

Psychometric Properties of the Screen for Child Anxiety Related Emotional Disorders (SCARED): A Replication Study

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ABSTRACT

Objective: To replicate and extend work on the psychometric properties of the Screen for Child Anxiety Related Emotional Disorders (SCARED), a child and parent self-report instrument used to screen for children with anxiety disorders. **Method:** The 41-item version of the SCARED was administered to a new sample of 190 outpatient children and adolescents and 166 parents. The internal consistency, discriminant, and convergent validity were assessed. In addition, using discriminant function analysis, a briefer version of the SCARED was developed. **Results:** Using item analyses and factor analyses on the 41-item version, 5 factors were obtained: panic/somatic, generalized anxiety, separation anxiety, social phobia, and school phobia. In general, the total score and each of the 5 factors for both the child and parent SCARED demonstrated good internal consistency and discriminant validity (both between anxiety and depressive and disruptive disorders and within anxiety disorders). A reduced version of the SCARED yielded 5 items and showed similar psychometrics to the full SCARED. **Conclusions:** In a new sample, the authors replicated their initial psychometric findings that the SCARED is a reliable and valid instrument to screen for childhood anxiety disorders in clinical settings. Furthermore, pending future research, the 5-item SCARED appears to be a promising brief screening inventory for anxiety disorders in epidemiological studies. *J. Am. Acad. Child Adolesc. Psychiatry*, 1999, 38(10):1230–1236. **Key Words:** anxiety disorders, rating scales.

The Screen for Child Anxiety Related Emotional Disorders (SCARED) (Birmaher et al., 1997) is a self-report instrument that was developed as a screening tool for childhood anxiety disorders. These disorders are usually underdiagnosed and undertreated because they are frequently accompanied by other psychiatric disorders (e.g., major depression, bipolar disorder) that may mask the presence of an underlying anxiety disorder and because these patients usually do not have behavioral

problems (Bernstein et al., 1996). The recognition of childhood anxiety disorders is important because if these disorders are not treated, they may affect the child's normal psychosocial development, predispose to the development of other psychiatric disorders (e.g., depression, substance abuse), may continue into adulthood (Pine et al., 1998), and convey poor prognosis for the treatment of associated disorders (e.g., depression) (Brent et al., 1998; Clarke et al., 1992; Sanford et al., 1995).

The original version of the SCARED consisted of 38 items and 5 factors that parallel the *DSM-IV* classification of anxiety disorders: panic/somatic, generalized anxiety, separation anxiety, social phobia, and a pertinent simple phobia, school phobia. A prior publication (Birmaher et al., 1997) showed that the child and parent versions of the SCARED have moderate parent-child agreement (intraclass correlation coefficients = 0.37–0.62) and good internal consistency ($\alpha = 0.7–0.9$), test-retest reliability ($\rho = 0.6–0.9$), and discriminant validity, both between anxiety and other psychiatric disorders and within anxiety disorders. In addition, the child and par-

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ent SCARED showed good convergent and divergent validity when compared with the Child Behavior Checklist (Achenbach and Edelbrock, 1983) and the State-Trait Anxiety Inventory for Children (Spielberger, 1973; Monga et al., unpublished). Furthermore, the SCARED was recently found to have the same 5 factors described above and good psychometric properties in a large community sample of Dutch school-age children and adolescents (Muris and Merckelbach, 1998, in press; Muris et al., 1998a-e, 1999, in press).

The above-noted results indicated that the SCARED is a promising screening instrument for anxiety disorders in clinical and community settings. The objective of this study was to replicate our prior findings in a new clinical sample of children and adolescents with anxiety, depression, or disruptive disorders using a modified 41-item version of the SCARED (Table 1). Furthermore, we developed a shorter, 5-item version of the SCARED (Table 1) that has the potential to be used in primary care and other community settings and report on its psychometric properties.

METHOD

The initial scale construction, item analysis, and scale reduction of the original 38-item SCARED were described in detail elsewhere (Birmaher et al., 1997). Briefly, 85 questions identifying symptoms of separation anxiety disorder (SAD), generalized anxiety disorder (GAD), social phobia, and school phobia (a simple phobia) based on *DSM-IV* (American Psychiatric Association, 1994) classification of anxiety disorders were generated by experienced clinicians. This questionnaire was administered to a small sample of children of various ages to determine basic comprehension. Comments and criticisms from these children were used to modify questions with age-appropriate wording and sentence construction. The questionnaire was then administered to children between the ages of 9 and 18 years of age and their parents who attended the Child Mood and Anxiety Outpatient Clinic at Western Psychiatric Institute and Clinic in Pittsburgh. Severity of symptoms for the past 3 months was rated using a 0- to 2-point rating scale, with 0 meaning not true or hardly ever true, 1 meaning sometimes true, and 2 meaning true or often true. The 38-item SCARED was derived after the factor analysis and deletion of items that overlapped with depressive symptoms. Because in our previous study the social factor did not discriminate well between patients with social phobia and other anxiety disorders, 3 items were added to the original 38-item version for the current investigation. These items were as follows: "I feel nervous when I am with other children or adults and I have to do something while they watch me"; "I feel nervous about going to parties, dances, or any place where there will be people that I don't know well"; and "I am shy."

Subjects and Procedures

Psychiatric diagnoses were made using a comprehensive symptom checklist for all *DSM-IV* diagnostic categories (B. Birmaher and K. Poling, unpublished manuscript, 1997). This checklist interview was

administered by trained clinicians supervised by a child and adolescent psychiatrist.

The SCARED was completed by a consecutive sample of children and their parents who attended a mood/anxiety disorders clinic. A total of 190 children and adolescents with anxiety, depressive, or disruptive disorders were studied (92 males and 98 females, 13.8 ± 2.5 years old with an age range between 9.0 to 19.0 years; 135 white, 43 African-American, and 11 Hispanic). The sample included in this study has not been reported previously and does not overlap with the sample used in

TABLE 1
Child 41-Item Screen for Child Anxiety Related
Emotional Disorders (SCARED) Scale

1. When I feel frightened, it is hard to breathe
2. I get headaches when I am at school
3. I don't like to be with people I don't know well
4. I get scared if I sleep away from home
5. I worry about other people liking me
6. When I get frightened, I feel like passing out
7. I am nervous
8. I follow my mother or father wherever they go
9. People tell me I look nervous
10. I feel nervous with people I don't know well
11. I get stomachaches at school
12. When I get frightened, I feel like I am going crazy
13. I worry about sleeping alone
14. I worry about being as good as other kids
15. When I get frightened, I feel like things are not real
16. I have nightmares about something bad happening to my parents
17. I worry about going to school
18. When I get frightened, my heart beats fast
19. I get shaky
20. I have nightmares about something bad happening to me
21. I worry about things working out for me
22. When I get frightened, I sweat a lot
23. I am a worrier
24. I get really frightened for no reason at all
25. I am afraid to be alone in the house
26. It is hard for me to talk with people I don't know well
27. When I get frightened, I feel like I am choking
28. People tell me that I worry too much
29. I don't like to be away from my family
30. I am afraid of having anxiety (or panic) attacks
31. I worry that something bad might happen to my parents
32. I feel shy with people I don't know well
33. I worry about what is going to happen in the future
34. When I get frightened, I feel like throwing up
35. I worry about how well I do things
36. I am scared to go to school
37. I worry about things that have already happened
38. When I get frightened, I feel dizzy
39. I feel nervous when I am with other children or adults and I have to do something while they watch me (for example: read aloud, speak, play a game, play a sport)
40. I feel nervous about going to parties, dances, or any place where there will be people that I don't know well
41. I am shy

Note: Items in boldface compose the abbreviated 5-item scale. Scale is scored on a scale from 0 to 2: 0 = not true or hardly ever true, 1 = sometimes true, and 2 = true or often true.

our prior study. Similar to other studies (Angold and Costello, 1993; Kashani and Orvaschel, 1990; Last, 1991; Last et al., 1987; Strauss et al., 1988), a subgroup (29%) of the anxious children included in this study had 2 or more anxiety disorders and there was substantial comorbidity with the depressive and disruptive disorders. Forty-five patients had anxiety disorders (11 SAD, 21 GAD, 7 social phobia, 1 school phobia, and 5 panic disorder); 59 had depressive disorders without comorbid anxiety (27 major depressive disorder, 16 dysthymia, 23 depressive disorder not otherwise specified); and 86 had disruptive disorders without comorbid anxiety (43 attention-deficit/hyperactivity disorder, 8 conduct disorder, and 30 oppositional defiant disorder).

Data Analysis

Data distributions were examined for normality using the Shapiro and Wilk W statistic (Shapiro and Wilks, 1965). Where significantly nonnormal distributions were found, transformations were performed to normalize the distributions before using parametric tests. In cases in which transformation did not normalize the data, nonparametric statistics (e.g., Kruskal-Wallis, Mann-Whitney U [MWU]) were used. Sample characteristics were compared using t tests, χ^2 , and Fisher exact test as appropriate. Fisher's z transformations were used to compare the magnitude of the correlation coefficients.

Data from both the parent and child samples were analyzed using item analysis and principal components factor analysis with varimax rotation (Spector, 1992). Only those solutions with factors with eigenvalues >1 and that were clinically sound were chosen. Internal consistency was measured by means of coefficient α and parent-child correlations through Spearman correlations (ρ).

The SCARED discriminant validity was examined using parametric and nonparametric statistics (e.g., analysis of variance). To assess the optimal cutoff score derived from the total score to discriminate between anxious and nonanxious children, the receiver operator curve (ROC) method was used (Mossman and Somoza, 1991; Somoza et al., 1989; Somoza and Mossman, 1991). The area under the curve (AUC) represents the probability that the score of a randomly selected subject with a given disorder (e.g., anxiety) exceeds that of a randomly selected subject without the disorder.

A shorter version of the SCARED was derived from the 41-item SCARED using discriminant function analysis for each factor. Using this method, we were able to identify the items from each factor which best discriminated between anxious and nonanxious children.

All values are reported as means \pm SD. All p values are based on 2-tailed tests. Corrections for multiple comparisons were performed using the method of Bonferroni.

RESULTS

Scale Internal Consistency. All 41 items had item remainder coefficients in the range of 0.34 to 0.67. For both the child and parent versions of the SCARED, the coefficient α values for the total score were approximately .90.

Factor Structure. Factor analysis showed a 5-factor solution: (1) panic/somatic; (2) generalized anxiety; (3) separation anxiety; (4) social phobia; and (5) school phobia. Each factor showed good internal consistency, with coefficient α values ranging between .78 and .87. As predicted, the 3 items that were added to the original SCARED loaded on the social phobia factor. Overall, the factor

analysis of the 41-item and the 38-item versions of the SCARED were very similar.

Parent-Child Correlations. The parent-child correlation for the total anxiety score was $\rho = 0.32$ ($p = .0001$). For each individual factor, the correlations ranged from 0.22 for general anxiety to 0.39 for separation anxiety ($p < .005$). The parents' scores were more highly correlated with the scores of the adolescents (>12 years old) than with the scores of the children (9-12 years old) (total score: 0.44 versus 0.03; $z = 2.38$, $p = .009$; separation anxiety factor: 0.39 versus 0.08, $z = 1.77$, $p = .04$; social phobia factor: 0.43 versus 0.05, $z = 2.11$, $p = .02$). Female patients showed significantly higher parent-child correlations than male patients for the panic/somatic factor (0.38 versus 0.24; $z = 2.26$, $p = .01$). However, male patients had higher parent-child correlations on the social phobia factor (0.49 versus 0.19, $z = 2.14$, $p = .02$).

DISCRIMINANT VALIDITY

Comparison of Anxiety Disorders as a Group With Other Nonanxiety Psychiatric Disorders

As depicted in Table 2, the total score and the scores for each of the 5 factors from the child SCARED significantly differentiated children with anxiety disorders from children with nonanxiety psychiatric disorders ($p < .005$). In the parent SCARED, the total score and the panic/somatic and separation anxiety factors differentiated between the children with anxiety disorders and those with nonanxiety disorders ($p \leq .005$).

Children With Anxiety Versus Pure Depressive Disorders. The total child anxiety score and each of the 5 factors significantly discriminated between anxious and depressed children ($p < .05$) (Table 3). The parent total score and the panic/somatic and separation anxiety factors significantly ($p \leq .05$) discriminated between the anxious and the depressed children.

Children With Anxiety Versus Disruptive Disorders. With the exception of the separation anxiety factor, the child anxiety total score and the other factors significantly differentiated children with anxiety disorders from those with disruptive disorders ($p < .005$) (Table 3). Except for the social phobia factor, the parent total anxiety score and the other 4 factors discriminated children with anxiety and disruptive disorders ($p \leq .05$).

Comparisons Among Individual Anxiety Disorders

Both the parent and the child SCARED panic/somatic factors significantly discriminated between those with

TABLE 2
Comparison of Anxiety Disorders With Nonanxiety Psychiatric Disorders (Child Version)

	Anxiety Cases (<i>n</i> = 45)	Nonanxiety Cases (<i>n</i> = 145)	Statistic	<i>p</i> Value
Total score	36.1 ± 17.3	20.3 ± 14.8	$t_{188} = 6.00$	<.0001
Factor 1 (panic/somatic)	9.4 ± 6.6	4.3 ± 4.3	MWU = 1,756.0	<.0001
Factor 2 (general anxiety)	9.4 ± 5.8	5.8 ± 4.4	$t_{186} = 4.48$	<.0001
Factor 3 (separation anxiety)	5.4 ± 4.0	3.6 ± 3.7	MWU = 2,323	.003
Factor 4 (social phobia)	8.0 ± 4.2	4.6 ± 3.7	$t_{184} = 5.22$	<.0001
Factor 5 (school phobia)	3.9 ± 2.7	2.1 ± 2.0	MWU = 5,381	.0001

Note: Values represent mean ± SD. MWU = Mann-Whitney *U*; *t* = *t* test.

panic disorder and those children with other anxiety disorders (parent: MWU = 72.5, $p = .004$; child: MWU = 18.0, $p = .003$). The child GAD ($t_{43} = 2.76$, $p = .009$) and social phobia ($t_{40} = 2.57$, $p = .007$) factors discriminated between children with the corresponding disorders from children with other anxiety disorders. The parent separation anxiety factor discriminated between those children with separation anxiety and children with other anxiety disorders (MWU = 72.5, $p = .008$). The school phobia factor could not be analyzed in the parent or child SCARED because of the small sample of children with school phobia ($n = 1$).

Receiver Operator Curve Analysis: Sensitivity and Specificity

The optimum cutoff point was determined by selecting the score that maximized both sensitivity and speci-

ficity. A cutoff point of 25 on the child SCARED resulted in the optimal sensitivity (71%) and specificity (67%, 61%, and 71%) when discriminating between anxiety and nonanxiety, anxiety and depression, and anxiety and disruptive disorders, respectively. The child and parent SCARED successfully discriminated anxiety from other disorders (all p values ≤ .005), with one exception: the parent SCARED did not significantly discriminate between anxiety and depression (AUC = 0.5935, p not significant).

THE FIVE-ITEM SCARED

The 41-item child and parent versions of the SCARED were reduced to 5 items (Table 1). The 5 items were obtained by selecting the single item from each of the 5 factors which loaded the highest in the dis-

TABLE 3
Comparison of Children With Any Anxiety Disorder, Pure Depression, and Pure Disruptive Disorders (Child Version)

	Anxiety (<i>n</i> = 45)	Depression (<i>n</i> = 59)	Disruptive (<i>n</i> = 86)	Statistic	<i>p</i> Value
Total score	36.1 ± 17.3 ^a	22.0 ± 14.5 ^b	19.2 ± 15.0 ^b	$F_{2,187} = 18.58$	<.0001
Factor 1 (panic/somatic)	9.4 ± 6.6 ^a	4.8 ± 4.2 ^b	4.0 ± 4.3 ^b	KW = 23.67	.0001
Factor 2 (general anxiety)	9.4 ± 5.4 ^a	6.6 ± 4.5 ^b	5.3 ± 4.2 ^b	BF = 10.88	<.0001
Factor 3 (separation anxiety)	5.4 ± 4.0 ^a	3.3 ± 3.6 ^b	3.8 ± 3.8 ^{a,b}	KW = 9.74	.008
Factor 4 (social phobia)	8.0 ± 4.2 ^a	5.1 ± 3.8 ^b	4.2 ± 3.5 ^b	$F_{2,186} = 14.62$.0001
Factor 5 (school phobia)	3.9 ± 2.7 ^a	2.2 ± 2.0 ^b	2.0 ± 2.1 ^b	KW = 16.44	<.0002

Note: Values represent mean ± SD. KW = Kruskal-Wallis test; F = F value; BF = Brown-Forsythe. Means not sharing a superscript are significantly different. All analyses were protected for multiple comparisons using the Bonferroni correction method.

criminant function analysis. These 5 items were then tested in the parent form. In general, the psychometric properties of the 5-item SCARED were similar to those of the 41-item SCARED for both the parent and child forms, and the ROCs for both scales were not significantly different. Based on the sensitivity and specificity of the 5-item scale, a cutoff of 3 can be used for discriminating anxiety from nonanxiety. With the child 5-item SCARED, the sensitivity was 74% and the specificity was 73%. The parent ROC was similar and did not add significantly to the screening accuracy of the child SCARED. The ROC did not vary by age.

DISCUSSION

In this study, we replicated and extended our previous work on the psychometrics of an empirically derived self-report instrument on anxiety symptoms in a new clinical sample. Similar to the original 38-item scale (Birmaher et al., 1997), the 41-item child and parent SCARED showed good internal consistency and moderate parent-child correlations. In addition, the 41-item SCARED yielded 5 factors including panic/somatic, GAD, separation anxiety, social phobia, and a simple phobia, school phobia. Overall, the 41-item parent and child SCARED successfully differentiated between anxiety disorders and depression, between anxiety and disruptive disorders, and, for the most part, within anxiety disorders. A shortened version of the SCARED (5 items) also showed good psychometric properties. On the basis of the above-noted findings, we believe that the SCARED is an appropriate instrument to screen for anxiety disorders in clinical populations. However, a replication of our findings by independent investigators is necessary.

Limitations

Before discussing our findings in more detail, it is important to describe the limitations of our study. First, the SCARED was constructed using a clinical sample of children. Therefore, results may not be generalized to its use or performance in community samples. Second, the psychiatric diagnoses in this study were generated using a checklist based on *DSM-IV* anxiety diagnoses instead of using available structured interviews. However, in our previous study (Birmaher et al., 1997), analysis of the data from patients interviewed with the Schedule for Affective Disorders and Schizophrenia for School-Age Children-Present Episode version (Chambers et al., 1985) yielded similar results to the patients interviewed

with the checklist. Third, the number of patients with each particular anxiety disorder, most notably patients with social and school phobia, was small. Finally, children's reading ability was not assessed.

Our findings are consistent with a recent study of a large community sample of schoolchildren in Holland (Muris and Merckelbach, 1998, in press; Muris et al., 1998a-e, 1999, in press). In this series of Dutch reports, the parent and child 38-item SCARED yielded the same 5 factors reported above. There was excellent convergent validity with various instruments, including a newly developed screening instrument, the Multidimensional Anxiety Scale for Children (March et al., 1997), good test-retest reliability, and low to moderate parent-child agreement. These results suggest that the SCARED is a valid instrument to screen for anxiety disorders in non-referred samples, but further studies in community samples are necessary.

In contrast with our previous report, the SCARED differentiated between patients with depression and those with anxiety. This is because, in this report, we compared all of the anxious patients with all of the non-anxious patients, whereas in our prior study we included only anxious patients who did not have comorbid depression or disruptive disorder. As a consequence, the sample of anxious patients was reduced in our previous report. We reanalyzed the data presented in our prior publication using the strategy described above and found that the 38-item SCARED also differentiated between anxious and depressed patients.

As expected, the 3 new social phobia items added to the original version of the SCARED were included on the social factor. In contrast to the original SCARED version, the new social phobia factor significantly differentiated between anxiety and other psychiatric disorders. However, because of the small sample of social phobic patients included in this study, we could not assess whether the addition of these 3 new items improved our ability to detect social phobia.

Overall, there were few discrepancies between the parent and the child SCARED. Furthermore, the Cronbach α values for the factor analysis of both the parent and the child versions of the SCARED were approximately .90. However, given the modest correlations between parents' and children's SCARED scores, in particular for young children, and the standard approach to obtain data, it makes sense to use both the child and parent SCARED, pending further studies. There were some age and sex dif-

ferences in the parent-child agreement for some anxiety disorders (e.g., SAD). However, because of the small samples of children and adolescents with specific disorders included in this study, these findings need further replication.

The 5-item parent and child SCARED showed good psychometric properties and therefore show promise as a screening instrument for epidemiological studies in which the burden of instruments administered to the participating subjects needs to be minimized. However, for clinical practice it is recommended that the full version of the SCARED be used because it gives a complete "clinical flavor" of the presence of diverse anxiety symptoms, and in our experience it appears useful for monitoring response to treatment.

Clinical Implications

The SCARED is a reliable and valid self-report instrument to screen for panic disorder, GAD, SAD, social phobia, and the presence of a relevant simple phobia, school phobia in clinical (Birmaher et al., 1997; this report) and community samples (Muris and Merckelbach, 1998, in press; Muris et al., 1998a-e, 1999, in press). Children (aged 9-18 years) and their parents can complete the 41-item instrument in 10 minutes while they wait to be seen by the clinicians. In clinical samples, a total score of ≥ 25 in the 41-item SCARED or ≥ 3 in the 5-item SCARED should raise the clinician's index of suspicion for the presence of one or more of the anxiety disorders screened by the SCARED. However, given that the SCARED is only a screening instrument, the diagnosis of anxiety disorder must rest upon a thorough clinical interview. Moreover, because of the usual differences found in parent-child agreement in reporting internalizing symptoms (depression and anxiety) (Kazdin et al., 1983; Orvaschel et al., 1982; Silverman, 1994), it is recommended that both the parent and the child SCARED be administered, but this should be subject to further evaluation. Future studies should evaluate the SCARED as a first-stage screening instrument in community studies and its utility to detect treatment effects.

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Cost As a Barrier to Condom Use: The Evidence for Condom Subsidies in the United States. Deborah Cohen, MD, MPH, Richard Scribner, MD, MPH, Roger Bedimo, MD, MPH, Thomas A. Farley, MD, MPH

Objectives: This study sought to determine the impact of price on condom use. *Methods:* A program based on distribution of condoms at no charge was replaced with one providing low-cost condoms (25 cents). Pretest and posttest surveys asked about condom use among persons reporting 2 or more sex partners. *Results:* At pretest, 57% of respondents had obtained free condoms, and 77% had used a condom during their most recent sexual encounter. When the price was raised to 25 cents, the respective percentages decreased to 30% and 64%. *Conclusions:* Cost is a barrier to condom use. Free condoms should be distributed to encourage their use by persons at risk for HIV and other sexually transmitted diseases. *Am J Public Health* 1999;89:567-568. Copyright 1999 by the American Public Health Association.