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Postprint / Postprint

Zeitschriftenartikel / journal article

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### Empfohlene Zitierung / Suggested Citation:

Lindhout, I. E., Markus, M. T., Hoogendijk, T. H. G., & Boer, F. (2009). Temperament and parental child-rearing style: unique contributions to clinical anxiety disorders in childhood. *European Child & Adolescent Psychiatry*, 18(7), 439-446. <https://doi.org/10.1007/s00787-009-0753-9>

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## Temperament and parental child-rearing style: unique contributions to clinical anxiety disorders in childhood

Received: 5 June 2008  
Accepted: 21 December 2008  
Published online: 5 February 2009

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■ **Abstract** Both temperament and parental child-rearing style are found to be associated with childhood anxiety disorders in population studies. This study investigates the contribution of not only temperament but also parental child-rearing to clinical childhood anxiety disorders. It also investigates whether the contribution of temperament is moderated by child-rearing style, as is suggested by some studies in the general population. Fifty children were included (25 with anxiety disorders and 25 non-clinical controls). Child-rearing and the child's temperament were assessed by means of parental questionnaire (Child Rearing Practices Report (CRPR) (Block in The Child-Rearing Practices Report. Institute of Human Development. University of California, Berkely, 1965; The Child-Rearing Practices Report (CRPR): a set of Q items for the description of parental socialisation attitudes and values. Unpublished manuscript. Institute of Human Development. University of California, Berkely, 1981), EAS Temperament Survey for Children (Boer and Westenberg in

J Pers Assess 62:537–551, 1994; Buss and Plomin in Temperament: early developing personality traits. Lawrence Erlbaum Associates, Inc, Hillsdale, 1984s). Analysis of variance showed that anxiety-disordered children scored significantly higher on the temperamental characteristics emotionality and shyness than non-clinical control children. Hierarchical logistic regression analyses showed that temperament (emotionality and shyness) and child-rearing style (more parental negative affect, and less encouraging independence of the child) both accounted for a unique proportion of the variance of anxiety disorders. Preliminary results suggest that child-rearing style did not moderate the association between children's temperament and childhood anxiety disorders. The limited sample size might have been underpowered to assess this interaction.

■ **Key words** temperament – child anxiety disorder – child-rearing style – parent report

## Introduction

Paediatric anxiety is a serious condition affecting approximately 6–10% of young children and adolescents [65], which tends to show continuity through childhood and adolescence [25, 27, 66], and can follow a chronic pathway into adulthood [20, 36]. The development of anxiety disorders in children is the result of a variety of factors. Especially temperament and parenting appear to be important aetiological factors [8, 10].

Temperament concerns the difference between individuals in their style of behaviour. Although temperament theorists differ with regard to issues such as the heritability of temperament, its relation to biological factors, and its stability through time and situations, there is a consensus that temperament consists of relatively consistent, basic dispositions inherent in the person that underlie and modulate the expression of activity, reactivity, emotionality and sociability [31]. Two temperamental traits stand out in the research of anxiety-disordered (AD) children: negative affectivity and shyness (or behavioural inhibition). Negative affectivity is generally defined as a temperamental sensitivity to negative stimuli, causing a broad range of negative moods, including fear/anxiety and sadness/depression but also such emotions as guilt, hostility and self-dissatisfaction [11]. Children with this temperament easily get angry and can become very distressed, for instance when they are not allowed something they would like or after the occurrence of something unpleasant. Shyness, sometimes operationalized as 'behavioural inhibition' [23], is defined as the consistent tendency to display fear and withdrawal in unfamiliar situations, with or without a social component [22]. Children with this temperament are often reticent in social contacts. They are shy towards strangers and timid in unfamiliar situations. There is substantial evidence that children with stable high levels of behavioural inhibition [41] and/or high emotionality run a higher risk of developing anxiety disorders [38]. Whereas behavioural inhibition is considered a specific risk factor for anxiety [3], negative affectivity has been found to be associated with both internalising and externalising behaviour in later childhood [15]. The direction of these associations is still in need of clarification. Furthermore, some temperamental characteristics (e.g. high level of effortful control) shield the child from anxiety [38].

Parenting style is a multifaceted phenomenon, but the multitude of studies that have been performed since the 1950s show that many of its facets can be ordered in a circumplex pattern with two orthogonal dimensions: warmth versus hostility, and control versus autonomy [32]. Research has reliably demon-

strated an association between parenting style and anxiety disorders in children. The parenting style of parents of AD children is characterised by over-control and increased criticism [8, 43]. These associations may well be reciprocal, with child characteristics giving rise to certain child-rearing styles, which in turn may instigate and reinforce the child's characteristics [8].

The established contributions of temperament and parenting to anxiety disorders in children might be merely additive, but could also show interaction. Research in the general population has produced equivocal results.

Studies of adults looking back upon their youth show associations between rearing style and temperament: perceived limited care or an excess of control by the parents is connected with more harm avoidance or shyness [14, 46, 47, 53]. It is likely that this association is the product of interaction. The child's temperament may impact on parenting behaviours, and parenting may moderate the expression of temperament as well [31]. A temperamentally based differential susceptibility [2] to child-rearing has been demonstrated in population studies. This suggests that parenting serves as a moderator between temperament and anxiety [31, 63]. In a sample of preadolescents the depressogenic effect of parental overprotection and lack of emotional warmth proved to be dependent on the child's temperament [40]. Also, children reared with less care or more control were shown to be more vulnerable to anxiety when they have a behaviourally inhibited temperament [12, 29, 52]. One study [37] showed differences in the behavioural problems of temperamentally highly irritable children dependent on the type of child-rearing: maternal psychological control was associated with internalizing problems, whereas maternal hostility was associated with externalizing problems. Other population studies, however, failed to find such interactive effects. In a cross-sectional study of 644 children and adolescents inhibited temperament, as well as parental control and anxious rearing were found to be associated with higher levels of anxious symptoms, but no interactive effects were found [64].

Using data collected in an ongoing longitudinal study of vulnerability and resilience among boys of low-income families, Feng and colleagues [16] were able to clarify the differential contributions of temperament and parenting to childhood anxiety during the developmental trajectory. Temperament (shyness) appeared strongly related to anxiety levels in early childhood, but parenting (high control) proved to be more contributing for anxiety that emerges in middle childhood or preadolescence, even among children who were not initially anxious.

In summary, parenting and temperament are both risk factors for anxiety in general populations [44]. It is an important research question whether this applies to clinical populations as well. This paper describes a controlled study of clinically referred AD children, which investigates whether AD children show higher levels of emotionality and shyness than normal controls. Secondly, it is hypothesised that childhood temperament and parental child-rearing style additively contribute to childhood anxiety disorders. Furthermore, on an exploratory level we investigated whether the contribution of temperament to anxiety disorders is moderated by child-rearing style.

## Method

### ■ Patient sample

All families of children (aged 8–13 years) referred consecutively to an outpatient clinic for child and adolescent psychiatry with anxiety disorder as the primary diagnosis and growing up in complete families, were asked to participate in the present study. Families were excluded if the child met criteria for the following DSM-III-R<sup>1</sup> diagnoses: mental retardation, pervasive developmental disorder or schizophrenia. Of the 35 eligible families 25 participated after signing informed consent. Ten families refused to participate for various reasons (mostly time constraints, sometimes the concern that the research would burden the child). Families which agreed to participate and those which declined did not differ significantly in the average age of the child, gender distribution of children and average income. The clinical families included 11 girls and 14 boys ( $M = 10.8$  years old) with anxiety disorders. The AD children had a diagnosis, as determined by means of the Anxiety Disorders Interview Schedule (ADIS-C/P) [54, 55, 59], of over-anxious disorder ( $N = 15$ ), generalised anxiety disorder ( $N = 2$ ), separation anxiety disorder ( $N = 16$ ), social phobia ( $N = 10$ ) or panic disorder without agoraphobia ( $N = 2$ ), according to DSM-III-R criteria [1]. Additional comorbid anxiety disorders were simple phobia ( $N = 8$ ) and posttraumatic stress disorder ( $N = 1$ ). Comorbidity among the anxiety disorders was common, with 56% of the children having more than one anxiety disorder diagnosis. Five AD children also had a diagnosis of dysthymia, two AD children had a major depression, and one AD child had a comorbid mood disorder of dysthymia and major depression.

<sup>1</sup>At the time of the study the DSM IV version of the ADIS-C was not yet available in its Dutch version.

### ■ Control sample

The non-clinical control group was recruited from circles of friends and acquaintances of the clinical families, to ensure optimal similarity in cultural and socio-economic status. The control group consisted of 25 two-parent families of which one child, within the age range of 7–13 years, participated. The children were 10 girls and 15 boys ( $M = 10.9$  years old). The children in this group had never used mental health services. They were assessed by means of a semi-structured diagnostic interview [54, 55, 59] (ADIS-C/P). If this revealed evidence of psychopathology the children were not included in the study. In seven of the original 32 families which were approached the child appeared not to be free from psychopathology. These families were therefore excluded.

The patient and control samples did not significantly differ in gender, age, birth order of the child, family income and ethnicity (Caucasian).

### ■ Measures

#### Psychiatric assessment

The ADIS-C and ADIS-P [59] are semistructured interviews with the child and one of its parents, respectively. In this study a Dutch version of both interviews was used, which has been developed by Siebelink and Treffers [54, 55]. The ADIS-C assesses all DSM-III-R anxiety and mood disorders, whereas the ADIS-P assesses some additional mental disorders (e.g. externalising disorders, psychosis and substance abuse) to be ruled out. The interrater and test-retest reliability of the ADIS are satisfactory, both at the level of individual symptoms and at the level of classifications [56, 57, 60]. All ADIS-C and ADIS-P interviews were scored twice, with the two interviewers of this study scoring independently. The interrater reliability (based on the scoring of audio-taped ADIS-interviews) was good, with kappa = 0.89 and 0.90 for the child and the parent interviews, respectively. In this study the ADIS-P regarding the AD child was administered to one parent (mother or father chosen randomly).

#### Child-rearing style

The CRPR [4, 5] assesses attitudes, values, goals and behaviours of parents with regard to child-rearing [5]. It is administered to children ranging in age from preschool [21] to late adolescence [17], and has shown stability through time [35, 49]. Originally the CRPR consisted of 91 socialization statements in a Q-sort

format. Deković and colleagues [13] developed a questionnaire format of the CRPR, with a 6-point Likert-type scale (ranging from 1 = not at all descriptive of me, to 6 = highly descriptive of me). The questionnaire format has proved to have good reliability as well as construct validity [13].

Factor analysis has shown two main factors: Nurture and restrictiveness [13, 48]. Some subscales of the original CRPR version, of which the items do not overlap with the two main scales, are also relevant to the investigation of parental warmth versus rejection, and control versus autonomy, i.e. negative affect toward child (Cronbach's alpha = 0.61), worry about the child (Cronbach's alpha = 0.59), encouraging independence (Cronbach's alpha = 0.69). That is why, for the purpose of our study, we used these subscales in addition to the main scales.

### Temperament

The EAS Temperament Survey for Children (parental ratings) [9] is a parental rating questionnaire consisting of four scales, each represented by five items: (a) the emotionality scale, which measures distress, (b) the activity scale, which measures tempo and vigor, (c) the shyness scale, which measures inhibition and tension when with unfamiliar others, and (d) the experimental sociability scale, which measures the preference for being with others to being alone. The psychometric properties of the Dutch translation of the EAS have been excellent for the emotionality, activity, and shyness scales. The results regarding the experimental sociability scale are ambiguous [7]. Age and gender of the child do not influence the overall reliability and validity [9, 18, 19, 42, 67]. The EAS has been used in clinical and community samples [26, 33, 45, 62], in childhood as well as adolescence [9, 18, 42, 67].

### Procedure

The study was approved by the institutional review board of Leiden University Medical Centre. Informed consent was obtained from all participating parents and children. The EAS was filled out by mothers. The CRPR was filled out by both parents separately. The ADIS-C/P was administered at home.

### Data analysis

Differences in temperament between 25 AD children and 25 control children were investigated by using analysis of variance. The findings were re-examined by conducting analysis of variance with gender, age

**Table 1** EAS: anxiety-disordered children (AD) versus non-clinical control (NCC) children

	AD-children (n = 25) Mean (SD)	NCC-children (n = 25) Mean (SD)	F(48, 1)	P value
Activity	3.3 (0.9)	3.3 (0.6)	0.13	<0.001
Emotionality	3.7 (0.8)	2.4 (0.8)	36.27	<0.001
Sociability	3.3 (0.7)	3.6 (0.7)	1.32	
Shyness	2.8 (0.9)	1.9 (0.6)	16.72	

and birth order of the child as covariates. All significant findings remained significant.

To examine whether temperament and child-rearing both contribute to childhood anxiety disorders, and, in addition, whether the effect of temperament was moderated by parenting style, logistic regression analyses were performed. For each EAS scale, associated with anxiety disorders, a separate hierarchical logistic regression analysis was employed, in which the temperament rating and (sub)scales of the CRPR were stepwise added to the model. For the logistic regression analyses, aggregated scores for parental style were used to reduce the potential number of predictor variables and number of analyses. Composite scores were based on means across mothers and fathers. This data reduction was justified since it was based on moderate intercorrelations among fathers and mothers (range  $r_s = 0.20-0.40$ ).

### Results

Table 1 presents temperamental differences between AD children and normal controls. The differences regarding emotionality and shyness are significant when AD children are compared with controls.

In order to test for collinearity, correlations were examined. For emotionality significant correlations were found with nurturance ( $-0.26$ ;  $P < 0.05$ ), negative affect ( $0.55$ ;  $P < 0.001$ ) and worry ( $0.43$ ;  $P < 0.01$ ). Significant correlation for shyness were found with negative affect ( $0.32$ ;  $P < 0.05$ ) and worry ( $0.47$ ;  $P < 0.001$ ). As the correlations between these variables do not exceed 0.8, the relationships between the independent variables will not pose problems in the logistic regression analyses.

To examine relations between AD on the one hand and temperament and parenting style on the other hand, we regressed AD on temperament, parenting style, and the interaction of temperament and parenting style. With 50 subjects the power to investigate the interaction between temperament and parenting is limited, and this means that these results should be interpreted with caution [24]. The logistic regression

**Table 2** Logistic regression of temperament-emotionality (EAS) and childrearing (CRPR) on anxiety disorders

	OR	Wald	P value	95% CI	Nk R <sup>2</sup>
Emotionality (EAS) <sup>a</sup>	0.16	7.0	0.008	0.04–0.63	
Negative affect (CRPR) <sup>b</sup>	0.61	5.6	0.018	0.40–0.92	
Encouraging independence (CRPR) <sup>b</sup>	1.23	3.5	0.063	1.00–1.53	0.74 <sup>b</sup>

OR unadjusted odds ratio, CI confidence interval, Nk R<sup>2</sup> Nagelkerke R<sup>2</sup>

<sup>a</sup>Step 1 LRA;  $\chi^2$  (df = 1) = 28.24, P < 0.001

<sup>b</sup>Step 2 LRA;  $\chi^2$  (df = 3) = 41.37, P < 0.001;  $\chi^2_{\text{improvement}}$  (df = 2) = 13.13, P < 0.001

**Table 3** Logistic regression of temperament-shyness (EAS) and childrearing (CRPR) on anxiety disorders

	OR	Wald	P value	95% CI	Nk R <sup>2</sup>
Shyness (EAS) <sup>a</sup>	0.28	5.1	0.024	0.09–0.85	
Negative affect (CRPR) <sup>b</sup>	0.54	8.8	0.003	0.34–0.81	
Encouraging independence (CRPR) <sup>b</sup>	1.22	3.9	0.050	1.00–1.50	0.72 <sup>b</sup>

OR unadjusted odds ratio, CI confidence interval, Nk R<sup>2</sup> Nagelkerke R<sup>2</sup>

<sup>a</sup>Step 1 LRA;  $\chi^2$  (df = 1) = 14.61, P < 0.001

<sup>b</sup>Step 2 LRA;  $\chi^2$  (df = 3) = 38.53, P < 0.001;  $\chi^2_{\text{improvement}}$  (df = 2) = 23.92, P < 0.001

analyses were restricted to the temperament scales for which differences were found between the AD and control group, i.e. emotionality and shyness. In an initial analysis child gender and age had been entered in the first step, but these variables were subsequently removed because, as expected, they were not significantly related to the outcome variable.

Separate logistic regression analyses were undertaken for the two temperament scales shyness and emotionality with AD as outcome. In these analyses variables were entered in the following order: temperament in the first step, the parenting scales in the second step as a block, and lastly, the temperament × parental style interaction terms as a block. At the second step variables were selected by means of backward elimination of the parenting variables.

Results (Table 2) indicated significant associations between the temperament emotionality rating and the presence of an anxiety disorder in the child. The likelihood of an anxiety disorder in the child is higher when the child's temperament rating of emotionality is higher. When we included the parenting variables in the second step of the logistic regression analysis, the parenting variables negative affect and encouraging independence of the child (trend: P = 0.063) accounted for a significant 17% of the variance in AD in addition to emotionality. The model predicts that, as parents' negative affect increases and the independence of the child is less encouraged, the likelihood of the presence of anxiety disorders in the child will increase. Overall, the variables together accounted

for 74% of the variation in AD. Interactions between emotionality and parenting measures did not approach significance.

In a second logistic regression analysis (Table 3) the temperament shyness rating was significant in predicting the presence of an anxiety disorder in the child. Again, the parenting variables negative affect and encouraging independence of the child contributed significantly to the model beyond the effect of the temperament shyness rating. Parents with higher levels of negative affect and lower levels of encouraging independence were significantly more likely to have a child with an anxiety disorder. This logistic regression model was statistically significant, with the variable scores together accounting for 72% of the variation in anxiety disorders. This was substantially more than that explained by the temperament rating of shyness alone, i.e. 34%. Interactions between shyness and parenting measures did not approach significance.

## Discussion

This study is, to the best of our knowledge, the first to extend the findings from general population studies by examining the contribution of temperament and child-rearing to clinical childhood anxiety disorders, as well as the potentially moderating role of parenting style. It was able to replicate earlier studies of mainly population samples in demonstrating temperamental differences between children in middle childhood with anxiety disorders and those without. In this study the EAS temperaments emotionality and shyness proved to be higher in AD children than in normal controls. Previously, we found that child-rearing style with regard to AD children compared to that towards normal control children and siblings was characterised by more rejection/criticism and more control [30]. In the present study we found that temperament (emotionality and shyness) and parenting style (over-controlling and rejective) have an additive effect. Furthermore, logistic regression analyses showed that the effect of temperament in childhood anxiety disorders was not moderated by parental child-rearing style. Thus, this study does not support a differential temperamental susceptibility for the impact of anxiety inducing child-rearing practices.

The additive effect of temperament of the child and parental child-rearing style without an additional moderating effect of child-rearing on temperament suggests that both factors represent separate paths in the development of anxiety, without parental rearing style moderating the effect of temperament on anxiety disorders. Shyness, for instance, can contribute to social anxiety in peer relationships [39]. Furthermore, parenting style in middle childhood can impact rela-

tions to the outside world because parental negative affect can cause the child to feel left to its own devices without feeling able to cope [8].

The present study shows limitations that need to be addressed. The small sample size limited the power of the analyses. Limited power and the relatively large amount of explained variance in the first steps of the logistic regression analyses may have caused the lack of significant interaction terms. Separate and combined analyses of larger samples of normal controls and AD children and the inclusion of a continuous measure of anxiety will allow a better investigation of interaction patterns. The absence of a clinical control group precludes judgement of the specificity of these results for AD children rather than for children with mental disorders in general. Other studies have shown that the associations between the temperaments emotionality and shyness and anxiety disorders are independent of co-morbid depression [33]. Our results seem to imply that child-rearing style is not in response to the temperamental characteristics of children which were examined in this study. However, due to the cross-sectional nature of this study, we cannot rule out the possibility that the disorder influenced the parental judgment of the child's temperament. Furthermore, it remains to be seen whether studies with other informants of child-rearing and temperament (such as the children, or observers) will confirm the present findings or show different results. There is also the concern of an overlap between characteristics of anxiety disorders and characteristics of certain temperaments. However, there is evidence that elimination of confounding items in the measurements does not bring down the magnitude of the associations between these concepts [28].

We have to acknowledge the possibility that different temperamental constructs from the ones included in this study, especially effortful control [51], would have yielded other results. It is hypothesised that it takes the combination of high emotionality and low effortful control to make children more prone to developing psychological disorders [31]. In addition, we have to take into consideration that in the development of anxiety disorders child-rearing may interact with personality factors [34], which were not included in the present study, for example ego-resilience [61].

Despite these limitations the results of the present study have important consequences. The association between temperamental characteristics and anxiety disorders has raised the question whether these characteristics will be useful markers for selecting children for primary prevention or early intervention protocols [6, 50]. The additive contribution of parenting style adds an interesting component to the way primary prevention could be conducted. It suggests that, in addition to identification of temperamentally vulnerable children, it is important to identify parents inclined to be critical or to discourage their child's independence. It is helpful for clinicians to keep in mind that these parental behaviours often are maladaptive ways of coping with the anxiety of the child, and to know that providing education to parents can be very successful [58].

## Summary

Temperament and parental child-rearing are suggested to be important aetiological factors in developing childhood anxiety disorders. The present study investigated whether temperamental characteristics of the child as well as child-rearing style—both assessed by means of parent-report—contribute independently to the prediction of clinical anxiety disorders in primary-school-age children. To extend findings from general population studies, we also investigated whether the contribution of temperament is moderated by child-rearing style. Temperamental emotionality and shyness as well as more parental negative affect and less encouragement of the child's independence each account for a unique proportion of the variance of childhood anxiety disorders. These findings support an additive model. No support has been found for a moderating role of child-rearing style between the child's temperament and childhood anxiety disorders, although a moderating role might have been obscured due to the limited sample size.

■ **Acknowledgments** Thanks are due to the participating families and staff members of Curium. We gratefully acknowledge the support of Sophie R. Borst, Marjo Borsje and Ragna Maignay, in conducting this study and Hein Putter for his statistical advises. Completion of this study was facilitated by Grant 4105 from the Dutch National Fund for Mental Health.

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