CrossMark

ORIGINAL ARTICLE

# Maternal Parenting and Child Behaviour: An Observational Study of Childhood Social Anxiety Disorder

Julia Asbrand[1] · Jennifer Hudson[2] · Julian Schmitz[3,4] · Brunna Tuschen-Caffier[1]

**Abstract** Etiological models of social anxiety disorder (SAD) suggest parenting is involved in the development of SAD. However, previous studies have often neglected potential contributions of child behaviour to parenting behaviour. Further, parent–child interaction has often been assessed in artificial laboratory settings thereby impairing ecological validity. Children (aged 9–13 years) with SAD ($n=27$) and healthy controls (HC, $n=27$) completed a puzzle task with mothers present at home. Parent–child interactions were analysed for parenting (e.g., negativity, involvement) and child behaviour (e.g., dependence, helplessness). Mothers of children with SAD showed more involvement than mothers of HC children. Maternal involvement was related to child dependence in HC dyads only, while maternal negativity was correlated with negative child behaviour in both groups. The study indicates maternal over-involvement in their interactions with children with SAD at home. The lack of relation to child behaviour in SAD dyads points to inflexibility in mother–child interactions.

✉ Julia Asbrand
julia.asbrand@psychologie.uni-freiburg.de

1    Department of Clinical Psychology and Psychotherapy,
     Institute of Psychology, University of Freiburg, Freiburg,
     Germany

2    Department of Psychology, Centre for Emotional Health,
     Macquarie University, Sydney, Australia

3    Department for Clinical Child and Adolescent Psychology,
     University of Leipzig, Leipzig, Germany

4    Leipzig Research Center for Early Child Development,
     University of Leipzig, Leipzig, Germany

## Introduction

Social anxiety disorder (SAD) usually emerges during late childhood or early adolescence and often persists if untreated (Chavira et al. 2004; Wittchen et al. 1999). Up to 7% of children and adolescents meet diagnostic criteria for SAD at some point in their development (Chavira et al. 2004). The persistent fear of embarrassment in social situations and evaluation by others eventually leads to the avoidance of social situations (DSM5; American Psychiatric Association 2013) and consequently impairs affected children's lives in several domains such as social relationships, academic performance, and general well-being (Kashdan and Herbert 2001; Spence and Rapee 2016). Etiological models of SAD as well as previous research support the relevance of both intra-individual (e.g., cognitive biases) and external factors such as family and peers for the development and maintenance of social fears (Spence and Rapee 2016). As the family is a particularly crucial environment in children's development, parenting has often been regarded as important external influence (e.g., Beidel and Turner 2007). However, research to date has mostly focused on the assessment of samples with mixed anxiety disorders in rather artificial laboratory settings, making inferences about SAD and naturalistic processes difficult. Further, the role of the child within parent–child interactions and his/her contribution to dysfunctional interactions has often been neglected (for an overview see McLeod et al. 2007). Hence, the aim of the current study was to shed light on the relevance of parenting factors in SAD in particular as well as the child's contribution to the interaction. Due to the peak of onset of SAD in early adolescence, as well as the developmental task of gaining independence (Beidel and Turner 2007), we focus on early adolescence between the ages of 10–13.

## Parenting Factors in SAD

Several etiological models of general pathological anxiety (e.g., Ballash et al. 2006; McLeod et al. 2007; Ollendick and Benoit 2012) as well as models of SAD in particular (e.g., Ollendick and Benoit 2012; Spence and Rapee 2016) focus on parenting as an important factor in the disorder's development and maintenance.

### Parental Involvement and Anxiety

In particular, most models postulate that *high parental involvement* can restrict the child's independence and lead to the child's avoidance of new situations (over-involvement, sometimes labelled "over-control"; e.g., Chorpita and Barlow 1998; Hudson and Rapee 2001; McLeod et al. 2007; Rapee 2001). A broad definition of over-involvement involves excessive interfering in children's behaviours, thoughts, and feelings, and not allowing the child to develop independence (Chorpita and Barlow 1998; Wood et al. 2003). If examined in the context of an interaction task, over-control seems a more applicable term as defined in a recent meta-analysis (Möller et al. 2016): the parent interferes with the child's behavior and neglects the child's needs, interests and desires thus restricting their autonomy. Over-involvement in the general sense (thus including both overcontrol and overprotection, see Möller et al. 2016) can heighten child anxiety by increasing the child's perception of threat (Rapee 2001), reducing their perceived threat control (Chorpita et al. 1998), or limiting their access to new challenging situations (Barlow 2002). Thus, if parents prevent their child from experiencing a sense of control in novel age-appropriate situations, the child may have difficulty developing a sense of self-efficacy and control of their own actions (McLeod et al. 2007). On the other hand, parenting behaviour which supports the child to act independently and to face difficult situations is assumed to be a protective factor, reducing the risk of developing an anxiety disorder (Rapee 2001).

Research has repeatedly shown over-involvement to be important for the development of anxiety in general (cf. Van der Bruggen et al. 2008; McLeod et al. 2007). Social anxiety, however, has only been addressed in subclinical samples or preschool samples, and thus there remains uncertainty over the relevance of parental over-involvement in SAD (Mills and Rubin 1998). The few existing studies on involvement and social anxiety (e.g., Bögels et al. 2001, 2011) suggest that children's initiative might be discouraged through parental over-involvement, leading to a lack of social skills in the long run through less social experiences and practice. Furthermore, autonomous child behaviour might be negatively associated with shame and anxiety due to the parents' overprotective reaction (Bögels et al. 2001). Interestingly, it is mainly children's *perception* of maternal overprotection that has been associated with social anxiety (Bögels et al. 2001).

### Parental Negativity and Anxiety

Beside parental involvement, a high level of *parental negativity* can be considered to be a second important parenting factor contributing to high social anxiety in children. Parental negativity can be conceptualized as lack of warmth, withdrawal, and rejection, and is often linked to high levels of criticism towards the child (e.g., McLeod et al. 2007). While a few studies have indeed found heightened negativity in mothers of children with mixed anxiety disorders (e.g., age 7–15 years; Hudson and Rapee 2001), many other studies have failed to do so (for an overview, see McLeod et al. 2007; Möller et al. 2016). As there are relatively few studies of SAD or high social anxiety specifically (mean age 11 years, Greco and Morris 2002; Hummel and Gross 2001), no clear conclusion can be made (cf McLeod et al. 2007; Möller et al. 2016).

## Interactional Processes and Child Characteristics in SAD

Broadening the traditional approach of assessing parenting behaviour, an increasing number of researchers have acknowledged that processes between parents and their children occur *reciprocally* rather than unidirectionally through parenting behaviour only (e.g., Chorpita and Barlow 1998; Dumas et al. 1995; Hudson and Rapee 2001; Rapee 2001; Rubin and Mills 1991). Thus, they refer to the child as an active participant in the relationship who provokes certain parenting practices. Related to this, children with genetic vulnerability to SAD show increased social anxiety-related concerns and personality characteristics (e.g., a tendency to avoid harm, general anxiety; Stein et al. 2001). During interactions involving unfamiliar children, mothers have been observed to be more involved with anxious children than with nonclinical children (Hudson et al. 2009). Interactional models, therefore, assume that characteristics of the child such as high anxiety sensitivity lead to over-sensitive parenting (i.e., heightened involvement) with the aim of reducing children's distress.

However, as mentioned earlier, high levels of involvement are considered maladaptive as this parenting behaviour reduces the child's perceived competence and autonomy (Chorpita and Barlow 1998; Krohne and Hock 1991; Rapee 2001; Rubin and Mills 1991). Even though interactional processes have been deemed important (e.g., Hudson and Rapee 2001), specific research on the interaction, or more specifically the role of the socially anxious child in the interaction, is scarce (Hummel and Gross 2001).

In an attempt to comprehend interactional processes more thoroughly, several child characteristics that may influence parenting behaviour have been discussed. For example, negative child affect has been linked to parental negativity and involvement (Woodruff-Borden et al. 2002). Dumas et al. (1995) suggested that non-compliance in children could accompany both controlling and negative parenting. Additionally, child helplessness has been proposed to influence negative parenting practices such as high criticism (e.g., Hokoda and Fincham 1995). Since over-involvement reduces the child's autonomy, Rapee (2001) suggested a link between high child dependence and high parental involvement. However, there is only limited research on child characteristics—especially concerning social anxiety—and the specific influence of child behaviour on parenting practices, even though multiple sources stress the importance of both child behaviour and interactional processes (Chorpita and Barlow 1998; Dumas et al. 1995; Hudson and Rapee 2001; Rapee 2001; Rubin and Mills 1991).

Observational studies have proven to be more sensitive for detecting characteristics of parenting behaviour (McLeod et al. 2007) than self-report questionnaires (e.g., Caster et al. 1999; Grüner et al. 1999; Muris et al. 2000). Though now more commonly used, observational studies have mainly focused on samples with mixed anxiety disorders in general (e.g., Hudson and Rapee 2001, 2002; Van der Bruggen et al. 2010). Additionally, different observational systems often limit comparability between studies. Some recent research has come to studying parenting in child anxiety by differentiated systems such as the *Tangram Coding System* by Hudson and Rapee (2001) (Creswell et al. 2010; Hudson et al. 2009; Van der Bruggen et al. 2010). However, even though the number of studies on parenting and anxiety in general has increased, findings on SAD in particular are scarce and mostly only cover subclinical high social anxiety (Greco and Morris 2002; Hummel and Gross 2001). Fathers of high socially anxious children showed more controlling behaviour during an origami task than fathers of low socially anxious children, while children's behaviour did not differ (Greco and Morris 2002). Another study found that parents of anxious children uttered less verbalizations during a puzzle task with their child as well as provided less positive feedback and more negative feedback than parents of children with low social anxiety. Furthermore, in contrast to parents of low socially anxious children, parents of high socially anxious children did not mirror their child's behaviour concerning the quality of verbalizations (Hummel and Gross 2001).

Methodological concerns also apply to the assessment of child behaviour as it is often assessed by self- or parent report only (see McLeod et al. 2007). One often used questionnaire by Castro and colleagues (Castro et al. 1993)[1]

measures perceptions of parental rearing practices such as rejection, overprotection, emotional warmth, and anxious rearing. While some studies using this questionnaire found relations between anxiety and parental rearing behaviour (e.g., Grüner et al. 1999; Muris et al. 2000), others have failed to do so (e.g., Muris et al. 1996). As McLeod et al. (2007) pointed out, both interview and questionnaire measures underestimate the magnitude of the association between parenting and child anxiety leading them to suggest that future research rely more on observational methods. Specifically considering interactional patterns in SAD, research on child behaviour remains limited and should be based on observational methods rather than self-report. Furthermore, only a few studies have used observational systems (e.g., Dumas et al. 1995; Greco and Morris 2002; Hummel and Gross 2001) which have further clarified child behaviour.

Most studies have examined interactions in the laboratory which allows a standardized setting and thus high internal validity (Gardner 2000). However, parent–child interactions usually take place in different settings, mostly at home, and are restricted only by the task itself, e.g., homework. The rather artificial laboratory environment, though allowing for experimental control, might also lead to both mother and child behaving differently (Dadds and Sanders 1992; Gardner 2000). Assessment in the laboratory is especially difficult for children with SAD as they react very sensitively to new surroundings, but the influence on parents is also tangible as they often suffer from social anxiety as well if their offspring is affected (e.g., Knappe et al. 2009). Thus, it is essential to assess interactions in their usual setting. Since home situations are still often managed by mothers only, this study focuses on mothers in the parent–child interaction.

## The Current Study

Overall, while research on the child's influence on parent–child interaction is limited and inconclusive, research has pointed to a strong relationship between parental over-involvement and child anxiety disorders in general under laboratory conditions (Ballash et al. 2006; Hudson and Rapee 2001; McLeod et al. 2007). Based on these findings, we expected that mothers of children with SAD would show more involvement than mothers of healthy controls in a naturalistic setting. As research on maternal negativity in anxiety disorders is inconclusive, we did not make any a priori predictions about differences in maternal negativity between mothers of children with SAD and mothers of children without SAD (*Maternal Behaviour*; Hudson and Rapee 2001; McLeod et al. 2007). Regarding child behaviour, we expected children with SAD to show

---

[1] "Egna minnen beträffande uppfostran" (EMBU).

higher non-compliance, helplessness, dependence, and negative affect than healthy controls (*Child Behaviour;* e.g., Dumas et al. 1995; Hokoda and Fincham 1995; Rapee 2001; Woodruff-Borden et al. 2002). Finally, we examined relations between maternal parenting and child behaviour including the child's SAD diagnosis as a possible moderator (*Mother–Child Interaction;* e.g., Chorpita and Barlow 1998; Dumas et al. 1995; Hudson and Rapee 2001; Rapee 2001; Rubin and Mills 1991).

## Method

### Participants

Children (aged 9–13) were recruited by advertisements in local newspapers, medical facilities and information handed out in schools as part of a larger research project funded by the Deutsche Forschungsgemeinschaft (DFG, German Research Foundation)[2]. The main symptoms of SAD and further psychopathology were assessed in 188 families in an initial telephone screening. If the screening pointed to either strong SAD symptoms or no symptoms at all ($n = 99$), the families attended a diagnostic session with two interviewers who had been trained for 2 days in the administration of the German Kinder-DIPS (Schneider et al. 2009). The diagnostic session also included several questionnaires on demographics and psychopathology. Since anxiety is often elevated in mothers of children with SAD (Bögels et al. 2001; Velting and Albano 2001), mothers answered questionnaires about their own level of anxiety (see materials).

Children were included in the SAD group if they were assessed to have SAD as a primary diagnosis while all children in the healthy control (HC) group had no lifetime diagnosis of any mental disorder. After diagnostics, 34 children qualified for the SAD group by fulfilling a primary DSM-IV-TR diagnosis of SAD[3] while 28 children participated in the healthy control group. Of all included mother–child dyads, 55 agreed to participate in the interaction task[4].

For participation, all dyads received 10 € in vouchers for children and 20 € for parents. Additionally, children with

SAD were offered a specific SAD group treatment (Kley et al. 2012). The study was approved by the local ethics committee.

### Procedure

In an initial diagnostic session with child and parent, both became acquainted with the experimenter to achieve familiarization for the following testing session. Children first participated in testing sessions for the larger research project during which they were further familiarized with video equipment and the set-up of testing sessions. For the interaction task, the experimenter visited families' homes after these first sessions.

The first part of the testing session included a physiological task which is presented elsewhere[5]. This was followed 7–14 days later by the interaction task within the home. Children were instructed to solve as many of the 12 presented tangram puzzles as possible during a 10-minute-period, and were told that the results would be evaluated afterwards (Hudson and Rapee 2001). The mother was allowed but not encouraged to help. The high task difficulty (none of the dyads solved all puzzles within 10 min) aimed to induce mental stress and frustration among the children. The interaction was recorded by a video camera and conducted in private without the experimenter present in the room. As the task provided a clear goal (even though not achievable in time), it is similar to a typical task such as homework or another form of preparation for school. After the allotted 10 min, both mother and child rated their feeling of tension during the task (*0*—not tense at all to *8*—very tense). Later, trained coders blind to the diagnostic status of the child rated the videos (see below).

### Materials

#### Child

*Kinder-DIPS (Schneider et al. 2009)* The Kinder-DIPS covers the most frequent mental disorders in children and youth. It was modified and extended from the Anxiety Disorders Interview Schedule for children (ADIS-C; Silverman and Nelles 1988) and validated in German samples (Unnewehr et al. 1995). To reach a diagnosis on DSM-IV criteria, both parent and child are interviewed separately which leads to a combined diagnosis. Children met diagnos-

---

[2] The larger study, which will be presented elsewhere (Asbrand et al. 2016), consisted of a social stress test and an eyetracking task (two testing sessions), both conducted in the laboratory. Between 7 and 14 days passed before the testing session at home.

[3] At the beginning of the study, the DSM5 (APA 2013) had not yet been published.

[4] Due to technical problems in assessment of one SAD dyad, final data were available from 26 SAD and 27 HC dyads.

---

[5] The physiological task included physical changes of position and light exercise. Any kind of mental stress was aimed to be as low as possible. Between the physiological task and the current interaction task, a relaxation phase without any tasks took place to allow recovery from possible physical strain (Asbrand et al. 2016).

tic criteria if the severity rating was above 4 on a scale from *0* (no impairment) to *8* (very severe impairment).

### Social Anxiety Scale for Children—Revised (SASC-R; La Greca and Stone 1993)

The SASC-R measures social anxiety symptoms by child self-report (18 social anxiety items, e.g., "I get nervous when I talk to new kids") and by parental report, with total scores ranging from 18 to 90. Both children and parents respond to each item using a 5-point Likert-type scale ranging from *1* (not at all) to *5* (all the time). An adapted version for parental assessment was used. The SASC-R has satisfactory test–retest reliability (0.67) and internal consistency (0.76; La Greca et al. 1988). Moderate correlations have been confirmed with general measures of anxiety, self-perceptions of social confidence, teacher ratings of anxiety withdrawal, and peer nominations of popularity (Ginsburg et al. 1998). The internal consistency of the SASC-R in the current sample was excellent (child: $\alpha = .96$, mother: $\alpha = .98$).

### Mother

#### Symptom Checklist Short (SCL-K-9, Klaghofer and Brähler 2001)

The SCL-K-9, a short version of the SCL-90-R (Derogatis and Savitz 1999), includes 9 items to economically screen for the most common psychopathological symptoms in adults (e.g., anxiety, depression etc.). Symptoms experienced in the past week (e.g., "How often did you feel like you were worrying too much?") are assessed on a 5-point Likert scale ("not at all" to "very often"). Internal consistency for the questionnaire is excellent (Cronbach's $\alpha = .87$). Convergent validity has been established by correlation with similar questionnaires (Klaghofer and Brähler 2001). Internal consistency for the SCL-K-9 in the current sample was good (Cronbach's $\alpha = .79$).

#### Mini-Social Phobia Inventory (Mini-SPIN, Connor et al. 2001)

The Mini-SPIN assessed generalized social anxiety using three items (e.g., "Being embarrassed or looking stupid are among my worst fears") answered on a 6-point-scale (*0* "not at all" to *5* "extremely"). The authors suggest a cut-off at 6 which implies moderate symptoms of social anxiety. Sensitivity (94.6%) and specificity (90.4%) at this cut-off are good (Connor et al. 2001). Internal consistency in the current sample was excellent (Cronbach's $\alpha = .91$).

### Behavioural Observation

Four advanced graduate students in clinical psychology coded the mother or child in all interactions, resulting in two ratings of both the mother and child in each interaction with balanced sets of coders.

### Tangram Coding System—Mother (Hudson and Rapee 2001)

The Tangram Coding System (TCS) measures the parenting factors *Involvement* and *Negativity*[6] on nine scales using a nine-point continuum (*0* "not at all" to *8* "extremely"): (1) General Degree of Involvement, (2) Degree of Unsolicited Help, (3) Touching of the Tangram Pieces, (4) Mother's Posture, (5) Mother's Focus during the interaction (towards the child or towards the task), (6) General Mood of the interaction, (7) Mother's Degree of Positive Affect, (8) Mother's Tension, and (9) Mother's Degree of Criticism. The authors of the original version of the TCS confirmed the first five scales as a measure of the mother's *Involvement* while the remaining four scales were affirmed as a measure of *Negativity*. For the current study, the system was first translated to German and then retranslated to English by a second bilingual native English speaker. Intraclass correlations (ICCs) were calculated using Shrout and Fleiss' (1979) model 1 to determine the inter-rater reliability of the four coders. Inter-rater reliability was high for all scales (ICCs = .674−.882, see Table 1) except for Mother's Focus (ICC = .464) which was therefore excluded from further analysis[7]. A factor analysis[8] using an orthogonal rotation confirmed the original two factors (see Table 1) with the exception of Mother's Posture which loaded on both factors and consequently was excluded from further analysis. Thus, *Involvement* consisted of General Degree of Involvement, Degree of Unsolicited Help, and Touching of the Tangram Pieces, while *Negativity* contained General Mood, Mother's Degree of Positive Affect, Mother's Tension, and Mother's Degree of Criticism. The two factors accounted for 74.7% of variance on all scales.

### Tangram Coding System—Child

In order to complement the observation of maternal behaviour, a similar system was developed to assess the child's behaviour and the interaction between child and mother (Chorpita and Barlow 1998; Rapee 2001; Spence and Rapee 2016). Three scales were rephrased from the original TCS; (1) Child's General Mood, (2) Child's Degree of Positive Affect, and (3) Child's Tension.

---

[6] To facilitate readability of methods and results, factors are italicised while scales are presented in usual font.

[7] Mother's Focus could not be interpreted due to deficient inter-rater reliability, probably caused by different set-ups and camera angles in each individual household.

[8] Sample size is often targeted at 300 or more cases (e.g., Tabachnick and Fidell 2013). However, fewer cases can be as meaningful when considering factor loadings and communalities. Factor loadings greater than 0.6 are considered reliable regardless of sample size (Guadagnoli and Velicer 1988). Similarly, communalites above 0.6 show adequacy even in sample sizes of less than 100 (MacCallum et al. 1999). In the current sample, factors that do not exceed these thresholds are not included in calculations of factors and, thus, further analysis.

**Table 1** Intraclass correlations and rotated factor loadings for all observation scales

| Mother | | | | | Child | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Observational scales | ICC | Factor 1 | Factor 2 | Communality | Observational scales | ICC | Factor 1 | Factor 2 | Communality |
| General mood | .722 | .894 | .002 | .850 | General mood | .736 | .965 | .118 | .904 |
| Mother's tension | .683 | .902 | .165 | .875 | Child's tension | .521 | .778 | .131 | .721 |
| Mother's affect | .750 | .929 | −.049 | .886 | Child's affect | .760 | .964 | −.013 | .907 |
| Mother's encouragement | .798 | .902 | .064 | .869 | Non-compliance to parental behaviour | .653 | .690 | −.075 | .635 |
| General degree of intrusiveness | .775 | .224 | .959 | .937 | Dependence | .682 | −.220 | .916 | .844 |
| Unsolicited help | .751 | .143 | .952 | .922 | Helplessness | .632 | .033 | .809 | .798 |
| Touching of puzzle pieces | .882 | .055 | .837 | .829 | Persistence on task[a] | .728 | .215 | .427 | .461 |
| Mother's posture[a] | .674 | −.109 | .208 | .132 | Responsiveness to mother[b] | .432 | – | – | – |
| Mother's focus[b] | .464 | – | – | – | Perceived difficulty of task[b] | .479 | – | – | – |

[a]Excluded: factor load on either factor <.5

[b]Excluded: ICC <.5

A further four scales which originated in the Parent Child Interaction System (PARCHISY; Deater-Deckard 2000; Deater-Deckard et al. 1997) were rephrased and adapted to the original TCS, i.e. (4) Non-Persistence on Task, (5) Non-Compliance to Parental Behaviour, (6) Non-Responsiveness to Mother's Questions, Comments, and Behaviours, and (7) Child's Dependence. We developed two additional scales in line with current research on perceived self-competence and helplessness (e.g., Chorpita and Barlow 1998; Rapee 2001) which complemented the parenting scales; (8) Helplessness (verbal/nonverbal), and (9) Perceived Difficulty of the Task. All scales were adapted to a 9-point continuum measurement for comparability with the maternal scales (*0* "not at all" to *8* "extremely"). High values indicated a high degree of each characteristic. ICCs were again calculated using Shrout and Fleiss' (1979) model 1 to determine the inter-rater reliability of the four coders. Inter-rater reliability was considered adequate to high for all scales (ICCs = .521−.736) except for Responsiveness to Mother and Perceived Difficulty of the Task (ICCs <.50, see Table 1), which were therefore excluded from the analysis. PCA with an orthogonal rotation confirmed two factors, which jointly accounted for 67.8%

of variance in all scales. Factor 1 included Child's General Mood, Child's Degree of Positive Affect, Child's Tension, and Non-Compliance to Parental Behaviour, which complement the parenting factor *Negativity*. Factor 2 consisted of Dependence and Helplessness which complement the parenting factor *Involvement*. In an attempt to integrate the scales, we further refer to the first child factor as *Distress* and to the second child factor as *Dependency*. Non-Persistence on Task was excluded since it did not load clearly on one of the factors (factor 1: .215, factor 2: .427).

**Statistical Analyses**

To examine the hypotheses for *Maternal Behaviour* and *Child Behaviour*, two multivariate analyses of variance (MANOVAs) on the factor Group (SAD, HC) inspected group differences for maternal behaviour (*Involvement, Negativity*) and child behaviour (*Distress, Dependency*)[9]. In the case of significant or almost significant group effects, a

---

[9] Age and gender have been discussed as influential on parenting (e.g., Hudson and Rapee 2001). However, including both as covariates revealed no significant influences, *p*s > .187.

second MANOVA including all subscales was performed. In the case of significant or almost significant group effects, follow-up independent sample *t* tests were performed to locate group effects for subscales of either *Involvement* (General Degree of Involvement, Unsolicited Help, Touching of Puzzle Pieces), *Negativity* (General Mood, Mother's Tension, Mother's Degree of Positive Affect, Mother's Degree of Criticism), *Dependency* (Child Dependence, Child Helplessness), and *Distress* (Child's General Mood, Child's Degree of Positive Affect, Child's Tension, and Non-Compliance) to further locate group differences.

For *Mother–Child Interaction*, we examined whether Group (SAD, HC) moderated the correlation between child behaviour and maternal behaviour. Thus, we computed multiple regressions using *Involvement* and *Negativity* respectively as dependent variables (criterions). Predictors for each multiple regression were z-standardized child factors (*Dependency, Distress*), Group and each interaction term to analyse moderator effects. Interaction terms were calculated by z-standardizing child factors in a first step, and multiplying by Group [using values −1 (SAD) and 1 (HC)] in a second step (Cohen et al. 2003). All predictors were included in the regression using a full model approach. Multiple regressions were preferred to multiple correlations as regressions can address differential relations between predictor and criterion in different groups, thus examine moderation effects (see Aiken and West 1991).

## Results

### Participants' Characteristics

SAD and HC children did not differ in age, education or gender distribution. However, as expected children with SAD and their mothers reported significantly higher scores on child social anxiety measures while mothers of children with SAD also showed significantly higher scores in the screening for maternal social anxiety and general psychopathology (see Table 2).

### Subjective Reports

Both maternal and child self-report of perceived tension during the task did not differ between groups, all $t < -1.38$, all $p > .174$.

### Observed Maternal Behaviour

A MANOVA with factor Group (SAD, HC) on maternal behaviour (*Involvement, Negativity)* showed a trend towards a significant main effect of Group, Wilk's $\lambda = .906$, $F(2,50) = 2.58$, $p = .086$, $\eta^2 = .094$. A follow-up MANOVA including all subscales showed a significant main effect of Group, Wilk's $\lambda = .620$, $F(7,45) = 3.94$, $p = .002$, $\eta^2 = .380$. Follow-up directional *t* tests showed significantly greater Touching of Puzzle Pieces by mothers in the SAD group, $t(51) = -2.87$, $p = .006$, $d = -0.80$, as well as a trend for higher General Involvement among mothers in the SAD group, $t(51) = -1.92$, $p = .006$, $d = -0.54$, and a trend towards more Negative Affect in mothers in the SAD group, $t(51) = -1.96$, $p = .055$, $d = -0.53$. All means and standard deviations are shown in Table 3.

### Observed Child Behaviour

A MANOVA with factor Group (SAD, HC) on child behaviour (*Dependency, Distress*) showed a trend for a main effect of Group, Wilk's $\lambda = .896$, $F(2,52) = 2.91$, $p = .064$, $\eta^2 = .104$. A follow-up MANOVA including all subscales similarly showed a trend for a main effect of Group, Wilk's $\lambda = .772$, $F(6,46) = 2.67$, $p = .053$, $\eta^2 = .228$. To further analyse the trend for group differences, post-hoc independent sample *t* tests were performed. Trends for a group difference were found for the subscales Negative Affect, $t(44.48) = -1.72$, $p = .091$, $d = -0.50$, and Non-Compliance, $t(51) = -1.71$, $p = .094$, $d = -0.45$. Thus, children with SAD showed more Negative Affect and Non-compliance. All results are presented in Table 4.

### Mother–Child Interaction

#### Involvement

A multiple regression analysis was performed with predictors consisting of the child factors *Distress* and *Dependency*, Group (SAD, HC) and all interaction terms for group with both child factors (Group × Distress, Group × Dependency, Distress × Dependency, Group × Distress × Dependency) and with maternal *Involvement* as the criterion using a full model approach. Significant predictors of *Involvement* were *Dependency,* $\beta = .328$, $p = .034$, and Group × Dependency, $\beta = -.394$, $p = .010$, while Group showed a trend for significance, $\beta = .248$, $p = .084$. No further predictors reached significance. A post-hoc correlational analysis for the interaction term Group × Dependency revealed that the correlation was only significant for the HC group, $r = .592$, $p = .001$, but not for the SAD group, $r = -.100$, n.s. That is, for children in the HC group, greater *Dependency* during the interaction was linked to greater maternal *Involvement*. The full model including all predictors was significant, $F(7,45) = 2.32$, $p = .041$, and accounted for 26.5% of the variance in maternal *Involvement*.

**Table 2** Participant characteristics

| | Target person | SAD M (SD) | HC M (SD) | Statistics |
|---|---|---|---|---|
| n | | 26 | 27 | |
| Age (years) | | 10.9 (1.26) | 11.1 (1.44) | $t(51) = 0.61$, n.s. |
| % female | | 65.4 | 70.4 | $c^2(1) = 0.70$, n.s. |
| % elementary school | | 29.6 | 18.5 | $\chi c^2(4) = 3.69$, n.s. |
| SASC-R (child) | Child | 46.8 (12.5) | 28.6 (9.69) | $t(51) = -5.94$*** |
| SASC-R (mother) | Child | 61.3 (13.3) | 27.6 (5.89) | $t(32.5) = -11.7$*** |
| Mini-SPIN (mother) | Mother | 4.29 (3.14) | 1.52 (1.60) | $t(33.3) = -3.89$*** |
| SCL-K-9 (mother) | Mother | 14.93 (4.10) | 12.37 (3.65) | $t(54) = -2.46$* |

*SASC-R* social anxiety scale for children—revised, *Mini-SPIN* Mini—Social Phobia Inventory, *SCL-K-9* Symptom Checklist 9 Items

n.s. $p \geq .05$, * $p < .05$, ** $p < .01$, *** $p < .001$

**Table 3** Means and statistics involvement and negativity scores (mother)

| | SAD M (SD) | HC M (SD) | F/t | p | $\eta^2$, d |
|---|---|---|---|---|---|
| Involvement | 6.01 (1.18) | 5.17 (1.66) | 4.64 | .036 | 0.08 |
| General degree of intrusiveness | 5.92 (1.28) | 5.22 (1.38) | −1.92 | .060 | 0.53 |
| Unsolicited help | 5.44 (1.51) | 4.85 (1.72) | −1.33 | .191 | 0.36 |
| Touching of puzzle pieces | 6.69 (0.91) | 5.43 (2.06) | −2.87 | .006 | 0.79 |
| Negativity | 3.32 (1.30) | 2.96 (1.08) | 1.20 | .278 | 0.02 |
| General mood | 3.00 (1.39) | 2.67 (1.06) | −0.99 | .328 | 0.27 |
| Mother's tension | 3.46 (1.36) | 3.22 (1.11) | −0.70 | .486 | 0.19 |
| Mother's affect | 3.32 (1.36) | 2.59 (1.37) | −1.96 | .055 | 0.53 |
| Mother's encouragement | 3.50 (1.36) | 3.37 (1.19) | −0.37 | .713 | 0.10 |

**Table 4** Means and statistics dependency and distress scores (child)

| | SAD M (SD) | HC M (SD) | F/t | p | $\eta^2$, d |
|---|---|---|---|---|---|
| Dependency | 3.62 (1.45) | 3.00 (1.04) | 3.15 | .082 | 0.06 |
| Child's helplessness | 3.58 (1.51) | 2.98 (1.17) | −1.60 | .115 | 0.44 |
| Child's dependence | 3.65 (1.61) | 3.02 (1.12) | −1.66 | .104 | 0.46 |
| Distress | 3.28 (1.26) | 2.82 (1.04) | 2.10 | .154 | 0.04 |
| Child's general mood | 3.08 (1.33) | 3.89 (1.30) | −0.52 | .606 | −0.15 |
| Child's tension | 3.56 (1.19) | 3.22 (1.05) | −1.09 | .280 | −0.31 |
| Child's affect | 3.88 (1.56) | 3.20 (1.31) | −1.72 | .091 | −0.48 |
| Child's non-compliance | 2.62 (1.59) | 1.98 (1.04) | −1.71 | .094 | −0.48 |

### Negativity

A multiple regression analysis was again performed with the same predictors, but with maternal *Negativity* as the criterion using a full model approach. *Negativity* was significantly predicted by *Distress,* $\beta = .614$, $p < .001$, and the interaction term Dependency × Distress, $\beta = .342$, $p = .020$. Thus, higher child *Distress* was related to higher *Negativity*. Moreover, the higher the *Dependency*, the stronger the relation between *Distress* and *Negativity*. No further predictors reached significance. The full model including all predictors was significant, $F(7,45) = 3.46$, $p = .005$, and accounted for 35.0% of the variance in maternal Negativity. Results for all regression analyses are reported in Table 5.

As previous studies have shown maternal parenting behaviour to be influenced by maternal anxiety (e.g., Woodruff-Borden et al. 2002), a post-hoc correlational

**Table 5** Regression models predicting maternal involvement and negativity

| Predictors | Model 1: maternal involvement ($R^2 = .265$) | | | | Model 2: maternal negativity ($R^2 = .350$) | | | |
|---|---|---|---|---|---|---|---|---|
| | b | SE | β | p | b | SE | β | p |
| Main effect | | | | | | | | |
| Dependency | .488 | .224 | .328 | .034 | .178 | .169 | .149 | .296 |
| Distress | −.050 | .224 | −.034 | .823 | .733 | .169 | .614 | <.001 |
| Group | .365 | .207 | .248 | .084 | −.079 | .156 | −.067 | .613 |
| Two-way interaction | | | | | | | | |
| Group × Dependency | −.605 | .224 | .394 | .010 | −.204 | .169 | −.166 | .232 |
| Group × Distress | .194 | .224 | .127 | .393 | −.104 | .169 | .085 | .543 |
| Dependency × Distress | −.164 | .216 | −.114 | .451 | .394 | .163 | .342 | .020 |
| Three-way interaction | | | | | | | | |
| Group × Dependency × Distress | .309 | .216 | .213 | .160 | −.210 | .163 | −.180 | .204 |

analysis was conducted to examine maternal anxiety as a possible influence on both maternal and child behaviour. However, maternal social anxiety did not correlate with maternal behaviour (*Involvement, Negativity*) or child behaviour (*Distress, Dependence*).

## Discussion

This study aimed to clarify if mothers of children with SAD show more involvement but not more negativity than mothers of healthy controls in their home environment, which would allow novel conclusions to be drawn about a familiar setting (Hudson and Rapee 2001; McLeod et al. 2007). Additionally, children with SAD were expected to be more non-compliant, more helpless, more dependent and to show more negative affect than HC children (e.g., Dumas et al. 1995; Hokoda and Fincham 1995; Rapee 2001; Woodruff-Borden et al. 2002). Lastly, we assessed whether the diagnostic status (SAD vs. HC) moderated the mother–child interaction (e.g., Chorpita and Barlow 1998; Dumas et al. 1995; Hudson and Rapee 2001; Rapee 2001; Rubin and Mills 1991). As expected, we found more involvement in mothers of children with SAD than in mothers of HC children, while the groups did not differ in parental negativity. Contrary to our hypotheses, children with SAD only showed marginally more negative affect and helplessness. Diagnostic status moderated the mother–child interaction, pointing to a significant relationship between dependence and maternal involvement in healthy controls but not in children with SAD.

### Over-Involvement and Negativity in Mothers of Children with SAD

In line with previous studies (Ballash et al. 2006; Chorpita and Barlow 1998; Hudson and Rapee 2001; McLeod et al.

2007), mothers in the clinical group showed more involvement. Importantly, our results extend previous laboratory findings, which used similar tasks akin to preparation for school, by showing that over-involvement may also be present during interactions outside the lab, and suggesting cross-situational over-involvement in mothers of children with SAD during specific interaction tasks. More specifically, mothers touched the puzzle pieces significantly more often, and helped more often without the child asking for help, which is in line with results for behavioural control (e.g., Caron et al. 2006; Greco and Morris 2002). One possible explanation might be that by touching the puzzle, mothers may convey the impression that the child is not able to solve the puzzle alone, thereby limiting the child's degree of self-efficacy (McLeod et al. 2007). Consequently, this kind of control may lead the child to constantly expect a threatening environment, which could increase hypervigilance and subjective fear. Furthermore, this behaviour limits the child's opportunity to successfully apply coping strategies to new situations on his/her own (Rapee 1997).

In our exploratory analysis, mothers of children with SAD did not show more negativity during the interaction with their child (see McLeod et al. 2007). While some studies such as Hudson and Rapee (2001) found heightened negativity among parents of anxious and oppositional children in contrast to parents of healthy controls when solving a puzzle task, Greco and Morris (2002) did not find differences in paternal rejection or criticism of socially anxious and healthy control children during a challenging origami task. As the combined findings point to a more ambiguous relationship between anxiety disorders and negativity (McLeod et al. 2007), methodological factors might be responsible for these differences. The methodology of previous research studies varies widely; some have used unstructured tasks such as discussions (see Van der Bruggen et al. 2008), put more pressure on the interaction by using very specific instructions, e.g., "You may only

help your child if you think it is really necessary" (Hudson and Rapee 2001), or manipulated parents' expectancies of the child's performance (Creswell et al. 2008). While this has enhanced our understanding of highly stressful interactions, it limits conclusions about naturalistic behaviour. Since parents were not limited by restricting instructions in our study, participating mothers probably reacted more naturally, which may explain the lack of difference in negativity. Additionally, the fewer restrictions on helping behaviour led to increased involvement in mothers of HC children compared to the original study by Hudson and Rapee (2001). However, involvement was still significantly lower than in mothers of children with SAD.

## Child behaviour in Mother–Child Interaction

Children take part in interactional processes actively and may prompt specific parenting behaviours in addition to simply reacting to parents—an aspect that is strongly emphasized theoretically by several researchers (e.g., Chorpita and Barlow 1998; Hudson and Rapee 2001; Rapee 2001) but which has rarely been taken into account in practice (e.g., Dumas et al. 1995; Rubin et al. 1999). Dumas et al. (1995) showed anxious children to be more non-compliant to their mothers during a grocery shopping task than healthy control children. Concerning negative child affect, Woodruff-Borden et al. (2002) did not report more negative affect in children of anxious parents but suggested that negative child affect prompts parental withdrawal. In the present study, only trend effects were found for more negative affect and non-compliance in the SAD group while no differences appeared for other measures of child behaviour. The relative lack of differences in child behaviour raises the question of whether pathological behaviours of anxious children are limited to disorder-specific situations—e.g., in this case social situations. As the situation did not include strong social stress, all children regardless of pathological status reacted similarly to the task with only a slight tendency for children with SAD to show more dependency. Thus, the assessment of children with SAD and their mothers during social stress would be necessary to clarify whether pathological interactional processes occur in these specific situations. Additionally, methodological factors may partially account for the unexpected findings. First, the few previous studies to have examined specific child factors in experimental research (Dumas et al. 1995; Hokoda and Fincham 1995; Woodruff-Borden et al. 2002) have asked different research questions and used different assessment systems. Second, children have been found to behave differently in the home setting (Gardner 2000) while most of the previous studies have been conducted in the laboratory. The stress level in the laboratory setting might be higher for anxious children and lead to more pronounced differences

in behaviour compared to HC children who do not experience the difference as strongly.

## Inflexible Parenting Behaviour in Parents of Children with SAD

Even though children's behaviour did not differ significantly between groups, interactions with parenting behaviour revealed interesting findings. Regression analyses showed a positive relationship between maternal *involvement* and child dependence only in HC dyads; thus if the child, for example, asks for more help, their mother becomes more involved. If changes in maternal involvement lead to changes in child's dependence and vice versa in HC dyads, the interaction may be characterized by flexible reciprocity. Taking into account that parental involvement in anxiety disorders is more pronounced than in control dyads (e.g., Hudson and Rapee 2001; McLeod et al. 2007), this finding only for HC dyads was particularly interesting. Researchers have proposed over-involvement to be a reaction to the child's withdrawal or anxious reaction (Chorpita and Barlow 1998; Rapee 1997; Rubin and Mills 1991). However, in the present study the behaviour of mothers of children with SAD was not correlated with their child's behaviour, contrary to the HC group. Rubin et al. (1999) pointed out in a study of toddlers that it might not be the child's actual behaviour which leads parenting behaviour but rather the parent's perception of the child. Thus, even though the child might show withdrawal and anxiety at a certain age, this does not drive parenting behaviour as much as the perception of the child's anxiety, which later appears to lead to a hardened parenting strategy of over-involvement. Thus, the absence of mother–child reciprocity points to biased perception of the child's distress as well as *inflexible* parenting strategies in mothers of children with SAD. Mental health has repeatedly been linked to so-called *psychological flexibility*, which has been described as the ability to adapt to situations and react accordingly (Kashdan and Rottenberg 2010). As shown in earlier research (Beidel and Turner 1997; Velting and Albano 2001) and in our screening data, mothers of children with SAD are more affected by symptoms of anxiety themselves even if they do not reach the clinical threshold. In a dimensional approach to anxiety, more psychopathological strain could thus be linked to less psychological flexibility leading to a rigid parenting style (Moyer and Sandoz 2014). Furthermore, a lack of psychological flexibility could explain contradictory findings on parental involvement in the treatment of child anxiety (e.g., Shortt et al. 2001; Spence et al. 2000). Hudson et al. (2009) examined parents in interaction with their own anxious child as well a non-anxious child. Parents of anxious children were less over-involved with a non-anxious child than with their own child, so it can be assumed

that parents of anxious children are able to apply different parenting strategies. Thus, the importance of the inclusion of parents in anxiety treatment could possibly lie in supporting them to flexibly adapt to their child's needs.

On the other hand, maternal *negativity* was related to negative child behaviour in both groups pointing to reciprocity between mother and child concerning mood, affect etc. Thus, negative child behaviour was visible at the same time as negative maternal behaviour. However, the relationship between child's distress and mother's negativity was moderated by the level of the child's dependence. The relationship between child's distress and mother's negativity was thus strengthened if the child also reacted dependently by showing more helplessness and little independent structuring of the task. Possibly, negative elements of the interaction including negative mood and affect but also the child's independence accumulate in the interactions, thus leading to a strained atmosphere between mother and child. For example, if a child shows symptoms of helplessness in an already strained interaction, the negative mood of both child and mother increases. However, we cannot assume a linear causal relationship but rather a reciprocal relationship between maternal and child mood as well as the influence of situational outer factors (e.g., a stressful task).

### Limitations and Implications

The following limitations might apply. As no child observational system existed to sufficiently complement the parental observational system, we adapted a new system from existing observational systems (Deater-Deckard 2000; Deater-Deckard et al. 1997; Hudson and Rapee 2001) and the literature on interactional processes between parent and child (e.g., Dumas et al. 1995; Greco and Morris 2002; Hudson and Rapee 2001) which ensured a theoretical foundation. Since both inter-rater reliability and exploratory factor analyses supported the applicability of the system, we believe that the results can be interpreted accordingly. However, replications using the newly adapted system are necessary. Additionally, replications using other anxiety disorders as control groups could shed light on the specificity of these findings for SAD. From a methodological point of view, a non-disorder-specific task (e.g., speech task; e.g., Woodruff-Borden et al. 2002) was used to achieve an interaction without inducing disorder-specific stress. An extension to this finding in future research would entail the child undertaking a disorder-specific stress task such as a speech preparation in interaction with the parents (e.g., Hostinar et al. 2015).

Since correlational results do not allow causal inferences, it might be possible that child behaviour precedes maternal behaviour or vice versa. Moreover, interactions

between parent and child are established over many years, complicating research on cause and effect. Thus, it might be more efficient to focus on changing interactional processes rather than understanding the origin of these complex processes. To shed light on this interaction, experimental research would be of interest, e.g., by training parents to react more flexibly towards their child (Moyer and Sandoz 2014).

Previous research on the inclusion of parents in child treatment has revealed ambiguous findings (Bögels and Brechman-Toussaint 2006; Breinholst et al. 2012), which is surprising from a developmental perspective as parents form a comparably stable part of their child's life and as such can encourage the use of new behaviours once treatment has ended (Spence et al. 2000). Our findings imply that the relationship between parent and child is characterized by complex interactions based not only on observable behaviour but also on (biased) perceptions of each other. Therefore, a thorough diagnostic of the parent–child interaction on a case-by-case basis is likely required to support parental inclusion in treatment. However, further research on this topic is essential.

### Conclusions

Over-involvement can be regarded as a cross-situational trait of mothers of children with SAD. Interestingly, a lack of differences in the behaviour of SAD and healthy control children in the current study could point to pathological behaviours of the child being specific to disorder-related situations which require further study. Without these pathological behaviours present, our results indicate that mothers of children with SAD show parental over-involvement regardless of the actual situational demands provided by the surroundings or their child. Supporting mothers to be more flexible in their parenting style could facilitate child recovery from anxiety in the long-term, as the child's own psychological flexibility is dependent on their parents' flexibility (e.g., Williams et al. 2012). More research is necessary to shed light on the interactional processes between mother and child and on possible ways to support adaptive parenting.

**Compliance with Ethical Standards**

**Conflict of Interest** Julia Asbrand, Jennifer Hudson, Julian Schmitz, Brunna Tuschen-Caffier declare that they have no conflict of interest.

**Ethical Approval** All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

**Informed Consent** Informed consent was obtained from all individual participants (children and parents) included in this study.

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

# References

Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Newbury Park: Sage.

American Psychiatric Association (APA). (2013). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.

Asbrand, J., Blechert, J., Nitschke, K., Tuschen-Caffier, B., & Schmitz, J. (2016). Aroused at home: Basic autonomic regulation during orthostatic and physical activation is altered in children with social anxiety disorder. *Journal of Abnormal Child Psychology*. doi:10.1007/s10802-016-0147-7.

Ballash, N. G., Pemble, M. K., Usui, W. M., Buckley, A. F., & Woodruff-Borden, J. (2006). Family functioning, perceived control, and anxiety: A mediational model. *Journal of Anxiety Disorders, 20*(4), 486–497. doi:10.1016/j.janxdis.2005.05.002.

Barlow, D. (2002). *Anxiety and its disorders* (2nd ed.). New York: Guilford.

Beidel, D. C., & Turner, S. M. (1997). At risk for anxiety: I. Psychopathology in the offspring of anxious parents. *Journal of the American Academy of Child and Adolescent Psychiatry, 36*, 918–924.

Beidel, D. C., & Turner, S. M. (2007). *Shy children, phobic adults*. Washington, DC: American Psychological Association.

Bögels, S., Stevens, J., & Majdandžić, M. (2011). Parenting and social anxiety: Fathers' versus mothers' influence on their children's anxiety in ambiguous social situations. *Journal of Child Psychology and Psychiatry, 52*(5), 599–606.

Bögels, S. M., & Brechman-Toussaint, M. L. (2006). Family issues in child anxiety: Attachment, family functioning, parental rearing and beliefs. *Clinical Psychology Review, 26*(7), 834–856. doi:10.1016/j.cpr.2005.08.001.

Bögels, S. M., van Oosten, A., Muris, P., & Smulders, D. (2001). Familial correlates of social anxiety in children and adolescents. *Behaviour Research and Therapy, 39*(3), 273–287.

Breinholst, S., Esbjørn, B. H., Reinholdt-Dunne, M. L., & Stallard, P. (2012). CBT for the treatment of child anxiety disorders: A review of why parental involvement has not enhanced outcomes. *Journal of Anxiety Disorders, 26*(3), 416–424. doi:10.1016/j.janxdis.2011.12.014.

Caron, A., Weiss, B., Harris, V., & Catron, T. (2006). Parenting behavior dimensions and child psychopathology: Specificity, task dependency, and interactive relations. *Journal of Clinical Child and Adolescent Psychology, 35*(1), 34–45. doi:10.1207/s15374424jccp3501_4.

Caster, J. B., Inderbitzen, H. M., & Hope, D. (1999). Relationship between youth and parent perceptions of family. *Journal of Anxiety Disorders, 13*(3), 237–251.

Castro, J., Toro, J., Van der Ende, J., & Arrindell, W. A. (1993). Exploring the feasibility of assessing perceived parental rearing styles in Spanish children with the EMBU. *International Journal of Social Psychiatry, 39*, 47–57.

Chorpita, B. F., & Barlow, D. H. (1998). The development of anxiety: The role of control in the early environment. *Psychological Bulletin, 124*(1), 3–21.

Chorpita, B. F., Brown, T. A., & Barlow, D. H. (1998). Perceived control as a mediator of family environment in etiological models of childhood anxiety. *Behavior Therapy, 29*(3), 457–476. doi:10.1016/S0005-7894(98)80043-9.

Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences* (3rd ed.). Mahwah, NJ: Erlbaum.

Connor, K. M., Kobak, K. A., Churchill, E., Katzelnick, D., & Davidson J. R. T. (2001). Mini-SPIN: A brief screening assessment for generalized social anxiety disorder. *Depression and Anxiety, 14*, 137–140.

Chavira, D. A., Stein, M. B., Bailey, K., & Stein, M. T. (2004). Comorbidity of generalized social anxiety disorder and depression in a pediatric primary care sample. *Journal of Affective Disorders, 80*(2–3), 163–171. doi:10.1016/S0165-0327(03)00103-4.

Creswell, C., O'Connor, T. G., & Brewin, C. R. (2008). The impact of parents' expectations on parenting behaviour: An experimental investigation. *Behavioural and Cognitive Psychotherapy, 36*(4), 483–490. doi:10.1017/S1352465808004414.

Creswell, C., Shildrick, S., & Field, A. P. (2010). Interpretation of ambiguity in children: a prospective study of associations with anxiety and parental interpretations. *Journal of Child and Family Studies, 20*(2), 240–250. doi:10.1007/s10826-010-9390-7.

Dadds, M. R., & Sanders, M. R. (1992). Family interaction and child psychopathology: A comparison of two observation strategies. *Journal of Child and Family Studies, 1*(4), 371–391. doi:10.1007/BF01321292.

Deater-Deckard, K. (2000). Parenting and child behavioral adjustment in early childhood: A quantitative genetic approach to studying family processes and child development. *Child Development, 71*, 468–484.

Deater-Deckard, K., Pylas, M. V., & Petrill, S. A. (1997). *Parent–Child Interaction System (PARCHISY)*. London: Institute of Psychiatry.

Derogatis, L. R., & Savitz, K. L. (1999). The SCL-90-R, Brief Symptom Inventory, and matching clinical rating scales. In M. E. Maruish (Ed.), *The use of psychological testing for treatment planning and outcome assessment* (2nd ed., pp. 679–724). Mahwah, NJ: Erlbaum.

Dumas, J. E., LaFreniere, P. J., & Serketich, W. J. (1995). "Balance of power": A transactional analysis of control in mother–child dyads involving socially competent, aggressive, and anxious children. *Journal of Abnormal Psychology, 104*(1), 104–113.

Gardner, F. (2000). Methodological issues in the direct observation of parent–child interaction: Do observational findings reflect the natural behavior of participants? *Clinical Child and Family Psychology Review, 3*(3), 185–198.

Ginsburg, G. S., La Greca, A. M., & Silverman, W. K. (1998). Social anxiety in children with anxiety disorders: Relation with social and emotional functioning. *Journal of Abnormal Child Psychology, 26*(3), 175–185.

Greco, L. A., & Morris, T. L. (2002). Paternal child-rearing style and child social anxiety: Investigation of child perceptions and actual father behavior. *Journal of Psychopathology and Behavioral Assessment, 24*(4), 259–267.

Grüner, K., Muris, P., & Merckelbach, H. (1999). The relationship between anxious rearing behaviours and anxiety disorders symptomatology in normal children. *Journal of Behavior Therapy and Experimental Psychiatry, 30*, 27–35.

Guadagnoli, E., & Velicer, W. F. (1988). Relation of sample size to the stability of component patterns. *Psychological Bulletin, 103*(2), 265–275.

Hokoda, A., & Fincham, E. D. (1995). Origins of children's helpless and mastery achievement patterns in the family. *Journal of Educational Psychology, 87*, 375–385.

Hostinar, C. E., Johnson, A. E., & Gunnar, M. R. (2015). Parent support is less effective in buffering cortisol stress reactivity for adolescents compared to children. *Developmental Science, 18*(2), 281–297.

Hudson, J. L., Doyle, A. M., & Gar, N. (2009). Child and maternal influence on parenting behavior in clinically anxious children. *Journal of Clinical Child and Adolescent Psychology, 38*(2), 256–262. doi:10.1080/15374410802698438.

Hudson, J. L., & Rapee, R. M. (2001). Parent–child interactions and anxiety disorders: An observational study. *Behaviour Research and Therapy, 39*(12), 1411–1427.

Hudson, J. L., & Rapee, R. M. (2002). Parent–child interactions in clinically anxious children and their siblings. *Journal of Clinical Child and Adolescent Psychology, 31*(4), 548–555.

Hummel, R. M., & Gross, A. M. (2001). Socially anxious children: An observational study of parent–child interaction. *Child and Family Behavior Therapy, 23*(3), 19–41.

Kashdan, T. B., & Herbert, J. D. (2001). Social anxiety disorder in childhood and adolescence: Current status and future directions. *Clinical Child and Family Psychology Review, 4*(1), 37–61.

Kashdan, T. B., & Rottenberg, J. (2010). Psychological flexibility as a fundamental aspect of health. *Clinical Psychology Review, 30*(7), 865–878. doi:10.1016/j.cpr.2010.03.001.

Klaghofer, R., & Brähler, E. (2001). Konstruktion und Teststatistische Prüfung einer Kurzform der SCL-90-R. *Zeitschrift für Klinische Psychologie, Psychiatrie und Psychotherapie, 49*, 115–124.

Kley, H., Heinrichs, N., Bender, C., & Tuschen-Caffier, B. (2012). Predictors of outcome in a cognitive-behavioral group program for children and adolescents with social anxiety disorder. *Journal of Anxiety Disorders, 26*(1), 79–87. doi:10.1016/j.janxdis.2011.09.002.

Knappe, S., Lieb, R., Beesdo, K., Fehm, L., Chooi, N., Low, P., Wittchen, H. (2009). The role of parental psychopathology and family environment for social phobia in the first three decades of life. *Depression and Anxiety, 370*, 363–370. doi:10.1002/DA.20527.

Krohne, H. W., & Hock, M. (1991). Relationships between restrictive mother–child interactions and anxiety of the child. *Anxiety Research, 4*, 109–124.

La Greca, A. M., Kraslow Dandes, S., Wick, P., Shaw, K., & Stone, W. L. (1988). Development of the Social Anxiety Scale for Children: Reliability and concurrent validity. *Journal of Clinical Child Psychology, 17*(1), 84–91.

La Greca, A. M., & Stone, W. L. (1993). Social anxiety scale for children—revised: Factor structure and concurrent validity. *Journal of Clinical Child Psychology, 22*(1), 17–27. doi:10.1207/s15374424jccp2201_2.

Lieb, R., Wittchen, H. U., Höfler, M., Fuetsch, M., Stein, M. B., & Merikangas, K. R. (2000). Parental psychopathology, parenting styles, and the risk of social phobia in offspring: A prospective-longitudinal community study. *Archives of General Psychiatry, 57*(9), 859–866.

MacCallum, R. C., Widaman, K. F., Zhang, S., & Hong, S. (1999). Sample size in factor analysis. *Psychological Methods, 4*(1), 84–99.

Majdandžić, M., Möller, E. L., De Vente, W., Bögels, S. M., & Van den Boom, D. C. (2014). Fathers' challenging parenting behavior prevents social anxiety development in their 4-year

old children: A longitudinal observational study. *Journal of Abnormal Child Psychology, 42*, 301–310.

McLeod, B. D., Wood, J. J., & Weisz, J. R. (2007). Examining the association between parenting and childhood anxiety: A meta-analysis. *Clinical Psychology Review, 27*(2), 155–172. doi:10.1016/j.cpr.2006.09.002.

Mills, R. S., & Rubin, K. H. (1998). Are behavioural and psychological control both differentially associated with childhood aggression and social withdrawal? *Canadian Journal of Behavioural Science/Revue canadienne des sciences du comportement, 30*(2), 132.

Möller, E. L., Nikolić, M., Majdandžić, M., & Bögels, S. M. (2016). Associations between maternal and paternal parenting behaviors, anxiety and its precursors in early childhood: a meta-analysis. *Clinical Psychology Review, 45*, 17–33.

Moyer, D. N., & Sandoz, E. K. (2014). The role of psychological flexibility in the relationship between parent and adolescent distress. *Journal of Child and Family Studies*. doi:10.1007/s10826-014-9947-y.

Muris, P., Bögels, S., Meesters, C., van der Kamp, N., & van Oosten, A. (1996). Parental rearing practices, fearfulness, and problem behaviour in clinically referred children. *Personality and Individual Differences, 21*(5), 813–818.

Muris, P., Meesters, C., Merckelbach, H., & Hülsenbeck, P. (2000). Worry in children is related to perceived parental rearing and attachment. *Behaviour Research and Therapy, 38*, 487–497.

Ollendick, T. H., & Benoit, K. E. (2012). A parent–child interactional model of social anxiety disorder in youth. *Clinical Child and Family Psychology Review, 15*(1), 81–91. doi:10.1007/s10567-011-0108-1.

Rapee, R. M. (1997). Potential role of childrearing practices in the development of anxiety and depression. *Clinical Psychology Review, 17*, 47–67.

Rapee, R. M. (2001). The development of generalized anxiety. In *The developmental psychopathology of anxiety*, pp. 481–503.

Rubin, K. H., & Mills, R. S.L. (1991). Conceptualizing developmental pathways to internalizing disorders in childhood. *Canadian Journal of Behavioural Science, 23*, 300–317.

Rubin, K. H., Nelson, L. J., Hastings, P., & Asendorpf, J. (1999). The transaction between parents' perceptions of their children's shyness and their parenting styles. *International Journal of Behavioral Development, 23*(4), 937–957.

Schneider, S., Unnewehr, S., & Margraf, J. (Eds.). (2009). *Kinder-DIPS: Diagnostisches Interview bei psychischen Störungen im Kindes- und Jugendalter* (2nd ed.). Heidelberg: Springer.

Shortt, A. L., Barrett, P. M., & Fox, T. L. (2001). Evaluating the FRIENDS program: A cognitive-behavioral group treatment for anxious children and their parents. *Journal of Clinical Child Psychology, 30*(4), 525–535. doi:10.1207/S15374424JCCP3004_09.

Shrout, P. E., & Fleiss, J. L. (1979). Intraclass correlations: Uses in assessing rater reliability. *Psychological Bulletin, 86*(2), 420–428.

Silverman, W. K., & Nelles, W. B. (1988). The anxiety disorders interview schedule for children. *Journal of the American Academy of Child and Adolescent Psychiatry, 27*(6), 772–778. doi:10.1097/00004583-198811000-00019.

Spence, S. H., Donovan, C., & Brechman-Toussaint, M. (2000). The treatment of childhood social phobia: The effectiveness of a social skills training-based, cognitive-behavioural intervention, with and without parental involvement. *Journal of Child Psychology and Psychiatry, 41*(6), 713–726.

Spence, S. H., & Rapee, R. M. (2016). The etiology of social anxiety disorder: An evidence-based model. *Behaviour Research and Therapy, 86*, 50–67.

Stein, M. B., Chartier, M. J., Lizak, M. V., & Jang, K. L. (2001). Familial aggregation of anxiety-related quantitative traits in generalized social phobia: Clues to understanding "disorder" heritability. *American Journal of Medical Genetics, 105*(1), 79–83.

Tabachnick, B. G., & Fidell, L. S. (2013). *Using multivariate statistics* (6th ed.). Pearson.

Unnewehr, S., Schneider, S., & Margraf, J. (1995). *Kinder-DIPS*. Berlin: Springer.

Van der Bruggen, C. O., Bögels, S. M., & van Zeilst, N. (2010). What influences parental controlling behaviour? The role of parent and child trait anxiety. *Cognition and Emotion, 24*(1), 141–149. doi:10.1080/02699930802618843.

Van der Bruggen, C. O., Stams, G. J. J. M., & Bögels, S. M. (2008). Research review: The relation between child and parent anxiety and parental control: A meta-analytic review. *Journal of Child Psychology and Psychiatry, and Allied Disciplines, 49*(12), 1257–1269. doi:10.1111/j.1469-7610.2008.01898.x.

Velting, O. N., & Albano, A. M. (2001). Current trends in the understanding and treatment of social phobia in youth. *Journal of Child Psychology and Psychiatry, 42*(1), 127–140.

Williams, K. E., Ciarrochi, J., & Heaven, P. C. L. (2012). Inflexible parents, inflexible kids: a 6-year longitudinal study of parenting style and the development of psychological flexibility in adolescents. *Journal of Youth and Adolescence, 41*(8), 1053–1066. doi:10.1007/s10964-012-9744-0.

Wittchen, H. U., Stein, M. B., & Kessler, R. C. (1999). Social fears and social phobia in a community sample of adolescents and young adults: prevalence, risk factors and co-morbidity. *Psychological Medicine, 29*(2), 309–323.

Wood, J. J., McLeod, B. D., Sigman, M., Hwang, W. C., & Chu, B. C. (2003). Parenting and childhood anxiety: Theory, empirical findings, and future directions. *Journal of Child Psychology and Psychiatry*, *44*(1), 134–151.

Woodruff-Borden, J., Morrow, C., Bourland, S., & Cambron, S. (2002). The behavior of anxious parents: Examining mechanisms of transmission of anxiety from parent to child. *Journal of Clinical Child and Adolescent Psychology, 31*(3), 364–374.