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ORIGINAL ARTICLE

Intergenerational Transmission of Social Anxiety in Childhood Through Fear of Negative Child Evaluation and Parenting

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Abstract

Background Parents' fear of negative evaluation (FNE) has been proposed to play a role in the intergenerational transmission of social anxiety. We investigated whether (1) parents' own FNE, a core belief of social anxiety, extends to their child's environment resulting in fear of negative child evaluation (FNCE); and (2) parents' FNCE mediates the association between parents' social anxiety, parenting behavior and children's social anxiety.

Methods In this cross-sectional study, fathers ($n = 84$) and mothers ($n = 92$) from 99 Caucasian families completed questionnaires on social anxiety, FNE, FNCE, and parenting (intrusiveness, negative parenting and encouragement of social daring) when their child was 7.5 years old. Child social anxiety was measured by questionnaires (child and parent report).

Results For both parents, FNE mediated the association between their social anxiety and FNCE. Furthermore, FNCE mediated the relation between both parents' social anxiety and intrusiveness and the relation between mothers' social anxiety and negative parenting. In addition, FNCE mediated the relation between fathers' social anxiety and children's social anxiety (parents' report only) directly and through intrusive parenting.

Conclusions Our study suggests that parents' FNE extends to their children's environment and provides support for the role of FNCE in various pathways of intergenerational transmission of social anxiety during middle childhood.

Keywords Fear of negative evaluation · Fear of negative child evaluation · Social anxiety · Intergenerational transmission · Parenting

Introduction

Social anxiety disorder (SAD) is a prevalent and disturbing psychological disorder in adults and children with 12-months prevalence estimates of SAD varying between 0.5 and 7% worldwide (American Psychiatric Association [APA], 2013) and a lifetime prevalence of 12.1% in the United States of America (Ruscio et al., 2008). SAD is characterized by excessive fear in social situations and by core beliefs concerning fear of negative evaluation (FNE) by others (APA, 2013). SAD is associated with low quality of life, poor academic or professional performance and unemployment and shows high comorbidity with other psychiatric disorders (Aderka et al., 2012; Fehm et al., 2008; Patel et al., 2002).

SAD typically develops in childhood; the median age of onset is 13 years (APA, 2013), but social anxiety symptoms may reveal themselves already in early childhood (Fuchs et al., 2013; Manti et al., 2009). Having parents with an anxiety disorder increases the risk to develop SAD (Lieb et al., 2000; Micco et al., 2009; Telman et al., 2018), which suggests intergenerational transmission of the disorder. This intergenerational transmission can to some extent be explained by genetic factors (Kendler et al., 1999; Scaini et al., 2014). Parenting behavior also appears to be relevant in the intergenerational transmission of anxiety and anxiety disorders. For example, over-controlling and rejecting parenting behavior have been shown to be associated with both parents' anxiety as well as with children's anxiety (Lieb et al., 2000; McLeod et al., 2007; Möller et al., 2016; van der Bruggen et al., 2008).

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About ten years ago, Schreier and Heinrichs (2010) introduced the construct fear of negative child evaluation (FNCE) as a factor that may be specifically tied to the intergenerational transmission of social anxiety. FNCE refers to the worries and fears parents have about negative evaluation of their child (Schreier & Heinrichs, 2010). Schreier and Heinrichs reasoned that FNCE is likely to be enhanced in parents with SAD, due to extension of their FNE by others ("Others are critical about me"), to the environment of their child ("People around my child are critical about my child"). Extension of FNE to FNCE may occur for different reasons (see also de Vente et al., 2011). For example, parents high on FNE, expecting others in their environment to be critical about them, may have high FNCE, because they and their child share the same environment. Alternatively, parents high on FNE may experience people in general as critical evaluators, resulting in extension of FNE to FNCE, irrespective of differences between their own and their child's environment. Or, parents who expect to be criticized because of certain traits (e.g., poor social skills), expect their child with similar traits to be negatively evaluated as well, thus resulting in more FNCE.

Support for extension of parents' fear beliefs to their child's environment is provided by the study of Lester et al. (2009), showing that parents extended their own interpretational bias towards possible threats into their child's environment. However, this core assumption of extension of parents' FNE to FNCE, which is fundamental to the idea that FNCE would play a role in the intergenerational transmission of social anxiety, has not been tested yet. Initial support for this extension has been obtained, as previous studies (de Vente et al., 2011; Schreier & Heinrichs, 2010) assessed associations between parents' social anxiety and FNCE. However, the social anxiety instruments used in these studies (i.e., the Mini-Social Phobia Inventory [mini-SPIN], a three item screening instrument, and the 18 item Social Phobia and Anxiety Inventory SPAI]) are general social anxiety measures, with only one or two items on cognitive aspects of social anxiety (i.e., beliefs concerning FNE such as "Looking stupid is among my worst fears"). Moreover, although FNE is a belief typically associated with social anxiety, actual associations between general social anxiety measures, such as the mini-SPIN and SPAI-18, and FNE measures are generally modest in size, around 0.50 (see for example Weeks et al., 2007 or Weiss et al., 2013). So for further theoretical validation, there is a need to clarify whether FNE indeed extends into FNCE.

Previous research (de Vente et al., 2011; Schreier & Heinrichs, 2010) provided empirical support for the relevance of FNCE in the intergenerational transmission of social anxiety in infancy an adolescence. First, in our previous work (de Vente et al., 2011), it was shown that already in early infancy, parents' social anxiety (measured before the child was born) is related to higher levels of FNCE (measured at infant age 4 months), and that higher levels of FNCE are related to more infant social fear at the age of 1 year. Second, Schreier and Heinrichs showed that FNCE actually mediates the relation between parents' social anxiety and child social anxiety during adolescence.

However, while previous studies support the idea that FNCE plays a role in the intergenerational transmission of social anxiety, it is still unclear *how* FNCE affects the child. More direct versus more indirect pathways may be distinguished. A more direct pathway through which FNCE may affect the child's fear reasoning from an early age onwards may be through social referencing while the parent experiences FNCE. As explained by Schreier and Heinrichs (2010), the results of Murray et al.'s study (2008) about maternal signals and infants' fear and avoidance using a social referencing paradigm, support this more direct pathway. Murray et al. found that the relation between mothers' social anxiety and their infant's change in avoidance behavior from 10 to 14 months was partially mediated by maternal fear responses during an encounter between the *infant* and a stranger. As Schreier and Heinrichs (2010) explained, maternal fear expressions during this particular social referencing task phase are a likely expression of mother's FNCE, as she may fear her child to be negatively evaluated in this interaction. Consequently, parents' fear expressions during child-stranger interactions may signal to the child that the social situation is threatening. Another more direct pathway may be the information pathway, for example when the parent verbalizes his/her FNCE to the child and thereby informs the child that people are critical. The potential of threat information on the development of social anxiety in general and on fear beliefs in general has been demonstrated by other scholars (e.g., Lawson et al., 2007; Muris et al., 2010), supporting this information pathway of intergenerational transmission of social anxiety.

In addition to these more direct pathways, FNCE may influence child social anxiety more indirectly, for example through affecting parenting behavior (de Vente et al., 2011). While meta-analyses have shown significant associations between parents' anxiety and overcontrolling and rejecting parenting behavior and between these parenting behaviors and child (social) anxiety, the associations are small to medium in size (see for example Chavira & Stein, 2005; McLeod et al., 2007; Möller et al., 2016; Van der Bruggen et al., 2008). As a result, more recent research started to focus on more specific, disorder-related parenting behavior, that may be more strongly related to parents' and the child's social anxiety (e.g., Murray et al., 2012). Parents' worries about negative evaluation of their child may trigger more intrusiveness, more negative parenting and less encouragement of social daring in parents. Intrusiveness is regarded a key component of overcontrol (McLeod et al., 2007) and

refers to overt interference with the child's behavior, without considering the needs or wishes of the child, for example excessively instructing the child how to behave. In an attempt to prevent their child from being negatively evaluated, parents higher in FNCE may show more intrusiveness, such as continuously directing their child towards making a good impression (see also de Vente et al., 2011). In turn, this intrusive behavior limits the child to develop their own competence in social situations and signals that other people are critical evaluators, increasing the risk of developing social anxiety in the child. In support of this idea, it was found that FNCE mediates the association between parents' social anxiety and over-involved parenting, which is a broader construct that includes intrusiveness, in infancy (de Vente et al., 2011).

Negative parenting is characterized by hostility, rejection and disapproval (Rapee, 1997; Wood et al., 2003). According to de Vente et al. (2011), parents high in FNCE may criticize their child and show more disapproval in order to let their child behave appropriately. In addition, parents high in FNCE may show more frequent disapproval and rejection because they feel more easily embarrassed about their child's behavior. This negative parenting may result in low self-esteem in the child and less confidence in handling social situations adequately, which in turn, feeds the child's social anxiety. Our previous finding that FNCE mediates the association between parents' social anxiety and negative parenting in infancy corroborates this idea (de Vente et al., 2011).

Encouragement of social daring is a subcomponent of challenging parenting behavior that has been proposed to buffer against anxiety development in children (Bögels & Perotti, 2011; Bögels & Phares, 2008; Majdandžić et al., 2014). In line, the meta-analysis of Möller et al. (2016) reported that father's challenging behavior was negatively associated with their child's anxiety. Challenging parenting behavior is characterized by playfully stimulating the child to push their limits (Majdandžić et al., 2016). Social daring refers to encouraging the child to engage in challenging social situations, such as performing for an audience or meeting new people. Regarding its relation to FNCE, parents high on FNCE may stimulate their child *less* to behave sociably (i.e., participate in social situations) and assertively, because of their perceptions of increased risk of social rejection of the child. Less encouragement of social daring in its turn presumably results in fewer opportunities for the child to practice their social skills and consequently to gain social competence, which in turn may lead to social anxiety. The only study on this relation so far, however, reported the opposite finding, that is, that parents high on FNCE reported to be *more* socially encouraging towards their children than parents low on FNCE (Schreier & Heinrichs, 2010). The researchers also found social encouragement to be positively associated with child social anxiety, which they suggested to potentially result from parental adaptation to child social anxiety—parents high on FNCE probably have more socially anxious children who elicit more social encouragement than less socially anxious children. Besides the association between FNCE and social encouragement, Schreier and Heinrichs (2010) did not study intergenerational transmission of social anxiety through FNCE and social encouragement. Therefore, additional research into FNCE as a mediator in the parent social anxiety—social encouragement association is warranted.

To summarize, previous studies provide support for FNCE as a mediator in the parent social anxiety—child social anxiety association and in the parent social anxiety—parenting association in infancy and adolescence. However, no previous studies addressed the complete mediating pathway from parent social anxiety, through both FNCE and parenting behavior, to child social anxiety. Hence, it is still unclear whether intergenerational transmission of social anxiety occurs through the more indirect pathway including both FNCE and parenting behavior.

While relevance of FNCE in social anxiety development has been demonstrated in infancy and adolescence (de Vente et al., 2011; Schreier & Heinrichs, 2010), it is still unclear whether FNCE also plays a role in the intergenerational transmission of social anxiety in middle childhood. A role of FNCE in the parent–child social anxiety relation in this developmental phase may be expected, since children in middle childhood have been exposed for a substantial number of years to their parents' social fear beliefs. Moreover, in middle childhood, children typically engage in multiple social contexts outside the family context (e.g. school, a friend's place, a sports club) that may give rise to more FNCE in parents, as parents are less able to prevent the child from making social mishaps.

Prior research suggests that fathers' and mothers' FNCE play a different role in the intergenerational transmission of social anxiety at different ages. In our previous study (de Vente et al., 2011), the strongest support was found for fathers' FNCE as a mediator in the relation between parent and infant social fear (although the indirect effect did not reach significance), whereas Schreier and Heinrichs (2010) found only mothers' FNCE to have this mediating role in adolescence. Of note, though, both studies tested mediation using the Baron and Kenny method (Baron & Kenny, 1986), which is considered overly strict in its assumptions to test mediation, resulting in low power to detect indirect effects (Hayes, 2009). In these studies, mediation analyses were not performed for mothers (de Vente et al., 2011) and fathers (Schreier & Heinrichs, 2010), respectively, because the first Baron and Kenny assumption, i.e., that the predictor (parents' social anxiety) should be significantly associated with the outcome (child social anxiety), was not met, while the other two assumptions were (significant association between

the mediator FNCE and both the predictor and the outcome). Hence, previous results regarding parent differences in the intergenerational transmission of social anxiety through FNCE await replication.

The aim of this study was threefold. First, we tested the hypothesis regarding a core assumption of FNCE, that is, that parents' FNE extends to their child, by assessing whether parents' FNE mediates the relation between parents' social anxiety and their FNCE. We predicted that FNE would mediate the parent social anxiety-FNCE association and that more social anxiety would be associated with more FNE and more FNCE. Second, we hypothesized that social anxiety is transmitted from parents to children through both indirect pathways (i.e., FNCE and parenting) as well as more direct pathways (FNCE independent of parenting) in middle childhood. We predicted to replicate our findings obtained in infancy, using data from the 7.5 years measurement of our longitudinal study. More specifically, concerning the indirect pathway, we expected more parental social anxiety to be associated with stronger FNCE and we expected stronger FNCE to be associated with more intrusive parenting, more negative parenting, and *less* encouragement of social daring. Subsequently, we expected more intrusive parenting, more negative parenting, and *less* encouragement of social daring to mediate the indirect pathway from more FNCE to more child social anxiety. Regarding the direct pathway, we expected higher parental social anxiety to be associated with higher FNCE and with higher child social anxiety, independent of parenting. Third, because previous studies on FNCE suggest that intergenerational pathways differ between parents, we explored the intergenerational pathways of social anxiety for fathers and mothers by testing our hypotheses separately in fathers and mothers. To overcome the limitation of the previous studies about FNCE that used the overly strict Baron and Kenny method (Baron & Kenny, 1986) to test mediation, we used the bootstrapping method (Hayes, 2009) to detect indirect effects that would support FNCE as part of a mechanism explaining the intergenerational transmission of social anxiety.

Method

Participants

Participants were 113 couples (M age fathers = 41.6 years, SD = 5.4; M age mothers = 38.6 years, SD = 4.1) and their first-born child (62 (55%) girls; M age = 89.9 months, SD = 1.33) who participated in the 7.5 years measurement of the study the Social Development of Children (see Majdandžić et al., 2018). This ongoing longitudinal study is conducted in the Netherlands and up till now consists of one prenatal measurement and five postnatal measurements that were conducted when the child was 4 months, 1 year, 2.5 years, 4.5 years, and 7.5 years old. Couples who were expecting their first child were recruited by midwives in Amsterdam and in cities within a range of 50 km around it, at pregnancy courses, and at baby shops, and through advertisements in magazines and on websites on parenthood.

Inclusion criteria were adequate command of the Dutch or English language for parents. Exclusion criteria were neurological deficits, a birth weight < 2500 g, and/or an Apgar score < 8 for the infants. After completing a measurement, families received a 20 euro gift voucher, and, at the postnatal measurements, a small present for the child and a recording of the laboratory sessions. The ethics committee of the University of Amsterdam approved the study and written informed consent from all parents was obtained. The study was conducted in accordance with the 1964 Helsinki Declaration.

The majority of parents in the original sample was of Dutch origin (89% of mothers, 95% of fathers) and parents' educational and professional level were fairly high (educational level [on a scale from 1: primary education, to 8: university]: mothers: M = 7.05, SD = 1.11; fathers: M = 6.57, SD = 1.59; professional level [on a scale from 1 (manual labor for which no education is required) to 11 (labor for which a university degree is required)]: mothers: M = 8.70, SD = 2.11, fathers: M = 8.22, SD = 2.66.

A total of 38 families dropped out between the prenatal measurement, that started with 151 families, and the 7.5 years measurement. Dropout analyses comparing dropped out families and participating families on demographic variables revealed that dropped out families had a lower mean educational level (M = 6.33, SD = 1.24 on a scale from *1* = primary school to *8* = university) than participating families (M = 6.89, SD = 1.09; $t(149) = 2.63$, $p = 0.010$), but they did not differ on mean professional level ($M_{\text{dropout families}} = 7.89$, $SD = 2.15$; $M_{\text{participating families}} = 8.53$, $SD = 2.06$ on a scale from 1 = manual labor for which no education is required to 11 = labor for which a university degree is required; $t(149) = 1.62$, $p = 0.106$). Concerning fathers' and mothers' social anxiety (prenatal measurement) and FNCE (1st post-natal measurement), no statistically significant differences were found between dropouts and completers (all p-values > 0.20).

Procedure

At the prenatal assessment, couples filled out questionnaires and completed a diagnostic interview. At the postnatal assessments, mothers and fathers filled out questionnaires, visited the laboratory separately with their child and home visits were made. For a description of measurements (see Majdandžić et al., 2018). For the present study, questionnaire

data on parents' and children's social anxiety, parents' FNE, FNCE, and parenting behavior were used from the 7.5 years measurement. The present selection was made because data on parents' FNE, a mediator variable, was only collected at the 7.5 years measurement.

Materials

Social Anxiety in Children

Social anxiety in children was measured through parent report (both fathers and mothers), using the social anxiety subscale of the Screen for Child Anxiety Related Emotional Disorders (SCARED; Birmaher et al., 1999; Bodden et al., 2009) and by child self-report, using the social phobia subscale of Picture Anxiety Test (PAT; Dubi & Schneider, 2009).

The social anxiety subscale of the SCARED consists of 9 items (e.g., "My child feels nervous with people he/she doesn't know well") which are scored on 0–2-point scales. Psychometric properties of the Dutch translation are good to excellent (Bodden et al., 2009). Cronbach's alpha in the present sample was good: 0.86 for mother- and 0.83 for father-report. Mother and father ratings of child social anxiety were significantly correlated: $r = 0.62$, $p < 0.001$, and were averaged into a composite score to obtain a more robust measure of child social anxiety.

The social phobia subscale of the PAT consists of 3 pictures representing different social situations, which are presented to the child. After each picture, the child is shown two pictures depicting two responses of a child to that situation. The child choses the response that best reflect his/her own reaction to or feelings in that situation. A mean score was calculated for the social phobia subscale that ranged from 0 to 3, with higher values representing more social anxiety. Psychometrics of the PAT are adequate to good (Dubi & Schneider, 2009). The Cronbach's alpha for the social phobia subscale in this study was acceptable: 0.69.

Social Anxiety in Parents

Parents' social anxiety was measured with the short Social Phobia and Anxiety Inventory-18 (SPAI-18; de Vente et al., 2014). In the short SPAI-18, the multiple responses per item (e.g., when confronted with strangers, authority figures, etc.) that are required for 15 items in the SPAI-18 were replaced by a single response per item using the wording: "with other people". Parents reported how often they experienced anxiety in various social situations (e.g., "I feel anxious when I am in a social situation and I become the center of attention"). Items are rated on 1–7 Likert-type scales (1—*never*, 7—*always*). Internal consistency of the short SPAI-18 was excellent: Cronbach's alpha = 0.95 for fathers and 0.96 for mothers.

Fear of Negative Evaluation in Parents

Parents' fear of negative evaluation was measured with the brief Fear of Negative Evaluation Questionnaire (FNE-Q; Leary, 1983), which consists of 12 items assessing worries and fears regarding negative evaluation ("Sometimes I think I am too concerned with what other people think of me."). Items were scored on 5-point Likert-scales ranging from 0—*not at all characteristic of me* to 4—*extremely characteristic of me*. Higher scores indicate more worries about fear of negative evaluation. Internal consistency of the brief FNE-Q was excellent: Cronbach's alpha = 0.95 for fathers and 0.97 for mothers.

Fear of Negative Child Evaluation

Fear of negative child evaluation was measured with the Fear of Negative Child Evaluation Questionnaire (FNCE-Q; Majdandžić et al., 2008a), which consists of 10 items assessing worries and fears regarding negative evaluation of one's child ("I worry about what kind of impression my child makes on others."). Items were scored on 5-point Likert-scales ranging from 0—*not at all characteristic of me* to 4—*extremely characteristic of me*. Higher scores indicate more worries about fear of negative evaluation of the child. Internal consistency of the FNCE-Q was excellent: Cronbach's alpha = 0.90 for fathers and 0.95 for mothers.

Parenting Behavior

Intrusiveness, negative parenting, and encouragement of social daring were assessed by self-report with the Comprehensive Parenting Behavior Questionnaire for 7–12-year-old children (CPBQ7-12; Majdandžić et al., 2008b). This questionnaire consists of 80 items and covers various rearing dimensions including Overinvolvement, Negativity and Challenging parenting behavior. From the Overinvolvement dimension, we used the sub-scale Intrusiveness which consists of 6 items and assesses the extent to which parents overtly control the child (e.g., "I often tell my child how he/she should behave"). The Negativity dimension consists of 6 items and assesses the degree to which the parent shows rejective or hostile parenting behaviors (e.g., "When I have had enough of my child, I sometimes make an aggressive comment"). From the Challenging parenting dimension, we used the subscale Encouragement of social daring, which consists of 9 items addressing the extent to which the parent encourages the child to meet new people and stand up for him/herself (e.g., "I encourage my child to undertake new hobbies or activities where he/she will meet new people.").

Items are rated on 5-point Likert-scales (1—*totally not applicable*, 5—*completely applicable*). Internal consistencies of the (sub)scales were adequate (Cronbach's alpha's mothers: Intrusiveness: 0.68; Negativity: 0.75; Encouragement of social daring: 0.70; fathers: Intrusiveness: 0.73; Negativity: 0.73; Encouragement of social daring: 0.72).

Statistical Approach

Outliers (values > z = |3.29|; Tabachnick & Fidell, 2013) were winsorized, that is, replaced by the nearest value within the normal range. Initially, we calculated correlation coefficients between all study variables. To test each of the three hypotheses, we conducted separate regression analyses and estimated indirect effects for the hypothesized mediating variables (i.e., FNE, FNCE and parenting behaviors) using PROCESS macro version 3.0 for SPSS (version 25) developed by Hayes (2017). In the PROCESS macro indirect effects are estimated using bootstrapping (5000 samples). To obtain standardized regressions coefficients (bèta's), variables were standardized using a z-transformation before analyses. We first tested whether parents' social anxiety extends to FNCE via the mediator FNE. Next, we tested the intergenerational model in two steps: 1) mediation of the social anxiety—parenting association by FNCE (to learn whether FNCE potentially affects parenting behavior); and 2) double mediation of the parent—child social anxiety association by FNCE and parenting behavior (to learn whether FNCE and parenting behavior potentially play a role in the intergenerational transmission of social anxiety). Since we explored differences between parents in intergenerational transmission of social anxiety, analyses were conducted separately for fathers and mothers.

Results

Initial Analyses and Descriptive Information

A total of 106 families provided questionnaire data at the 7.5 years measurement, however, several questionnaires were not completed resulting in missing data for some variables. In this paper we report about data from 99 families that provided data for at least one of the planned mediation models. Outliers were found in the following variables: FNCE (1 father, 2 mothers), social fear scale of the SCARED (1 parent couple), and PAT (1 child) and winsorized. After winsorizing, variable distributions were visually inspected and appeared to be approximately normal.

Mean parents' rating of children's social anxiety was 3.89 (range: 0–14; $SD = 3.29$; $N = 99$) on the social fear scale of the SCARED, which is below the clinical cut-off score of 8 used to discriminate between children and adolescents with and without social anxiety disorder (Bodden et al., 2009). The mean score of social anxiety as reported by child report on the PAT was: 0.73 (range: 0–3; $SD = 0.66$; $N = 86$). Descriptive statistics of predictor and mediator variables are presented in Table 1. Parents scored on average well below the clinical cut-off score of 48 used to discriminate between patients that applied for therapy for social anxiety disorder and a healthy reference group (de Vente et al., 2014). Mothers showed higher means than fathers for social anxiety, FNE and FNCE; however, only the differences on FNE and FNCE reached statistical significance ($t(76) = 4.83$, $p = < 0.001$; $t(82) = 2.21$, $p = 0.030$, respectively). Concerning parenting, no statistically significant father-mother differences occurred, except for social daring, on which mothers scored higher than fathers ($t(76) = 2.63$, $p = 0.010$).

Correlation coefficients between all study variables are presented in Table 2. Parent social anxiety, FNE and FNCE were significantly positively related for both fathers and

Table 1 Means and standard deviations of the predictor and mediator variables

	Fathers			Mothers		
	N	*M*	*SD*	*N*	*M*	*SD*
Mediator (/outcome) variables						
FNE (FNE-Q)	84	8.50	8.61	92	15.34	11.91
FNCE (FNCE-Q)	84	6.49	5.99	92	8.81	8.37
Intrusive parenting (CPBQ7-12)	84	2.15	0.58	92	2.10	0.57
Negative parenting (CPBQ7-12)	84	2.08	0.54	92	2.01	0.56
Encouragement of social daring (CPBQ7-12)	84	3.89	0.47	92	4.09	0.45
Predictor variable						
Parents' social anxiety (short SPAI-18)	84	26.54	15.28	92	30.41	15.63

CPBQ7-12 Comprehensive Parenting Behaviour Questionnaire—7–12-year version; *short SPAI-18* short version of the SPAI-18; *FNE(-Q)* Fear of Negative Evaluation(-Questionnaire); *FNCE(-Q)* Fear of Negative Child Evaluation(-Questionnaire)

Table 2 Pearson's correlation coefficients between outcome, predictor, and mediator variables (p-values within parentheses) for fathers (lower left triangle) and mothers (upper right triangle)

	1	2	3	4	5	6	7	8
Outcome variables								
Child social anxiety								
1. *Parents' report* (SCARED)	–	**.36 (.001)**	**.35 (.001)**	**.21 (.040)**	.16 (.129)	.12 (.255)	.09 (.386)	**– .33 (.001)**
2. *Child report* (PAT)	**.36 (.001)**	–	**.24 (.033)**	.10 (.374)	– .06 (.612)	.06 (.611)	.08 (.452)	– .14 (.224)
Predictor variable								
3. Parents' social anxiety (short SPAI-18)	**.26 (.016)**	– .09 (.442	**–**	**.68 (<.001)**	**.32 (.002)**	**.31 (.003)**	**.31 (.003)**	**– .39 (<.001)**
Mediator variables								
4. Parents' FNE (FNE-Q)	**.34 (.002)**	.00 (.985)	**.69 (<.001)**	–	**.47 (<.001)**	**.23 (.026)**	.20 (.055)	– .31 (.229)
5. FNCE (FNCE-Q)	**.23 (.039)**	.00 (.989)	**.43 (<.001)**	**.62 (<.001)**	**–**	**.51 (<.001)**	**.33 (.001)**	– .05 (.670)
6. Intrusive parenting (CPBQ7-12)	– .18 (.108)	**– .24 (.049)**	.16 (.144)	**.23 (.038)**	**.35 (.001)**	**–**	**.62 (<.001)**	**– .23 (.029)**
7. Negative parenting (CPBQ7-12)	– .11 (.317)	– .17 (.169)	**.29 (.008)**	**.22 (.046)**	.12 (.269)	**.51 (<.001)**	**–**	– .15 (.157)
8. Encouragement of social daring (CPBQ7-12)	.01 (.956)	– .14 (.247)	– .08 (.472)	– .09 (.442)	– .18 (.100)	– .21 (.051)	– .10 (.384)	–

Statistically significant results are presented in bold

CPBQ7-12 Comprehensive Parenting Behaviour Questionnaire—7–12-year version; *short SPAI-18* short version of the SPAI-18; *FNE(-Q)* Fear of Negative Evaluation(-Questionnaire); *FNCE(-Q)* Fear of Negative Child Evaluation(-Questionnaire).

mothers. Parents' report and child report of child social anxiety were significantly positively related, illustrating reporter agreement on child social anxiety.

In support of intergenerational transmission of social anxiety, we found that fathers' and mothers' social anxiety was significantly positively related to child social anxiety (measured through parent and child report), except for the association between fathers' social anxiety and parents' report of child social anxiety.

Fathers' and mothers' social anxiety were positively related to both intrusive and negative parenting, and negatively related to encouragement of social daring, but the associations with intrusive parenting and encouragement of social daring for fathers were not statistically significant. FNE, however, was significantly positively associated with intrusive parenting and negative parenting for both parents, illustrating that more social anxiety as indexed by its core belief FNE, is associated with more intrusive and more negative parenting. Associations of FNE with encouragement of social daring were very small and statistically non-significant for both parents.

FNCE was positively related to both intrusive and negative parenting for both parents, however, the association between FNCE and negative parenting did not reach statistical significance among fathers. FNCE was negatively associated with encouragement of social daring for both parents, however, the associations were statistically non-significant.

Regarding the parenting-child social anxiety associations, we found negative, rather than positive, associations between negative and intrusive parenting and child social anxiety for fathers, but only the association between intrusive parenting and child social anxiety reported by the child was statistically significant. Concerning encouragement of social daring among fathers, we found a small negative association with child social anxiety (child report only), which was in the expected direction but statistically non-significant. For mothers, associations between intrusive and negative parenting and child social anxiety were in the predicted direction, though small and not statistically significant. Concerning mothers' encouragement of social daring, in accordance with our prediction, we found a significant negative association with child social anxiety (parent report) and a similar result concerning child self-report, which was not statistically significant, though.

Extension of Parental Social Fear Beliefs to Their Child

Extension of parents' social fear beliefs to their child's environment was tested using a mediation model (model 4, as defined by Hayes, 2013) with parents' FNE as a mediator, parents' social anxiety as the independent variable and parents' FNCE as the dependent variable ($n = 84$ for fathers, $n = 92$ for mothers). Figure 1 shows the mediation models for fathers and mothers. As predicted, we found significant

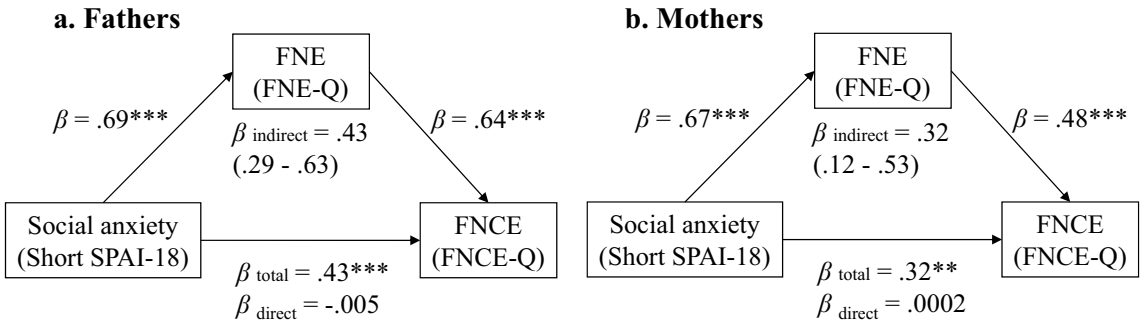

Fig. 1 Mediation models regarding the associations between social anxiety, fear of negative evaluation (FNE) and fear of negative child evaluation (FNCE) and indirect effects for fathers (**a**) and mothers (**b**) *Note* Coefficients are standardized beta's with bootstrapped confidence intervals for indirect effect within brackets. *$p < .05$; **$p < .01$; ***$p < .001$

indirect effects through FNE for both fathers ($\beta = 0.43$, SE = 0.09, CI = 0.29–0.63) and mothers ($\beta = 0.32$, SE = 0.11, CI = 0.12–0.53).

Intergenerational Transmission of Social Anxiety Through FNCE and Parenting

To assess the mediating role of FNCE in intergenerational transmission of social anxiety, we first ran four mediation models, using mediation model 4 (Hayes, 2013), in which FNCE was assessed as a mediator in the parents social anxiety—parenting behavior association ($n = 84$ for fathers and $n = 92$ for mothers). In this manner, we aimed to test the part of the model in which parents' social anxiety is associated with certain parenting behaviors (known for their association with child social anxiety) through FNCE. We found significant indirect effects for FNCE in the association between fathers' and mothers' social anxiety and their intrusive parenting (fathers: $\beta = 0.15$, SE = 0.06, CI = 0.04–0.29; mothers: $\beta = 0.14$, SE = 0.06, CI = 0.04–0.27) and negative parenting (mothers: $\beta = 0.08$, SE = 0.05, CI = 0.01–0.20) (see Fig. 3). The indirect effect for FNCE in the association between social anxiety and negative parenting was not significant for fathers and the indirect effect for FNCE in the association between social anxiety and encouragement of social daring was not statistically significant for both parents. In Fig. 2, the models with significant indirect effects are presented.

To test the mediating role of FNCE combined with parenting behavior in the intergenerational transmission of social anxiety, we used a series of double mediator models with FNCE and parenting behavior (intrusive parenting, negative parenting and encouragement of social daring, respectively) as mediators, parents' social anxiety as the independent variable and child social anxiety as the dependent variable (for child anxiety parent report: $n = 84$ for fathers and $n = 92$ for mothers; for child anxiety child report n = 71 for fathers and n = 82 for mothers). Indirect effects were obtained for FNCE individually as an index of the direct pathway through FNCE and for FNCE combined with parenting as an index of the indirect pathway through both FNCE and parenting, using mediation model 6 (Hayes, 2013).

Concerning the direct pathway between parent and child social anxiety through FNCE, we found a significant indirect effect for fathers ($\beta = 0.10$, SE = 0.06, CI = 0.01–0.24, $n = 84$). In support of the indirect pathway through FNCE and parenting, we found a significant indirect effect for FNCE combined with intrusive parenting for fathers ($\beta = -0.04$, SE = 0.02, CI = − 0.10–− 0.01, $n = 84$) in the association between fathers' social anxiety (short SPAI-18) and child social anxiety (parent report). Both indirect effects (M1 and M1&2, respectively) are depicted in Fig. 2. We found no significant indirect effects for mothers ($n = 92$ for models including child social anxiety parent report and $n = 82$ for models including child social anxiety child report) and no significant indirect effect through FNCE and negative parenting behavior or encouragement of social daring for fathers ($n = 84$ for models including child social anxiety parent report and $n = 71$ for models including child social anxiety child report). In Fig. 3, the model with significant indirect effects is presented. To test the robustness of this model, we reanalyzed the data using independent father and mother ratings of child social anxiety. Results were highly similar to those obtained using the child social anxiety composite measure, only the indirect effect regarding father FNCE in the father social anxiety—child social anxiety rated by mothers was somewhat lower, no longer significant, but still in the expected direction: 0.07 (CI: − 0.03–0.21).

Discussion

The goal of this study was to assess the role of both parents' FNCE in the intergenerational transmission of social anxiety by (1) testing a core assumption that parents FNE extends to their child('s environment), resulting in FNCE, and (2) examining intergenerational pathways through FNCE and

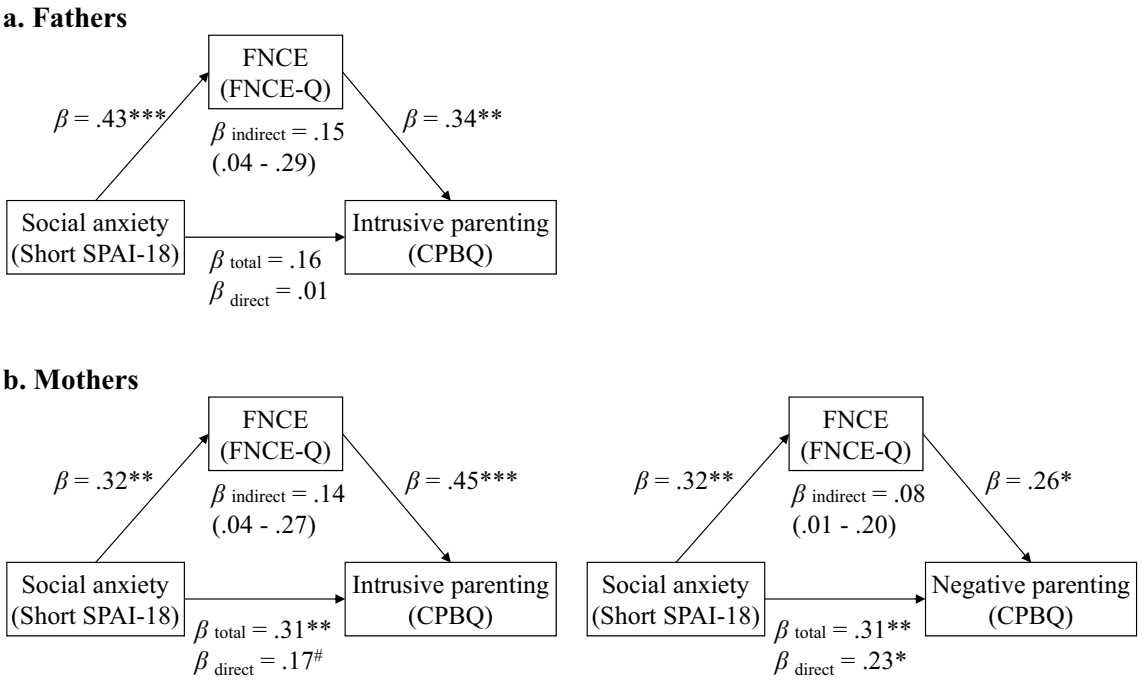

Fig. 2 Mediation models regarding the associations between social anxiety, fear of negative child evaluation (FNCE) and parenting behavior for fathers (**a**) and mothers (**b**). *Note*. Coefficients are standardized beta's with bootstrapped confidence intervals for indirect effect within brackets. *$p < .05$; **$p < .01$; ***$p < .001$

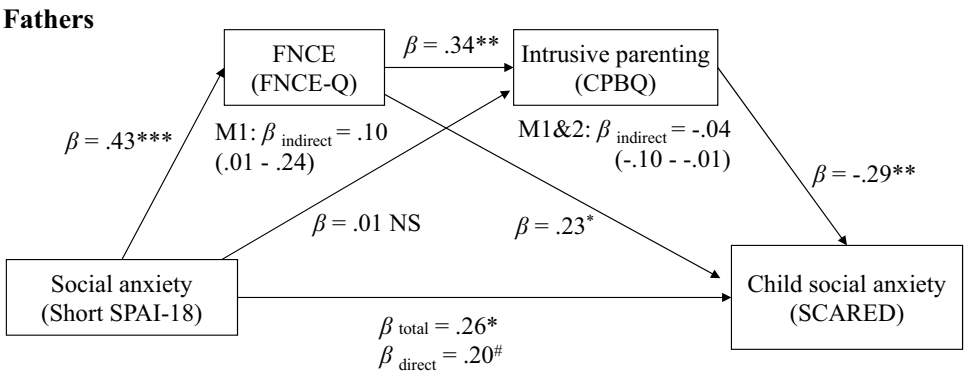

Fig. 3 Mediation model regarding the associations between parent social anxiety, fear of negative child evaluation (FNCE), intrusive parenting behavior, and child social anxiety for fathers. *Note* Coefficients are standardized beta's with bootstrapped confidence intervals for indirect effect within brackets. M1: Indirect effect of FNCE in the association between fathers' social anxiety and child social anxiety. M1&2: Indirect effect of FNCE and intrusive parenting combined in the association between fathers' social anxiety and child social anxiety. *$p < .05$; **$p < .01$; ***$p < .001$

parenting behavior. First, we found strong support for extension of fathers' and mothers' FNE to FNCE, as we demonstrated almost complete mediation of the social anxiety—FNCE association by FNE for both fathers and mothers. This means that socially anxious fathers and mothers who strongly fear negative evaluation by others also expect their child to be negatively evaluated by others. Second, analyses on the mediating role of FNCE in the parents' social anxiety—parenting relationship showed that FNCE mediates the relation between social anxiety and intrusive (fathers and mothers) and negative (mothers only) parenting, which are parenting dimensions that have both been associated with more social anxiety in children. Moreover, both the direct and indirect intergenerational pathway of social anxiety through FNCE among fathers was supported, as we found FNCE to mediate the relation between father and child social anxiety and we found joint mediation of FNCE and intrusive parenting behavior in the fathers' and child social anxiety

relation. Taken together, we found support for FNCE as part of a mechanism explaining intergenerational transmission of social anxiety in middle childhood.

Our findings regarding the associations of FNCE with parents' social anxiety and FNE strengthen the validity of the FNCE construct, as until now, only associations of FNCE with social anxiety, that is, experiencing anxiety in social situations, but not with its core belief FNE, had been reported (de Vente et al., 2011; Schreier & Heinrichs, 2010). Moreover, the finding that parents' FNE is strongly associated with FNCE, together with the results of Lester et al. (2009) on parents' extension of threat bias to their child's environment provides additional support for the idea that parents fear beliefs are extended to their child's environment.

Concerning the direct intergenerational pathway of social anxiety through FNCE in school-aged children, our finding of FNCE as a mediator in the parent–child social anxiety association is in line with our previous finding in infancy (de Vente et al., 2011) and the study of Schreier and Heinrichs (2010) in adolescence. Like previous findings, our study showed that a higher level of parental social anxiety was associated with a higher level of FNCE and a higher level of child social fear/anxiety. Our current findings further strengthen the notion that FNCE is part of a mechanism that could act through for example expressed parental fear and thereby explain intergenerational transmission of social anxiety. Concerning the indirect intergenerational pathway through FNCE and parenting behavior, the findings that FNCE mediated the association between parents' social anxiety and intrusive and negative parenting, which are both known to be associated with child social anxiety (e.g., Lieb et al., 2000; McLeod et al., 2007; Möller et al., 2016; van der Bruggen et al., 2008), provided initial support for FNCE as a relevant factor in the intergenerational transmission of social anxiety through parenting behavior. Our subsequent finding of double mediation of FNCE and intrusive parenting in the father-child social anxiety relation provides initial support for an additional intergenerational pathway through both FNCE and parenting behavior, a pathway which had not been assessed in previous studies.

Our results further suggest that FNCE is not only involved in a transmission-of-risk pathway, but may also act in a protective manner, since higher FNCE in socially anxious fathers was associated with more intrusive parenting, which was in turn unexpectedly associated with a *lower* level of child social anxiety. Thus, socially anxious fathers that are high in FNCE and in intrusive parenting seem to reduce their child's risk for SAD. The protective intergenerational social anxiety pathway among fathers through FNCE and intrusive parenting behavior was unexpected. However, as the double mediation pathway remained significant independent of which parents reported about child social anxiety, it seems to be robust. Since we also found support for the commonly presumed social anxiety—FNCE—intrusive parenting *risk* pathway for child SAD in the father social anxiety—FNCE—intrusive parenting model, the protective pathway may suggest that for a subgroup of fathers, more intrusiveness implies more *involvement* (rather than "over-involvement") with the child, that may function protectively against social anxiety. Alternatively, this indirect pathway may reflect an effect of child characteristics on fathers' FNCE, such that for children low on social anxiety, in other words, the more extraverted, dominant and possibly impulsive children, socially anxious fathers experience more FNCE and demonstrate more intrusive parenting. Support for such an evocative effect of parents' psychological control by children's impulsivity has been found in studies about externalizing problems in children (e.g., Chen et al., 2020).

No significant associations between encouragement of social daring and FNCE were found for either parent. Our results seem to suggest that encouragement of social daring mediates the intergenerational transmission of social anxiety for mothers, given the significant correlations between mothers' social anxiety, their encouragement of social daring and child social anxiety (parent report only). However, FNCE does not seem to play a role in this transmission pathway in middle childhood, neither by increasing the risk, as predicted from theory on over-protective parenting, nor by protection from risk, like the results from the study of Schreier and Heinrichs (2010) on social encouragement suggested.

In our study, results differed for fathers and mothers. First, we found FNCE to mediate only the father-child social anxiety association, both directly through FNCE and indirectly, through FNCE and (less) intrusive parenting, but not the mother–child social anxiety association. Our results are consistent with our previous findings in infancy (de Vente et al., 2011), that supported FNCE as a mediator in the fathers' (but not the mothers') social anxiety—infant social fear association, but in contrast to the findings of Schreier and Heinrichs (2010), who found a mediating role of FNCE among mothers only. Together, these results suggest that fathers' and mothers' FNCE play a different role depending on age, as the study of Schreier and Heinrichs was conducted in adolescents and the current study in schoolchildren. Alternatively, differences in culture may explain this father-mother difference, as our longitudinal study was conducted among Dutch parents and Schreier and Heinrichs study among German parents. Thirdly, we cannot rule out that father-mother differences between the studies are due to differences in set-up and instruments. A second father-mother difference was our finding that FNCE mediated the associations between parents' social anxiety and negative parenting only among mothers and not among fathers. Again, these results are consistent with our previous findings (de Vente et al., 2011) that also showed FNCE to mediate the association between mothers' social anxiety

and negative parenting in infancy, but not in fathers. Taken together, our results suggest that fathers' and mothers' FNCE plays a different role in the intergenerational transmission of social anxiety that may depend on age and/or culture. In line with results from other studies on father-mother differences in the context of anxiety development (e.g., see Möller et al. [2016] for a review), our results support the model of Bögels and Phares (2008), in which fathers and mothers, due to their different roles in child upbringing, are presumed to differentially affect anxiety in their children.

Several limitations of this study need to be considered. First, this study had a cross-sectional design, hence causal inferences cannot be made. Second, our sample consisted primarily of relatively highly educated, Caucasian families, thereby confining generalizability of our findings to other populations. Third, we included parent report of social anxiety and parenting behavior and the mediation models were only significant for parent-reported social anxiety of the child, but not for child-reported social anxiety. One may argue that our associations were inflated due to data coming for the same source (i.e., informant). It should be noted though, that parent report of child social anxiety was based on averaged father and mother report, so inflation is probably not very strong. Moreover, there is evidence to suggest that parent-report of child social anxiety has a better diagnostic value than child reported social anxiety (Bodden et al., 2009). However, future research using observational data of parenting behavior to test these models would yield stronger support for the role of FNCE in the intergenerational transmission of social anxiety. Fourth, we measured parents' social anxiety as a trait and child social anxiety symptoms rather than SAD itself. Although the trait level and symptoms of social anxiety are highly predictive of SAD (Bodden et al., 2009; de Vente et al., 2014), we cannot extrapolate our findings to clinical levels of social anxiety as displayed in individuals diagnosed with SAD.

Our findings give rise to the following directions for future research. First, future studies may further address the assumption that FNE extends to FNCE by exploring the more specific content of the FNCE beliefs (e.g., "all people are critical, so I expect my child to be critically evaluated by others" versus "my child is shy, like me, and therefore I expect my child to be negatively evaluated by others") and/or using an experimental design to test the causal relation between the constructs. Second, future studies may explore other parental behaviors in association with FNCE, such as expressed fear, modelling, and/or reinforcing fear reactions or avoidant behaviors. We found evidence for both a direct (through FNCE) and an indirect intergenerational pathway (through FNCE and intrusive parenting), which suggests that FNCE affects child social anxiety in multiple ways. Hence, studying additional parent behaviors in association with parent and child social anxiety may reveal additional intergenerational social anxiety pathways of risk and protection. Third, while we focused on relations directed from FNCE to parenting and child social anxiety, these relations may also exist in the opposite direction. For example, the child's shyness may evoke FNCE in the parent, because shyness is valued less in western societies with a preference for extraversion and assertiveness. Future studies may study bidirectional associations of FNCE with parent and child social anxiety using experimental designs and/or more advanced modelling, such as cross-lagged panel modelling, using longitudinal data in order to further unravel the role of FNCE in the intergenerational transmission of social anxiety.

FNCE is a promising target to address in cognitive therapy for parents with SAD, in order to reduce the risk of intergenerational transmission of SAD. However, until now, causal relations between parent social anxiety, FNCE and child social anxiety have not been established yet. Therefore, further experimental evidence is required before specific clinical implications can be made.

Our study is the first to provide direct evidence for extension of parents' FNE to their child resulting in FNCE. Furthermore, our study is the first to provide direct support for an intergenerational pathway of social anxiety through FNCE and parenting behavior. Furthermore, we replicated the earlier findings of intergenerational transmission of social anxiety through FNCE, but now in middle childhood. In sum, this study offers substantial further evidence for the role of FNCE in the intergenerational transmission of social anxiety. In addition, FNCE is a promising factor to be targeted by cognitive behavioral parent-directed interventions.

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Declarations

Conflict of interest Wieke de Vente, Mirjana Majdandžić, and Susan M. Bögels declare that they have no conflict of interest.

Ethical Approval and Informed Consent The ethics committee of the University of Amsterdam approved the study and written informed consent from all parents was obtained. The study was conducted in accordance with the 1964 Helsinki Declaration.

Animal Rights No animal studies were carried out by the authors for this article.

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