxiety**

A linear regression was performed to examine whether psychological control was associated with anxiety in children. It was hypothesized that parental psychological control would predict more anxiety in children. Contrary to the hypothesis, parental psychological control accounted for 1% of the variance in anxiety in children,  $R^2 = .01$ ,  $F(1,164) = 1.22$ ,  $p = .27$  and this effect was statistically non-significant.

### **Moderation by gestational age**

A hierarchical multiple regression analysis was conducted to test whether gestational age moderated the relation between parental psychological control and anxiety. It was expected that the relation between parental psychological control and anxiety would be stronger for the preterm group. However, results showed no interaction effect,  $\beta = .06$ ,  $SE = .06$ ,  $p = .34$ .

Table 4

*Hierarchical Multiple Regression Analysis predicting Anxiety (n = 166)*

	$\beta$	SE	t	95% CI	
				LL	UL
Constant	.09****	.02	5.82	.06	.12
Psychological control	< .01	.04	.06	-.08	.08
Gestational age	.04	.02	1.75	< -.01	.08
Interaction	.06	.06	.96	-.06	.17

*Note.*  $R^2=.03$ ,  $\beta$  = beta; SE= standard error; CI= confidence interval; LL lower limit; UL= upper limit. \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

### Discussion

The aim of this study was to obtain a better understanding of predictors of anxiety in early development. This study examined the difference between preterm born children and term born children in the development of anxiety and the relation between parenting and anxiety in children and whether this relation was moderated by gestational age.

#### Differences in anxiety between groups

Consistent to expectations, preterm born children showed higher levels of anxiety in toddlerhood than term born children. This is in accordance with theories that propose that preterm children have brain alternations and this is associated with an increased risk of anxiety symptoms in children (Spittle et al., 2009; Loe et al., 2013). The current study extends previous studies by including moderately preterm children in the examination of anxiety in toddlerhood. Results have shown that besides very preterm children, also moderately preterm children are at increased risk for developing anxiety. One previous study also reported more anxious/depressed behavior at preschool age in moderately preterm children compared to term born children (Potijk et al., 2012). Our results show that moderately preterm children can be a potential target group for the prevention of developing anxiety disorders, as anxiety in preschool age is associated with psychiatric disorders in childhood and adolescence (Bittner et al., 2007).

#### Parental structure and anxiety

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Consistent with expectations, parental structure was associated with less anxiety in toddlers. Existing theories state that clear and consistent guidelines, expectations and predictable consequences in parenting, would lead to the belief of control over their environment in children, which protects against the development of anxiety (Laurin et al., 2015; Farkas & Grolnick, 2010). Results of this study confirm the theory. This study is innovative in measuring the impact of parental structure on anxiety development at preschool age. The finding that parental structure is associated with less anxiety in young children, suggests that interventions focusing on parental structure should be effective in ameliorating anxiety symptoms. This is consistent with studies finding that parenting interventions aimed at consistent discipline styles were effective in reducing internalizing problems in preschool children (Cartwright-Hatton, McNally, & White, 2005; Cartwright-Hatton, McNally, White, & Verduyn, 2005). Mothers can provide structure in parenting by learning to be consistent in parenting, learning disciplinary procedures, learning to withdraw attention for inappropriate behavior, learning to give commands in an acceptable manner and learning to use a time-out. These positive parenting behaviors may be easier to teach to mothers than teaching them to stop the use of negative parenting behavior (Bögels & Brechman-Toussaint, 2006).

### **Parental psychological control and anxiety**

Surprisingly, parental psychological control was not related to anxiety in young children. This is in contrast with studies suggesting that parental control is the strongest and most consistent parenting predictor of childhood anxiety (Laurin et al., 2015; McLeod et al., 2007; Van der Bruggen et al., 2008). The absence of a significant relation between parental psychological control and anxiety may be explained by implications with the reliability and validity of the instrument measuring parental psychological control. The construct parental psychological control was measured with only 6 items with lower than ideal inter-item correlations, which indicates that the questionnaire is not reliable. Besides that, the low amount of variance within the construct could explain the absence of the significant relation between parental psychological control and anxiety. Moreover, items of self-reporting questionnaires of parenting often are associated with a degree of social desirability (Morsbach & Prinz, 2006). Since parental psychological control is considered as negative parenting behavior, mothers' attitudes about their parenting may be unrelated to the actual behaviors. Observations may give a more objective view on parenting and are found to be most reliable in assessing parenting (Wood, McLeod, Sigman, Hwang, & Chu, 2003; McLeod et al., 2007).

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Using multi-method designs in assessing parental psychological would obtain a more complete and reliable picture of parenting behavior (Bögels & Van Melick, 2004).

Since the hypothesis is based on studies with older children, it may be that parental control is less salient in the early development of anxiety compared to the development of anxiety in older children. It has been suggested that parenting has more negative effects in adolescence, because in this period children strive for autonomy, which is deprived by parental psychological control (Bögels & Phares, 2008). Associations may be stronger in later childhood as a result of influences of parent-child interactions over time (Maccoby, 1992).

### **Moderation by gestational age**

Based on the differential susceptibility theory (Belsky, 2005), it was hypothesized that moderately preterm children are more susceptible for parenting behavior than term born children. However, no differences were found between the moderately preterm born group and the term born group, considering the relation between parenting and anxiety. It may be that very preterm children are more susceptible to effects of parenting than moderately preterm children. Studies supported this idea and found increasing internalizing problems in children when gestational age decreased (Stoelhorst et al., 2003; Rautava et al., 2010).

Another possible explanation, could be the low amount of variance between the preterm group and the term born group. A sample with more variance in parenting between the groups would create a better context to investigate the relations among the different constructs. It could be that parenting is more influential depending on socio-economic status and therefore more high risk families should be included in further research.

### **Limitations, strengths and suggestions for further research**

This study contains some limitations, which must be taken into account when interpreting the results. First, the sample existed mainly of highly educated and Western participants, and is therefore a generally low risk sample. Second, causality cannot be inferred from the results. The associations between parenting and child anxiety reciprocally affect one another over time (Murray et al., 2009). That is, parenting behavior may evoke child anxiety, but child anxiety may also elicit certain parenting behavior (Hudson, Doyle, & Gar, 2009; Thirlwall & Creswall, 2010). Also, parenting behaviors can be a response to specific difficulties that are presented by the immaturity of preterm children, which leads to preterm child's outcomes (Gerner, 1999). Third, the results of this study only relied on data obtained

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from a single informant and therefore results cannot be generalized to fathers. Fathers may play a different role in encouraging child anxiety and in protecting the child against anxiety (Bögels & Phares, 2008). Fathers' role can be characterized by more risk-taking behavior and stimulating independency, which may protect against anxiety (Bögels & Phares, 2008; Paquette, 2004). Fourth, it should be noted that one question was removed from the anxiety scale and therefore anxiety was measured by only 9 items. However, contrary to the other items, the removed item was formulated as an open question, causing higher scores on this item.

Notwithstanding these limitations, this study also knows its strengths. First, data of moderately preterm children and term born children were collected by the same method. The present study is not the first to examine the effects of parenting onto anxiety in children. However, to our knowledge, this is the first study to measure different types of parenting and anxiety in preschool age, as well as to assess the moderating role of gestational age. Another strength of this study is the inclusion of moderately preterm children, in contrast to the very preterm children in existing literature.

Several suggestions for further research will be given. First, studies must use a representative sample including non-western and low educated families. Second, the unique role of fathers in parenting and the development of anxiety should be investigated. Third, the associations between parenting behavior and anxiety in children should be interpreted bidirectionally. It is of importance to use designs that allow for causal conclusions. Fourth, to increase validity, future work should incorporate multimodal assessments of constructs.

In summary, limitations of the measurements and non-representative sample make it difficult to state clear causal conclusions. Nevertheless, it was found that moderately preterm children showed higher levels of anxiety than term born children. Also, parental structure was related to less anxiety in children. However, parental psychological control was not predictive in anxiety in children and also a moderating role of gestational age was not found. Further research should use multimethod assessment in measuring parenting and anxiety in preschool age. Our results show that moderately preterm children can be a target group for preventing developing anxiety disorders. The presence of a relation between parental structure and anxiety in toddlers, shows the importance of using parenting intervention and prevention programs in reducing and treating anxiety in children.



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