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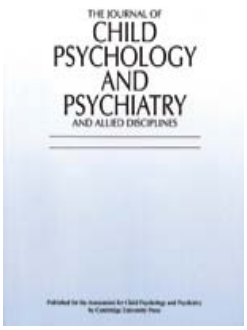

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The Discrimination of Children's Phobias Using the Revised Fear Survey Schedule for Children

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The discriminant validity of children's and parents' ratings of the child's fear on the Revised Fear Survey Schedule for Children (FSSC-R; Ollendick, 1983) was examined using a clinic sample of children who met DSM criteria for phobic disorders ($N = 120$). Discriminant function analyses and item analyses were conducted to determine if children meeting diagnostic criteria for a primary disorder of social phobia, simple phobia of the dark/sleeping alone, simple phobia of animals, or a simple phobia of shots/doctors could be differentiated on the basis of FSSC-R subscale scores and items. Results of the discriminant function analyses indicated that the child-completed as well as the parent-completed FSSC-Rs were similarly useful in differentiating the specific types of phobias. Results of the item analyses indicated that child-completed FSSC-R items could discriminate among the different simple phobias but not social phobia and that parent-completed FSSC-R items could discriminate not only the different simple phobias but also social phobia. Results are discussed in terms of the utility of the FSSC-R in the assessment of clinically significant fears in children with phobic disorders and the relative utility of child and parent ratings in the assessment of childhood fears.

Keywords: Anxiety, assessment, fears, phobia, rating-scales, parent–child concordance.

Abbreviations: ADIS-C: Anxiety Disorders Interview Schedule for Children; CAPP: Child Anxiety and Phobia Program; FSSC-R: Revised Fear Survey Schedule for Children; FSSC-R/P: parent version of the FSSC-R; NPP: negative predictive power; PPP: positive predictive power; SIP: simple phobia; SOP: social phobia.

Introduction

Since the publication of Ollendick's (1983) seminal study, in which he presented the revision of Scherer and Nakamura's (1968) Fear Survey Schedule, the Revised Fear Survey Schedule for Children (FSSC-R) has been the cornerstone of almost every published article that has appeared on childhood fear (see Silverman & Hicks-Carmichael, 1999, for a review). In Ollendick's initial investigation, in which 217 children (ages 8–11) participated, the FSSC-R was found to possess high test–retest reliability ($r = .82$) and acceptable convergent validity (e.g. $r = .51$ with the State-Trait Anxiety Inventory for Children–Trait Version). In addition, using exploratory factor analysis, a five-factor solution was obtained. These factors were named Fear of the Unknown, Fear of Minor Injury and Small Animals, Fear of Danger and Death, Medical Fears, and Fear of Failure and Criticism.

The knowledge that has accumulated about the fears of children as a consequence of Ollendick's (1983) revised fear inventory is impressive. In addition to a series of studies that provides support for the FSSC-R's excellent psychometric properties and for its five-factor solution (e.g. Ollendick, King, & Frary, 1989), a body of work has accumulated that provides normative information about childhood fears. This work includes information about patterns of children's fears as a function of age and gender as well as how these patterns may vary across countries and cultures, including the United States, Australia, Great Britain, China, and Nigeria (e.g. see Ollendick et al., 1989; Ollendick, Matson, & Helsel, 1985; Ollendick, Yang, King, Dong, & Akande, 1996; Ollendick, Yule, & Ollier, 1991).

Although the FSSC-R has played an important role in providing normative information about children's fear, there has been less attention paid to its clinical utility. However, the evidence that has been garnered suggests that the FSSC-R may be useful in the clinical arena as well. For example, in the Ollendick (1983) study, the FSSC-R was found to be able to discriminate between children with "school phobia" and "nonanxious" children. In another study that used a community sample of school-aged children, Beidel and Turner (1988) found that the FSSC-R could discriminate "test anxious" from "non-test anxious" children.

The study that is perhaps most noteworthy, in terms of

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documenting the potential clinical utility of the FSSC-R, was an investigation conducted by Last, Francis, and Strauss (1989). Using 111 children (ages 5–18 years) who were referred to a childhood anxiety disorders specialty clinic and who met DSM-III criteria for either separation anxiety disorder ($N = 44$), overanxious disorder ($N = 33$), or a phobic disorder related to school (either social or simple phobia; $N = 34$), Last et al. (1989) compared these groups' FSSC-R total and factor subscale scores. The results indicated that the three groups could *not* be differentiated on the basis of either the total or the factor subscale scores. However, the groups could be differentiated qualitatively via an item analysis of the most commonly reported fears. For example, children with separation anxiety disorder endorsed the item "getting lost" with the greatest frequency; children with overanxious disorder endorsed the item "being criticized," "making mistakes," and "being called on" with the greatest frequency; and children with school phobia endorsed "going to school" with the greatest frequency. Based on these findings, Last et al. (1989, p. 137) recommended that future studies "... focus on the types of fears endorsed by different anxiety disorder groups rather than on standard quantitative scores." Last et al. also recommended that investigators examine whether similar findings are obtained using other clinic samples.

Within this frame, in the present study, FSSC-R scores of children who were found to meet DSM-III-R criteria for a primary diagnosis of one of the following phobias—simple phobia of the dark/sleeping alone (i.e. "night-time fears"), simple phobia of animals, simple phobia of shots/doctors[1], or social phobia—were compared. Of primary interest was whether self-ratings on the FSSC-R would discriminate the children in accordance with their specific type of phobia. In particular, although Last et al. (1989) found that it was the qualitative analysis of the FSSC-R, not the quantitative analysis, that could differentiate among the different types of anxiety disorder groups, in this study it was predicted that *both* qualitative analyses and quantitative analyses would differentiate among the different types of children's phobias. This was predicted because the FSSC-R factor subscales appear to map on to specific types of childhood phobias more clearly than on to the childhood anxiety problems that were studied in the Last et al. study (e.g. separation anxiety disorder, overanxious disorder). For example, the FSSC-R factor Fear of the Unknown appears to correspond with or map on to the types of fears and concerns of children who present with a simple phobia of the dark/sleeping alone, the FSSC-R factor Fear of Minor Injury maps on to a simple phobia of shots/doctors, the FSSC-R factor Small Animals maps on to a simple phobia of animals[2], and the Fear of Failure and Criticism factor maps on to the fears and concerns of children with social phobia.

Also of interest in this study was to examine the utility of not only children's self-ratings of their fears but the utility of parents' ratings of their children's fears using a parent-completed version of the FSSC-R (i.e. parents rated the fears of their children using the same items and rating scale as the FSSC-R). Parent ratings of their children's fears using a parent-completed FSSC-R have been used in previous investigations of childhood fears (e.g. Matson & Love, 1990; Silverman & Nelles, 1989). Silverman and Nelles, for example, found that parent ratings provided a stable index of childhood fear over a 12-month time interval. Determining whether parent ratings have utility in differentiating among different types of phobias in children is important because of the common clinical and research practice among developmental psychopathologists and child psychiatrists of obtaining information about children's emotional and behavioral functioning from both children and parents (see Edelbrock, 1994, for a review). As a methodological recommendation, for example, Edelbrock has suggested that although useful and reliable information can be obtained from children and parents, each may provide unique information. In the context of children's fears, for instance, children's self-reports may discriminate certain phobias better than parents' reports of their children's fears. However, investigations that have examined the relative discriminant validity of children's and parents' fear ratings in a clinic sample of children with phobic disorders have not been conducted.

In summary, it was predicted that the factor subscale scores of the child version of the FSSC-R would quantitatively discriminate among the different types of children's phobias, specifically, among social phobia, simple phobias of the dark/sleeping alone, animals, and shots/doctors. It also was predicted that the factor subscale scores of the parent version of the FSSC-R (FSSC-R/P) would show similar quantitative discrimination. In addition, as suggested by the findings of Last et al. (1989), it was hypothesized that specific qualitative items on the FSSC-R would differentiate the four phobia groups and similarly that specific qualitative items on the FSSC-R/P would differentiate the four phobia groups. Specifically, it was hypothesized that the most commonly reported fears would conceptually correspond to the type of phobia diagnosis (e.g. simple phobia diagnosis dark/sleeping alone would correspond most with children's endorsement of the FSSC-R item "dark places").

Method

Participants

The sample was comprised of 120 children who presented to the Child Anxiety and Phobia Program (CAPP), housed within the Child and Family Psychosocial Research Center at Florida International University, Miami. All participants were referred to CAPP due to difficulties with excessive fear or anxiety. The families were either self-referred in response to clinic publicity

[1] Our examination of the FSSC-R factors in relation to these simple phobias was guided by the delineation in DSM-IV of subtypes of specific phobia—three of which were studied here (i.e. Animal Type, Blood-Injection-Injury Type, and Situational Type). Thus, each of the simple phobias examined in this study are representative of one of these subtypes.

[2] This study was conducted while DSM-III-R was in use as well as during the transition to DSM-IV. The changes made to the diagnostic categories investigated, however, were not substantive. For example, a main change was that "simple phobia" was renamed "specific phobia." In this paper we use the term "simple phobia" (SIP).

Table 1
Demographic and Diagnostic Information for the Four Phobia Groups

	SIP/A	SIP/D	SIP/S	SOP
N	16	60	10	34
Age: Mean (*SD*)	9.38 (3.2)	9.22 (2.1)	11.80 (3.5)	11.76 (3.1)
Gender: *N* (%)				
Girls	12 (75)	28 (47)	4 (40)	8 (24)
Ethnicity: *N* (%)				
White	11 (69)	36 (60)	5 (50)	20 (59)
Hispanic	5 (31)	22 (36)	3 (30)	11 (32)
Black	0	1 (2)	0	1 (3)
Other/Not reported	0	1 (2)	2 (20)	2 (6)
SES: *N* (%)				
\$0–\$18,000	1 (6)	10 (17)	1 (10)	6 (18)
\$19,000–\$40,000	3 (19)	15 (25)	1 (10)	11 (32)
Over \$40,000	10 (62)	27 (45)	7 (70)	14 (41)
Not reported	2 (13)	8 (13)	1 (10)	3 (9)
Secondary Diagnosis: *N* (%)				
Separation anxiety disorder	3 (19)	15 (25)	2 (20)	2 (6)
Other SIP	5 (31)	14 (23)	6 (60)	1 (3)
Overanxious disorder	2 (13)	6 (10)	0	12 (35)
Other anxiety	0	7 (12)	0	9 (26)
Affective	0	0	0	3 (9)
Externalizing	0	5 (8)	1 (10)	4 (12)
No diagnosis	6 (37)	13 (22)	1 (10)	3 (9)

SIP/A: Simple phobia of Animals; SIP/D: Simple phobia of the Dark/Sleeping alone; SIP/S: Simple phobia of Shots/Doctors; SOP: Social phobia.

or were referred by pediatricians, school psychologists, or other mental health professionals. Of the 120 children, 52 were girls and 68 were boys, with a mean age of 10.18 years and an age range from 6 to 17 years. In terms of ethnicity, 60% of participants were Euro-American, 34% were Hispanic-American, 2% were African-American, 2% were of other ethnic backgrounds, and 2% chose not to report their ethnic background. The range of the participants' family income was as follows: \$0 to \$19,000 (15%), \$20,000 to \$40,000 (25%), above \$40,000 (48%), and 12% did not report their income. Children were selected for this study if they met diagnostic criteria for a primary DSM-III-R (or DSM-IV) disorder of social phobia ($N = 34$), simple phobia of the dark/sleeping alone ($N = 60$), simple phobia of animals ($N = 16$), or simple phobia of shots/doctors ($N = 10$). Demographic information broken down by the four diagnostic groups is presented in Table 1.

Comorbid secondary diagnoses in this sample were common. Only 19% of the sample did not meet criteria for a secondary diagnosis. The most frequently diagnosed secondary diagnoses were: an additional simple phobia (22%), separation anxiety disorder (18%), overanxious disorder (17%), attention deficit hyperactivity disorder (7%), social phobia (3%), and affective disorders (3%). Disorders diagnosed to a lesser extent were: post-traumatic stress disorder, oppositional defiant disorder, avoidant disorder, generalized anxiety disorder, and panic disorder (11%).

In terms of secondary diagnosis overlap, only 13 of the 120 children had secondary diagnoses that overlapped with one of the primary phobias of interest in this study (e.g. a child with a primary phobia of the dark/sleeping alone who also had a secondary diagnosis of either social phobia or simple phobias of animals or shots/doctors). Specifically, of the children with a primary diagnosis of shots/doctor phobia, two had secondary diagnoses of animal phobia; of the children with a primary diagnosis of the dark/sleeping alone phobia, four had secondary social phobia and four had shots/doctor phobia; of the children with a primary diagnosis of animal phobia, one had a secondary phobia of the dark/sleeping alone and two had a phobia of shots/doctors; and none of the children with social phobia had secondary diagnoses that overlapped with other primary diagnoses. Because comorbidity is generally high in child and adolescent clinical samples, these children were retained in our subsequent analyses to maximize the external validity of the study's findings. However, the effect of overlap was examined.

Measures

The FSSC-R (Ollendick, 1983) was used to assess fears. The FSSC-R is an 80-item fear inventory designed to assess the frequency, intensity, and content of children's fears. Children rate how afraid they are of each fear item using a 3-point scale: none (1), some (2), or a lot (3). The FSSC-R has been shown to have acceptable test–retest reliability and validity estimates (King & Ollendick, 1992; Ollendick, 1983; Ollendick et al. 1989, 1996). As noted, the FSSC-R contains five factor analytic derived subscales: Fear of the Unknown, Fear of Minor Injury and Small Animals, Fear of Danger and Death, Medical Fears, and Fear of Failure and Criticism. These factors have been shown to have satisfactory internal consistency and to be stable across cultures.

The parent version of the FSSC-R (FSSC-R/P) that was used is identical to the child-completed version in terms of content, rating scale, and scoring. The only difference is that the parents are asked to rate what they view to be the fears of their children (Matson & Love, 1990; Silverman & Nelles, 1989).

Procedure

Informed parental consent and child assent were obtained before conducting any part of the assessment procedures. As part of a comprehensive assessment, both the child and the parent completed a packet of questionnaires concerning the child's emotional and behavioral functioning, which included the FSSC-R and FSSC-R/P. Younger children were assisted in the completion of questionnaires by a trained undergraduate

research assistant as necessary. The Anxiety Disorders Interview Schedule for Children (ADIS-C; Silverman & Nelles, 1988) was administered to all referred children and parents. The ADIS-C is a structured interview that emphasizes the anxiety disorders. The interviews permit the clinician to assess and diagnose, via DSM criteria, other major childhood disorders, including the externalizing and affective disorders. To determine diagnoses, separate interviews were conducted with the parent (ADIS-C parent version) and the child (ADIS-C child version). The clinician assigned diagnoses that both sources agreed were most interfering. In cases of discordance, the clinician adjusted the severity ratings in consideration of both sources' views about interference making diagnosis a function of both sources' reports. In cases of multiple diagnoses the relative impact or interference of the specific diagnoses being made was used as the basis for assigning the primary diagnosis, the secondary diagnosis, etc., as delineated in the ADIS-C guide (see Albano & Silverman, 1996).

Diagnosticians were trained by observing live and videotaped samples of the interviews. Initial discrepancies were discussed to reach agreement in training sessions. All diagnosticians had to meet reliability criteria of 100% agreement with a trained interviewer on five child–parent interviews before conducting an interview by themselves. A subsample of the participants in this study comprised the samples in previous reliability studies of the ADIS-C (i.e. Silverman & Eisen, 1992; Silverman & Nelles, 1988). In both Silverman and Eisen and Silverman and Nelles, the majority of the participants were found to meet criteria for simple and social phobias. Those studies demonstrated satisfactory inter-rater diagnostic reliability (e.g. $r = .98$ on the ADIS-C child version and $r = .93$ on the ADIS-C parent version; Silverman & Nelles, 1988) and test–retest reliability (e.g. Silverman & Eisen, 1992, reported for the composite diagnoses of these disorders, kappas of .84 and .73 for simple phobias and social phobia, respectively). Further, in this study, a subsample of the child and parent interviews were videotaped and observed by independent judges blind to the diagnostic status of the children. Over 95% agreement on all primary composite diagnoses and 85% or higher agreement on all additional comorbid diagnoses were obtained.

Results

Mean scores and standard deviations for the total FSSC-R and FSSC-R/P were 132.59 (26.9) and 137.28 (24.1), respectively. Examination of the total and factor subscale scores of both child and parent versions of the FSSC-R indicated acceptable ranges and skew for the planned analyses. Internal consistency estimates of the factor subscales using coefficient alpha ranged from .71 to .89 for the child version and ranged from .78 to .92 for the parent version, suggesting satisfactory subscale internal consistency reliability estimates.

Table 2 presents the correlations between children's and parents' ratings on the total score and each factor subscale score. Correlations between the FSSC-R and FSSC-R/P total and subscale ratings and also age are presented in Table 2. The correlation between the total scores on the child and parent versions was .21 ($p < .05$). Further, each of the subscale scores on the FSSC-R was moderately but significantly correlated with the corresponding subscale score in the FSSC-R/P except for the Danger and Death subscale and the Failure and Criticism subscale (see Table 2).

Analyses of variance and chi-square analyses were conducted on each of the demographic variables across the four phobia diagnostic groups. Analysis of variance using age as the dependent variable indicated a significant effect of diagnostic group [$F(3, 116) = 8.22$, $p < .001$]. Scheffé's comparisons indicated that children with social phobia were significantly older than children with simple phobia of the dark/sleeping alone and simple phobia of animals. Given these findings, the influence of age was considered in the planned discriminant function analyses and ANOVAs. Chi-square analyses indicated no differences in terms of family income or ethnicity among the four groups but revealed significant differences for gender ($\chi^2 = 12.28$, $p < .01$), indicating that significantly more girls than boys had animal phobias and significantly more boys than girls had social phobia. To examine the potential influence of gender on FSSC-R scoring in the planned analyses, 2 (Gender) by 4 (Diagnostic Group) ANOVAs were conducted on the total scores and each of the five factor subscale scores for both the parent and child versions. Results indicated no significant interactions of Gender with Diagnostic Group on FSSC-R total or factor subscale scores for either the parent or child versions. Thus, gender was not considered in the discriminant function analyses.

Before conducting multivariate discriminant function analysis, the mean factor subscale scores across the diagnostic groups were examined by conducting univariate ANCOVAs for each of the factor subscale scores. Age was used as a covariate given the differences in age across diagnostic groups. Results, including means and

Table 2
Intercorrelations among Parent and Child Total and Subscale Scores on the FSSC-R and FSSC-R/P and Age

	Child FSSC-R						
	Age	Total score	Unknown	Animals	Danger/ Death	Medical	Failure/ Criticism
Age	—	−.29**	−.42**	−.34**	−.34**	−.09	.03
Parent FSSC-R							
Total score	−.16	.21*	.22*	.19	.14	.10	.18
Unknown	−.41**	.26**	.41**	.21*	.24*	−.02	.11
Animals	−.24*	.24*	.22*	.30**	.19	.24*	.12
Danger/Death	−.12	.20*	.25*	.17	.12	.09	.17
Medical	−.14	.19	.09	.22*	.12	.43**	.11
Failure/Criticism	.23*	−.04	−.12	−.09	−.07	−.08	.14

*$p < .05$; ** = $p < .01$; two-tailed.

Table 3
Means (Standard Deviations) of the Factor Subscale Scores for the Four Phobia Groups

Factor	Group				F	p
	SIP/A	SIP/D	SIP/S	SOP		
FSSC-R: Child Version						
1. Unknown	30.11 (7.3)	34.65 (7.8)[1]	29.54 (8.2)	27.23 (5.8)[1]	4.19	.007
2. Medical	8.14 (2.3)	7.07 (2.2)[1]	9.90 (2.0)[1,2]	6.71 (2.4)[2]	6.58	.000
3. Failure/Criticism	35.79 (6.8)	37.50 (9.2)	39.89 (9.0)	38.04 (8.4)	0.46	.712
4. Animals	27.88 (7.5)	26.99 (6.6)	30.20 (9.0)	24.08 (5.1)	2.66	.051
5. Danger/Death	20.16 (5.4)	23.38 (5.0)	20.58 (5.8)	20.49 (5.3)	1.73	.164
FSSC-R/P: Parent version						
1. Unknown	27.89 (7.7)[1]	35.85 (5.8)[1,2,3]	27.38 (8.1)[2]	30.40 (7.4)[3]	5.86	.001
2. Medical	9.55 (2.7)	7.87 (2.2)	10.13 (1.7)	8.22 (2.1)	4.76	.004
3. Failure/Criticism	35.90 (5.6)[1]	39.25 (8.2)[2]	37.40 (8.9)[3]	49.72 (7.4)[1,2,3]	12.05	.000
4. Animals	32.50 (10.5)	26.53 (7.0)	29.88 (8.8)	25.69 (6.8)	3.09	.031
5. Danger/Death	18.52 (4.4)	20.82 (5.9)	19.60 (5.2)	19.70 (5.0)	0.50	.685

F tests are calculated while controlling for age using ANCOVA. For children, age was a significant covariate for the Unknown, the Danger/Death, and the Animal factor subscale scores, $p < .001$. For parents, age was a significant covariate for the Failure/Criticism, Animals, and the Unknown factor scores, $p < .05$. Like superscripts indicate significant differences on Scheffé's contrasts. Some parents failed to complete the parent version, resulting in lower *N*s for the FSSC-R/P. See Table 1 for abbreviations.

standard deviations for scores on the five factors for the child and parent versions of the FSSC-R among the groups, are presented in Table 3. ANCOVAs on the child version were significant (applying a corrected alpha of .01 using a Bonferroni correction for the five tests) for the Unknown and Medical factor subscales and marginally significant for the Animal factor subscale. Scheffé's comparisons were conducted for the significant ANCOVAs. Significant contrasts and covariates are indicated in Table 3. ANCOVAs on the parent version were significant at the .01 level for the Failure and Criticism, Unknown, and Medical factor subscales and marginally significant for the Animals factor subscale. Again, Scheffé's comparisons were conducted for the significant ANCOVAs with significant contrasts and covariates indicated in Table 3.

The Discrimination of Phobias Using Factor Subscale Scores

Parallel stepwise discriminant function analyses were conducted on the child and parent versions of the FSSC-R[3].

Child ratings. Stepwise discriminant function analysis was conducted using the five factor subscales on the FSSC-R as predictors and the diagnostic groups as the criterion variable. To test the discriminative utility of the subscales, the change in Rao's V at each step was examined. Rao's V statistic was used because the change in V provides a robust test of the statistical significance of the particular predictors (similar to a change in F in stepwise multiple regression; see Tabachnick & Fidell, 1996). Results of this analysis are summarized in Table 4.

Age was entered into the analysis first, followed by the factor subscales in random order. Age and each of the factor subscales produced a significant change in Rao's V. Results also revealed two significant discriminant functions that cumulatively accounted for 96.22% of between-group variability. Specifically, with both functions in the analysis $\chi^2(18) = 92.1$ ($p < .001$) indicated a significant relation between the groups and the predictors. After removing the first discriminant function the $\chi^2(10) = 34.0$ ($p < .001$) indicated there was still a significant relation between the groups and the predictors. The eigenvalues associated with the discriminant functions indicate the relative proportion of among-group variability accounted for by each function (Tabachnick & Fidell, 1996). The first discriminant function accounted for 66.43% of among-group variability and 29.79% was accounted for by the second. The canonical discriminant functions evaluated at the group centroids and the loading matrix of correlations between the factor subscales of the FSSC-R and the discriminant functions are also presented in Table 4. Examination of group centroids indicated that the first discriminant function separated the dark/sleeping alone phobic group from the shots/doctors phobic group, with the animal phobic and social groups in the middle. The second discriminant function maximally separated the social phobic group from the shots/doctor group and animal phobic group, with the dark/sleeping alone group in the

[3] An interesting developmental question arises regarding potential differential classification accuracy as a function of age and gender. We examined the effects of age and gender by conducting separate discriminant function analyses for boys and girls and also for children (aged 6–10) and adolescents (aged 11–17). No evidence for differential classification accuracy was found. For example, on the basis of child reports on the FSSC-R roughly 60% of the children were correctly classified in both the boy and girl subsamples. For this reason, as well as because of problems in discriminant function analyses when the number of predictor variables exceed the cell size of the smallest group (see Tabachnick & Fidell, 1996), the following results report only analyses for the total sample.

Table 4
Summary of Discriminant Function Analysis using FSSC-R

Step	Factor entered	Rao's V	Change in V	*p*
1	Age	24.66	24.66	.0001
2	Unknown	38.88	14.22	.0026
3	Animals	71.55	32.67	.0001
4	Danger/Death	81.62	10.07	.0180
5	Medical	105.90	24.28	.0001
6	Failure/Criticism	116.20	10.25	.0165

	Canonical discriminant functions evaluated at group centroids		
Group	Function 1	Function 2	Function 3
SIP/A	0.569	0.691	−0.398
SIP/D	−0.730	0.136	0.062
SIP/S	1.774	0.726	0.396
SOP	0.500	−0.778	−0.039

	Correlations of FSSC-R subscales with discriminant functions		
	Function 1	Function 2	Function 3
Age	0.44	−0.51	0.50
Unknown	−0.46	0.43	0.58
Animals	0.03	0.48	0.38
Danger/Death	−0.31	0.11	0.57
Medical	0.31	0.54	0.49
Failure/Criticism	0.05	−0.05	0.52

		Classification results[a]: Predicted group membership			
Group	*N*	SIP/A	SIP/D	SIP/S	SOP
1. SIP/A	16	8	3	3	2
		50%	18.8%	18.8%	12.5%
2. SIP/D	60	9	40	1	10
		15.0%	66.7%	1.7%	16.7%
3. SIP/S	10	2	0	7	1
		20%	0.0%	70%	10%
4. SOP	34	6	6	3	19
		17.6%	17.6%	8.8%	55.9%

[a] Total cases correctly classified: 61.67%. See Table 1 for abbreviations.

middle. Finally, classification results indicated that 62% of the cases could be correctly classified on the basis of the discriminant function analysis using the factor subscale scores with age entered first (a separate analysis indicated that 58% could be correctly classified without including age). The percentages for correctly classified cases in each diagnostic group are presented in Table 4.

Because of the unequal cell sizes in this sample, discriminant function analyses were conducted while modifying the probabilities with which cases are classified to examine if classification accuracy could be increased. Specifically, in a four-group design, the prior probability of a case falling into any one group is .25. However, because the unequal sample sizes can be viewed as representative of the population of children with phobias, this information can be reflected in the discriminant analysis by modifying the prior probabilities according to the proportional distribution of cases in the groups (Tabachnick & Fidell, 1996). Overall classification accuracy increased from 62% to 68%: Specifically, increasing classification accuracy of the dark/sleeping alone (85% correct) and social phobia (62% correct) groups and decreasing accuracy in the animal (19% correct) and shots/doctor (60% correct) groups (see bottom of Table 4 for comparison).

Separate discriminant function analyses were also conducted excluding those 13 cases with overlapping secondary diagnoses to determine whether diagnostic overlap influenced results. Excluding these cases did not considerably increase the discriminant validity of the child ratings. For example, results revealed two significant discriminant functions that cumulatively accounted for 96.57% of between-group variability. Examination of group centroids indicated similar separation of the groups and overall classification accuracy only increased from 62% to 64%.

Table 5
Summary of Discriminant Function Analysis using FSSC-R/P

Step	Factor entered	Rao's V	Change in V	*p*
1	Age	14.45	14.45	.0024
2	Unknown	33.34	18.89	.0003
3	Animals	79.07	45.73	.0001
4	Danger/Death	85.29	6.21	.1018
5	Medical	99.41	14.13	.0027
6	Failure/Criticism	170.90	71.51	.0001

	Canonical discriminant functions evaluated at group centroids		
Group	Function 1	Function 2	Function 3
SIP/A	1.998	0.021	−0.428
SIP/D	−0.438	−0.736	0.005
SIP/S	1.888	0.176	0.614
SOP	−0.546	1.330	−0.016

	Correlations of FSSC-R/P subscales with discriminant functions		
	Function 1	Function 2	Function 3
Age	0.08	0.40	0.63
Unknown	−0.37	−0.41	−0.05
Animals	0.29	−0.04	−0.30
Danger/Death	−0.11	−0.10	0.19
Medical	0.33	0.10	0.28
Failure/Criticism	−0.36	0.63	0.05

		Classification results[a]: Predicted group membership			
Group	*N*	SIP/A	SIP/D	SIP/S	SOP
1. SIP/A	11	7	1	2	1
		63.6%	9.1%	18.2%	9.1%
2. SIP/D	51	2	39	3	7
		3.9%	76.5%	5.9%	13.7%
3. SIP/S	8	4	0	3	1
		50%	0.0%	37.5%	12.5%
4. SOP	27	0	3	2	22
		0.0%	11.1%	7.4%	81.5%

[a] Total cases correctly classified: 73.2%. See Table 1 for abbreviations.

Parent ratings. Stepwise discriminant function analysis using the five factor subscales on the FSSC-R/P was conducted with diagnostic status as the criterion variable in the same manner as used with the child version. Results of this analysis are summarized in Table 5.

Age was entered into the analysis first and then the factor subscales. Age and each of the factor subscales except the Danger and Death factor produced a significant change in Rao's V. Results also revealed two significant discriminant functions that cumulatively accounted for 97.05% of between-group variability. Specifically, with both functions in the analysis χ^2 (18) = 120.7 ($p < .001$) indicated a significant relation between the groups and the predictors and after removing the first discriminant function the $\chi^2(10) = 59.1$ ($p < .001$) indicated there was still a significant relation between the groups and the predictors. The first discriminant function accounted for 66.43% of among-group variability and 29.79% was accounted for by the second. The canonical discriminant functions evaluated at the group centroids and the loading matrix of correlations between the factor subscales of the FSSC-R/P and the discriminant functions are presented in Table 5. Examination of group centroids indicate that the first discriminant function separated the dark/sleeping alone phobic and social phobic groups from the shots/doctor phobic and animal phobic groups. The second discriminant function separated the dark/sleeping alone phobic group from the social phobic group with the animal phobic and shots/doctor groups in the middle. Finally, classification results indicated that 73% of the cases could be correctly classified on the basis of the discriminant function analysis using the factor subscale scores on the FSSC-R/P (separate analysis indicated that 72% could be correctly classified without including age). The percentages for correctly classified cases in each diagnostic group are presented in Table 5.

Discriminant function analyses were conducted while

Table 6
Most Commonly Reported Fears in the Four Phobia Groups

Rank	Groups			
	SIP/Animals	SIP/Dark	SIP/Shots	SOP
FSSC-R: Child version				
1	(dogs 81%)	(falling 57%)	(shots 70%)	(getting lost 35%)
2	(shots 56%)	(not breathing 53%)*	(doctor 60%)	(burglar 35%)*
3	(punished 44%)	(getting lost 53%)*	(hospital 60%)	(fire burned 32%)*
4	(hospital 44%)	(hit by car 52%)*	(sharp objects 50%)	(oral report 32%)
5	(bears/wolves 38%)	(fire burned 52%)*	(fire burned 50%)*	(hit by car 32%)*
FSSC-R/P: Parent version				
1	(dogs 63%)	(bed in dark 78%)	(shots 70%)	(criticized 59%)
2	(shots 56%)	(dark places 65%)	(hospital 50%)	(foolish 53%)*
3	(doctors 44%)	(dark room 63%)	(doctor 40%)	(teased 47%)
4	(hospital 38%)	(alone 62%)	(dentist 40%)	(mistakes 44%)
5	(death 31%)*	(burglar 53%)*	(blood 40%)	(recital 44%)

Abbreviated FSSC-R items with percentage reported in parentheses. Asterisks indicate fears commonly reported in normative samples of children (Ollendick et al., 1985).

modifying the probabilities with which cases are classified as done with the child ratings. Overall classification accuracy increased from 73% to 78%. Classification accuracy increased in the dark/sleeping alone (86% correct) group. Accuracy was unchanged in the animal (64% correct), shots/doctor (38% correct) and social phobia (82% correct) groups (see bottom of Table 5 for comparison).

As with the child ratings, separate discriminant function analyses were conducted excluding the 13 cases with overlapping secondary diagnoses. Again, excluding those cases did not considerably increase the discriminant validity of the parent ratings. For example, results revealed two significant discriminant functions that cumulatively accounted for 95.6% of between-group variability. Examination of group centroids indicated similar separation of the groups and overall classification accuracy increased from 73% to 78%[4].

[4] Given that both parent and child reports of the child's fears were found to be useful in discriminating the phobias, the question arises as to whether combining the information from the two sources increases classification accuracy. We examined this issue in two ways. First, we examined if the different discriminant function analyses resulting from the two sources result in classification of the same cases. Only three cases correctly classified by child reports on the FSSC-R were not correctly classified by parent reports on the FSSC-R/P. In other words, the increased classification accuracy of the parent version was the result of cases not classified by child reports except in three instances. Second, we conducted a discriminant function analysis combining child and parent reports. Overall classification accuracy was increased to 75%. Thus, combining child and parent reports increased classification accuracy of parent ratings by 2% and child ratings by 14%. However, this analysis contained more predictors than subjects in the shots/doctor phobia group, making a test of the assumption of homogeneity of variance-covariance matrices impossible (Tabachnick & Fidell, 1996). Thus, the results of this analysis are not presented in detail, but are available from the authors upon request.

The Discrimination of Phobias Using Item Analysis

As a final test of the discriminatory power of the FSSC-R, parallel child and parent item analysis similar to the one performed by Last et al. (1989) was conducted to determine the most common fears in each of the four phobia groups. The most common fears were determined by summing the number of items that each child endorsed as "a lot" and determining the relative frequency of those fears in each of the four phobia groups. Results in terms of the five most commonly reported fears are presented in Table 6 and provide a qualitative comparison of the correspondence between items frequently reported on the FSSC-R and the type of phobia diagnosis and also the correspondence between the parent and child ratings.

Child ratings. In terms of the FSSC-R, the number one most commonly reported fear corresponded with the type of phobia in the animal phobic (i.e. "dogs") and shots/doctor phobic groups (i.e. "shots"). The social phobic and dark/sleeping alone phobic group's most commonly reported fear was not consistent with social phobia (i.e. "getting lost") or a simple phobia of the dark/sleeping alone (i.e. "falling"). However, one of the top five most commonly reported fears, "giving an oral report," corresponded with social phobia (see Table 6). Chi-square analyses were conducted to determine the relative prevalence of the number one most commonly reported fears amongst the diagnostic groups. Two (fear [i.e. endorsed "a lot" for the particular fear], no fear [i.e. endorsed "some" or "none" for the particular fear]) by 4 (diagnostic groups) chi-square analyses were conducted on each of the most commonly reported fears for each group.

Analysis of the item "dogs" (i.e. the highest for children with animal phobias) indicated that significantly more children who met diagnostic criteria for animal phobia reported having a fear of dogs than children in the other groups ($\chi^2 = 22.80$, $p < .001$). Analysis of the item "getting a shot from the nurse or doctor" (i.e. the highest for shot/doctor phobics) indicated that significantly

more children who met diagnostic criteria for shots/doctor phobia reported having a fear of shots than the other groups ($\chi^2 = 11.80$, $p < .01$). However, analysis of the items "falling from high places" and "getting lost in a strange place" (i.e. the highest for children with dark/sleeping alone and social phobia respectively) revealed inconsistent differences. Specifically, no significant differences were found for the item "falling from high places" ($\chi^2 = 6.77$, $p > .05$) and the item "getting lost in a strange place" was significant ($\chi^2 = 9.91$, $p < .05$) but the analysis indicated that it was not the social phobic children but the dark/sleeping alone phobic children who reported a fear of getting lost significantly more often than children in the other groups.

To examine the findings for social and dark/sleeping alone phobic children in greater detail, the conceptually consistent item on the FSSC-R that was reported by parents on the FSSC-R/P to be the most common fear in dark/sleeping alone phobic children (i.e. the item "going to bed in the dark") was analyzed via a 2×4 chi-square. Analysis of this item indicated that children meeting diagnostic criteria for a phobia of dark/sleeping alone reported a fear of going to bed in the dark significantly more often than children in the other groups ($\chi^2 = 19.38$, $p < .001$). Next, the conceptually consistent item on the FSSC-R that was reported by parents on the FSSC-R/P to be the most common fear in social phobic children (i.e. the item "being criticized by others") and each of the top five most commonly reported fears reported by social phobic children (see Table 6) were analyzed via the 2×4 chi-square analyses. Children with social phobia did not self-report significantly more specific fears as compared to the other groups in these analyses.

Parent ratings. Results of the item analysis on the FSSC-R/P indicated a high degree of correspondence between the type of phobia and the most prevalent fears reported on the FSSC-R/P in each group. That is, each of the number one most commonly parent-reported fears conceptually corresponded with the type of phobia in each of the phobia groups.

Analysis of the item "dogs" (i.e. the highest for children with animal phobia) indicated that significantly more children who met diagnostic criteria for animal phobia were reported to have a fear of dogs by their parents than were reported by the parents of children in the other groups ($\chi^2 = 25.12$, $p < .001$). Analysis of the item "getting a shot from a nurse or doctor" (i.e. the highest for shots/doctor phobic children) indicated that children who met diagnostic criteria for shot phobia were reported to have a fear of shots by their parents significantly more often than the children meeting diagnostic criteria for simple phobia of the dark/sleeping alone and social phobia ($\chi^2 = 10.47$, $p < .05$) but not more often than children in the animal phobia group. Analysis of the item "going to bed in dark" (i.e. the highest for dark/sleeping alone phobic children) indicated that significantly more children meeting diagnostic criteria for a dark/sleeping alone phobia were reported to have a fear of going to bed in the dark by their parents than the other groups ($\chi^2 = 40.84$, $p < .001$). Finally, analysis of the item "being criticized" (i.e. the highest for children with social phobia) indicated that significantly more children meeting diagnostic criteria for social phobia were reported to have a fear of being criticized by their parents than the other groups ($\chi^2 = 37.30$, $p < .001$).

Positive and Negative Predictive Power

Having identified four face valid items that discriminated the phobia groups with a fair degree of consistency across parents and children, we next examined the positive predictive power (PPP; i.e. the number of participants endorsing the item "a lot" who have the particular phobia divided by the total number of participants endorsing the item "a lot") and negative predictive power (NPP; i.e. the number of participants not endorsing the item "a lot" who did not have the particular phobia divided by the total number of participants not endorsing the item "a lot") of the "dogs," "getting a shot from a nurse or doctor," "going to bed in the dark," and "being criticized" items for both parent and child reports. PPP and NPP are considered the most useful statistics for providing information for diagnostic decision making (see, e.g., Milich, Widiger, & Landau, 1987; Waldman & Lilienfield, 1991) and thus within the frame of this paper provide information for screening purposes. Specifically, these statistics provide an index of the likelihood that a child will meet diagnostic criteria for a phobia given that she or he endorsed the screening item for that phobia (PPP) or likelihood that a child will not meet diagnostic criteria for a phobia given that she or he did not endorse the screening item for that phobia (NPP).

In terms of the FSSC-R, the base rate (i.e. participants endorsing the item "a lot" divided by the total number of participants) of the dog item was .31, PPP was .35, and NPP .96 for children in the animal phobia group. Base rate of the going to bed in the dark item was .32, PPP was .79, and NPP was .63 for children in the dark/sleeping alone phobia group. Base rate of the getting a shot from a nurse or doctor item was .34, PPP was .17, and NPP was .96 for children in the shots/doctor phobia group. Base rate of the being criticized item was .15, PPP was .50, and NPP was .75 for children in the social phobia group.

In terms of the FSSC-R/P, the base rate of the dog item was .25, PPP was .40, and NPP .97 for children in the animal phobia group. Base rate of the going to bed in the dark item was .61, PPP was .77, and NPP was .87 for children in the dark/sleeping alone phobia group. Base rate of the getting a shot from a nurse or doctor item was .45, PPP was .16, and NPP was .96 for children in the shots/doctor phobia group. Base rate of the being criticized item was .29, PPP was .69, and NPP was .90 for children in the social phobia group.

To facilitate the construction of decision rules based on factor subscale scores that might be useful for screening purposes, we also examined the PPP and NPP of the factor subscales. PPP was defined as: The number of participants scoring one standard deviation above the mean on particular subscales who have the corresponding phobia, divided by the total number of participants scoring one standard deviation above the mean on particular subscale. NPP was defined as: The number of participants scoring below one standard deviation above the mean on particular subscales who did not have the corresponding phobia, divided by the total number of

participants scoring below one standard deviation above the mean on particular subscale.

In terms of the child reports on the FSSC-R, the base rate (i.e. participants scoring one standard deviation above the mean on the subscale divided by the total number of participants) of the Animal subscale was .15, PPP was .22, and NPP was .88 for children in the animal phobia group. The base rate of the Unknown subscale was .21, PPP was .80, and NPP was .58 for children in the dark/sleeping alone phobia group. The base rate of the Medical subscale was .10, PPP was .25, and NPP was .94 for children in the shots/doctor phobia group. The base rate of the Failure and Criticism subscale was .16, PPP was .26, and NPP was .71 for children in the social phobia group.

In terms of the parent reports on the FSSC-R/P, the base rate of the Animal subscale was .17, PPP was .25, and NPP .91 for children in the animal phobia group. The base rate of the Unknown subscale was .18, PPP was .71, and NPP was .51 for children in the dark/sleeping alone phobia group. The base rate of the Medical subscale was .20, PPP was .21, and NPP was .95 for children in the shots/doctor phobia group. The base rate of the Failure and Criticism subscale was .19, PPP was .72, and NPP was .82 for children in the social phobia group.

Discussion

Results of the present investigation suggest that the FSSC-R is useful in discriminating among different types of phobias. These findings extend previous work (e.g. Last et al., 1989) and contribute to the literature by providing evidence that the FSSC-R has potential utility for screening children's phobic disorders. This study also contributes by examining the utility of parents' ratings of their children's fears by using a parent-completed version of the FSSC-R. Specifically, the findings demonstrate that useful information can be obtained from either children or their parents in the assessment of the child's fear.

In terms of total mean factor subscale scores, univariate tests demonstrated moderate discrimination of the phobic groups (e.g. Medical fears subscale scores were highest for children who were diagnosed via structured interviews as having a simple phobia of shots/doctors but Failure and Criticism subscale scores were not highest for children with social phobia). The parent version demonstrated somewhat better discrimination of the phobic groups. For example, the highest total mean factor subscale scores corresponded to the conceptually consistent diagnostic group (e.g. Fear of the Unknown subscale scores were highest for dark/sleeping alone phobic children, Medical fears factor subscale scores were highest for shot/doctor phobic children, etc.). Similar to Last et al. (1989), when we examined the discrimination of groups with the factor subscales quantitatively, the results of the univariate ANCOVAs provided less than compelling evidence and thus point to the importance of utilizing multivariate analyses for quantitative tests and qualitative item analyses.

The prediction that the factor subscales of the FSSC-R and FSSC-R/P would discriminate children who met diagnostic criteria for social phobia and simple phobias of either the dark/sleeping alone, animals, or shots was strongly supported by the discriminant function analyses. For instance, the finding that 62% and 73% of the cases could be correctly classified by child and parent reports, respectively, provides strong evidence of the discriminant validity of the FSSC-R and FSSC-R/P subscales. Further, these results, in combination with findings regarding the positive and negative predictive power of the subscales, provide useful information for screening purposes. Specifically, scores one standard deviation above the mean on the Animal, Unknown, Medical, and Failure and Criticism subscales each had either strong PPP or strong NPP or both in predicting their corresponding phobia diagnosis.

The finding that specific qualitative FSSC-R items can differentiate among the phobia diagnostic groups was consistent with the results of the discriminant function analysis as well as the findings of Last et al. (1989). Specifically, FSSC-R/P item analyses indicated a high degree of conceptual correspondence between each type of phobia and the most prevalent fears reported on the FSSC-R/P. In terms of the FSSC-R, the number one most commonly reported fear corresponded with the type of phobia in the animal phobic and shots/doctor phobic groups and were reported significantly more often in their respective groups than the other groups. Although the dark/sleeping alone phobic group's most commonly reported fear was not consistent with a simple phobia of the dark/sleeping alone, analysis of the item "going to bed in the dark" indicated that children meeting diagnostic criteria for a phobia of dark/sleeping alone could be discriminated on the basis of this item. Social phobic children were not well discriminated by their own self-reports (i.e. although one of the top five most commonly reported fears "giving an oral report" corresponded with social phobia, item analyses were not significant). It may be that social evaluative fears manifest themselves by under-reporting on the FSSC-R in children with social phobia. However, additional research is needed to explore this issue further before firm conclusions can be drawn. Moreover, NPP was fairly high for the "being criticized" item on the FSSC-R for child self-reports, which suggests that the item may have screening utility.

As with the subscale scores, the results of the item analyses in combination with findings regarding the positive and negative predictive power of the subscales provide evidence for the utility of these items for screening for these phobias. Specifically, endorsing the items regarding dogs, going to bed in the dark, getting a shot, and being criticized "a lot" had either strong PPP or strong NPP or both in predicting their corresponding phobia diagnosis for both parent and child reports. It is interesting to note that NPPs were generally higher for both subscale scores and items suggesting, for instance, that failure to endorse an item on the FSSC-R or FSSC-R/P is more predictive of *not having* the phobia than endorsing the item is predictive of *having* the phobia. Taken all together, however, results from the discriminant function analysis and the item analysis provide evidence for the utility of either child or parent reports of the child's fears in discriminating different types of phobia problems of childhood and also suggest that the items

identified and subscales may be useful as screening tools using either child or parent reports.

The finding in this study that child and parent total scores show relatively low correspondence ($r = .21$) is consistent with previous research findings. For example, Achenbach, McConaughy, and Howell (1987), in their review examining correlations of child, parent, and teacher ratings of child behavioral and emotional problems found an average correlation of only .25 between child and parent ratings. However, as Table 2 shows, the Unknown, Animal, and Medical subscales showed higher correspondence, whereas the Danger/Death and Failure/Criticism subscales had lower correspondence. The lower correspondence of the Fear of Failure and Criticism subscales is consistent with the idea that social evaluative fears manifest themselves by their underestimation in self-reports. Moreover, despite the low correlation between child and parent ratings of childhood fear, child and parent ratings were fairly similar in terms of globally discriminating among different types of phobia problems of childhood (e.g. child and parent ratings, each separately, accurately classified over 60% of the participants).

The results of the specific discriminant classification analyses in terms of differential classification accuracy between the child and parent version suggest, on the other hand, that important added information can be garnered from using an additional informant. For example, children with dark/sleeping alone phobias and shots/doctor phobias were more accurately classified than children in the other two groups using the child version, whereas children with dark/sleeping alone, social, and animal phobias had high levels of accurate classification using the parent version while children in the shots/doctor phobia group did not (see Tables 4 and 5). Further, child reports of fears in social phobic children were not consistent with the type of phobia diagnosis using the item analysis. These results not only suggest the potential benefit of obtaining data from an additional source when resources permit but also may help to facilitate decisions as to which informant to gather information from when time resources must be economically allocated. For instance, it may be preferable to use parental reports of children's fears in socially phobic children when time concerns limit data collection opportunities.

Despite the important contributions this study makes, the investigation is not without limitations. First, although the sample size was relatively large, the cell size of the shots/doctor group was fairly small and the groups had a disproportionate number of participants in each cell. However, compared to other investigations of phobias the sample size in this investigation represents a comparatively large sample of children with phobias (e.g. Last et al.'s 1989 sample contained a total of only 34 phobic children). Further, although modifying the classification probabilities increased classification accuracy, the increased accuracy was not substantial (6% and 5% increased overall classification accuracy for child and parent reports, respectively). Second, although it was of interest in this investigation to examine the discriminant validity of the FSSC-R in a clinical sample, it will be important for future investigations to fully test the FSSC-R's utility as a screening tool for phobias by examining whether it can be used to identify children from a community sample who meet diagnostic criteria for phobias on structured diagnostic interviews. Finally, future research is needed to examine the factors which influence parent–child congruence in reporting the child's fears and also the greater congruence of parent ratings with diagnoses.

In summary, the results presented here offer support for the discrimination of phobias in children using the FSSC-R by either parent and child reports. In terms of the use of multiple informants, the results of the present investigation support the use of both parents' and children's reports to gain accuracy in the discrimination of children's phobias using the FSSC-R. However, the results also suggest that the use of multiple informants is not a necessary requirement to obtain useful discriminative information.

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