

Anxious by Maternal - versus Self-Report: Are They the Same Children?

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Abstract

Introduction: Assessing childhood anxiety is complicated by differences between informants, particularly parents and children. We examined factors associated with mother- and child-report, to understand how children identified by each might differ. **Method:** Eighty-five children with anxiety disorders diagnosed by semi-structured interview, and 45 children without such disorders and their mothers completed a standardized anxiety questionnaire. Predictors of questionnaire scores by mother- and child-report were examined, and a comparison of children high- and low- on self- report was done. **Results:** Child anxiety self-reports were best predicted by depressive symptoms, maternal psychopathology (self-report), and a support-seeking coping style (adjusted $R^2 = .299$). Maternal reports were best predicted by child functioning (clinician-rated) and maternal psychopathology (self-report) (adjusted $R^2 = .305$). Children high on self-report showed higher depressive symptoms ($p = .001$) and reported higher use of avoidant ($p < .05$) and support-seeking ($p < .01$) coping strategies than low self-reporters. Diagnosis was more significantly linked to maternal- than child-report (chi-square = 49.99, $p < .001$ for mother; 4.27, $p < .05$ for child). **Conclusion:** Depressive symptoms and coping style appear to predict children's self-reported anxiety, but clinicians may place greater emphasis on maternal report in assigning diagnoses, potentially missing some children with significant anxiety.

Key words: anxiety disorders, child, measurement, informant differences, regression

Résumé

Introduction: L'évaluation de l'anxiété est compliquée par les divergences constatées dans le rapport des informants, notamment lorsqu'il s'agit des parents et des enfants. Nous étudions les facteurs mentionnés par la mère et par l'enfant afin de comprendre ce qui les différencie. **Méthodologie:** Quarante-vingt-cinq enfants ayant reçu un diagnostic d'anxiété à la suite d'une entrevue semi-structurée et 45 enfants sans diagnostic ont rempli un questionnaire standardisé sur l'anxiété. Les mères ont également rempli ce questionnaire. Nous avons étudié les prédicteurs du score dans les rapports remplis par les mères et par les enfants et comparé les scores élevés aux scores bas. **Résultats:** Le questionnaire rempli par les enfants a fait ressortir que les meilleurs prédicteurs de l'anxiété étaient les symptômes de dépression, la psychopathologie maternelle (questionnaire auto-administré) et l'évitement par la recherche d'appui (R^2 ajusté = 0,299). Celui remis par les mères a permis d'établir que les meilleurs prédicteurs de l'anxiété étaient le fonctionnement de l'enfant (noté par le médecin) et la psychopathologie maternelle (questionnaire auto-administré) (R^2 ajusté = 0,305). Lorsque le score du questionnaire rempli par les enfants était élevé, ceux-ci affichaient davantage de symptômes dépressifs ($p = 0,001$), de stratégies d'évitement ($p < 0,05$), et une plus grande recherche d'appui ($p < 0,01$) que les autres. La corrélation dans le diagnostic était plus grande dans le rapport de la mère (chi carré = 49,99 ; $p < 0,001$) que dans celui de l'enfant (chi carré = 40,27 ; $p < 0,05$). **Conclusion:** Le rapport rempli par les enfants indique que les symptômes de la dépression et le style d'évitement sont des prédicteurs de l'anxiété. Les cliniciens qui basent surtout leur diagnostic sur le rapport de la mère risquent d'oublier les enfants qui souffrent d'anxiété sévère.

Mots clés: troubles anxieux, enfant, mesure, différence entre informants, régression

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Anxiety disorders are prevalent and debilitating, with affected children facing impairment at home, at school, and with peers (Bernstein et al., 1996). In assessing childhood anxiety, parent-child reporting differences are a vexing problem (Barbosa et al., 2002; Manassis et al., 1997; Nauta et al., 2004; Wren et al., 2007). Correlations between child- and parent-report are modest, and lower for clinical than non-clinical populations (Barbosa et al., 2002; Nauta et al., 2004).

Parental reports of child anxiety are sometimes reflective of parental anxiety (Krain & Kendall, 2000). Child-reported anxiety may be affected by developmental factors or coping

style (Manassis et al., 1997). Younger child age, female gender of child, and lower parental education predicted child-reported anxiety in a recent non-clinical sample (Wren et al., 2007), but it is not clear if this applies to clinically anxious children. Diagnosis can be dependent on which reporter's information the clinician emphasizes, potentially resulting in missed or misidentified cases.

Differences between parent- and child-reports may also influence differences between efficacy and effectiveness in treatment outcome research. Thus, treatment studies may evaluate efficacy based on decreased child-reported anxiety, but commu-

nity results may be judged more by parental perception of decreased child anxiety. Understanding the antecedents of child-reported and parent-reported anxiety might aid in understanding these differences, and in deciding how to combine discrepant reports. Unfortunately, predictors of child- and parent-reported anxiety are rarely examined.

We examined predictors of child-reported anxiety, parent-reported anxiety, and the difference between them in children with and without anxiety disorders. We examined only maternal report, as too few fathers participated in the study for analysis. Previously, we found that children anxious on both self- and parent-report reported more depression and used a greater variety of coping strategies than children anxious on self-report alone (Manassis et al., 1997). We attempted to replicate this finding, and also relate self- and parent-reports to clinician diagnosis.

We hypothesized that factors related to parental or family pathology, or to general child development and child functioning would be more predictive of parent-reported anxiety, and factors related specifically to the child (e.g., child depression, coping style, age, IQ) would be more predictive of child-reported anxiety. Parental or family pathology were hypothesized to predict reporting differences between informants.

Method

Subjects:

The sample consisted of 130 children, 90 boys and 40 girls, ages 8 to 12 years (mean = 9.61 ± 1.28 years). Eighty-five met criteria for one or more anxiety disorders, and 45 did not. The latter were either community-recruited ($n=35$) or clinic-referred ($n=10$) and were considered controls.

Anxious children (58 boys, 27 girls; mean age = 9.56 ± 1.26 years) were a consecutive sample recruited from an outpatient clinic of a tertiary treatment center serving a large urban and suburban population. All were unmedicated, or had discontinued psychoactive medication for seven half-lives prior to participation to ensure washout ($n = 6$; all on psychostimulants for comorbid ADHD). All racial and socioeconomic groups were represented, but with over-representation of Caucasian and more

affluent families relative to the local census population.

Community subjects (30 boys, 15 girls; mean age = 9.78 ± 1.34 years) were recruited from local schools. Principals nominated students with no signs of emotional or behavioral problems, and each student was also asked to nominate a friend (snowball technique). Controls had to be within one standard deviation of the population mean on standardized measures of anxiety symptoms. Two potential controls were excluded for this reason, but did not have clinical disorders on interview.

To determine diagnosis, potential subjects and their parents completed the Anxiety Disorders Interview Schedule (ADIS; Silverman & Albano, 1996), a well-validated, semi-structured interview using DSM – IV criteria. Interviewers were child psychiatrists, trained to reliability on the instrument with at least 3 years experience using it in other research studies. With parental consent, 10% of diagnostic interviews (randomly selected) were audiotaped and scored by an independent rater to ensure interviewer reliability. No discrepancies occurred between interviewer and rater as to group assignment (anxious versus control). Control subjects could not meet criteria for either an internalizing or externalizing disorder on ADIS.

Separation Anxiety Disorder, Generalized Anxiety Disorder, and Social Phobia were included, as these disorders are highly comorbid and therefore often studied together (Bernstein et al., 1996). Because this was a clinical sample, other comorbid conditions (Learning Disabilities, ADHD, Oppositional Defiant Disorder, Conduct Disorder, Depression) were expected. Although these could affect interpretation of data, they are frequent in this population so it was not feasible to exclude subjects with them. We excluded children who had an IQ < 80 (estimated by vocabulary and block design subtests of the Wechsler Intelligence Scales for Children) (WISC-III; Semrud-Clikeman et al., 1992), lacked fluency in English, or were suffering from psychosis or serious visual, auditory, or speech deficits (no such exclusions occurred).

Procedure:

The project was approved by our hospital

Research Ethics Board. Children and parents provided informed assent and consent respectively. Administration of measures was done by research technician blind to child diagnosis, and counterbalanced to control for order effects. Normal hearing was confirmed by audiological screening.

Measures:

The main measure of child- and maternal-report anxiety was the Screen for Child Anxiety Related Emotional Disorders (SCARED; Birmaher et al., 1997). This is a 41-item self-report for children and their parents which screens for anxiety disorders. It yields five factors, but only the parent-report and child-report totals of all factors were used in the present analyses. In clinical samples, the child and parent versions of the SCARED demonstrated good internal consistency (alphas = 0.74 to 0.93), test-retest reliability (ICC's: 0.70 to 0.90), and moderate parent child agreement (Birmaher et al., 1997; 1999). The SCARED appears to differentiate between anxiety disorders and disruptive disorders (Birmaher et al., 1997).

a) Additional Child Measures

These included the Coping Strategies Checklist (CCSC; Sandler & Ayers, 1990), the Children's Depression Inventory (CDI; Kovacs, 1983), and the Brief Family Assessment Measure (brief FAM; Skinner et al., 1995). The CCSC is a 44-item self-report to assess coping strategies children use when faced with a problem, using a 4-point Likert scale. It was standardized on a large community sample of elementary school children, and has high internal consistency and reliability. It yields four coping factors: Active, Avoidant, Distraction, and Support-seeking, with Active considered most adaptive and Avoidant most associated with anxiety. The CDI is a 27-item, 3-point self-report of depression in children in the previous 2 weeks. Only the total score was used in this study. The scale has high internal consistency and moderate test-retest reliability (Kovacs, 1983). The brief FAM is a one-page self-report questionnaire about family functioning using a 4-point scale. It is a short form of the Family Assessment Measure, and has acceptable reliability and validity.

b) Additional Maternal Measures

Mothers provided basic demographic information and an index of child developmental problems (Ontario Child Health Study, Boyle et al., 1993). They also completed the brief FAM and the Brief Symptom Inventory -53 (BSI; Derogatis, 1993). The BSI is a 53-item, 5-point Likert scale to assess psychological symptoms in adults within the previous week. The measure correlates highly with clinical ratings and measures of adjustment, and differentiates between patient and non-patient groups.

c) Clinician Measure

Clinicians completed the Children's Global Assessment Scale (CGAS; Shaffer et al., 1983). It is a 100-point rating of children's (aged 4 to 16) adaptive functioning during the previous month, with 1 being most impaired and 100 being least impaired. Descriptors are given for each 10-point interval. Clinicians select the interval corresponding to the child's current functioning, and then assign an exact rating within that interval. Controls had CGAS ratings ranging from 61 to 85 (mean rating = 74); children with anxiety disorders: 40 to 66 (mean rating = 54).

Statistical Analysis:

The Statistical Package for the Social Sciences – PC version (SPSSPC) was used for all analyses. Bivariate correlations were determined between child anxiety by SCARED self-report, child anxiety by SCARED maternal report, the difference between reporter scores, and each of the other measures administered (Table 1). Given that some anxious children had comorbid ADHD, partial correlations were done controlling for the ADHD index of the Conners' questionnaire (maternal report; Conners, 1989), but these did not alter significant associations so comorbid ADHD was not considered further. Correlations were also examined separately by gender, but no differences were found. We recorded intercorrelations among potential predictors of child report, maternal report, and the difference (Table 1), and entered all significant predictors in subsequent regressions.

Stepwise regressions were used (Table 2), first for the entire sample and then separately for children with and without anxiety disorder diagnoses. As the sample without anxiety disorder

Table 1. Correlations among Predictors of Child-Report SCARED, Maternal-Report SCARED, and Reporting Differences

	Age	CGAS	Est.IQ	BSI	Cfam	Mfam	CDI	Accop	Avcop	Dcop	Scop	Dev	Manx	Canx
Age	1													
CGAS	-.100	1												
Est.IQ	-.055	.156	1											
BSI	-.076	-.218	-.082	1										
Cfam	-.019	-.289	-.120	.177	1									
Mfam	-.042	-.157	-.097	.382	.153	1								
CDI	.174	-.276	-.124	-.009	.473	-.145	1							
Accop	-.108	.158	-.064	-.063	-.142	-.206	-.022	1						
Avcop	-.101	-.101	-.100	.159	.259	-.129	.298	.429	1					
Dcop	.156	-.121	.005	-.034	.071	.016	-.023	.279	.213	1				
Scop	-.039	.003	-.191	.063	-.118	-.055	.075	.594	.215	.249	1			
Dev	.120	-.213	-.386	.259	.249	.083	.289	.044	.248	-.010	.028	1		
Manx	.009	-.418	-.234	.334	.107	.287	.240	-.095	.148	-.117	.013	.326	1	
Canx	-.025	-.303	-.200	.282	.187	-.003	.496	.092	.370	-.018	.253	.104	.276	1
Differ	-.008	.096	.045	-.066	.031	-.273	.177	.134	.148	.102	.163	-.199	-.644	.558

Significant correlations are indicated in bold type.

CGAS = Children’s Global Assessment Scale; Est.IQ = Estimated IQ; BSI = Brief Symptom Inventory: global symptoms; Cfam = Child Report on Brief Family Assessment Measure; Mfam = Maternal Report on Brief Family Assessment Measure; CDI = Children’s Depression Inventory (total t-score); Accop = Active Coping; Avcop = Avoidant Coping; Dcop = Distracting Coping; Scop = Support-seeking Coping; Dev = History of developmental problems; Manx = Maternal report of Child Anxiety; Canx = Child self-report of anxiety; Differ = Canx – Manx

ders was relatively small (n = 45), only the five most significant correlates were entered as predictors in these regressions, consistent with accepted statistical recommendations.

To attempt to replicate our previous findings (Manassis et al., 1997), children high and low on self-reported anxiety were then contrasted on coping style (MANOVA) and depression (ANOVA), including an examination of any differences between children with and without anxiety disorders (Table 3). As the SCARED lacks published norms, median splits were done on child and maternal-report scores, resulting in dichotomous variables (high/low child report; high/low mother report), that were then entered into the analyses. Scores of 23 and below were low reporters; 24 and above were high reporters, for both the child and maternal median splits.

Finally, to better understand associations between high/low self- and maternal-report anxiety, and between each of these reports and diagnosis, chi-square analyses were done.

Results

Stepwise regressions are shown in Table 2. Depression (CDI), self-reported maternal psy-

chopathology (BSI), and support-seeking coping (CCSC) together accounted for 30% of the variance in self-reported anxiety for the sample. Global functioning (CGAS) and maternal psychopathology (BSI) together accounted for 31% of the variance in maternal-reported anxiety for the sample. For children with anxiety disorders, the predictors of maternal-reported anxiety were the same as for the total sample, and accounted for 19% of the variance. For self-reported anxiety, significant predictors included depression (CDI) and self-reported maternal psychopathology (BSI) as in the total sample, but also avoidant (rather than support-seeking) coping, and together accounted for 33% of the variance. Only maternal report of family dysfunction predicted the difference between reporters, accounting for 4% of the variance in the total sample and 11% in the children with anxiety disorders. There were no significant predictors of self- or maternal-reported anxiety or the difference between reporters in the children who did not have clinical anxiety disorders. Because maternal psychopathology appeared to be a salient factor in both anxiety reports, these regressions were re-run with maternal psychopathology entered first. Other predictors above remained significant.

Table 2. Stepwise Regressions Predicting Child Report SCARED, Maternal Report SCARED, and Reporting Differences

Predictors:	Beta	T	Significance	F for Model	Significance	Adjusted R ² & Standard Error
Child Report (sample)						
CDI: total	.433	4.501	.000	11.96	.000	.299 (11.80)
BSI: global symptoms	.241	2.513	.014			
Support-seeking Coping	.241	2.503	.015			
Maternal Report (sample)						
CGAS	-.382	-3.83	.000	17.03	.000	.305 (11.17)
BSI: global symptoms	.348	3.48	.001			
Child Report (anxiety disorders)						
CDI: total	.390	3.650	.001	11.59	.000	.328 (11.69)
Avoidant Coping	.298	2.782	.007			
BSI: global symptoms	.239	2.306	.024			
Maternal Report (anxiety disorders)						
BSI: global symptoms	.335	2.895	.005	8.16	.001	.188 (11.43)
CGAS	-.271	-2.339	.023			
Reporting Difference (sample)						
Mfam	-.227	-2.330	.022	5.43	.022	.042 (16.62)
Reporting Difference (anxiety disorders)						
Mfam	-.347	-2.941	.005	8.65	.005	.107 (16.90)

Note: Only best model for each dependant variable is reported; only significant predictors are listed.

CDI = Children’s Depression Inventory; BSI = Brief Symptom Inventory; CGAS = Children’s Global Assessment Scale

When contrasting children high and low on self-reported anxiety using analyses of variance (Table 3; ANOVA for CDI total score; MANOVA for CCSC variables), high anxiety reporters endorsed more depression ($F=10.55$, $p=.001$). There was also a significant effect for diagnosis ($F=12.65$, $p=.001$), with children with diagnosed anxiety disorders endorsing more depression. There was no significant interaction between diagnostic status and high/low self-report, however, suggesting that the link between endorsing symptoms of anxiety and symptoms of depression is found irrespective of the presence of anxiety disorder. High anxiety reporters also endorsed more avoidant and support-seeking coping strategies than low reporters (Significance: .044 and .005 respectively), but there were no significant diagnostic effects and no significant interaction effects.

Both child and maternal reports were significantly associated with diagnosis, but the association appeared to be stronger for maternal report (Child Chi-Square=4.265; Significance=.039; Maternal Chi-Square=49.990; Significance=.000). Child and mater-

nal reports were associated with each other (Chi square =8.506, $p=.006$), but when examining these reports as continuous variables, the association between them was moderate ($R=.276$ for whole sample, $p=.002$; $R=.209$ for anxiety disorders, $p=.06$; no significant correlation for controls).

Discussion

Child- and maternal-reported anxiety was predicted by different factors. These factors accounted for about 30% of the variance for both reports, suggesting a clinically meaningful association but also the presence of further predictors that were not studied. Differences between child and maternal reports were modestly related to maternal reports of family problems. Children with anxiety disorders constituted two thirds of the sample, and their predictors of self-reported anxiety, parent-reported anxiety and the difference between them were similar to those for the whole sample. Consistent with previous findings, avoidant coping predicted child anxiety in anxious subjects (Mendlowitz et al., 1999). In the sample as a whole, support-seeking coping

Table 3. Differences between Children High and Low on Self-reported Anxiety

Variable	High Anxiety (n=71)	Low Anxiety (n=59)	Significance for Model	Significance for High/ Low Anxiety
CDI (total t-score)	50.11 (11.42)	42.66 (8.29)	.000	.001*
CCSC:Active Coping	9.55 (2.09)	9.09 (2.11)	.188	.244
Avoidant Coping	5.24 (0.97)	4.65 (1.21)	.012	.044
Distraction	3.79 (0.92)	3.72 (1.43)	.216	.905
Seeking Support	4.11 (1.10)	3.58 (1.04)	.046	.005

*For this variable only, anxious and non-anxious diagnostic groups also differed at the .001 significance level; no significant diagnostic differences on CCSC; no significant interactions between diagnosis and high/low self-report on any variable.

CDI = Children's Depression Inventory; CCSC = Children's Coping Strategies Checklist

was a more salient predictor. The lack of significant predictors in children without anxiety disorders likely occurred because the range for anxiety symptoms was quite narrow in this small, essentially non-anxious group.

Significant correlates were generally consistent with our initial hypotheses (i.e., specific child factors correlated with child report; family and general child factors correlated with maternal report; family factors correlated with the difference in reports). Significant predictors in stepwise regressions, however, were not entirely consistent with these hypotheses. As expected, child-reported anxiety was predicted by child-reported depression and one dimension of coping (support-seeking), although age and estimated IQ (all >80, see above) were not significant. It is unclear whether this represents an association of these specific factors, or a more globally low sense of self-efficacy in these children or emotion regulation difficulty (Hannesdottir & Ollendick, 2007), as all three factors (anxiety, depression, support-seeking coping) could relate to these more general constructs. Contrary to our hypotheses, self-reported maternal psychopathology also appeared to play a role in child-reported anxiety. This finding suggests that maternal psychopathology may not only bias mothers towards seeing their children as more anxious, but may also influence children's perceptions of themselves, or may contribute to child anxiety through modeling or parenting practices. Alternatively, this factor may indicate greater genetic 'loading' for anxiety, thereby influencing both reports.

As expected, maternal-reported anxiety was predicted by child functioning and self-reported maternal psychopathology. Children whose global functioning is lower may be perceived as

more vulnerable and therefore more anxious by mothers, especially if mothers are struggling with mental health problems themselves. Contrary to our hypotheses, family functioning and developmental problems were not significantly related to maternal-reported anxiety.

The relationship between maternal reports of family problems and differences between informants was expected, as family members may be less attuned to one another's concerns when there is family dysfunction. It is also possible that this finding reflects a generally heightened level of maternal distress. Maternal psychopathology was not, however, related to the difference between informants.

Consistent with previous studies, self-reported depression related to increased use of various coping strategies in children with high self-report anxiety (Manassis et al., 1997). Avoidance and support-seeking were particularly high in this group. Also consistent with previous studies, the correlations between child- and maternal reports of child anxiety were low (.209 for anxiety disordered children), even lower than those recently found by Nauta and colleagues (2004) (.41 to .66).

Diagnosis appeared more strongly related to maternal-report (despite being based on both child and parent interviews), suggesting that clinicians may emphasize maternal reports in assigning diagnoses. The association between maternal report and child functioning may help explain this finding, as impaired functioning is an important criterion in making a DSM anxiety diagnosis. The potential influence of maternal psychopathology on maternal reports, however, should be borne in mind.

Limitations

These include the study's high reliance on

questionnaire (rather than observational) measures, making it difficult to ascertain which children in the sample were actually most or least anxious. The study is cross-sectional, limiting our ability to make any causal inferences regarding the factors associated with self- or maternal-report anxiety. Longitudinal studies with objective measures are needed to corroborate our findings. The preponderance of boys may have introduced some gender bias. Studies of more ethnically and economically diverse samples are indicated, to determine the generalizability of these findings.

Conclusion

The findings support the importance of obtaining both parent and child reports of anxiety, in clinical practice and research. Maternal psychopathology may be associated with both of these reports, so its potential influence should be considered. This is particularly relevant when assigning diagnoses, where parent-report may be given more emphasis by clinicians. Child self-reports should be obtained and given at least as much weight as parent reports, to avoid missing significantly anxious children or misidentifying non-anxious children as anxious. Finally, this is the second study showing an association between self-reported anxiety, depression, and coping in children, highlighting the importance of assessing these factors in planning for intervention, and of helping anxious children develop a greater sense of self-efficacy and ability to regulate negative emotion.

Acknowledgements/Conflict of Interest

This work was supported by the Ontario Mental Health Foundation. The authors have no further conflicts to disclose.

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