Structure, developmental course, and correlates of children's anxiety disorder-related behavior in a Hellenic community sample

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Abstract

The generality of the *DSM-IV* diagnostic structure for children's anxiety disorders, as measured by the Spence Children's Anxiety Scale (SCAS) was investigated with a Greek-language version of the scale. An exploratory factor analysis produced a six-factor solution in general accord with the *DSM-IV*-based theoretical structure of responding. However, a generalized anxiety factor incorporated three unexpected items interpreted as representing excessive worry, including two items intended to measure obsessions, raising the question of children's ability to discriminate the intrusiveness of vexatious cognition. Anxiety scores were negatively correlated with school adjustment and performance, and decreased with age, with the exception of social phobia scores, which increased. Anxiety scores were substantially higher than those observed in most cultures, particularly on social phobia and compulsive behavior subscales. Hellenic children might regard compulsive behaviors as more socially acceptable than other anxiety disorder-related behaviors, whereas higher overall anxiety scores appear to be related to socio-economic circumstances.
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In the Hellenic Republic, investigation of the correlates and determinants of anxiety disorders has been limited by the absence of reliable and valid measures of the behaviors that compose them. Moreover, clinicians working with Greek-speaking populations have not enjoyed the benefits of scales known to facilitate the differential diagnosis of anxiety disorders. Recently, however, progress has been made in the development of Greek-language measures of anxiety

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disorder-related behaviors, with the standardization of the Hellenic Fear Survey Schedule for Adults [(FSS-GR; Mellon, 2000) based on the Fear Survey Schedule (Wolpe & Lang, 1977)] and of the Hellenic Fear Survey Schedule for Children [(FSSC-GR; Mellon, Koliadis, & Paraskevopoulos, 2004) based on the Fear Survey Schedule for Children-Revised (FSSC-R; Ollendick, 1983)].

In addition to providing requisite tools for Greek-speaking researchers and clinicians, these studies have advanced our understanding of cross-cultural similarities and differences in the structure of fears. For example, while the psychometric properties and factor structure of responding on the FSS-GR and the FSSC-GR were broadly similar those obtained abroad, factor analyses of both adult and child responses in Greece revealed clear clustering of behaviors related to agoraphobic and travel fears that had not been previously observed in community samples. In addition, analyses of Hellenic children's responses revealed a structured dimension of school performance fears as distinct from fears of failure and criticism (the correlation between subscale scores based on these factors was relatively weak) that had not been observed in other cultures.

Self-reported fear levels on both the child and adult Hellenic scales were substantially higher than those observed in most western countries. The meaning of these differences is not yet clear. Perhaps Hellenic respondents were more forthcoming in reporting their fears, in which case the agoraphobic dimension in adults and children and/or the school performance fear dimension in children might exist as latent structures in data from other countries. On the other hand, fears in Greece might have a distinctive structure rooted in local cultural practices. For example, well-structured agoraphobic and travel fears might issue from common Hellenic child-rearing practices that foster family unity by emphasizing the unpredictability, uncontrollability and severity of dangers that exist outside the home. A structured dimension of school performance fears might issue from a Hellenic education system that harshly penalizes minor failures in the recitation of vast quantities of materials memorized by rote, encouraging analogous didactic practices by parents who are justifiably concerned about their children's eventual access to tertiary education (see Benincasa, 1997; Flouris, Calogiannakis-Hourdakis, Spiridakis, & Cambell, 1994; Mellon, 2000; Mellon et al., 2004 for discussions).

The Hellenic fear studies have also replicated two common findings on gender differences and on the developmental course of self-reported fears; on average, males report substantially lower levels of fears than females, and the levels of factor analysis-based fear subscale scores remain stable or decline during primary school—with the exception of social and school performance fears, which increase with age. In Hellenic children, both fears of failure and criticism and school performance fears increased substantially between the ages of 7 and 12 years; by adulthood, social circumstances are the predominant objects of fear and dread.

While data from the FSSC-GR have provided useful information on the normative structure and the developmental course of children's fears, the FSSC-R is generally considered to be a measure of specific fears and phobias that does not measure other important dimensions of anxiety disorders (McCathie & Spence, 1991; Muris, Merkelbach, Ollendick, King, & Bogie, 2002; Perrin & Last, 1992; Stallings & March, 1995). Specifically, while subscale scores from the FSSC-R discriminate among social and specific phobias (e.g., Weems, Silverman, Saavedra, Pina, & White Lumpkin, 1999) they do not provide measures of certain problematic behaviors essential to the diagnosis of obsessive-compulsive disorder, panic disorder, generalized anxiety disorder, and separation anxiety disorder. The development of reliable and valid measures of these characteristics would be of great value to Greek researchers and clinicians, and additionally

would contribute to the emerging characterization of the structure of children's anxiety disorder-related behavior in the Hellenic Republic and across cultures.

In addition to providing an overall anxiety score, the Spence Children's Anxiety Scale (SCAS; Spence, 1997, 1998) was developed to measure specific characteristics of childhood anxiety disorders in community samples in accord with the diagnostic criteria of the *DSM-IV* (APA, 1994). Subsets of the 38 anxiety disorder-related items of the SCAS are intended to measure the frequencies of occurrence of the following clusters of anxiety disorder-related behaviors, as defined by *DSM-IV* criteria: panic disorder/agoraphobia (e.g., "I suddenly feel as if I can't breathe when there is no reason for this"); social phobia (e.g., "I worry what other people think of me"); separation anxiety disorder (e.g., "I feel scared if I have to sleep on my own"); generalized anxiety disorder (e.g., "I worry about things," "I feel afraid"); obsessive-compulsive disorder (e.g., "I have to do some things in just the right way to keep bad things from happening"); and physical injury fears, that is, fears elicited by objects and events that are among the most common objects of specific phobias in children (e.g., "I am scared of dogs"). Empirical evidence indicates that the SCAS can discriminate between children who satisfy the diagnostic criteria for specific *DSM-IV* anxiety disorders from those who do not (Muris, Schmidt, & Merckelbach, 2000; Spence, 1998).

Accordingly, the present report concerns the development of a Hellenic version of the Spence Children's Anxiety Scale and the implications of the results of its administration with a large community sample with regard to the structure, developmental course and correlates of anxiety disorder-related behavior. Beyond investigating the internal consistency, test–retest reliability, and age- and gender-related differences of children's self-reported anxiety disorder-related behavior on a Greek-language version of the SCAS (the Hellenic Spence Children's Anxiety Scale, or SCAS-GR), the present study provides data for the further exploration of common and uncommon characteristics of the structure of anxiety disorders in children across cultures, via a comparative analysis with findings from research with the SCAS and with Hellenic and foreign versions of the FSSC-R. In addition, teacher's reports of the children's school performance and adjustment in relation to children's self-reported levels behaviors that characterize anxiety disorders contribute to the data base concerning the functional significance of these disorders, as well as providing an assessment of the convergent validity of scores on the Hellenic SCAS.

1. Method

1.1. Participants

Data were collected at 17 public schools throughout the five school districts of the Athens-Piraeus area, home to nearly one third of the Hellenic Republic's 11 million residents. Fifteen hundred and twenty children (778 boys and 742 girls) participated this investigation, representing 1.96% of all children registered in the 4th, 5th, and 6th grades. Fourth graders ($N = 496$) were 9–10 years of age, 5th graders ($N = 439$) were 10–11 years of age, and 6th graders ($N = 585$) were 11–12 years of age. Schools were chosen to represent a range of socio-economic catchment areas. The children's reports of their parents' education levels were as follows: primary education, 8.5% of fathers and 6.2% of mothers; gymnasium (junior high school), 14.6% of fathers and 11.6% of mothers; lyceum (high school), 32.6% of fathers and 33.3% of mothers, and tertiary education, 44.3% of fathers and 41.9% of mothers. By their own report, 18% of the children's mothers and 20% of their fathers were born in foreign countries, principally in Albania, and 12% of the children themselves were foreign-born.

1.2. Instruments

The children were administered the SCAS-GR, a 45-item adaptation of the 44-item SCAS. The ordering of the original SCAS items was retained except for one additional item, which appeared as item 45; this item tapped fears of elevators (see below). As opposed to the FSSC-R, which measures the *intensity* of fear elicited by objects and events, the SCAS measures the *frequency of occurrence* of behaviors that are diagnostic characteristics of anxiety disorders (see McCathie & Spence, 1991, for discussion). Accordingly, children were asked to rate the frequency with which they experience each of 39 clinically relevant behaviors on a 4-point scale: *never* (0), *sometimes* (1), *often* (2) or *always* (3); thus higher scores represent higher frequencies of anxiety disorder-related behaviors. Consistent with the SCAS, the SCAS-GR contained six items describing positively regarded behaviors (such as item 31, "I feel happy''); these items were designed to reduce negative response bias. Responses to these items are usually not scored. Also consistent with the SCAS, a final item requested the participants to name anything else that they were "really afraid'' of, and to rate the frequency of occurrence of this fear. Because of wide variance in responding, children's reports on this item were excluded from the total anxiety and subscale scores. The instructions indicated that there were no right or wrong answers.

The children were also administered the Parental Consequences for Students' Behavior scale (PCSB; Mellon & Moutavelis, 2005), a 62-item self-report instrument designed to measure the frequency with which their parents positively reinforce, negatively reinforce, punish and provide no consequences for their studying behavior. Data from this newly developed instrument will not be reported here.

In addition, the children completed a six-item demographics questionnaire concerning their parents' occupation, educational level, and country of origin, plus their own country of origin, number of siblings, and birth order, as well as the physical proximity of their close relatives.

Finally, the children's teachers completed a questionnaire for each child, which included six demographic questions plus eight questions drawn from a Greek-language translation of the Teacher's Report Form (Achenbach, 1991). Four of the latter questions tapped the children's performance in the Greek language, in mathematics, in history and in physics, on a 5-point scale ranging from "well below average'' to "well above average.'' The other four items measured the teachers' judgments of the children's work habits, conduct, effort and disposition, using a 7-point scale ranging from "well below'' to "well above'' average relative to other children of the same age.

1.3. Procedure

1.3.1. Adaptation of the SCAS and pilot evaluation

The SCAS was adapted from English into Greek in accordance with guidelines developed by the International Test Commission (van de Vijver & Hambleton, 1996). At the outset, the instrument was examined for uncommon referents and inconsistencies with local conditions. Two minor changes were made. On item 30, "I am afraid of being in crowded places like shopping centers, the movies, buses, busy playgrounds," "shopping center'' was replaced with "open-air markets.'' Shopping centers are to be found in Greek cities, but the ubiquitous "*laikoi agores*'' (from which the term "agoraphobia'' is derived) provide more familiar scenes of crowded, energetic trading. On item 39, "I am afraid of being in closed places, like tunnels and small rooms," "tunnels'' was replaced with "small storage areas.'' While tunnels are encountered in the Hellenic Republic, they are rarely if ever long enough to give one the impression of entrapment.

A more substantial alteration concerned item 25 of the SCAS, ''I am afraid of being in high places or lifts (elevators).'' This item is from the SCAS subscale for the assessment of specific phobia; however, it appears to conflate fear of falling from heights, which is theoretically a physical injury fear, with fear of entrapment, which is theoretically an agoraphobic fear. On the FSSC-GR, fear of elevators was quite weakly related to a ''Danger and death'' factor, and loaded on a factor that included fear of closed spaces and fear of dark rooms and closets. Accordingly, the descriptor ''elevators'' was removed from item 25 and, as clinical experience and FSSC-GR data indicate that fears of elevators are rather common in Hellenic children, ''I am afraid of being in elevators'' was added as a 45th item.

After these changes, the scale was independently translated by the bilingual authors (one a native speaker of English, the other a native speaker of Greek). The two translations were then independently back-translated into English, in counterbalanced order, by four bilingual native Greek speakers (one clinical psychologist and three primary school teachers). Minor differences between the two translations were resolved by comparison of the accuracy of the eight back translations in discussions among the six translators.

The resulting version of the SCAS-GR was administered to 66 children (20 fourth graders, 23 fifth graders, and 23 sixth graders). Items were read aloud by the native Greek-speaking author. At the conclusion of the administration, the children were asked to describe what they had understood each item to mean. It was the authors' impression that the items were adequately understood by the children, an impression that was supported by the measure of internal consistency of responding on the 39 SCAS-GR anxiety disorder-related items (Cronbach's $\alpha = .86$). Thus the SCAS-GR as used in the pilot evaluation was deemed appropriate for more extensive investigation.

1.3.2. Principle investigation

Data were collected in 75 classroom groups of 12–28 children (mean class size was 20.3). Instruments were administered in the following fixed order: SCAS-GR, PCSB, and demographic questionnaire, with all items being read aloud by the native Greek-speaking author. The children's names did not appear on the instruments they completed; the children were identified by a number code, and were assured that their answers would be treated confidentially. Teachers' questionnaires were completed on the same day of administration. Data were analyzed using the statistical package SPSS version 12.0.

1.3.3. Evaluation of temporal stability of scores

Test–retest reliability data were collected from a sub-sample of 121 children (4th graders, $N = 34$; 5th graders, $N = 41$; 6th graders, $N = 46$). The second administration occurred exactly 21 days after the first administration. The test–retest sub-sample was similar to the full data set regarding gender (60 boys and 61 girls) and country of birth (foreign born = 12, or approximately 10% of the sub-sample).

2. Results

2.1. Psychometric reliability assessment

As measured by Cronbach's α, the internal consistency of the children's responses on the 39 anxiety disorder-related items of the SCAS-GR was .90, which is similar to the response homogeneity reported for samples of similar-aged children in Australian ($\alpha = .92$; Spence, 1998),

German ($\alpha = .92$; Essau, Muris, & Ederer, 2002), Japanese ($\alpha = .88$; Ishikawa, Oota, & Sakano, 2001, as cited in Essau et al., 2002) and South African ($\alpha = .92$; Muris, Schmidt, Engelbrecht, & Perold, 2002) samples.

The three-week test–retest reliability coefficient of total anxiety scores (i.e., sum of 39 anxiety disorder-related items) on SCAS-GR was .83, which was higher, as would be expected, than the 6th-month test–retest reliability reported for an Australian sample ($r = .60$; Spence, 1997), and similar to the two-week test–retest reliability of Hellenic children's responses on the considerably longer (80-item) FSSC-GR ($r = .88$; Mellon et al., 2004).

Separate reliability analyses for younger (4th grade) children and for foreign-born children produced results similar to those of the full sample, suggesting that these groups did not have particular difficulties understanding and responding to the SCAS-GR items. Internal consistency for 4th graders was $\alpha = .90$ ($N = 496$) and test–retest reliability was $r = .80$ ($N = 34$). Internal consistency for foreign-born children was $\alpha = .88$ ($N = 179$) and test–retest reliability was $r = .95$; however, as noted above there were only 12 foreign-born participants in the test–retest sub-sample.

2.2. Factor structure and psychometric properties of subscale scores

As the dimensions of anxiety disorders, the descriptive styles of respondents and their tendencies to disclose anxiety disorder-related behavior are likely to differ somewhat from one culture to another, the SCAS-GR is properly considered to be a new scale. Thus, an exploratory rather than confirmatory strategy was employed in the investigation of the factor structure of Hellenic children's self-reported anxiety disorder-related behavior; this approach affords comparison of cross-loading patterns.

A principal components analysis with varimax rotation produced seven factors with an eigenvalue of greater than one. Examination of the scree plot revealed six to seven factors, but the last factor of the seven-factor solution was not interpretable. Thus, the six-factor solution was selected as providing the best conceptual fit of the data; this solution accounted for 42% of the total variance in responding. In comparison, a six-factor PCA with varimax rotation with a sample of Australian schoolchildren (Spence, 1998) accounted for 47% of the total variance.

The factor structure is presented in Table 1 along with the eigenvalues, the percentages of variance accounted for, and measures of the internal consistency (Cronbach's α) and temporal stability ($r_{\text{test–retest}}$) of subscales based on the six SCAS-GR factors. Of the 39 anxiety disorder-related items, 32 had their highest factor loading on the factor predicted on the basis of independent judges' categorization of SCAS items in the initial development of the scale (Spence, 1998). This compares favorably to the 32 SCAS items that loaded on their predicted factors in the initial development of the scale; however, on the SCAS only two items cross-loaded (i.e., loading of $\geq .35$ on a second factor) whereas the SCAS-GR had four cross-loaded items. Letter codes to the left of each item number indicate the *DSM-IV* anxiety disorder diagnostic categories that the corresponding English-language items were intended to measure in the original development of the SCAS. A majority of items in each of the six SCAS-GR factors corresponded to the items of one of the six SCAS theoretical factors.

The psychometric properties of subscales based on the six SCAS-GR factors were quite similar to those reported for corresponding subscales abroad. In two studies that have reported measures of internal consistency of responding for school-age children on each subscale (Essau et al., 2002; Spence, 1998) Cronbach's α for SCAS subscales ranged between .57 and .82, with a median of .72; in the present study, they ranged from .56 to .78, with a median of .76. As opposed

Table 1
Rotated component reliabilities and item loadings from the exploratory factor analysis

Component	E	Variance %	α	$r_{test-retest}$
I. Panic disorder and agoraphobia (8 items)	8.57	21.97	.78	.78
II. Generalized anxiety disorder (9 items)	2.20	5.64	.76	.69
III. Separation anxiety disorder (5 items)	1.71	4.39	.71	.78
IV. Physical injury fears (7 items)	1.54	3.94	.71	.79
V. Social phobia (6 items)	1.28	3.28	.71	.76
VI. Compulsive behavior (4 items)	1.10	2.71	.56	.75

Predicted category, item number and item	SCAS-GR factor loadings (with highest factor loadings in italics)					
	I PA	II GA	III SA	IV PIF	V SP	VI CB
Items with highest loading for Factor I: Panic disorder and agoraphobia (PA)						
PA (36) My heart suddenly starts to beat too quickly for no reason.	*.67*	.21	.09	.03	.09	.08
PA (32) All of a sudden I feel really scared for no reason at all.	*.65*	.24	.18	.10	.04	.00
PA (13) I suddenly feel as if I can't breathe when there is no reason for this.	*.62*	.20	.12	−.04	.07	.06
PA (34) I suddenly become dizzy or faint when there is no reason for this.	*.61*	.18	−.02	.10	.09	.06
PA (21) I suddenly start to tremble or shake when there is no reason for this.	*.56*	.23	.07	.14	.01	−.07
PA (37) I worry that I will suddenly get a scared feeling when there is nothing to be afraid of.	*.48*	.24	.31	.14	.10	.02
SA (16) I have trouble going to school in the mornings because I feel nervous or afraid.	*.46*	.05	.13	.06	.32	.11
PA (30) I am afraid of being in crowded places, like markets, movies, buses, busy playgrounds.	*.37*	−.04	.16	.22	.32	.20
Items with highest loading for Factor II: Generalized anxiety disorder (GA)						
OC (19) I can't seem to get bad or silly thoughts out of my head.	.21	*.65*	.08	.10	.10	.07
OC (41) I get bothered by bad or silly thoughts or pictures in my mind.	.21	*.59*	.15	.07	.15	.05
GA (1) I worry about things.	.14	*.51*	.11	.08	.22	.04
GA (22) I worry that something bad will happen to me.	.32	*.48*	.09	.17	.10	.16
GA (24) When I have a problem, I feel shaky	.29	*.48*	−.05	.20	.16	.05
GA (20) When I have a problem, my heart beats really fast.	.27	*.42*	.16	−.04	.10	.16
GA (4) I feel afraid.	.17	*.41*	.39	.27	.07	.00
SA (12) I worry that something awful will happen to my family.	.22	*.39*	.12	.09	.13	.17
GA (3) When I have a problem, I get a funny feeling in my stomach.	.20	*.30*	.23	−.19	.16	.04
Items with highest loading for Factor III: Separation anxiety disorder (SA)						
SA (5) I would feel afraid of being on my own at home.	.10	.14	*.67*	.23	.08	−.06
SA (8) I worry about being away from my parents.	.17	.09	*.64*	.07	.13	.23

Table 1 (*Continued*)

Predicted category, item number and item	SCAS-GR factor loadings (with highest factor loadings in italics)					
	I PA	II GA	III SA	IV PIF	V SP	VI CB
SA (15) I feel scared to have to sleep on my own.	.11	.21	*.62*	.17	.10	−.10
PIF (2) I am scared of the dark.	.03	.31	*.52*	.36	−.04	−.08
SA (44) I would feel scared if I had to stay away from home overnight.	.16	−.06	*.48*	.21	.18	.11
Items with highest loading for Factor IV: Physical injury fears (PIF)						
PIF (25) I am scared of being in high places.	.01	.24	.13	*.61*	.06	.07
PIF (18) I am scared of dogs.	.03	.12	.06	*.59*	.02	−.02
PIF (45) I am scared of being in lifts (elevators).	.16	−.01	.18	*.57*	.15	.17
PIF (33) I am scared of insects or spiders.	.00	.09	.26	*.57*	.13	−.02
PIF (23) I am scared of going to the doctor or dentist.	.19	.07	.14	*.46*	.22	−.12
PA (28) I feel scared if I have to travel in a car, or on a bus or train.	.32	−.16	.22	*.41*	.22	.09
PA (39) I am afraid of being in small closed places, like small rooms or small storage spaces.	.21	.15	.38	*.39*	.16	.13
Items with highest loading for Factor V: Social phobia (SP)						
SP (6) I feel scared when I have to take a test.	.08	.24	.08	.15	*.65*	−.04
SP (10) I worry that I will do badly at my school work.	.08	.32	.02	.09	*.61*	−.06
SP (35) I feel afraid if I have to talk in front of my class.	.20	.21	.09	.19	*.58*	−.07
SP (29) I worry what other people think of me.	.15	.37	.06	.09	*.53*	.05
SP (7) I feel afraid to use public toilets or bathrooms.	.11	−.11	.19	.01	*.51*	.14
SP (9) I feel afraid that I will make a fool of myself in front of other people.	−.08	.38	.10	.18	*.46*	.07
Items with highest loading for Factor VI: Compulsive behavior (CB)						
OC (40) I have to do some things over and over again (like washing my hands, cleaning or putting things in a certain order).	.02	.12	−.07	.08	.06	*.67*
OC (14) I have to keep checking that I have done things right (like the switch is off or the door is locked).	.00	−.09	.07	−.14	.00	*.66*
OC (42) I have to do some things in just the right way to keep bad things from happening.	.09	.18	−.06	.12	.03	*.58*
OC (27) I have to think special thoughts to stop bad things from happening.	.17	.21	.21	.04	−.02	*.54*

to the previous studies, in which the lowest measures of internal consistency were reported for physical injury fears factors, in the present study α was lowest for Factor VI (CB) which was composed of only four items as opposed to six items in obsessive-compulsive disorder subscales in previous studies; the SCAS-GR physical injury fears factor had seven items in comparison with the five-item SCAS PIF subscale, and its internal consistency was correspondingly higher. Temporal stability measures for all six SCAS-GR subscales were acceptable.

2.3. Total anxiety disorder-related behavior scores

The SCAS-GR total anxiety scores are presented in Table 2. The mean total anxiety score for all participants, 42.3, was considerably higher than means obtained from Australian (34.1; Spence, 1997), German and Japanese (22.9 and 22.4, respectively; Essau, Sakano, Ishikawa, & Sasagawa, 2004) samples of children of similar ages. Although their statistical reliability cannot be assessed, these differences are considerable even if one takes into account the fact that the SCAS-GR has an additional item due to the splitting of item 25 into two items (the mean of mean scores on items 25 and 45 was 1.11, yielding a corrected total anxiety score of 41.2). However, similar total anxiety scores were reported for low, low-middle and middle socio-economic status sub-samples in South African school-aged children (43.4; 46.4, and 45.1, respectively) although not for a middle-high SES group (25.2; Muris, Schmidt, et al., 2002).

An examination of the data summarized in Table 2 indicates that girls, on average, had higher total anxiety scores than boys, and that total anxiety scores tended to decrease with increases in age, especially between the 5th and 6th grades. The reliabilities of these gender and age differences were evaluated by a 2 (Gender) by 3 (grade in school) ANOVA on the total anxiety scores. This analysis revealed significant main effects for gender [$F(1, 1438) = 86.53, P < .001$] and grade [$F(2, 1438) = 12.02, P < .001$] with non-significant interaction. A Student–Newman–Keuls post hoc analysis ($\alpha = .05$) revealed that while total anxiety scores for 6th graders were reliably lower than scores for 5th graders, the latter scores were not reliably lower than those of 4th graders.

2.4. Anxiety disorder subscale scores

In Table 3, the mean subscale scores and their standard deviations are presented for each age group and gender. Age by gender ANOVAs revealed that girls' scores were significantly higher than boys' scores on all subscales except compulsive behavior, where no gender differences were found [PA, $F(1, 1498) = 32.87, P < .001$; GA, $F(1, 1498) = 19.87, P < .001$; SA, $F(1, 1507) = 73.96, P < .001$; PIF, $F(1, 1501) = 123.28, P < .001$; SP, $F(1, 1506) = 64.57, P < .001$; CB, $F(1, 1508) = 1.38, P = .24$]. Significant age group effects were found for all six subscales [PA, $F(2, 1498) = 22.02, P < .001$, Student–Newman–Keuls ($\alpha = .05$), 4th > 5th > 6th; GA, $F(2, 1498) = 8.25, P < .001$, 4th = 5th > 6th; SA, $F(2, 1507) = 20.23, P < .001$, 4th = 5th > 6th;

Table 2
Means (and standard deviations) of SCAS-GR total anxiety scores by school grade and gender

Group	All grades	4th grade	5th grade	6th grade
All participants	42.3 (17.0)	44.3 (18.1)	43.8 (17.4)	39.7 (15.4)
Boys	38.4 (15.9)	39.5 (15.7)	39.8 (17.0)	36.5 (15.0)
Girls	46.4 (17.2)	49.0 (19.1)	48.2 (16.9)	43.0 (15.1)

Table 3
Means (and standard deviations) of SCAS-GR subscale scores and means (and standard deviations) of item scores for each factor (in italics), by age and gender, together with mean item scores interpolated from Spence (1997)

Group	PA	GA	SA	PIF	SP	CB
All participants	4.2 (3.9)	10.8 (4.9)	5.1 (3.6)	6.9 (4.4)	8.4 (4.0)	7.3 (2.8)
	.52 (.48)	*1.20 (.55)*	*1.03 (.72)*	*.98 (.62)*	*1.39 (.67)*	*1.82 (.71)*
Boys	3.7 (1.5)	10.2 (4.8)	4.4 (3.5)	5.8 (4.0)	7.6 (3.9)	7.2 (3.0)
	.46 (.43)	*1.14 (.54)*	*.87 (.69)*	*.82 (.57)*	*1.26 (.65)*	*1.79 (.74)*
Girls	4.7 (4.2)	11.4 (5.0)	5.9 (3.6)	8.1 (4.4)	9.2 (4.0)	7.4 (2.7)
	.59 (.53)	*1.26 (.55)*	*1.18 (.72)*	*1.16 (.63)*	*1.53 (.67)*	*1.84 (.67)*
4th grade	5.0 (4.5)	10.9 (5.2)	5.5 (3.8)	7.5 (4.6)	7.9 (3.1)	7.9 (2.9)
	.61 (.56)	*1.21 (.57)*	*1.11 (.75)*	*1.07 (.66)*	*1.31 (.65)*	*1.96 (.71)*
5th grade	4.3 (3.7)	11.4 (5.0)	5.7 (3.8)	7.1 (4.4)	8.4 (4.0)	7.2 (2.8)
	.54 (.46)	*1.26 (.56)*	*1.13 (.75)*	*1.01 (.63)*	*1.40 (.67)*	*1.81 (.70)*
6th grade	4.2 (3.9)	10.2 (4.5)	4.4 (3.3)	6.9 (4.4)	8.7 (4.1)	6.8 (2.8)
	.43 (.41)	*1.13 (.50)*	*.89 (.65)*	*.90 (.57)*	*1.46 (.68)*	*1.70 (.69)*
Spence (1997)	*.47 (.47)*	*1.03 (.37)*	*.81 (.59)*	*.74 (.55)*	*1.15 (.78)*	*1.0 (.61)*

PIF, $F(1, 1501) = 12.37$, $P < .001$, 4th = 5th > 6th; SP, $F(2, 1506) = 6.65$, $P < .001$, 4th < 5th = 6th; CB, $F(2, 1508) = 19.12$, $P < .001$, 4th > 5th > 6th]. Thus, subscale scores decreased with increases in age for all subscales except social phobia, for which scores increased with age.

Because the subscales have different numbers of items, Table 3 also presents the mean item scores for each subscale, along with their standard deviations, for each age group and gender, in order to simplify comparisons of item endorsement across the diagnostic dimensions. For all groups except one, the ordering of sizes of mean item scores were the same: the lowest mean scores were reported for the items of the panic disorder/agoraphobia subscale followed, in ascending order, by mean item scores on physical injury fears, separation anxiety disorder, generalized anxiety disorder, and social phobia, with the highest item means on the compulsive behavior subscale. The exception occurred with the oldest group of children (6th grade) for which the item mean on physical injury fears was slightly higher than that of separation anxiety disorder items.

For comparison purposes, Table 3 also presents the interpolated item means (and their standard deviations) from the corresponding subscales of a sample of similar-aged Australian schoolchildren (Spence, 1997). From this comparison it appears that the relative elevations of scores observed with children in Hellenic primary schools were not evenly distributed across anxiety disorder subscales. Specifically, while the mean item scores of Hellenic children were only 5% higher than those of Australian children on the panic disorder/agoraphobia dimension, they were between 17 and 24% higher on GA, SA, PIF and SP. Most strikingly, mean item scores on the four-item SCAS-GR compulsive behavior subscale were 82% higher than mean item scores on the six-item obsessive-compulsive disorder subscale of the SCAS.

The extraordinarily high scores on the items of the SCAS-GR compulsive behavior subscale, together with the failure to observe a gender difference in self-disclosure on this subscale, raise the possibility that for children in Hellenic primary schools, the behaviors reported on CB might have been viewed as more socially acceptable or desirable relative to behaviors reported on other scales. This possibility was examined with the use of the positively valenced filler items on the scale. As noted above, the Spence scale contains six items such as "I am popular among other

kids my own age,'' ''I am a good person'' and ''I am proud of my school work,'' that are intended to reduce negative response bias. While these items are not normally scored, the sum of responses on these items might be considered to provide a measure of children's self-regard. As a subscale, these items yielded a Cronbach's α of .67 and a test–retest reliability of .64. As children with higher levels of anxiety disorder-related behaviors tend to judge themselves as less able to control their environments (Ollendick, 1983), self-regard and scores on anxiety disorder subscales would be expected to correlate negatively.

Indeed, scores on five of the six SCAS-GR anxiety disorder subscales were negatively correlated with self-regard scores [range: $r = -.18$ (SA) to $-.29$ (SP); all with $P < .001$]. The exception was the compulsive behavior subscale, scores on which were *positively* correlated with self-regard scores ($r = .13$, $P < .001$). The correlation coefficient was larger ($r = .19$) for boys alone.

2.5. Levels of anxiety-related behavior in relation to socio-economic indicators

In an effort to investigate the basis of the higher scores on the Hellenic SCAS in comparison with SCAS scores abroad, the relation of anxiety scores to socio-economic status was considered because, as noted above, in a previous investigation SCAS scores were considerably higher in lower SES groups (Muris, Schmidt, et al., 2002; note, however, that there were not only economic but also cultural differences between these groups). In the present study, participants' self-reports of their parents' occupations proved to be too vague to reliably categorize; thus, the parent's *levels of education* were used as indicators of socio-economic status. Despite the fact that by their children's reports, more than 70% of mothers worked outside the home, mothers' education levels were not systematically related to their children's anxiety levels. However, fathers' education levels (which might be more closely related, on average, to familial socio-economic status) were systematically related their children's anxiety levels, as is shown in Table 4.

In the Hellenic Republic, education is compulsory until the completion of the gymnasium (roughly, junior high school). Because the number of fathers that had finished their studies at this compulsory level was much smaller than the number who had finished secondary or tertiary education, equal-sized random sub-samples were taken from the participants of the latter two groups ($N = 324$ from each group); these sub-samples were matched to the compulsory-education sub-sample with regard to grade level and gender distributions. An ANOVA indicated a statistically significant main effect of fathers' education level in relation to their children's self-reported total anxiety scores [$F(2, 923) = 4.85$; $P < .01$] with a Student–Newman–Keuls post hoc analysis ($\alpha = .05$) indicating that the anxiety levels of the children of fathers who had completed

Table 4

Fathers' education levels and children's birthplace in relation to children's mean levels of anxiety disorder-related behavior (with their standard deviations)

Group	Total anxiety	PA	GA	SA	PIF	SP	CB
Compulsory ($N = 324$)	44.5 (15.8)	4.5 (3.7)	11.2 (4.7)	5.5 (3.4)	7.3 (4.3)	8.8 (3.8)	7.3 (2.8)
Secondary[a] ($N = 324$)	41.8 (16.5)	4.1 (3.6)	11.0 (4.9)	5.0 (3.5)	6.5 (4.1)	8.3 (4.1)	7.3 (2.8)
Tertiary[a] ($N = 324$)	40.5 (16.6)	3.7 (3.6)	10.2 (4.7)	4.9 (3.7)	6.8 (4.4)	8.2 (4.2)	7.2 (2.9)
Foreign-born ($N = 179$)	46.2 (16.6)	4.8 (3.8)	11.6 (4.5)	5.4 (3.5)	8.5 (4.6)	9.0 (4.0)	7.3 (2.8)
Native-born[a] ($N = 179$)	41.6 (16.7)	3.8 (3.6)	10.8 (5.0)	5.2 (3.8)	6.6 (4.5)	8.1 (4.2)	7.4 (2.9)

[a] Randomly selected sub-samples matched for distributions of school grade and gender.

only compulsory education were reliably higher than those of the children whose fathers had completed secondary or tertiary education. A series of ANOVAS on the subscale scores indicated moderate main effects of fathers' education only for the panic disorder/agoraphobia [$F(2, 962) = 3.87$; $P < .05$] and the generalized anxiety disorder [$F(2, 962) = 4.46$; $P < .05$] dimensions; scores on both subscales were reliably lower for participants whose fathers were reported to have completed university or technical schools.

As a second socio-economic indicator, levels of anxiety disorder-related behaviors were compared in foreign-born and native-born children. The birth countries of the foreign-born participants in the sample are all sources of economic immigration to the Hellenic Republic; thus a large majority of these participants are reasonably assumed to be the children of relatively recent economic immigrants. Because the number of foreign-born children was much smaller than the number of native-born children, an equal-sized comparison group of native-born participants, matched for grade level and gender distributions, was formed by random selection.

The results of this comparison are also presented in Table 4. On average, children assumed to be the offspring of recent economic immigrants had higher total anxiety scores than native-born children; an ANOVA indicated that this difference was statistically reliable [$F(1, 357) = 6.52$, $P < .01$]. With the exception of the compulsive behavior scale, foreign-born subjects' scores were higher on all subscales; however, differences were statistically significant only for the panic disorder/agoraphobia [$F(1, 357) = 6.47$, $P < .01$] and physical injury fears [$F(1, 357) = 15.33$, $P < .001$] subscales.

2.6. Discriminate and convergent validity assessments

In order to discriminate between levels of behaviors associated with different anxiety disorders, the intercorrelations between subscale scores should be substantially lower than the correlation of scores on each subscale with total anxiety scores. Table 5 presents the intercorrelations between subscales and, for comparison purposes, the correlation of scores on each subscale with total anxiety scores. All subscale intercorrelations were substantially lower than the respective correlations of scores on each subscale with the total anxiety score. The SCAS-GR subscale intercorrelations were lower than 29 of the 30 corresponding intercorrelations reported for German (Muris et al., 2000) and Australian (Spence, 1998) children of similar ages. Range, median, and mean intercorrelations for the three samples were as follows: Hellenic, .15–.63, .45, .40; German, .41–.69, .59, .57; Australian, .55–.91, .78, .76.

Table 5
Intercorrelations among subscale and total anxiety scores

Scales	PA	GA	SA	PIF	SP	CB	Total
PA Panic/agoraphobia							
GA Generalized anxiety	.63						
SA Separation anxiety	.47	.47					
PIF Physical injury fears	.45	.45	.59				
SP Social phobia	.46	.54	.40	.46			
CB Compulsive behavior	.27	.28	.16	.15	.17		
Total anxiety score	*.78*	*.82*	*.72*	*.75*	*.73*	*.42*	
Teachers' evaluation of performance & adjustment	−.21	−.14	−.10	−.11	−.14	−.09	−.19

Note also that the correlations of scores on the compulsive behavior subscale with total anxiety scores and with the other subscale scores were substantially lower than the corresponding correlations among scores on other subscales; thus, compulsive behavior scores were the least predictive of total anxiety as well as of levels of anxiety disorder-related behaviors as measured by other SCAS-GR subscales.

Convergent validity was assessed by evaluation of the relation between teachers' assessments of their students' school performance and adjustment and levels of behaviors related to anxiety disorders. If the SCAS-GR measures levels of anxiety disorder-related behavior, which is assumed to be incongruent with school performance and adjustment (e.g., Papay & Speilberger, 1986; Van Ameringen, Mancini, & Farvolden, 2003), these variables would be expected to correlate negatively. Teachers' evaluation of students' school performance in four subjects and of their school adjustment on four dimensions were highly intercorrelated; internal consistency among the eight items as measured by Cronbach's α was .94. Therefore, the eight items were combined into a single global measure of school performance and adjustment. As presented in the bottom row of Table 5, the teachers' combined evaluations of the children's school performance and adjustment were indeed negatively correlated with the children's self-reports of the frequencies of occurrence of anxiety disorder-related behaviors, as measured by total anxiety scores well as by scores on each of the six subscales. Correlation coefficient values were modest, resembling those from a similar assessment of the relation between anxiety and school performance levels with younger children (Papay & Speilberger, 1986); however, all correlations were statistically significant (two-tailed, $P < .001$).

2.7. Most frequently endorsed anxiety disorder-related behaviors

To explore the most frequently endorsed anxiety disorder-related behaviors, the 10 SCAS-GR items that most often evoked the evaluation ''often'' or ''always'' were tabulated and are presented in Table 6. All four items of the compulsive behavior subscale were among the most frequently endorsed items for all groupings of Hellenic children. Four items from the social phobia subscale were also among the 10 most frequently endorsed items for all subjects overall; the rankings of these items rose systematically with the children's ages. [Although not shown in Table 6, the two other SP items also showed age-related increases in endorsement ranking: item 10 (''I worry that I will do badly at my school work'') was ranked 19th for 4th graders, 17th for 5th graders, and 11th for 6th graders; similarly, item 35 (''I feel afraid if I have to talk in front of my class'') rose from 30th for 4th graders to 25th for 5th graders and to 15th for 6th graders.]

A comparison of the 'top 10' SCAS-GR items with previously published data on the 10 most frequently endorsed items for both German and Japanese schoolchildren (Essau et al., 2004) revealed four common items for Hellenic and German samples and five common items for Hellenic and Japanese samples; German and Japanese samples also had five common items. Only item 33 (PIF, ''I am scared of insects or spiders'') was among the most frequently endorsed items for all three samples. Hellenic and German samples had two SP items and one CB item in common among the 10 most frequently endorsed anxiety disorder-related behaviors, and the Hellenic and Japanese samples had two other CB items, plus one other SP item and one GA item in common. Although both Japanese and German samples had several compulsive behavior and social phobia items among the most frequently endorsed items, their 'top 10' lists were not dominated by these two categories as was true of the Hellenic sample.

Table 6
Ten most frequently endorsed (rated as occurring "often" or "always") anxiety disorder-related behaviors by gender and age group (item ranking and, in italics, percent of children endorsing)

Subscale and item	All	Boys only	Girls only	4th grade	5th grade	6th grade
(CB) I have to keep checking that I have done things right (like the switch is off or the door is locked).	1 *74.1*	1 *75.1*	1 *76.9*	1 *82.8*	1 *74.1*	1 *71.6*
(SP) I feel afraid that I will make a fool of myself in front of other people.	2 *59.7*	2 *56.3*	2 *63.3*	4 *57.7*	2 *61.6*	2 *62.6*
(CB) I have to do some things over and over again (like washing my hands, cleaning or putting things in a certain order).	3 *56.7*	3 *56.3*	3 *60.0*	3 *59.9*	4 *57.4*	3 *53.5*
(CB) I have to think special thoughts to stop bad things from happening.	4 *55.2*	4 *53.2*	5 *57.3*	2 *65.0*	2 *61.6*	9 *42.2*
(CB) I have to do some things in just the right way to keep bad things from happening.	5 *48.8*	5 *51.6*	9 *48.8*	6 *49.7*	8 *46.2*	5 *49.9*
(SP) I feel scared when I have to take a test.	6 *46.0*	11 *37.1*	6 *55.4*	15 *38.8*	5 *47.8*	4 *50.8*
(GA) When I have a problem, my heart beats really fast.	7 *45.1*	6 *43.1*	8 *47.2*	8 *44.8*	9 *45.3*	7 *45.2*
(SP) I worry what other people think of me.	8 *43.9*	8 *39.8*	7 *48.2*	14 *40.6*	10 *44.9*	6 *46.0*
(PIF) I am scared of insects or spiders.	9 *42.2*	15 *28.0*	4 *58.6*	7 *45.8*	13 *41.3*	10 *40.7*
(SP) I feel afraid to use public toilets or bathrooms.	10 *41.0*	10 *38.1*	10 *45.1*	11 *42.1*	14 *39.1*	8 *43.6*

3. Discussion

Overall, the present results might be viewed as providing strong support for the generality of *DSM-IV* conceptualization of the structure of anxiety disorders, as measured by the Spence Children's Anxiety Scale, to a distinct Balkan and Mediterranean culture. Although an exploratory rather than confirmatory strategy was pursued in the evaluation of the factor structure of responding on the Hellenic SCAS, the most parsimonious solution attempted was remarkably similar to that obtained with the original Australian sample, thus conforming well to the diagnostic structure of children's anxiety disorders as defined by the *DSM-IV*. The subscales derived from the factor analysis were similar in both item content and in psychometric properties to those obtained in a number of cultures.

In general, cross-cultural precedence exists for the SCAS-GR items that had their highest factor loading on a non-predicted subscale and for items that cross-loaded on a second factor. For example, while the item "I have trouble going to school in the morning because I feel nervous or afraid" was theoretically a separation anxiety item, its highest SCAS-GR loading was on the panic disorder/agoraphobia factor. This item had also failed to load on SA in Australian (Spence, 1998) and South African (Muris, Schmidt, et al., 2002) samples, loading instead on social phobia (SP) factors; the present loading on SP was .32. The high loading of this item on PA is understandable if one considers that an unwillingness to leave the home is characteristic of

agoraphobia; this item had also loaded on PA in a sample of young adolescent Australians (Spence, Barrett, & Turner, 2003). Similarly, the item ''I am scared of the dark,'' was designed to contribute to the physical injury fears dimension, but on the SCAS-GR its highest factor loading was on separation anxiety (the item cross-loaded on PIF). This item also loaded highest on a separation anxiety disorder factor for a sample of Australian children (Spence, 1998) and cross-loaded on separation anxiety and fear of physical injury factors in young Australian adolescents (Spence et al., 2003). These loading patterns are understandable if one considers that darkness reliably accompanies children's nocturnal separation from their parents.

More significant discrepancies from the *DSM-IV*-based theoretical structure of responding on the SCAS-GR were observed on items designed to measure behaviors specific to generalized anxiety disorder and to obsessive-compulsive disorder. These findings are relevant to an issue concerning the content validity of the Spence Children's Anxiety Scale's generalized anxiety disorder subscale as well as to concerns about the content of the *DSM-IV* diagnostic criteria for obsessive-compulsive disorder in children.

Chorpita, Yim, Moffitt, Umemoto, and Francis (2000) argued that collectively, the items of the SCAS GAD subscale were more consistent with the *DSM-III-R* criteria for overanxious disorder rather than with the *DSM-IV* criteria for generalized anxiety disorder, because its items over-represent muscle tension and autonomic hyperarousal at the expense of excessive worry, the key characteristic of the *DSM-IV* conceptualization of GAD (see also Brown, Marten, & Barlow, 1995; Tracey, Chorpita, Douban, & Barlow, 1997). The SCAS-GR factor upon which all six SCAS generalized anxiety disorder items had their highest factor loading also contained three items that, while intended for other subscales, are readily interpreted as representing excessive worries. One of these items, although proposed as a measure of separation anxiety, was a self-declared worry (''I worry that something awful will happen to my family'') that had previously loaded on a generalized anxiety disorder factor in a mixed-ethnicity Hawaiian sample using a modified SCAS that included seven additional excessive worry items (Chorpita et al., 2000).

The other two items that unexpectedly loaded on the SCAS-GR GAD subscale were intended to measure obsessions as observed in obsessive-compulsive disorder. The *DSM-IV* defines obsessions as ideas, thoughts, impulses or images that are experienced as intrusive, alien or 'ego-dystonic' and are not simply excessive worries. However, both item 19, ''I can't seem to get bad or silly thoughts out of my head,'' and item 41, ''I get bothered by bad or silly thoughts or pictures in my mind'' can be interpreted as describing repetitive worries (bad thoughts or images) that have been denounced by parents or other authorities as excessive, absurd or childish (i.e., silly). This was apparently the normative interpretation of these items by schoolchildren in Greece, as self-disclosure on these items was unrelated to responding on the four remaining items of the SCAS obsessive-compulsive scale. Moreover, items 19 and 41 were the *most representative* of the nine SCAS-GR generalized anxiety disorder factor items.

Although these nominal obsessive-compulsive disorder items have not been reported to load on a GAD factor in previous SCAS studies, on the aforementioned revised SCAS with additional worry items (Chorpita et al., 2000), item 41 had the lowest factor loading among the items of an obsessive-compulsive factor, upon which item 19 failed to load. Moreover, two SCAS studies have reported failures to extract obsessive-compulsive disorder and generalized anxiety disorder as distinct factors in Japanese, German and South African samples (Essau et al., 2004; Muris, Schmidt, et al., 2002), although the contribution of responding on the intended obsession items to these extraction failures is unclear.

These findings might be interpreted as providing support for the view that the original SCAS generalized anxiety disorder subscale under-represents excessive worry, as children in Hellenic

schools would appear, in effect, to have supplemented the GAD scale with three additional excessive worries. The findings might also be viewed as indicating that the two SCAS obsession items (at least, in their present Greek-language translation) do not adequately represent this *DSM-IV* characteristic of obsessive-compulsive disorder.

Alternatively, however, these findings might be interpreted as indicating that the phenomenon of obsession itself is poorly differentiated in, or poorly discriminated by, children. Note that one of the four items of the SCAS-GR compulsive behavior factor describes a *non-intrusive* compulsive *cognition* (item 27, "I have to think special thoughts to stop bad things from happening"); thus, the problem in reporting obsessions does not appear to issue from their cognitive nature itself. Rather, the problem appears to be specific to the discrimination of their unbidden or 'ego-dystonic' quality.

While repetitive and annoying thoughts are subject to observation, the concept of *intrusive* thoughts is based in the assumption that *other* thoughts *are* under volitional control, that is to say, are determined by some sort of personal agency independent of the organism's history of interaction with physical events. Such determination is not observable. Of course, people do experience thoughts as intrusive, but when we measure this phenomenon we are measuring the frequency with which the subject makes a theoretical abstraction about the causes (or lack thereof) of his or her vexatious cognition; we do not measure the sources or the mode of determination of thoughts or images themselves. Thus, in contrast with compulsive cognition, obsessions are defined by causal attributions; in this sense, obsessions may have more in common with auditory hallucinations than with compulsive thoughts and ritualistic acts (cf. García-Montes, Pérez-Álvarez, Balbuena, Garcelán, & Cangas, in press; Morrison, Haddock, & Tarrier, 1995).

One might well argue that the distinction between voluntary and involuntary thought is ontologically dubious; at the very least, it would appear to represent a difficult discrimination for children in Hellenic primary schools, who responded to items intended to represent obsessions in terms of the worrisome or vexatious *content* of the thoughts described, rather than their theoretical *provenance* in spontaneous mental actuation. The objective difficulty (or impossibility) of discriminating between reprimanded but repetitive worries and 'ego-dystonic' thoughts and images is consistent with the aforementioned difficulties in extracting independent obsessive-compulsive and general anxiety disorders in previous SCAS studies, as well as with findings that children report obsessions much less frequently than they report compulsions (e.g., Apter et al., 1996; Zohar & Bruno, 1997).

In the present study, a clear four-item compulsive behavior factor *was* extracted, but as this factor does not include items describing repetitive thoughts or images experienced as unbidden, it was named "compulsive behavior" (CB) rather than obsessive-compulsive disorder. The mean item scores on the CB items were considerably higher than those on other SCAS-GR subscales; they were also considerably higher than previously reported mean item scores on the six-item SCAS obsessive-compulsive subscale.

In accord with the aforementioned interpretation of the factor structure of responding on the SCAS-GR, the four items of the compulsive behavior subscale are the only items on the scale that describe *instrumental* behaviors that are *not worries*. Presumably, worries alter environmental conditions via their effect on other peoples' behavior, such as when they are voiced as complaints or as cloaked entreaties for assistance or for the alleviation of demands. Arguably this social mediation is why, while often effective, worrying is generally not considered to be mature, manly or desirable. In contrast, the four instrumental behaviors described in the SCAS-GR compulsive behavior subscale alter environmental conditions

directly; the repetition of words or phrases, rechecking, reordering and repetitive cleaning, and the strict maintenance of complex routines all serve to terminate warning signals for disturbing events (including frightening social events) *without the intervention of other people*. The unmediated instrumental nature of the 'coping' behaviors described in this subscale might underlie the finding that, in comparison with scores on other subscales, compulsive behavior scores were less predictive of total anxiety scores as well as of levels of behaviors specific to other anxiety disorders.

Because they describe neither the socially mediated worries nor the autonomic responses that characterize other anxiety disorders (behaviors that are more frequently interpreted as indications of emotional weakness) it is possible that the relative elevation of scores on the SCAS-GR compulsive behavior scale is based in part on judgments that the behaviors described in its items are less undesirable. This interpretation is consistent with a general absence of gender differences in self-disclosure of compulsive behavior. It has been argued that higher self-reported fear scores in females are based in normative gender-related differences in the reinforcement and punishment of fear disclosure, rather than in the levels of fears per se (e.g., Ginsburg & Silverman, 2000). Higher scores have been reported for female respondents on all SCAS anxiety disorder subscales except for the obsessive-compulsive subscale, for which gender differences are smaller or nonexistent (e.g., Spence, 1997, 1998); this finding was replicated in the present study.

The interpretation that compulsive behavior items (while clearly recognizable as characteristic of psychopathology by psychologists) were regarded by children in Hellenic primary schools as more acceptable relative to other anxiety disorder-related behaviors was supported by the observation that the only subscale for which scores were positively correlated with a measure of self-regard was the compulsive behavior scale. This positive correlation was more systematic for boys, for whom self-reporting may be more strongly related, on average, to the social acceptability of the behaviors disclosed.

Anecdotal evidence is also consistent with the view that the diagnostic characteristics of obsessive-compulsive disorder might be viewed less pejoratively in the Hellenic Republic relative to other anxiety disorder-related behaviors. As noted above, academic curricula in our country are largely based in the rote memorization of material, culminating in highly competitive entrance examinations determining the quite limited access to tertiary education; examinations that are likewise based on the accuracy of memorization of extensive texts (Benincasa, 1997). Memorization is largely a matter of rigid attention, verbal and motor repetition, and checking—behavioral characteristics that form the core of obsessive-compulsive disorder. In our culture, academic and other behaviors that do not increase the accuracy of rote memorization are frequently punished—not just at school, but at home.

Hellenic parents commonly "*diavazoun*" their young children in the after school hours on a daily basis. In large measure, this means that they test the accuracy of their children's recall of the current curriculum material. In effect, this practice provides for yet another check for the outcome of rigid attention, extensive verbal and motor repetition, and checking. Failures to perform are often punished (in the least, by a return to the material to be memorized). Such practices have been regarded as potential determinants of well-structured school performance fears in Hellenic schoolchildren not observed in other cultures (Mellon et al., 2004); their role in the determination of behaviors that characterize obsessive-compulsive disorder is now under investigation.

While Hellenic Republic children's scores on the compulsive behavior and social phobia scales were particularly elevated relative to scores from most other countries, a finding also

reflected in an analysis of the 10 most frequently endorsed items, our children's scores were higher on average on other subscales as well. This is the fourth study of self-reported anxiety disorder-related behaviors in the Hellenic Republic to find such relative elevations (see Mellon, 2000; Mellon et al., 2004; Simos, 2001).

When interpreting such differences, we must consider the fact that self-report instruments measure the *disclosure* of behavior rather than the behaviors disclosed. There is some empirical evidence that the Hellenic culture encourages emotional self-disclosure more than some other verbal communities. Specifically, Rosenthal, Efklides, and Demetriou (1988) reported that young adolescents born and raised in the Hellenic Republic more frequently disclosed problems with their studies and with their personal relationships in comparison with Australians of Greek and Anglican ethnicity.

On the other hand, however, there is empirical evidence of strong stigmatization of mental health difficulties in general in Greece; in a study of adults' fears, by far the most frequently endorsed item was to be characterized with psychological problems, with more than 50% of respondents reporting ''much'' or ''very much'' fear of this event (Mellon, 2000). Despite substantial efforts to raise sensitivity, in the Hellenic Republic persons depicted as having psychological problems, including anxiety disorders, are still routinely ridiculed in advertising campaigns, situation comedies, and in everyday dialogue; one might well expect these circumstances to limit the disclosure of anxiety disorder-related behaviors. Thus, while their elevated anxiety scores might only be a matter of freer disclosure of emotions, the possibility remains that relative to most other countries studied to date, people living in the Hellenic Republic have, on average, more anxiety disorder-related behavior to report.

Beyond the educational and cultural practices already cited, elevated anxiety scores in Greece might be based in part on more general economic conditions. To date, the only groups to have produced SCAS scores similar in elevation to those obtained in the Hellenic Republic were from low, low-middle and middle-socioeconomic classes (but not from a middle-high socioeconomic class) in a mixed-culture South African sample (Muris, Schmidt, et al., 2002). However, in the South African study the groups differed in language and ethnicity in addition to socioeconomic status.

In the present study, children's anxiety scores were systematically differentiated relative to a socio-economic indicator (their fathers' education level) within a *single* culture; consistent with the South African data, socio-economically disadvantaged children in Hellenic primary schools reported higher levels of anxiety disorder-related behaviors. Moreover, the foreign-born children of economic immigrants to the Hellenic Republic reported higher levels of anxiety disorder-related behaviors, on average, in comparison with native-born children. As the Hellenic Republic is among the poorest countries in Europe, higher average anxiety scores here relative to those obtained in countries such as Germany and Australia (which are home to many Greek economic immigrants) might result from the multitude of aversive events associated with a lack of money—particularly in a country with western consumer values but comparatively low incomes.

In the Hellenic Republic, children's self-reported levels of anxiety disorder-related behaviors were differentiated by age. While total anxiety scores and scores on five subscales tended to decrease with increases in age, scores on a social phobia subscale increased with age. These findings are in general accord with those observed in German and Japanese (Essau et al., 2004) and Australian (Spence, 1998) schoolchildren with the SCAS, as well as with factor-based fear scores of Hellenic children on the FSSC-GR, for which only fears of failure and criticism and school performance fears increased with age (Mellon et al., 2004).

The generality of this pattern of findings is consistent with the possibility that with the exception of social phobia, the behaviors that define *DSM-IV* anxiety disorders do not so much develop as fail to degenerate during the primary school years; that is to say, older children might satisfy the diagnostic criteria for these disorders when the emotional and avoidance behaviors that more commonly characterize younger children have not extinguished or been supplanted by other age-appropriate behaviors. In contrast, the developmental course of behavior related to social phobia is consistent with a more general pattern of age-related increases in fear, dread and avoidance of our conspecifics, cumulating in an adulthood in which anxiety is principally associated with the presence or the conduct of other human beings.

While its diagnostic utility remains to be directly assessed, the Hellenic Spence Children's Anxiety Scale would appear to be a promising research and clinical instrument. Beyond the aforementioned similarities in the factor structure and psychometric properties of responding on the SCAS-GR relative to SCAS responding abroad, the intercorrelations among SCAS-GR subscales were, if different, lower than those previously observed with the SCAS. As the SCAS is known to discriminate among anxiety disorders in accord with *DSM-IV* criteria, this finding provides indirect evidence for the diagnostic utility of the SCAS-GR subscale scores.

Moreover, as would be consistent with a measure of problematic emotional behavior, teachers' global assessments of the children's school performance and adjustment were negatively correlated with total anxiety scores as well as with scores on each of the six SCAS-GR anxiety-disorder subscales. These findings also add to a growing body of evidence of an adverse relation between anxiety disorder-related behavior and intellectual development (Ollendick & King, 1994; Papay & Speilberger, 1986; Van Ameringen et al., 2003).

Acknowledgments

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