ORIGINAL CONTRIBUTION

Agreement and discrepancy between mother and child in the evaluation of children's anxiety symptoms and anxiety life interference

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Abstract This study explored the agreement and discrepancy between mother and child reports of children's anxiety symptoms and anxiety life interference. A large community sample of 1,065 Portuguese children aged between 7 and 14 years and their mothers completed a DSM-based anxiety symptoms scale. For a subsample of 135 children with an anxiety disorder, additional data on children's anxiety life interference and maternal anxiety and depression symptoms were collected. The results showed that children generally reported higher levels of anxiety symptoms than their mothers. Overall, most correlations between mother and child reports of anxiety symptoms were significant but in the low to moderate range, with the strongest associations for symptoms of specific phobias and school phobia. In the subsample of children with an anxiety disorder, mothers reported higher levels of anxiety life interference than children, and the correlation between mother and child reports of anxiety life interference was significant but again modest in magnitude. Lastly, maternal anxiety was positively associated with the discrepancy between mother and child reports of anxiety symptoms. Together, the results of this study further underline the importance of a multi-informant approach in the evaluation of children's anxiety problems.

Introduction

Anxiety disorders are among the most prevalent mental disorders in childhood and adolescence [1]. In the short run, anxiety disorders compromise children's well-being and have negative implications for different domains of life, including school, social, and family functioning. A study analysing the societal costs of this type of psychopathology revealed that families of children with anxiety disorders have 20 times higher costs (e.g. medication, visits to mental health professionals, parents' productivity loss, school absenteeism) than families from the general population [2]. Anxiety disorders also have a long-term impact, predicting severe anxiety disorders and other psychiatric disorders in adulthood [3, 4]. The high prevalence of anxiety disorders in children, the associated negative impact, and high financial costs all highlight the need to develop strategies and instruments for adequate screening and assessment to allow for timely referral of children to specialised services. However, the evaluation of anxiety problems and disorders in childhood poses various challenges.

One major challenge, which is also common to the evaluation of other forms of psychopathology in youths, concerns the choice of the appropriate informant [5]. Although anxiety has some overt manifestations (e.g. engaging in avoidance behaviour, asking for reassurance, clinging), the emotion itself is often non-observable, and therefore, children are important informants for the evaluation of its frequency, intensity, and severity. However,

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children are not always accurate reporters owing to their limited cognitive and linguistic capacities. Furthermore, anxious children in particular worry about how they are perceived by others, which often prompts them to provide socially desirable answers when they are questioned about their symptoms [6]. For these and other reasons [7, 8], a multi-informant approach should be common practise in research and clinical settings for the evaluation of children's anxiety problems.

However, not surprisingly, studies evaluating the cross-informant agreement of children's anxiety problems have generally revealed low to moderate parent–child agreement [6, 9–11]. In addition, reports of anxiety symptoms by parents and child vary systematically in terms of the nature (higher agreement when the symptoms are clearly observable, e.g. behavioural avoidance) and setting (lower agreement when the behaviours are exhibited in school settings) of the child's symptoms [12]. When looking at the absolute levels of symptoms, most studies have found that children report higher levels of intensity, frequency, and severity than parents [9, 11–13]. In clinical samples, a difference in the opposite direction has occasionally been documented. For example, Krain and Kendall [14] conducted a study with 239 anxiety-disordered youths aged between 7 and 15 years and noted that mothers and fathers reported more anxiety symptoms for their children than children did themselves [15]. However, this aberrant finding is thought to reflect some type of bias in treatment-seeking samples.

In summary, previous research has shown that reports of anxiety symptoms by different informants are correlated to some degree (low to moderate agreement) but show clear discrepancies. Thus, further studies are needed on informant agreement and discrepancy regarding childhood anxiety symptoms that take into account specific anxiety dimensions and the characteristics of the sample (community vs. clinical samples). Additionally, research on this topic has mainly focused on the frequency or intensity of the symptoms or on the presence/absence of clinical diagnoses, discarding other important dimensions in the assessment of childhood anxiety disorders. For example, interference with daily functioning is a central aspect of current conceptualisations of psychopathology [16] and a key component to meet the diagnostic criteria for anxiety disorders. However, previous studies on agreement and discrepancy regarding childhood anxiety symptoms have largely neglected this issue. One exception is a study by Reuterskiöld, Öst, and Ollendick [17], who explored the diagnostic agreement between children and parents in the Anxiety Disorders Interview Schedule, which includes an index of interference, in a clinical sample of 110 children with a diagnosis of specific phobia. The results indicated a moderate to high level of parent–child agreement for the

diagnostic severity of anxiety disorders (r's between 0.41 and 0.67), with higher agreement occurring in children who reported high motivation and low self-concept and in parents with psychopathology. In another investigation, Lyneham et al. [18] studied the psychometric properties of the Child Anxiety Life Interference Scale, an instrument that allows for the assessment of interference and impairment due to child anxiety from the perspectives of the child and the parent. The study, which was conducted with a clinical sample of 622 children, revealed a moderate to high level of agreement between children and parents (r's between 0.37 and 0.50). Thus, the Reuterskiöld et al. [17] and Lyneham et al. [18] studies, which were both conducted in clinical populations, revealed moderate to high parent–child agreement but did not examine the discrepancy between both informants regarding children's anxiety life interference.

The low to moderate agreement and discrepancies between parent and child reports have been reported not only in the evaluation of anxiety symptoms but also in the measurement of several types of psychopathology in youths. It has been concluded that the manifestation of psychopathological problems can be quite different across situations, implying that each informant may provide unique information about the child's functioning. However, factors other than situational specificity might contribute to differences in reports of children's symptoms by various informants. One factor that is involved seems to be the type of psychopathology, with lower agreement being found for internalising than for externalising problems [19]. Furthermore, family factors, such as parental psychopathology, may also affect informant agreement, although the literature has produced somewhat conflicting findings on family factors. While some studies have found that high levels of maternal anxiety are associated with a tendency to report higher levels of symptoms for their children [5, 15], some others have not found significant associations between maternal anxiety and parental reports of children's anxiety [14].

Demographic variables such as children's age and sex may also have an impact on parent–child (dis)agreement. Various studies have documented sex effects, with fathers' reports of child anxiety being more clearly correlated with boys' than with girls' self-reports [14]. Furthermore, male children were found to show a higher agreement with their parents for some anxiety problems than female children [10, 20], although Reuterskiöld et al. [17] found a gender difference in the opposite direction. With regard to age, some studies have found lower agreement for older children [14], attributing this finding to a decrease in communication between parents and their adolescent children, while other studies have not found significant differences [10, 17] or have even found differences in the opposite direction [20].

Lastly, tentative evidence indicates that demographic and parent characteristics have an interactive effect on parent–child (dis)agreement in reports of children's anxiety symptoms. In a clinical sample of 41 dyads of mothers and children aged between 7 and 13 years with a primary diagnosis of anxiety disorder, Niditch and Varela [21] found that mothers with low anxiety had reports that were consistent with their children across various ages. However, significant discrepancies between child and mother reports were observed in the case of anxious mothers: younger children reported higher levels of anxiety than their mothers, whereas older children reported lower levels than their mothers.

The current research further examines mother and child agreement in the evaluation of anxiety in a large sample of Portuguese school children. Mothers were chosen as parent informants in this study because they typically spend more time with their children [22], and therefore have more opportunities to observe anxiety symptoms in their offspring. This study explores agreement and discrepancies between informant reports considering different dimensions of anxiety in two samples (a community sample, $N = 1,065$, and a subsample of children fulfilling the diagnostic criteria of an anxiety disorder, $n = 135$). The use of a subsample of children with a diagnosis of anxiety disorder who were recruited from the community and who did not look for treatment will allow the hypothesis that the higher level of anxiety reported by parents (vs. children) in clinical samples reflects some type of bias in treatment-seeking samples to be tested. The present investigation also extends previous research on agreement and discrepancy between parent and child reports with respect to the interference of anxiety symptoms on children's lives. Earlier studies on this topic were conducted exclusively with clinical samples and only addressed agreement while neglecting the discrepancy between parent and child reports of this anxiety construct. Lastly, the current study also explores the impact of child (i.e. sex, age) and maternal factors (i.e. anxiety) as well as their interaction effects on the discrepancy in scores, and thus further examines the interesting results documented by Niditch and Varela [21] .

Materials and methods

Participants

The sample consisted of 1,065 Portuguese school children (505 boys and 560 girls) and their mothers (Table 1). The age of the children ranged from 7 to 14 years ($M = 9.79$, $SD = 1.31$). Of these children, 135 children (64 boys and 71 girls) fulfilling the diagnostic criteria of an anxiety

Table 1 Socio-demographic characteristics of the samples

	Total sample ($N = 1,065$)	Subsample ($n = 135$)
Age (in years)		
Range	7–14	7–12
Mean (SD)	9.79 (1.31)	9.72 (1.04)
Gender (%)		
Male	47.4	47.4
Female	52.6	52.6
Family structure (%)		
Two parent	71.7	67.4
Single parent	25.6	31.9
Unknown	2.7	0.7
Income (%)		
Low	37.7	34.1
Medium	41.5	42.2
Medium–high	20.8	23.7
Principal diagnosis		
Separation anxiety disorder		20.7 %
Generalised anxiety disorder		31.1 %
Social phobia		29.6 %
Specific phobia		17.8 %
Panic disorder		0.7 %
Mean (SD) interference scores—child		5.16 (2.14)
Mean (SD) interference scores—parent		5.64 (1.92)
Total number of diagnoses		2.68 (1.29)

disorder composed the subsample in focus in this study. These children had a mean age of 9.72 years ($SD = 1.04$, range 7–12 years) and were diagnosed with separation anxiety disorder, social phobia, generalised anxiety disorder, specific phobia, or panic disorder. Comorbidity was common in the sample: that is, 75 % of children had more than one anxiety diagnosis (27 % had two, 30 % had three, and 18 % had even four or more). Thirty-two percent of the children with anxiety disorders came from divorced/single parent families, and 42 % had a medium socio-economic status (SES estimated on the parent's level of education and occupation). Moreover, it should be noted that there were no significant differences between the total sample and the subsample regarding demographic characteristics (i.e. age, sex, and SES).

Assessment

Children's anxiety and anxiety life interference

The Screen for Child Anxiety Related Emotional Disorders-Revised version (SCARED-R; Muris et al. [23]) is a

self-report questionnaire consisting of 69 items for assessing symptoms of the following anxiety disorders in children: separation anxiety disorder, generalised anxiety disorder, panic disorder, social phobia, school phobia, specific phobia, obsessive–compulsive disorder, and acute or posttraumatic stress disorder. Children rate how frequently they experience each symptom (e.g. "I worry about going to school") on a 3-point scale: 0 (never or almost never), 1 (sometimes), or 2 (often). Item scores can be combined into separate scores for each anxiety disorder and for the total scale. The Portuguese version of the SCARED-R showed high levels of internal consistency, good test–retest reliability, and adequate convergent and discriminant validity [24]. In the present study, the child and parent versions of the SCARED-R were employed. The reliability analysis of both versions in the samples of the present study indicated satisfactory internal consistency, with Cronbach's alphas in the 0.90 range for the total scale and between 0.60 and 0.90 for the subscales. The school phobia subscale of the child version was the only exception, with an alpha of 0.49.

The Anxiety Disorders Interview Schedule for Children, Child and Parent Versions (ADIS-C/P; Albano and Silverman [25]) is a semi-structured interview for diagnosing anxiety disorders in youths (7–18 years). The interview initially probes respondents for the main criteria of a diagnosis, which when positively endorsed are then followed by a more detailed assessment of symptoms, level of fear, avoidance, and interference. Although the ADIS-C/P primarily aims to establish anxiety disorder diagnoses, other disorders are also included (e.g. attention-deficit and hyperactivity disorder and depressive disorder). This interview has well-established reliability and validity [26].

The Children's Anxiety Life Interference Scale (CALIS; Lyneham et al. [18]) is a questionnaire about the impact of children's fears and worries on daily life from the perspective of the child as well as the parent. The CALIS-C (9-item) and CALIS-P (15-item) are parallel child and parent report forms assessing anxiety-related life interference in children's school, social, and home/family functioning. Each item is rated on a 5-point Likert scale: (0) not at all, (1) only a little, (2) sometimes, (3) quite a lot, and (4) a great deal. In the present study, we only used the parent and child items regarding anxiety interference in the child's life (9 items). Reliability estimates have been found to be adequate, and moderate to strong convergent and discriminant validity have been documented [18]. The Portuguese version of the CALIS has similar psychometric properties (Marques et al. [27]), and this was confirmed in the present sample, with Cronbach's alphas of 0.76 (CALIS-C) and 0.79 (CALIS-P).

Mothers' psychopathology

The Brief Symptom Inventory (BSI; Derrogatis [28]) is a 53-item scale to assess psychological symptoms. The items of the BSI, which have to be rated on a 5-point Likert scale, define a broad spectrum of psychiatric symptoms and can be allocated to the following scales: somatisation, obsessive–compulsive, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism. We used the Portuguese version of the scale, which showed good psychometric qualities (including good reliability and construct and criterion validity) [29]. Although the whole scale was administered, for the purpose of this study, we only used mothers' scores on the anxiety and depression subscales, which showed high internal consistency ($\alpha = 0.84$ for depression and $\alpha = 0.78$ for anxiety).

Procedure

The data were collected within the context of a larger study on the mediators and moderators of treatment for childhood anxiety. The study was approved by the General Administration for Innovation and Curriculum Development in Lisbon, Portugal, and organised in collaboration with the school boards and teachers of the schools involved. Children were recruited from Portuguese public and private schools. The recruitment was conducted in two phases (see Fig. 1). All children from the 3rd to 6th grade of 11 schools were invited to participate in the study, with the only exclusion criterion being the inability to understand the questionnaires (e.g. insufficient knowledge of the Portuguese language or the presence of a severe developmental disorder). Parental informed consent and child assent were obtained before the assessment was conducted in each of the phases. The first phase of the study consisted of a universal screening to identify children with high levels of anxiety symptoms. All of the children authorised to participate in the study (74 %) completed the child version of the SCARED-R during regular classes, while their mothers filled out the questionnaire at home. The children and their mothers ($N = 1,065$) who participated in the first screening phase composed the total sample of the present study.

Next, all of the children scoring above the 95th percentile on the total scale or the subscales of generalised anxiety disorder, separation anxiety disorder, or social phobia, either on the parent or child version of the SCARED-R ($n = 275$), were invited to participate in the second phase of the study. The majority of the mothers and children participated in the diagnostic interview ($n = 180$).

Mothers and children were interviewed together by trained clinical psychologists with previous experience in
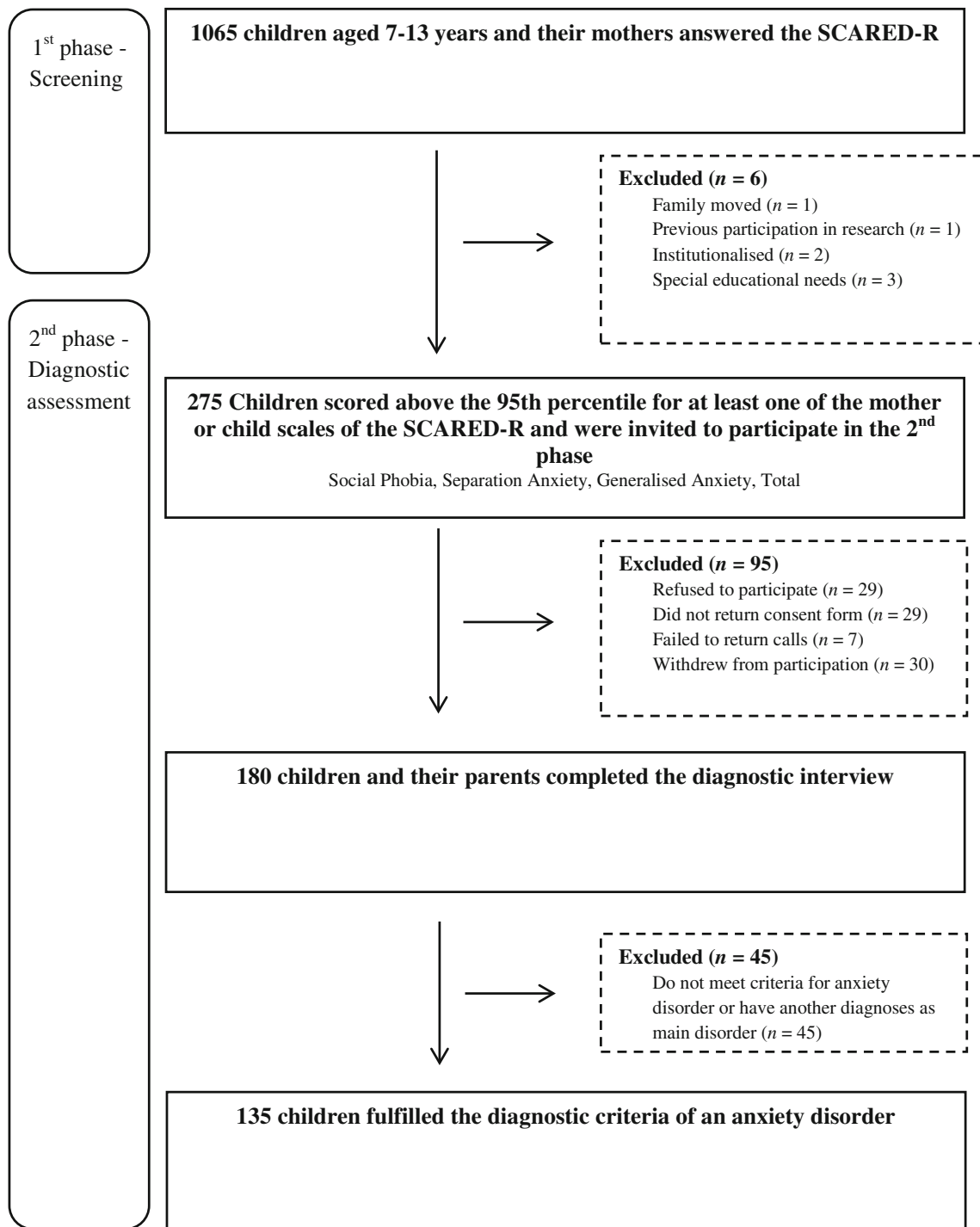
Fig. 1 Flow diagram of participants' progress through the phases of the study

the administration of the ADIS-C/P. The majority of the interviews were conducted in the schools. Following the procedure used by Khanna and Kendall [30], parents and children were interviewed together. Each interview was supported by a booklet that was specifically designed for this project, including pictures, fear lists, fear thermometers, and calendars. The descriptions of various sections were accompanied by pictures. For each section, the initial inquiry and the questions assessing the presence or absence of diagnostic criteria were first posed to the child, and the parents were probed afterwards. For the assessment of fear/distress, avoidance, and interference,

parents and children were probed separately: the child responded directly to the interviewer using the thermometer; the parent filled out a table in the booklet and was probed by the interviewer afterwards. The modules on externalising disorders were only administered to parents. If there was disagreement between parent and child in response to an item, we followed the recommendations of Grills and Ollendick [10], who combined both reports using the "OR" rule to make decisions regarding the presence of a symptom or diagnosis, considering external validators of impairment, and examining the source of disagreement. At the end of the interview, the mother and child independently completed the CALIS. The BSI was sent to the home of the families and returned to the research team via the child's teacher. The children who fulfilled the diagnostic criteria of an anxiety disorder ($n = 135$) composed the anxiety-disordered subsample of the study.

Data analysis

We conducted two types of analyses to examine the (dis)agreement among informants' ratings of anxiety symptoms. First, we computed Pearson correlation coefficients to study the overlap between mother and child ratings of children's anxiety symptoms. Next, paired sample t tests were conducted to examine whether child and mother ratings of children's anxiety symptoms were significantly different. These analyses were conducted for both the total sample and the subsample of anxiety-disordered children. The (dis)agreement among informants' ratings of anxiety life interference was only assessed for the subsample of anxiety-disordered children. This subsample was also used to examine the predictors of the discrepancy between mother and child reports. For this examination, we first computed two measures of discrepancy, one for child anxiety symptoms (total SCARED-R) and one for child life interference (CALIS). Mother–child reporting discrepancies were assessed using standardised difference scores (SDS), following the recommendations from De Los Reyes and Kazdin [31]. The child's Z scores were subtracted from the mother's Z scores. Positive values thus indicated higher scores reported by the mother relative to the child, while negative values indicated higher scores reported by the child relative to the mother. We then conducted two hierarchical regression analyses: one with informant discrepancy regarding child anxiety symptoms ($n = 111$) as the dependent variable and one with informant discrepancy regarding anxiety life interference ($n = 84$) as the dependent variable. All continuous predictors were centred to the mean. The predictors were the child's age (0 = children aged 7–9 years, 1 = children aged 10–12 years) and sex (0 = male, 1 = female) (step

1), the mother's BSI depression and anxiety mean-centred scores (step 2), and possible interaction terms of the child's age and gender and the mother's BSI mean-centred scores (step 3). For each step, all predictors were forced to enter. For these analyses, the sample size was somewhat lower because some parents did not return the BSI and/or the CALIS.

Results

Agreement between mother and child

For the total sample, all of the mother–child correlations were significant and of low to moderate magnitude (Table 2). The strongest correlations were found between child and mother reports of specific phobia and school phobia symptoms ($r = 0.42$ and 0.33, respectively), while the lowest correlations were observed for traumatic stress disorder, obsessive–compulsive disorder, generalised anxiety disorder, and panic disorder. For the subsample of children with a diagnosis of anxiety disorder, only the correlations between child and mother reports of specific phobia and school phobia symptoms were significant ($r = 0.30$ and 0.31, respectively), and again these correlations were of

Table 2 Correlations between child and mother reports of children's anxiety symptoms and anxiety life interference as computed for the total sample and the subsample of children with anxiety disorders

	Total sample ($N = 1,065$)	High-anxiety subsample ($n = 135$)
SCARED-R		
Total score	0.27*	−0.09
Panic disorder	0.21*	−0.05
Generalised anxiety disorder	0.20*	−0.08
Social phobia	0.25*	0.06
Separation anxiety disorder	0.29*	0.05
Obsessive–compulsive disorder	0.15*	0.14
Specific phobias	0.42*	0.30*
School phobia	0.33*	0.31*
Traumatic stress disorder	0.16*	−0.03
CALIS		
Anxiety life interference	–[a]	0.33*

SCARED-R Screen for Child Anxiety Related Emotional Disorders-Revised version, *CALIS* Children's Anxiety Life Interference Scale

* $p < 0.001$

[a] Anxiety life interference was not assessed for the total sample

moderate magnitude. For this subsample of children, the correlation between child and mother reports of anxiety life interference was also significant ($r = 0.33$). An additional analysis comparing the magnitude of these correlations across both samples showed that mother–child agreement for anxiety symptoms was generally larger in the total sample than in the subsample of children with anxiety disorders ($t = 3.98$, $p < 0.001$ for the SCARED-R total score; t's ranging from 2.12 to 3.07, all p's < 0.05 for the subscales). However, for the SCARED-R subscales measuring symptoms of obsessive compulsive disorder, school phobia, and specific phobia, the mother–child correlations were comparable between the samples.

Discrepancy between mother and child

Table 3 presents the mean scores (standard deviations) on the SCARED-R and CALIS for mothers and children in both samples. As the table shows, children consistently reported higher levels of anxiety symptoms than their mothers—in both the total sample and the subsample of children with anxiety disorders [all $t(1,065/134)$'s ≥ 2.13, p's < 0.05]. Inspection of the magnitude of these discrepancies between mother and child by means of Cohen's d indicated that most of these differences were of low to medium size (i.e. d values up to 0.50). Note, however, that definitively larger effect sizes were found for the differences between child and mother on the SCARED-R total score (total sample: $d = 0.81$), panic disorder (high-anxiety subsample: $d = 0.82$), obsessive–compulsive disorder (both samples: $d = 1.53$ and 1.34), and traumatic stress disorder (high- anxiety subsample: $d = 0.80$).

In general, discrepancies between mother and child reports of anxiety symptoms were of a similar magnitude in both samples (see Table 3). Exceptions to this rule were school phobia, for which the subsample of children with anxiety disorders showed a greater discrepancy than the total sample ($d = 0.41$ vs. 0.06, respectively), and social phobia and separation anxiety disorder, for which the discrepancy was larger in the total sample than in the high-anxiety subsample ($d = 0.47$ and 0.26, respectively, for social phobia and 0.48 and 0.29, respectively, for separation anxiety disorder).

Regarding the interference of anxiety in children's lives, as indexed by the CALIS in the high-anxiety subsample, a significant difference between mother and child reports was found [$t(103) = 2.78$, $p < 0.01$]. As shown in Table 3, mothers reported a higher level of anxiety interference in their child's life than children, although the absolute value was fairly low for both informants.

Table 3 Mean scores (standard deviations) for child and mother reports of children's anxiety symptoms and anxiety life interference for the total sample and the subsample of children with anxiety disorders

	Total sample ($N = 1,065$)				High-anxiety subsample ($n = 135$)			
	Child	Mother	t	Cohen's d	Child	Mother	t	Cohen's d
SCARED-R								
Total scale	47.43 (19.39)	32.68 (16.87)	21.85***	0.81	63.06 (22.01)	47.37 (20.49)	5.80***	0.74
Panic disorder	5.52 (4.40)	2.66 (3.00)	19.51***	0.76	8.44 (5.74)	4.38 (4.05)	6.57***	0.82
Generalised anxiety disorder	8.01 (3.61)	7.13 (3.26)	6.56***	0.26	10.59 (4.06)	9.57 (3.51)	2.13*	0.27
Social phobia	6.21 (3.05)	4.69 (3.46)	12.35***	0.47	7.87 (3.22)	6.95 (3.86)	2.19*	0.26
Separation anxiety disorder	6.65 (3.18)	5.14 (3.15)	13.08***	0.48	8.59 (3.60)	7.50 (3.83)	2.46*	0.29
Obsessive–compulsive disorder	8.34 (3.11)	3.93 (2.65)	38.09***	1.53	10.05 (3.36)	5.48 (3.44)	11.93***	1.34
Specific phobias	7.99 (5.11)	6.33 (4.79)	10.17***	0.34	11.23 (6.08)	9.47 (6.24)	2.82**	0.29
School phobia	1.51 (1.43)	1.08 (1.41)	8.45***	0.06	2.12 (1.63)	1.46 (1.57)	4.07***	0.41
Traumatic stress disorder	3.21 (1.98)	1.71 (1.58)	20.88***	0.75	4.18 (2.03)	2.56 (2.01)	6.46***	0.80
CALIS								
Anxiety life interference	–	–		–	7.60 (5.19)	9.24 (5.22)	2.78**	0.32

The magnitude of the differences is expressed in Cohen's d

SCARED-R Screen for Child Anxiety Related Emotional Disorders-Revised version, *CALIS* Children's Anxiety Life Interference Scale

* $p < 0.05$

** $p < 0.01$

*** $p < 0.001$

Predictors of the discrepancy between mother and child reports

Table 4 shows the results of the hierarchical regression analysis in which the discrepancy between mother and child reports of children's anxiety symptoms was predicted by the child's sex and age (step 1), the mother's anxiety and depression symptoms (step 2), and interaction terms of the child's age and gender and the mother's symptoms (tested in step 3 in separate analyses). The results indicated that child demographics did not make a significant contribution to the model in step 1. However, in step 2, the mother's anxiety symptoms did emerge as a significant predictor of a discrepancy in scores. The positive β value indicated that as mother anxiety symptoms increased, the discrepancy between mother and child reports of anxiety symptoms increased, with mothers reporting higher anxiety levels for their child than children. The mother-related variables entered in step 2 accounted for 17 % of the variance in the discrepancy between mother and child reports of children's anxiety symptoms. In step 3, none of the interaction terms were found to explain additional variance in the mother–child discrepancy in scores of children's anxiety symptoms.

The second regression analysis examining predictors of the discrepancy between mother and child reports of

Table 4 Hierarchical regressions analyses investigating predictors of the mother–child discrepancy in reports of children's anxiety symptoms for the subsample of children with anxiety disorders ($n = 111$)

Dependent variable	ΔR^2	B	SE	β	t
Step 1: Child demographics	0.01				
Sex		−0.04	0.28	−0.01	−0.13
Age		−0.01	0.29	−0.01	−0.04
Step 2: Mother symptoms	0.17**				
Anxiety		0.13	0.04	0.32*	2.98*
Depression		0.05	0.04	0.13	1.24
Step 3: Interaction terms	0.00–0.01				
Child age × maternal anxiety		−0.04	0.08	−0.07	−0.45
Child age × maternal depression		−0.05	0.07	−0.11	−0.77
Child sex × maternal anxiety		−0.01	0.08	−0.03	−0.18
Child sex × maternal depression		−0.05	0.06	−0.11	−0.85

In step 3, interaction terms were tested in separate regression analyses

* $p < 0.01$

** $p < 0.001$

anxiety life interference did not yield a significant regression model, implying that none of child demographics, mother symptoms, or interaction terms made a statistically meaningful contribution to the model.

Discussion

The current study investigated the agreement and discrepancy between mother and child reports of children's anxiety symptoms and anxiety life interference in a large sample of Portuguese school children, of which a substantial minority was found to display clinical levels of anxiety. Consistent with previous studies [6, 9, 10], we found low to moderate correlations between mother and child reports of children's anxiety. The strongest correlations were found between child and mother reports of specific phobia and school phobia symptoms, while the lowest agreement was found for symptoms of obsessive–compulsive disorder, traumatic stress disorder, generalised anxiety disorder, and panic disorder. These results are also in line with earlier findings indicating stronger agreement for anxiety symptoms with an observable behavioural component and lower agreement for symptom dimensions with a more internalised nature [6].

Significant differences between mother and child reports of children's anxiety symptoms were found [9, 11–13], with children reporting higher levels of anxiety symptoms than mothers. This result can be explained by the fact that because of their internalised nature, anxiety symptoms can be more readily accessed by the person experiencing those symptoms than by an external observer. The finding of a similar mother–child difference in reports of anxiety symptoms in the subsample of children with anxiety disorders contrasts the results of research conducted in clinically referred samples of anxious youths [14, 15]. This finding thus supports the notion that the effect found in these clinical studies is most likely due to a bias in treatment-seeking samples.

To our knowledge, this is the first study exploring the agreement and discrepancy between parent and child reports regarding anxiety life interference in a clinical sample recruited from the community. The results revealed a significant but fairly low correlation between child and mother reports of anxiety life interference, which was also lower than that documented by Lyneham et al. [18]. The lower correlation found in the present study may be due to sample differences, as Lyneham et al. relied on a clinically referred sample, whereas children in the present study were recruited from the general population. The results also show a significant low- to medium- sized difference between the reports of both informants. Note that this difference was in the opposite direction of the differences

between mother and child reports of anxiety symptoms: that is, mothers reported higher levels of life interference than children. This aberrant result may have been obtained because children are less capable of evaluating anxiety life interference, as such an evaluation requires rather complex cognitive abilities (i.e. attending to multiple dimensions of a problem, understanding the cause–effect relationship), which may not have been fully present in these school-aged children.

It is also important to mention that, although the children from the subsample were diagnosed with anxiety disorders, the absolute life interference as reported by mothers and children was fairly low (mean scores of 6.63 and 8.40, respectively, with a possible maximal score of 40), suggesting that both informants perceived a rather low level of impact of anxiety problems. This result appears to indicate that children and parents may recognise the impact of anxiety symptoms in specific areas (e.g. school) but that they are largely unaware of the impact of anxiety symptoms in other domains of children's lives. This result is consistent with the fact that the sample in this study was not a sample of help-seeking children. Additionally, during the diagnostic interview, many parents and children admitted that they had never thought before about the effect of anxiety symptoms on the children's lives.

Mothers' anxiety symptoms, but not depression, emerged as a significant predictor of the discrepancy between mother and child reports of children's anxiety symptoms. This result is consistent with the studies of Frick et al. [5] and Briggs-Gowan et al. [15], who also found that mothers who reported high levels of anxiety symptoms tended to report higher levels of such symptoms in their children. This result can be interpreted in several ways. On the one hand, it is likely that anxious mothers are more aware of these symptoms in their children owing to their own experience with anxiety problems. On the other hand, it is also possible that this finding merely reflects distortions in maternal reporting of such symptoms. Thus, anxious mothers may have a lower threshold for detecting anxiety problems in their offspring or may project some of their own symptoms to their children.

Children's age and sex did not emerge as significant predictors of the discrepancy between mother and child reports of children's anxiety symptoms and anxiety life interference and did not interact with maternal symptoms to produce an effect on the discrepancy in scores. Thus, the role of these demographic variables in the mother–child disagreement in reports of children's anxiety symptoms remains unclear [8, 10, 19]. More research is certainly required on this topic, and an effort should be made to perform such studies under optimal conditions. For example, the lack of a significant effect of children's age on the

discrepancy between informants may have been related to the restricted age range of the sample in the present study, whereas the absence of effects on the discrepancy between mother and child reports regarding anxiety life interference could be related to the aforementioned low base rates of anxiety life interference.

Admittedly, there are a number of limitations of the current study that need to be acknowledged. First, by focusing on children and their mothers, this study only yields a partial picture of the cross-informant agreement and discrepancy in reports of children's anxiety symptoms and anxiety life interference. To tackle this issue, future research should also include other informants, such as fathers, friends, and teachers. Second, the children in this study were aged between 7 and 14 years, and most of them were still in their middle childhood years. Although previous investigations have demonstrated that anxiety symptoms are fairly common at this age [31], specific anxiety problems become more prevalent (and thus more visible) during adolescence (e.g. panic disorder, social anxiety disorder) [32]. Thus, it would be interesting to examine a sample with a broader age range that includes more adolescent participants.

Despite these limitations, the present findings may have several implications for the assessment of anxious youths. First, the low agreement between mother and child reports found for the majority of anxiety symptoms suggests that it is advisable to integrate both parents' and children's perspectives in the screening and evaluation of childhood anxiety. In the case of anxiety problems, for which a behavioural component is not evident, the information reported by the child should be given more weight because parents seem to be less aware of these symptoms. On the other hand, parents may be equally reliable informants for anxiety problems that are readily observable (i.e. specific phobias). The results for the subsample of children with anxiety disorders highlight the importance of conducting universal screening for the detection of anxiety problems, as these results effectively illustrate that anxiety symptoms and their impact on children's lives can remain unnoticed [33]. Previous research on parental help-seeking indicates that such behaviour is more dependent on the amount of distress or burden that parents perceive than on the intensity/frequency of their children's symptoms [34]. In our subsample of children with a clinical diagnosis of anxiety, the life interference scores were still fairly low, making it unlikely that these families would spontaneously seek help in the near future.

On a final note, the results of this study stress the importance of a multi-informant approach in the evaluation of children's anxiety. For such an assessment, incorporating the perspectives of different informants is often necessary to provide a more complete evaluation of the

anxious child. For a sensitive and adequate screening of children's anxiety symptoms and their impact on daily life, the perspectives of both the child and the parents should be considered. Beyond studying the determinants of informant discrepancies and agreement, future research should examine how these discrepancies affect the search for treatments, treatment adherence, and treatment outcomes. Such research might also have important clinical implications, as informant discrepancies could provide a guideline for further improving the treatment of children with anxiety disorders.

Conflict of interest On behalf of all authors, the corresponding author states that there is no conflict of interest.

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