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A parent-report measure of children's anxiety: psychometric properties and comparison with child-report in a clinic and normal sample

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Abstract

This study examined the psychometric properties of the parent version of the Spence Children's Anxiety Scale (SCAS-P); 484 parents of anxiety disordered children and 261 parents in a normal control group participated in the study. Results of confirmatory factor analysis provided support for six intercorrelated factors, that corresponded with the child self-report as well as with the classification of anxiety disorders by DSM-IV (namely separation anxiety, generalized anxiety, social phobia, panic/agoraphobia, obsessive–compulsive disorder, and fear of physical injuries). A post-hoc model in which generalized anxiety functioned as the higher order factor for the other five factors described the data equally well. The reliability of the subscales was satisfactory to excellent. Evidence was found for both convergent and divergent validity: the measure correlated well with the parent report for internalizing symptoms, and lower with externalizing symptoms. Parent–child agreement ranged from 0.41 to 0.66 in the anxiety-disordered group, and from 0.23 to 0.60 in the control group. The measure differentiated significantly between anxiety-disordered children versus controls, and also between the different anxiety disorders except

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GAD. The SCAS-P is recommended as a screening instrument for normal children and as a diagnostic instrument in clinical settings.

Keywords: Children; Parents; Assessment; Anxiety; Confirmatory factor analysis

1. Introduction

In the past few years, research on the assessment of childhood anxiety has focused on constructing child self-report questionnaires that are related to the commonly used classification system of DSM-IV (American Psychiatric Association, 1994). Prior to this, questionnaires did not examine specific anxiety disorders, but were typically designed to measure indicators of anxiety in general. Moreover, they were generally derived from adult anxiety measures rather than being based on child specific items.

The need for a child self-report questionnaire following the DSM-classification was evident and led to the development of measures such as the Spence Children's Anxiety Scale (SCAS; Spence, 1997) and the Screen for Child Anxiety Related Emotional Disorders (SCARED; Birmaher et al., 1997). Both instruments have recently been studied on their psychometric qualities, both separately as well as in relation to each other. Satisfactory reliability is a basic and essential requirement for an assessment instrument. For individual assessment purposes, Cronbach's alpha's of at least 0.80 have been recommended, whereas for research purposes reliabilities of 0.70 or higher may suffice (Nunnally, 1978). Further, a sound instrument should preferably show different types of validity. Convergent validity should be reflected by relatively high correlations with instruments that are meant to measure similar constructs whereas divergent validity should be demonstrated by relatively low correlations with instruments measuring other variables. In addition, clinical practice requires that an instrument can differentiate between anxiety disorders and normal controls, and ideally also between the distinct anxiety disorders.

The results for the SCAS and the SCARED produced support for the classification of anxiety disorders according to the DSM-IV and demonstrated their psychometric properties to be acceptable (Essau, Muris & Ederer, 2002; Muris, Merkelbach, Ollendick, King & Bogie, 2002).

Although the SCAS and the SCARED display many similarities, they also show some differences. First, the SCAS was developed as a screening instrument in normal populations, whereas the SCARED was developed in clinical populations. Second, the SCAS contains 38 items and was intended to measure symptoms of the following DSM-IV anxiety disorders: (1) panic disorder/agoraphobia, (2) generalized anxiety disorder, (3) social phobia, (4) separation anxiety disorder, (5) obsessive–compulsive disorder, and (6) some specific fears, mainly fear of physical injury/animals. The original SCARED, consisting of 85 items and subsequently reduced to 41 items (Birmaher et al., 1997), was developed to measure symptoms of (1) panic disorder, (2) generalized anxiety disorder, (3) social phobia, (4) separation anxiety disorder and (5) school phobia (the latter not being a DSM-IV anxiety disorder). So, despite fewer items, the SCAS shows a broader scope and a closer connection with the DSM-IV structure than the original version of the SCARED. This situation inspired some researchers (Muris, Merkelbach, Van

Brakel & Mayer, 1999; Muris, Schmidt & Merckelbach, 2000) to present adaptations of the SCARED, including 66 items, with symptoms of obsessive–compulsive disorder and PTSS added, but in recent studies only the 41-item, five subscale version is used. Third, the correlation between the social phobia subscales of both questionnaires appeared to be unexpectedly low ($r = 0.37$ in Muris et al., 1999; $r = 0.58$ in Muris et al., 2002; $r = 0.59$ in Essau et al., 2002), suggesting that they measure different aspects of social phobic fears; the SCARED predominantly measures fear of meeting unfamiliar people, whereas the social phobia items in the SCAS are more closely related to the DSM-IV social phobia criteria, such as fear of social or performance situations and fear of negative evaluation (Essau et al., 2002). Finally, the SCAS is rated on a four-point scale with a broader range of possible answers (ranging from 0 = never to 3 = always), while the present 41-item version of the SCARED is rated on a three-point scale (0 = almost never, 1 = sometimes, 2 = often). In sum, both questionnaires have their own merits for the assessment of anxiety symptoms, although the SCAS seems to be broader in scope and in range in severity of symptoms.

Both measures are, however, limited to child self-report. In the assessment of childhood disorders, it is both common and recommended to include multiple informants, most commonly children, parents and teachers. Each informant may contribute information about different aspects of the disorder, thus complementing each other. Diagnostic interviews most often include both parents and children (e.g. the Anxiety Disorders Interview Schedule Child and Parent Version: ADIS-C/P; Albano & Silverman, 1994). Also, some well-known and widely used 'general' child behavior questionnaires have both child and parent versions and include some items relating to anxiety (e.g. the Youth Self Report and the Child Behavior Checklist: YSR and CBCL; Achenbach, 1991). However, both parent diagnostic interviews, such as the ADIS-C/P and more general parent questionnaires for child behavior, such as the CBCL, have their limitations in the clinical assessment of childhood anxiety. Structured interviews are time-consuming and parent questionnaires such as the CBCL do not provide sufficient detail regarding specific symptoms of anxiety disorders. There is a need for a relatively quick, but sufficiently detailed, reliable and valid parent questionnaire that provides a screen to identify children and adolescents who show high levels of anxiety symptoms across a range of anxiety disorders, and for whom a more detailed structured, clinical interview may then be warranted.

The issue of agreement between parent and child report is notoriously problematic in clinical assessment, with correlations as low as 0.25 for parent–child agreement for some measures of child behavior problems (Achenbach, McConaughty, & Howell, 1987). Parent–child agreement was found to be larger when the behavior is observable (Jensen, Traylor, Xrenakis, & Davis, 1988; March, Parker, Sullivan, & Stallings, 1997), and to be smaller for internalizing symptoms than for externalizing behavior (Rey, Schrader, & Morris-Yates, 1992). In line with this, Birmaher et al. (1997) published some data about a parent version of the SCARED and reported a relatively low correspondence between parent and child: $r = 0.33$ for the total scale, with the subscales ranging from $r = 0.20$ for social phobia to 0.47 for SAD.

With regard to age, studies show contradictory findings, but Achenbach et al. (1987) concluded that parent child agreement is higher for younger children than for adolescents. Similarly, within the field of anxiety disorders lower age has been associated with higher parent–child agreement (Rapee, Barrett, Dadds, & Evans, 1994).

Low correlations between child and parent reports do not automatically lead to the conclusion that the validity of the instruments is questionable. It must be noted that the measures often correlate well with other measures of the same construct when completed by the same informant. For instance, for the SCAS (child questionnaire), convergent validity was high with regard to another child self-report on anxiety, but weaker with regard to parental reports of the child's internalizing and withdrawal symptoms (Spence, 1998). One possible explanation for poor parent–child agreement is that parents and children are not assessing the same underlying constructs when they complete the questionnaire. Perhaps, parents and children conceptualize anxiety differently, leading to a different pattern of responses. Examination of the factorial structure of a measure across different informants may cast some light on this possibility. To date, studies examining the comparability of the factor structure in parent and child measures are scarce. Cole, Hoffman, Tram, and Maxwell (2000) found the factor structure in a global anxiety questionnaire, the Revised Children's Manifest Anxiety Scale (RCMAS; Reynolds & Richmond, 1978), to be similar in child and parent reports, but not equivalent. They found three-factor solutions in both child and parent report, with two comparable factors, but the third factor was different for the different informants. Cole et al. (2000) suggested that parents and children focus on somewhat different aspects of anxiety and depression, originating from different underlying factors. Given that the RCMAS represents a general measure for child anxiety symptoms, it is possible that a questionnaire such as the SCAS that is based on well-defined clusters of symptoms, will manifest more similar factors across informants.

Given the potential value of a parental questionnaire measure of childhood anxiety, as noted above, the present study was designed to examine the psychometric properties of the parent version of the SCAS. Factor structure and psychometric properties such as internal consistency, convergent and divergent validity were investigated. The study included two samples of Dutch and Australian normal and clinically referred children with a wide age range, different anxiety disorders, and a variety of co-morbid disorders.

2. Method

2.1. Participants

Participants in this study were children aged from 6 to 18 yr and their parents. The groups consisted of anxiety-disordered children and normal controls, from three different settings: Macquarie University and Queensland University in Australia, and the University of Groningen in the Netherlands. The demographic variables of these six subgroups are shown in Table 1. The data from these groups were pooled into one anxiety-disordered group and one normal control group. In addition to comparisons between anxiety-disordered versus normal controls, differences between Australian and Dutch children were also investigated.

The anxiety-disordered group consisted of 484 children, aged 6–17 yr (mean age 10.4; SD = 2.5). 264 children were male and 220 were female (respectively 55% and 45%). Primary diagnoses were separation anxiety disorder ($n = 95$, 20%), generalized anxiety disorder ($n = 164$, 34%), social phobia ($n = 137$, 28%), specific phobia ($n = 49$, 10%), anxiety disorder not otherwise specified ($n = 2$, 0.4%), panic disorder ($n = 19$, 4%), and obsessive–compulsive disorder ($n = 18$, 4%). Children had zero to five secondary diagnoses (mean 1.6, SD = 1.3), including

Table 1
Demographic variables

		Australian anxious Macquarie ($n = 380$)	Australian anxious Queensland ($n = 22$)	Dutch anxious ($n = 82$)	Australian controls Macquarie ($n = 40$)	Australian controls Queensland ($n = 104$)	Dutch controls ($n = 117$)
Age (SD)		10.3 (2.6)	10.2 (1.1)	11.0 (2.5)	10.9 (2.9)	10.6 (1.0)	12.4 (1.8)
Age range		6–17	9–12	7–17	6–17	9–12	8–18
Gender	Male	210 (55.3%)	13 (59.1%)	41 (50%)	27 (67.5%)	42 (40.4%)	56 (47.9%)
	Female	170 (44.8%)	9 (40.9%)	41 (50%)	13 (32.5%)	62 (59.6%)	61 (52.1%)
Marital status parents	Married	312 (82.1%)	16 (72.7%)	70 (85.4%)	34 (81.6%)	68 (65.4%)	–
	Separated/divorced	51 (13.4%)	4 (18.2%)	5 (6.1%)	3 (7.5%)	25 (24%)	–
	Never married	6 (1.6%)	2 (9.1%)	2 (2.4%)	2 (5%)	8 (7.7%)	–
	Widowed	1 (0.3%)	–	1 (1.2%)	–	2 (1.9%)	–
	Unknown	10 (2.6%)	–	4 (4.9%)	1 (2.5%)	1 (1%)	117 (100%)
Family composition	Dual original	306 (80.5%)	–	70 (85.4%)	32 (80%)	–	–
	Single mother	48 (12.6%)	–	8 (9.8%)	3 (3.7%)	–	–
	Single father	1 (0.3%)	–	–	–	–	–
	Parent and step-parent	16 (4.2%)	–	1 (1.2%)	3 (7.5%)	–	–
	Unknown	9 (2.4%)	22 (100%)	3 (7.5%)	2 (5%)	104 (100%)	117 (100%)
Parental age	Mother	41.3 (5.3)	–	41.4 (5.2)	40.6 (5.5)	–	42.3 (4.2)
	Father	43.4 (5.9)	–	44.0 (5.8)	44.2 (6.1)	–	44.2 (4.0)
Primary diagnosis of child	SAD	62 (16.3%)	6 (27.3%)	27 (32.9%)		–	–
	GAD	139 (36.6%)	8 (36.4%)	17 (20.7%)	–	–	–
	SoPh	84 (26.1%)	6 (27.3%)	32 (39%)	–	–	–
	SpPh	40 (12.4%)	2 (9.1%)	–	–	–	–
	ANOS	2 (0.5%)	–	–	–	–	–
	Panic	13 (3.4%)	–	6 (7.3%)	–	–	–
	OCD	18 (4.7%)	–	–	–	–	–
	None	–	–	–	40 (100%)	–	–
	Unknown	–	–	–	–	104 (100%)	117 (100%)
Number of co-morbid diagnoses	Mean (SD)	1.7 (1.4)	0.8 (0.4)	1.1 (0.8)	–	–	–
	Range	0–5	0–1	0–3	–	–	–

Table 2
Fit Indices for five hypothesized models, with comparisons between models

Model	χ^2	df	*P*	NFI	NNFI	CFI	RMSEA	Stand. RMR	Comparison	χ^2 Δ	*Df* Δ	*P* of χ^2 change
Null model	37757	703										
Model 1: 1 factor	5728	666	<0.001	0.84	0.84	0.85	0.100	0.096	Model 1 vs model 3	2472	16	<0.001
Model 2: 6 uncorrelated factors	5021	665	<0.001	0.85	0.85	0.80	0.095	0.22	Model 2 vs model 3	1765	5	<0.001
Model 3: 6 correlated factors	3269	650	<0.001	0.89	0.90	0.91	0.075	0.087	Null model vs model 3	34588	53	<0.001
Model 4: 6 first-order factors, 1 second-order factor	Improper solution due to non positive definite PSI (Heywood case)											
Post-hoc-model: 5 factors with GAD as higher-order factor	3392	660	<0.001	0.89	0.90	0.90	0.076	0.089	Model 5 versus model 3	Target coefficient = 0.96		

anxiety disorders, mood disorders, ADHD, and oppositional disorder. Most families were intact with both original parents living together ($n = 376$, 78%), with other parents being single ($n = 57$, 12%), or living with a new partner ($n = 17$, 4%). Most parents were married ($n = 391$, 81%). The majority of the sample was Australian ($n = 402$; 83%) and the other children were Dutch ($n = 82$; 17%).

The normal control group consisted of 261 children, of which 117 (45%) were Dutch and 144 (55%) were Australian. They were aged 6–18 yr (mean age 11.5, SD = 2.0). 125 children were boys (48%), and 136 were girls (52%). Data relating to family composition and parental marital status were not available for the normal control children.

Some analyses were conducted on the total sample (n = 745). Overall, children were aged 6–18 years (mean age 10.8, SD = 2.4), the sample had 389 boys (52%) and 356 girls (48%).

2.2. Measures

Spence Children's Anxiety Scale (SCAS; Spence, 1998). The SCAS was developed to assess anxiety symptoms in children in the general population. The SCAS has 44 items on a 0 (never) to 3 (always) scale and consists of six subscales, namely Panic attack and agoraphobia (9 items), Separation anxiety disorder (6 items), Social phobia (6 items), Physical injury fears (5 items), Obsessive compulsive disorder (6 items), and Generalized anxiety disorder (6 items). Six items are positive worded filler items. The SCAS showed high internal consistency, not only for the total scale, but also for each subscale (Spence, 1998). The test–retest reliability over a six-month period was acceptable in a community sample. Spence (1998) reported the SCAS to show both convergent (with another child anxiety measure, namely the RCMAS (Reynolds & Richmond, 1978)) and divergent validity (with a child depression measure, namely the Child Depression Inventory (CDI; Kovacs, 1981)).

Spence Child Anxiety Scale for Parents (SCAS-P; Spence, 1999). The items of the SCAS-P were formulated as closely as possible to the corresponding item of the child version of the SCAS. Items referring to an internal state (e.g. item 4, I feel afraid) were rephrased into observable behavior for parents (e.g. My child complains of feeling afraid). The positive filler items were not included in the SCAS-P, leaving 38 items in the scale on the same 0 (never) to 3 (always) scale. All items are displayed in Table 3. The Dutch translation of both the parent and child versions of the SCAS was conducted by the Dutch authors using a forwards and backwards translation method (Scholing, Nauta, & Spence, 1999a,b). Copies of the SCAS-P may be obtained from http://www2.psy.uq.edu.au/~sues/scas/. Copies of the Dutch translation may be obtained from the first author.

Child Behavior CheckList (CBCL; Achenbach, 1991). The CBCL is a commonly used parent measure to assess child behavior problems. It includes 118 items addressing behavioral and emotional problems. Parents are asked to evaluate whether the behavior is not true (0) for their child, somewhat or sometimes true (1), or very true or often true (2), now or during the past six months. In this study, the internalizing subscale was used to evaluate convergent validity of the SCAS-P, and the externalizing subscale for divergent validity. For reasons of comparability between the two countries in this study, *t*-scores were used in the analyses. The psychometric properties of this scale have been well established and the measure is widely used internationally.

Table 3
Confirmatory factor analysis: factor loadings (completely standardized) for six correlated factors[a]

Original scale	SCAS items	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
SAD	(5) My child would feel afraid of being on his/her own at home	0.68					
SAD	(8) My child worries about being away from us/me	0.83					
SAD	(11) My child worries that something awful will happen to someone in our family	0.64					
SAD	(14) My child is scared if (s)he has to sleep on his/her own	0.66					
SAD	(38) My child would feel scared if (s)he had to stay away from home overnight	0.43					
SAD	(15) My child has trouble going to school in the mornings because (s)he feels nervous or afraid	0.70					
SoPh	(6) My child is scared when (s)he has to take a test		0.62				
SoPh	(7) My child is afraid when (s)he has to use public toilets		0.29				
SoPh	(9) My child feels afraid that (s)he will make a fool of him/herself in front of people		0.78				
SoPh	(10) My child worries that he/she will do badly at school		0.76				
SoPh	(26) My child worries what other people think of him/her		0.76				
SoPh	(31) My child feels afraid when (s)he has to talk in front of the class		0.63				
GAD	(1) My child worries about things			0.71			
GAD	(3) When my child has a problem, (s)he complains of having a funny feeling in his/her stomach			0.57			
GAD	(4) My child complains of feeling afraid			0.73			
GAD	(18) When my child has a problem, s(he) complains of his/her heart beating really fast			0.57			
GAD	(20) My child worries that something bad will happen to him/her			0.76			
GAD	(22) When my child has a problem, (s)he feels shaky			0.53			
Panic/Ag	(12) My child complains of suddenly feeling as if (s)he can't breathe when there is no reason for this				0.69		
Panic/Ag	(19) My child suddenly starts to tremble or shake when there is no reason for this				0.65		
Panic/Ag	(25) My child feels scared if (s)he has to travel in the car, or on a bus or train				0.46		

Table 3 (*continued*)

Original scale	SCAS items	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
Panic/Ag	(27) My child is afraid of being in crowded places (like shopping centres, the movies, buses, busy playgrounds)				0.47		
Panic/Ag	(28) All of a sudden my child feels really scared for no reason at all				0.75		
Panic/Ag	(30) My child complains of suddenly becoming dizzy or faint when there is no reason for this				0.56		
Panic/Ag	(32) My child complains of his/her heart suddenly starting to beat too quickly for no reason				0.67		
Panic/Ag	(33) My child worries that (s)he will suddenly get a scared feeling when there is nothing to be afraid of				0.69		
Panic/Ag	(34) My child is afraid of being in small closed places, like tunnels or small rooms				0.29		
OCD	(13) My child has to keep checking that (s)he has done things right (like the switch is off, or the door is locked)					0.48	
OCD	(17) My child can't seem to get bad or silly thoughts out of his/her head					0.77	
OCD	(24) My child has to think special thoughts (like numbers or words) to stop bad things from happening					0.56	
OCD	(35) My child has to do some things over and over again (like washing his/her hands, cleaning or putting things in a certain order)					0.49	
OCD	(36) My child gets bothered by bad or silly thoughts or pictures in his/her head					0.79	
OCD	(37) My child has to do certain things in just the right way to stop bad things from happening					0.53	
Ph Inj	(2) My child is scared of the dark						0.72
Ph Inj	(16) My child is scared of dogs						0.36
Ph Inj	(21) My child is scared of going to the doctor or dentist						0.31
Ph Inj	(23) My child is scared of heights (eg. Being at the top of a cliff)						0.37
Ph Inj	(29) My child is scared of insects or spiders						0.37

[a] SAD: separation anxiety disorder; SoPh: social phobia; GAD: generalized anxiety disorder; Panic/Ag: panic/agoraphobia; OCD: obsessive–compulsive disorder; Ph Inj: physical injury fears.

The Anxiety Disorder Interview Schedule (ADIS C/P; Silverman & Albano, 1996). The ADIS C/P is a semi-structured interview based on DSM-IV classification of psychopathology (American Psychiatric Association, 1994), and includes both a child and a parent interview. It addresses the following anxiety disorders: separation anxiety disorder, social phobia, generalized anxiety disorder, specific phobias, panic, agoraphobia, and obsessive–compulsive disorder. Furthermore, it allows for evaluation of depression, dysthymia, ADHD, oppositional disorder, and conduct disorder. The ADIS was used to establish diagnoses of the children from clinical subgroups. The clinician followed the ADIS C/P manual for the assignment of diagnoses (Albano & Silverman, 1994). If discrepancies were found between parent and child report, then procedures were followed as outlined in the ADIS C/P manuals. Additionally, the clinician gave severity scores to each diagnosis, with a range of 0 (no interference in daily life) to 8 (extreme interference in daily life). Severity scores of 4–8 indicate the presence of a disorder. The primary disorder was the disorder with the highest severity score. Other disorders, if present, were regarded as secondary diagnoses. Previous studies have shown moderate to high interrater-reliabilities for the diagnoses of the separate anxiety disorders using in the ADIS C/P (e.g., Rapee et al., 1994; kappa ranging from 0.59 to 0.82). Thus, inter-rater reliability of diagnoses was not established again for the present study.

2.3. Procedure

Macquarie clinically anxious group ($n = 380$). The children in this sample attended the Child and Adolescent Anxiety Clinic at Macquarie University for assessment and treatment. Parents contacted the clinic directly and were referred from a range of sources including general practitioners, school counselors, media articles or word of mouth. All children were assessed by graduate students in psychology, under the supervision of experienced clinical psychologists. Assessment was based on both the Child and Parent versions of the ADIS C/P. Parents and children completed the questionnaire battery at home and brought the completed questionnaires to their initial assessment session. Parents were asked to help their child complete the questionnaires if necessary by reading the questions aloud, but were instructed not to interpret their child's responses.

Macquarie non-clinical controls ($n = 40$). The children in this sample were recruited through flyers in local businesses and media advertisements asking for confident and worry-free children between the ages of 7 and 16 yr to act as research volunteers. First year psychology students at Macquarie University who were parents of children between the ages of 7 and 16 yr were also recruited to the study and received course credit for their participation. Graduate students in psychology interviewed all participants using parent and child versions ADIS C/P. Participants completed the questionnaire battery at home and returned their questionnaires at their interview session. Families were given 'thank you' packs that included vouchers for local businesses in appreciation for their time and effort in acting as research volunteers.

Queensland clinically anxious group ($n = 22$). The children in this sample were attending a university clinic for assessment of potential anxiety disorder and were referred by school guidance officers, GPs or parents in response to media coverage. Questionnaires were completed on an individual basis, with a researcher present. The parent version of the ADIS-C/P was administered

in the clinic, with questionnaires being completed either in the clinic or at home and mailed back to the researchers. Written, informed consent was obtained from all parents and children.

Queensland normal controls ($n = 104$). Students in this sample attended a middle-income state primary school in a metropolitan area. Children completed the questionnaire on an individual basis, in the presence of a researcher. Items were read aloud for children in grade 4, and then as necessary for children in higher grades who experienced problems reading the items. Parent questionnaires were completed at home and returned by the child to the researcher. Inclusion/exclusions criteria required that children were free from intellectual impairment or a learning disorder (as reported by parents and teachers).

Dutch anxiety disordered children ($n = 82$). This sample was obtained from three different Dutch settings that included an outpatient clinic (Academic Centre for Child and Adolescent Psychiatry Groningen), a regional outpatient setting for mental health (Centre for Youth Mental Health Care Groningen) and the outpatient facility of the department of clinical psychology of the University of Groningen. Children were referred by their family physician or by parents in response to media (information on radio, in local newspapers, leaflets in schools and medical settings). Written, informed consent was obtained from all parents and those children aged 12 yr and above. All children were diagnosed during regular intake evaluations by a psychiatrist, a child psychologist, social worker, or a supervised trainee. Subsequently, two trained clinicians interviewed the child and parents separately with the ADIS C/P. After the interview, children completed the questionnaires in the presence of a researcher who gave instructions to the child and could be asked for help if necessary.

Dutch normal control sample ($n = 117$). Seven schools in both rural and urban areas participated in this study. In six schools, children took an information leaflet home, asking for families to participate in the study. Families that returned the leaflet received questionnaires at home and sent back the completed forms. The seventh school agreed to have the children fill out the questionnaires in the classroom. The children took the parent questionnaires home, and asked the parents to return them to the investigator.

3. Results

3.1. Preliminary analyses

In the anxiety disordered group, 399 mothers and 322 fathers filled out the questionnaires independently, and 82 parents filled them out together. The normal control group had 40 mother reports, 18 father reports, and 221 reports of parents that filled out the questionnaires together. Father and mother scores on the subscales of the SCAS-P were highly correlated, with correlations varying from 0.51 (generalized anxiety) to 0.73 (separation anxiety). Correlations of 0.50 and higher indicate that the variables measure one concept and can be taken together (Briggs & Cheek, 1986). Therefore, we decided to use the mean scores of mother and father reports for further analyses, if both scores were available.

ANOVAs were performed to check whether the Australian and Dutch data differed on the SCAS-P, and no significant differences were found in the anxiety-disordered group. The Dutch normal control group showed significantly lower scores on the SCAS-P than both Australian

normal control groups. The Dutch children were also older than the Australian children were. When corrected for age, we found no significant difference between the groups on the SCAS-P. Based on these findings, we decided to pool the data into two groups, namely anxiety disordered and normal controls. Children in the control group were significantly older than the anxiety disordered children (aged 11.5 (SD = 2.0) and 10.4 (SD = 2.5) respectively; $F(1, 743) = 36.9$, $P < 0.001$). There was no significant difference in gender ($\chi^2 = 3.0$, $P < 0.09$) between the two groups.

3.2. Confirmatory Factor Analysis

The starting-point for analyzing the factor structure of the SCAS-P was the available empirical knowledge. The basis of today's empirical knowledge of the classification of anxiety disorders is the DSM-IV (Anon, 1994). In prior research on the SCAS child measure Spence (1998) found evidence for six intercorrelated factors parallel to the DSM-IV classification of the childhood anxiety disorders, and for one higher order factor, suggesting that there may be one general underlying concept of anxiety. Rather than examining the factor structure of the parent measure using exploratory means, as one would do without any guiding theory or related empirical evidence, we hypothesized four models derived from the DSM-IV structure and the findings by Spence: (1) one factor, (2) six uncorrelated factors, (3) six correlated factors, and (4) six correlated factors and one higher order factor. These models were evaluated by the statistical package of LISREL. This model testing provides a technique to determine which model is the most accurate in describing the data. Because of the skewness and kurtosis in the data, we choose the parameter estimation that was most robust to non-normality: the robust maximum likelihood parameter using an asymptotic covariance matrix (Boomsma & Hoogland, 2001).

In LISREL, many goodness of fit indices are provided. The value of χ^2 is a likelihood ratio test statistic. A statistically significant χ^2 value that is large with regard to the degrees of freedom reveals a significant difference between the hypothesized model and the observed data, thus rejecting the null hypothesis that the model fits the data. The χ^2 value is known to be dependent on sample size (e.g. Stevens, 1996) with models often being rejected in large samples. Other goodness of fit indices have been developed that are not or less dependent on sample size. The Normed Fit Index (NFI), Non-Normed Fit-Index (NNFI), and the Comparative Fit Index (CFI) were chosen for this study. Values of 0.90 or higher indicate that the hypothesized model fits the data adequately. The Root Mean Squared Error of Approximation (RMSEA) takes into account the degrees of freedom of the model relative to the discrepancy between the model and the observed data. A value of 0.05 or lower indicates a good fit of the data, values around 0.08 indicate a reasonable error of approximation, and values greater than 0.10 indicate that the model does not fit the data (Browne & Cudeck, 1992). Finally, the Standardized Root Mean Square Residuals (St RMR) is supposed to be lower than 0.10 and is preferably around 0.05 or lower if the model fits the data well.

3.2.1. Model 1: one single factor

The first model that was tested was a single factor model (model 1), assuming that all items load onto one single anxiety factor, without differentiating between different clusters of anxiety. This model would prevail over the other models if parents regard anxiety in their children as

one phenomenon rather than as distinct clusters of symptoms. All items loaded significantly on the single factor, with loadings ranging from 0.20 to 0.74. Six items had a loading smaller than 0.30. Table 2 summarizes the findings with regard to the goodness of fit indices. Low factor loadings, the large χ^2 value, the low goodness of fit indices (NFI, NNFI, CFI), and the large RMSEA and standardized RMR lead to the conclusion that this model did not fit the data.

3.2.2. Model 2: six uncorrelated factors

The second model evaluated whether six uncorrelated factors describe the data best. The DSM-IV suggests a specific clustering of anxiety symptoms, and according to model 2 parents are thought to experience their child's anxiety also in distinct, unrelated clusters. All items loaded significantly on their hypothesized factor, with factor loadings ranging from 0.25 to 0.90. Three items had loadings lower than 0.40, namely item 7 'My child is afraid when (s)he has to use public toilets', 21 'My child is scared of going to the doctor or dentist', and 34 'My child is afraid of being in small closed places, like tunnels or small rooms'. The goodness of fit indices (NFI, NNFI, CFI) were lower than 0.90, the χ^2 value was large, and the RMSEA exceeded the required 0.05 (see Table 3), thus providing evidence that this model of six uncorrelated factor did not describe the data adequately.

3.2.3. Model 3: six correlated factors

This model took into account that the factors were likely to be intercorrelated given the reported co morbidity among anxiety disorders. The factor loadings of this model are displayed in Table 2. The factor loadings ranged from 0.29 to 0.78. Five factor loadings were lower than 0.40, namely item 7 'My child is afraid when (s)he has to use public toilets', 16 'My child is scared of dogs', 21 'My child is scared of going to the doctor or dentist', 29 'My child is scared of insects or spiders' and 34 'My child is afraid of being in small closed places, like tunnels or small rooms'. The χ^2 value was large, but the goodness of fit indices showed a quite reasonable fit of the data, with the NFI, NNFI and CFI close to 0.90, the RMSEA lower than 0.08, and the standardized RMR lower than 0.10. Given that the χ^2 value is influenced by sample size, and that the other indices give support for the hypothesized model, it is concluded that this model provided a relative good fit for the data.

3.2.4. Model 4: six correlated factors and one higher order factor

In the process of testing the fourth model, an improper solution was found, due to a non-positive definite Psi value. This problem is also referred to as a Heywood case. It is often encountered when the factors of the model are highly intercorrelated. In this case, we found the main problem in the latent factor, that we described as generalized anxiety disorder. This factor had a correlation over 1.00 with the latent higher order factor. Hence, it was not possible to investigate this model any further without changing the content of items for each factor. Given the confirmatory approach in this study, no efforts were made to change the model.

3.2.5. Model 5: five correlated factors and generalized anxiety as one higher-order factor

A further plausible model was examined following the findings of model 4. In both child and adult literature, it has been suggested that generalized anxiety disorder may be viewed as the 'basic' anxiety disorder (Rapee, 1991). For instance, Spence (1997) found that most of the variance in generalized anxiety was explained by one higher-order factor of anxiety in general. This

effect was even stronger in our model 4, with correlations outreaching the range of +1. Therefore, we hypothesized that the generalized anxiety disorder factor may in itself be the higher order factor. So, model 5 reflects a model of five separate anxiety factors, with one higher-order factor, being generalized anxiety disorder. The standardized loadings of the five factors on the generalized anxiety factor were high, being for 0.55 social anxiety, 0.78 for separation anxiety, 0.79 for panic/agoraphobia, 0.66 for physical injury fears, 0.77 for obsessive–compulsive disorder. The percentages of unique variance accounted for by each of the first factor order factors were: 70% for social anxiety, 39% for separation anxiety, 38% for panic/agoraphobia, 56% for physical injury fears, 41% for obsessive–compulsive disorder. Table 2 shows the goodness of fit indices for model 5: satisfactory NFI, NNFI, and CFI, reasonable RMSEA and standardized RMR, and a large χ^2 value. Model 5 seems to describe the data adequately.

3.2.6. Comparing models 1–5

Table 2 summarizes the findings of testing the models. All χ^2 values were relatively high and indicated a deviation from the hypothesized models. Since χ^2 values are known to be influenced by sample size (e.g. Stevens, 1996), the goodness of fit indices were used to further evaluate the different models. Looking at the goodness of fit indices, models 3 and 5 provided the best fit for the data. It should be noted that a higher order model (such as model 5) can never provide a better fit than the first order model (model 3) from which it is formed, and merely examines the extent to which the covariation between factors can be adequately explained by the higher order structure. The fit of models 3 and 5 can be compared through the use of a target coefficient as described by Marsh and Hocevar (1985). The target coefficient is defined as the ratio of the χ^2 value of the first model to the χ^2 value of the more restricted second-order model. The target coefficient has an upper limit of 1, and a value higher than 0.90 is an indication that the covariance between the first order factors can satisfactorily be explained by the higher order factor. In our case, the target coefficient was 0.96. Therefore, it is concluded that model 5 describes the data most adequately.

3.3. Post-hoc exploratory factor analysis

An exploratory factor analysis was conducted post-hoc in order to evaluate the percentage of explained variance by the six factors, as well as the factor loadings of the items on the six factors. The six factors respectively explained 22.1, 8.3, 7.6, 6.5, 4.8 and 4.1% of the variance, in total 53.4%. Corrected item correlations of the items on the a priori determined scales ranged from 0.14 to 0.72 (mean 0.49) and are displayed in Table 3. The majority of items loaded strongly and significantly on their hypothesized factor.

3.4. Factorial invariance

In order to show factorial invariance across different samples, several confirmatory analyses were conducted. Confirmatory factor analyses were performed with the computer program Simultaneous Components Analysis (SCA; Kiers, 1990). With confirmatory factor analysis the strength of recurrence of defined factors in a new population is assessed. The percentage of variance that can be explained by the a priori defined factors is compared to the percentage found

by exploratory factor analyses (PCA), which is (by definition) the maximum amount of variance that the data can explain. Little difference between these percentages indicates a good fit of the data to the proposed number of factors. Next, Tucker's phi coefficients were computed for each factor. Phi values of 0.85 or higher provide confirmatory evidence for the hypothesized factor in the present sample. For further details of the procedure the reader is referred to ten Berge (1986). Six intercorrelated factors (1/0.3 matrix) were presumed in the confirmatory factor analyses.

3.4.1. Factorial invariance of the SCAS-P

Results of the confirmatory factor analysis revealed that 51.4% variance was explained by the six hypothesized, correlated factors. This is 3.9% less variance than could be explained through PCA (53.4%), indicating the maximum percentage of explained variance by six factors. Examination of the separate components revealed the following phi coefficients for the six correlated factors: separation anxiety 0.90, social phobia 0.95, generalized anxiety 0.90, panic/agoraphobia 0.93, obsessive–compulsive disorder 0.96, and physical injury fears 0.94. The mean phi for all scales was 0.93, suggesting that these data are well described by the six intercorrelated factors that were specified a priori.

3.4.2. Factorial invariance with regard to clinical group, age, gender, and country

To evaluate whether the factor structure of six correlated factors was invariant across different samples, various confirmatory factor analyses were conducted. In the anxiety disordered group ($n = 462$) and the normal control group ($n = 261$), the difference in percentage of explained variance was satisfactory (53.3% in PCA, 48.9% in SCA, and 55.6% in PCA, 51.8% in SCA respectively). All phi coefficients of the subscales were well above 0.80 (mean of 0.92 in the anxious group, and 0.91 in the normal control group). In the Dutch group ($n = 199$) the percentage of explained variance was 56.4% through PCA and 51.2% through SCA, and the mean of phi coefficients for the subscales was 0.92. In the Australian group ($n = 524$), 55.6% explained variance was obtained through PCA, versus 51.8% through SCA. The mean of phi coefficients was 0.93 for the subscales. With regard to gender, in the male sample ($n = 376$) 54.9% of variance was explained through PCA and 50.4% through SCA. The mean phi coefficient was 0.93. In girls ($n = 347$), 57.4% of variance was explained through PCA and 53.6% through SCA. The mean phi coefficient was 0.93. Finally, two age groups were formed, one from 6 to 11 yr and the other from 12 to 18 yr. In the younger group ($n = 454$), PCA explained 52.7% of the variance through PCA and 48.7% through SCA. The mean phi coefficient was 0.93. In the older group ($n = 269$), 47.9% of explained variance was obtained through PCA and 42.6% through SCA, and a mean phi coefficient of 0.91 was found for the subscales. In all, there was an absolute difference of percentage of explained variance of 4–5% between the maximum possible percentage (through PCA) and the hypothesized division of items in correlated factors (SCA). All phi values were well above 0.85. These results indicate that the factors of the SCAS-P are sufficiently invariant across age, gender, and the two countries studied.

3.5. Reliability

Cronbach's alpha coefficients were calculated for each subscale of the SCAS-P. Since alphas are largely dependent on scale length, corrected reliability coefficients were computed by the

Spearman Brown formula. The internal consistency for the subscales in the two different samples was satisfactory to excellent for most subscales (Nunnally, 1978). In the anxiety disordered group, the results were the following (Cronbach's alpha with corrected Spearman Brown coefficients in parentheses): separation anxiety 0.76 (0.91), social phobia 0.77 (0.92), generalized anxiety 0.75 (0.91), panic/agoraphobia 0.81 (0.92), obsessive–compulsive disorder 0.78 (0.92), and physical injury fears 0.61 (0.83). In the normal control group, these figures were: separation anxiety 0.74 (0.90), social phobia 0.74 (0.90), generalized anxiety 0.67 (0.85), panic/agoraphobia 0.61 (0.80), obsessive–compulsive disorder 0.74 (0.90), and physical injury fears 0.58 (0.81). The alpha for the total scale was equally high in both groups (0.89), which indicates high internal homogeneity.

3.6. Intercorrelations of SCAS-P subscales

Table 4 displays the intercorrelations of SCAS-P subscales. In the anxious group, correlations varied from 0.19 to 0.66, with a mean of 0.35. The highest correlations were found between generalized anxiety, panic/agoraphobia, and separation anxiety. In the control group subscale intercorrelations were higher, varying from 0.33 to 0.57 (mean 0.44).

3.7. Convergent and divergent validity

To determine convergent and divergent validity of the SCAS-P, the total score was correlated with other parent and child reports. The SCAS-P total scale correlated strongly and significantly with the CBCL-internalizing subscale (0.55 in the anxiety disordered group, 0.59 in the normal control group) and significantly, but at a lower level, with the CBCL-externalizing subscale (0.33 in the anxiety disordered group, 0.34 in the normal control group). As predicted, the correlation with the CBCL-internalizing subscale was significantly higher than the correlation with the CBCL-externalizing subscale in both groups (anxious group: $Z = 387.7$, $P < 0.001$; control

Table 4
Intercorrelations of SCAS-P subscales for anxious group ($n = 484$) and control group ($n = 261$; in parentheses)[a]

	Separation anxiety	Generalized anxiety	Social phobia	Panic/agoraphobia	Physical injury fears	OCD	Total
SAD	1						
GAD	0.60 (0.55)	1					
SoPh	0.19 (0.45)	0.33 (0.57)	1				
Panic/Ag	0.42 (0.38)	0.66 (0.53)	0.20 (0.37)	1			
Ph Inj	0.38 (0.51)	0.34 (0.33)	0.29 (0.36)	0.25 (0.31)	1		
OCD	0.35 (0.44)	0.48 (0.51)	0.19 (0.35)	0.36 (0.51)	0.20 (.31)	1	
Total	0.72 (0.80)	0.84 (0.79)	0.55 (0.75)	0.72 (0.66)	0.59 (.66)	0.61 (.68)	1

[a] All intercorrelations were significant at $P < 0.001$.

group: $Z = 49.8$, $P < 0.001$; Meng, Rosenthal, & Rubin, 1992), thus providing evidence for convergent and divergent validity respectively.

In terms of convergence between parent and child self-report on the separate SCAS subscales, intercorrelations ranged from 0.41 to 0.66 in the anxiety-disordered group, and from 0.23 to 0.60 in the control group (see also Table 5). Parent–child agreement was highest for the subscales that consisted of items with observable behavior (e.g. separation anxiety). Also, as expected, higher concordance was found between corresponding subscales than between non-corresponding subscales.

3.8. Discriminant validity

3.8.1. Discrimination between anxiety disordered children and normal controls

In order to establish discriminant validity we predicted that parents of normal controls would report significantly less symptoms on all subscales of the SCAS-P than parents of anxiety disordered children. Due to non-normality in the data, nonparametric Mann–Whitney U tests rather than ANOVAs were conducted in order to evaluate between group differences. Table 6 shows the means and standard deviations of all subscale scores in both groups. Results showed that the anxiety-disordered group had significantly higher scores on all subscales than the normal control group.

A discriminant analysis was performed to check whether scores on the SCAS-P can reliably predict children's diagnostic status with respect to anxiety disorders. In discriminant analysis, a high percentage of correctly classified children indicates a good ability to differentiate between groups. The analysis revealed one highly significant function (Wilks lambda 0.65, $P < 0.001$). The correlations between the discriminating variables and the discriminant function were generally high (generalized anxiety 0.90; social phobia 0.66; separation anxiety 0.75; panic/agoraphobia 0.53; obsessive–compulsive disorder 0.47; and physical injury fears 0.39). The standardized canonical discriminant function coefficients revealed that the classification was mostly determined by SCAS-P generalized anxiety scores (0.62), followed by social phobia (0.37), and separation anxiety (0.35) scores, and not at all by scores on panic (−0.07), OCD (0.01), or physical injury fears (−0.07). Overall, 80.5% of the children were correctly classified (86% of the anxiety disordered and 71% of the normal controls).

3.8.2. Discrimination between the different anxiety disorders

Another issue in discriminant analyses is the differentiation between anxiety disorders. We expected the groups of children with primary diagnoses of separation anxiety disorder, social phobia, generalized anxiety disorder, panic/agoraphobia, and obsessive–compulsive disorder (according to the ADIS C/P) to show elevated levels of reported anxiety on the matching subscales on the SCAS-P, as well as lower levels of reported anxiety on the non-matching subscales. Table 7 shows that children with primary separation anxiety disorder had indeed higher scores on the separation anxiety subscale. Similarly, children with social phobia and OCD had the highest scores on the corresponding subscales of the SCAS-P. The subscales of GAD and panic/agoraphobia, however, were less specific and children with other diagnoses also had high scores on these subscales.

Table 5
Correlations between SCAS-C and SCAS-P for the anxious group ($n = 467$) and normal controls ($n = 260$; in parentheses)

Child/parent	Separation anxiety		Generalized anxiety		Social phobia		Panic/agora-phobia		Physical injury fears		OCD		Total	
Separation anxiety	**0.66****	**(0.60******)**	0.26**	(0.29**)	0.07	(0.26**)	0.24**	(0.25**)	0.28**	(0.08)	0.18**	(0.30**)	0.38**	(0.43**)
Generalized anxiety	0.42**	(0.29**)	**0.47****	**(0.28******)**	0.21**	(0.27**)	0.38**	(0.25**)	0.26**	(−0.13*)	0.26**	(0.26**)	0.46**	(0.33**)
Social phobia	0.06	(0.30**)	0.16**	(0.31**)	**0.41****	**(0.55******)**	0.13**	(0.28**)	0.21**	(0.09)	0.11*	(0.29**)	0.23**	(0.44**)
Panic/agoraphobia	0.27**	(0.21**)	0.40**	(0.23**)	0.22**	(0.20**)	**0.48****	**(0.33*****)**	0.20**	(0.01)	0.20**	(0.24**)	0.41**	(0.29**)
Physical injury fears	0.29**	(0.33**)	0.16*	(0.19**)	0.18**	(0.24**)	0.10*	(0.18**)	**0.55****	**(0.23******)**	0.09	(0.11*)	0.27**	(0.36**)
OCD	0.27**	(0.22**)	0.29**	(0.21**)	0.11*	(0.14*)	0.20**	(0.13*)	0.13*	(−0.04)	**0.50****	**(0.27******)**	0.34**	(0.24**)
Total	0.49**	(0.47**)	0.42**	(0.36**)	0.30**	(0.40**)	0.38**	(0.33**)	0.39**	(0.07)	0.33**	(0.34**)	**0.51****	**(0.49******)**

*significant $P < 0.01$, **significant $P < 0.001$, one-tailed.

Table 6
Means and standard deviations of SCAS-P subscales and between group differences[a]

SCAS-P Subscale	Anxiety disordered ($n = 484$)	Normal controls ($n = 261$)	Mann–Whitney U tests (z-values)
Separation anxiety	6.9 (4.1)	2.6 (2.8)	−13.7**
Generalized anxiety	6.6 (3.1)	2.7 (2.0)	−16.0**
Social phobia	7.7 (3.8)	4.2 (2.8)	−11.9**
Panic/agoraphobia	3.6 (3.9)	1.0 (1.6)	−12.6**
Physical injury fears	4.1 (2.8)	2.6 (2.3)	−7.8**
OCD	3.0 (3.1)	1.1 (1.7)	−10.9**
Total	31.8 (14.1)	14.2 (9.7)	−16.1**

[a] **$P < 0.001$.

To further examine the ability of the SCAS-P to classify children into the group of their original primary diagnosis according to the ADIS C/P, a discriminant analysis was conducted within the anxiety-disordered group. Children with a specific phobia were excluded, since no SCAS-P subscale refers primarily to that classification. Discriminant analysis revealed four significant canonical functions, with the following Wilks lambdas: 0.37 ($P < 0.001$), 0.58 ($P < 0.001$), 0.77 ($P < 0.001$), and 0.98 ($P < 0.05$). The correlations between the four functions and the discriminating variables are displayed in Table 8, whereas the standardized canonical discriminant function coefficients are summarized in Table 9. The SCAS-P correctly classified 51.7% of children in total, being quite accurate in classifying separation anxiety (70%), social phobia (60%), panic/agoraphobia (68%) and obsessive–compulsive disorder (72%). However, the SCAS-P had more difficulty in discriminating children with generalized anxiety disorder: only 31% of children who were diagnosed with generalized anxiety disorder were correctly classified, whereas 20% of them were classified as socially phobic, and 14% as separation anxious.

Table 7
Means and standard deviations of SCAS-P subscales by primary anxiety disorder diagnostic group

Primary diagnosis SCAS-P subscale	Separation anxiety (n=95)	Generalized anxiety (n=164)	Social phobia (n=137)	Panic/agoraphobia (n=19)	Specific phobia (n=49)	OCD (n=18)
Separation anxiety	**10.5 (3.2)**	6.2 (3.6)	5.0 (3.6)	8.0 (5.2)	7.1 (3.8)	6.1 (4.1)
Generalized anxiety	7.5 (2.9)	**6.6 (3.2)**	5.6 (2.8)	9.4 (4.3)	6.7 (2.9)	6.1 (3.1)
Social phobia	6.6 (3.6)	7.9 (3.7)	**9.1 (3.4)**	6.5 (3.9)	5.7 (3.4)	6.9 (4.3)
Panic/agoraphobia	3.9 (3.3)	3.1 (3.6)	2.9 (3.1)	**11.2 (7.1)**	3.6 (3.1)	3.3 (3.2)
Physical injury fears	4.7 (3.2)	4.0 (2.4)	3.8 (2.7)	3.3 (2.9)	5.4 (3.0)	3.1 (2.6)
OCD	3.2 (2.7)	3.0 (2.9)	2.1 (2.1)	3.7 (4.8)	2.7 (2.5)	**9.1 (4.5)**
Total SCAS-P	36.5 (13.3)	30.8 (13.5)	28.4 (13.0)	42.1 (22.6)	31.2 (12.8)	34.7 (13.2)

Table 8
Correlations between discriminant functions and discriminating variables

	Function 1	Function 2	Function 3	Function 4
Separation anxiety	0.76*	−0.05	−0.04	0.26
Social phobia	−0.33*	−0.11	−0.13	0.29
Physical injury fears	0.17*	−0.09	−0.16	−0.01
OCD	0.16	0.78	0.25	−0.04
Panic/agoraphobia	0.22	−0.15	0.81*	0.12
Generalized anxiety	0.33	−0.07	0.31	−0.43

*Indicates largest absolute correlation between each variable and any discriminant function.

Table 9
Standardized canonical discriminant function coefficients

	Function 1	Function 2	Function 3	Function 4
Separation anxiety	0.99	−0.08	−0.38	0.66
Generalized anxiety	0.10	−0.35	−0.08	−1.43
Physical injury fears	0.05	−0.07	−0.24	−0.12
OCD	−0.04	1.16	0.13	0.09
Panic/agoraphobia	−0.09	−0.27	1.12	0.60
Social phobia	−0.70	−0.17	−0.25	0.49

3.9. Age and gender effects on SCAS-P

Pearson correlations were carried out to determine the effect of the child's age on SCAS-P subscales. We expected negative correlations between age and separation anxiety, and positive correlations between age and social phobia and panic/agoraphobia. Subsequently, children were divided in a younger (6–11 yr) or older (12–17 yr) age group, and MANOVAs (gender, age group) were performed to evaluate age or gender effects. This analysis allowed for the evaluation of interaction effects between age and gender. All analyses were carried out on the total sample ($n = 745$). The total score of the SCAS-P had a significant negative correlation with age ($r = -0.16$, $P < 0.001$). Focusing on the distinct subscales, significant correlations were found between age and generalized anxiety ($r = -12$, $P < 0.001$), panic/agoraphobia (0.10, $P < 0.001$), separation anxiety (-0.32, $P < 0.001$) and physical injury fears (-0.26, $P < 0.001$). The other subscales revealed no effect of age. MANOVA including all subscales revealed a multivariate effect of age group ($F(1, 743) = 17.3$, $P < 0.001$), no multivariate effect of gender ($F(1, 721) = 1.45$, $P < 0.18$), and no interaction effect between age and gender ($F(1, 743) = 1.50$ $P < 0.16$). Univariate results for age group showed significant effects for separation anxiety ($F(1, 743) = 52.9$, $P < 0.001$; younger children had higher scores), generalized anxiety ($F(1, 743) = 7.98$, $P < 0.001$; younger children had higher scores), panic/agoraphobia ($F(1, 743) = 5.35$, $P < 0.02$; younger children had lower scores), and physical injury fears ($F(1, 743) = 25.6$, $P < 0.001$; younger children had higher scores). Table 10 shows the mean values and standard deviations by age group and gender for subscales and total scores, for clinical and community samples separately.

Table 10
Means and standard deviations of SCAS-P subscales in normals and anxiety disordered children, separate for gender and age groups

		Anxiety disordered children		Normal control children	
		6–11 yr	12–18 yr	6–11 yr	12–18 yr
Separation anxiety, 6 items	Boys	7.2 (4.0)	5.8 (4.0)	3.4 (3.5)	1.8 (2.1)
	Girls	7.8 (4.0)	5.4 (4.1)	3.7 (2.9)	1.8 (2.1)
Social phobia, 6 items	Boys	7.3 (3.6)	7.5 (3.9)	4.3 (3.0)	3.4 (2.1)
	Girls	7.7 (4.0)	8.5 (3.6)	4.8 (3.2)	4.1 (2.7)
Generalized anxiety, 6 items	Boys	6.5 (2.9)	6.6 (3.3)	2.9 (2.1)	2.5 (2.2)
	Girls	6.7 (3.3)	6.6 (3.4)	3.1 (1.9)	2.4 (2.0)
Panic/agoraphobia, 9 items	Boys	2.9 (2.9)	4.4 (4.6)	1.0 (1.6)	0.9 (1.6)
	Girls	3.3 (3.4)	4.9 (5.4)	0.9 (1.2)	1.2 (2.1)
Physical injury fears, 5 items	Boys	4.4 (2.8)	3.0 (2.5)	3.2 (2.8)	2.1 (2.1)
	Girls	4.5 (2.9)	3.9 (2.6)	2.7 (1.8)	2.4 (2.2)
Obsessive–compulsive disorder, 6 items	Boys	3.1 (2.9)	3.0 (3.0)	1.2 (1.7)	1.1 (2.0)
	Girls	3.1 (3.0)	2.8 (3.5)	1.1 (1.8)	0.8 (1.5)
Total, 38 items	Boys	31.4 (12.9)	30.1 (14.9)	16.0 (11.6)	11.8 (8.3)
	Girls	33.0 (13.5)	32.2 (16.7)	15.9 (9.0)	12.6 (9.1)

4. Discussion

This paper presents the psychometric properties of the SCAS-P, a parent completed measure derived from the SCAS, a child questionnaire designed to assess children's symptoms of anxiety along the structure of the DSM-IV. Based on 484 anxiety disordered children and 264 normal controls, the results suggest that the SCAS-P shows generally good psychometric properties and that it seems highly useful for both research and clinical purposes, especially when combined with the child version. The first goal of this study was to determine whether the factor structure of the parent measure was consistent with the child version, reflecting the specific anxiety disorder subtypes outlined by DSM-IV. Confirmatory factor analysis suggested that the structure of the parent scale could be explained satisfactorily by six intercorrelated factors that showed considerable concordance with subscales predicted from the DSM-IV anxiety disorders. Next, we examined whether a higher-order factor could explain the intercorrelations between the six factors. Due to the strong intercorrelations between the factors and the higher-order factor, this model could not be analyzed satisfactorily. The intercorrelation was especially strong between the generalized anxiety disorder factor and the higher-order factor. In fact, this finding is not new. In both the child and adult literature, it is suggested that generalized anxiety disorder may be viewed as the basic' anxiety disorder, and not as a separate anxiety disorder. This may be due to the considerable amount of overlap between anxiety disorders, especially with regard to

worry (Weems, Silverman, & La Greca, 2000). Indeed, quite a few items of the SCAS-P in the non-GAD-factors are formulated in terms of worry (e.g. item 11 'My child worries that something awful will happen to someone in our family' (separation anxiety) or item 26 'My child worries what other people think of him/her' (social phobia)). In the development of a parent measure for preschool children, Spence, Rapee, McDonald, & Ingram (2001) also found little support for a separate GAD-factor, and suggested that these GAD-items may reflect a relatively pure, high trait anxiety. Similarly Spence (1997) found little support for a GAD-factor in the development of the child version of the SCAS. In fact, most of the variance in generalized anxiety was explained by one higher-order factor of anxiety in general. This effect was even stronger in our model 4, with correlations outreaching the range of +1. Therefore, we hypothesized that the generalized anxiety disorder factor may in itself be the higher order factor. This model of five factors and one generalized anxiety disorder as a higher-order factor fitted the data relatively well. As such, the generalized anxiety disorder factor satisfactorily explained the covariation between the other five factors. The high degree of inter-correlation between factors found in the present study is consistent with previous research involving child self report of anxiety (e.g. Spence, 1997) and also in a parent measure of anxiety for preschool children (Spence et al., 2001). Further research is warranted to examine the validity of GAD as a separate anxiety disorder as distinct from an underlying trait of anxiety in general.

Internal reliabilities of the subscales were satisfactory in both the clinical and the normal control group. Reliability coefficients that were corrected for scale length ranged from 0.81 to 0.90 in the normal group and from 0.83 to 0.92 in the clinical group, thus providing evidence for internal consistency of the subscales, supporting their use not only for research purposes, but also for clinical practice (Nunnally, 1978). The SCAS-P also showed good convergent validity, both with another parent measure (CBCL-internalizing) and with the child measure of anxiety symptoms (SCAS). Moreover, the subscales of the parent measure correlated highly with the corresponding subscales of the child measure. In fact, parent child agreement was higher (0.51 for total score; 0.51 mean of all subscales in the anxiety disordered group; respectively 0.49 and 0.38 in the normal control group) than in most studies that have examined parent–child agreement of emotional and behavioral problems (0.25 for internalizing problems of the CBCL and 0.32 for the total score of the SCARED; Birmaher et al., 1997). Interestingly, but not surprisingly, informant agreement was somewhat lower in the subscales referring to internal processes (such as GAD and OCD) than it was for more observable behavioral symptoms such as separation anxiety and physical injury fears. Children, and especially older children, may not so much share all their thoughts and feelings with their parents. In this study, parent child agreement was higher in the anxiety-disordered group than the normal control group.

The study also investigated whether the SCAS-P could differentiate between normal controls and anxiety disordered children. Significant differences were evident between groups for the mean scores on all subscales. Discriminant analyses then showed that a high percentage of children was classified correctly based on SCAS-P subscales. It is important to note that some of the errors in classification may reflect the presence of anxiety disorders in the normal control group. It is natural to find some clinically anxious children in the normal control group, since prevalence rates in the normal population are presumed to be at least 4% (based on both parent and child interview) (Kashani & Orvaschel, 1990). On the other hand, we also found some parents of the anxiety-disordered children who presented their child's symptoms within the nor-

mal range. Post-hoc analyses showed that 37% of the clinically diagnosed children had parent ratings within the normal range (defined as below the mean +1 standard deviation cut-off, using the national normal data of this paper). One explanation may lie in the fact that the SCAS-P is a symptoms-oriented questionnaire. Higher scores are found when one reports many anxiety symptoms while reports of few anxiety symptoms lead to a low score. However, having fewer symptoms does not necessarily mean that the individual has a less severe disorder. Some children who are referred for treatment only have one specific but highly interfering problem. In this respect, it is recommended to not only look at total scores, but also at subscales and individual items on which parents indicate a 3 ('always afraid'). In order to obtain a reliable and valid clinical diagnosis and detailed case formulation, a questionnaire of this type is designed to be used in conjunction with parent and child interviews, rather than in isolation.

In terms of discriminant validity between the different anxiety disorders, 80.5% of the children were correctly classified (86% of the anxiety disordered and 71% of the normal controls) as having a clinical diagnosis of an anxiety disorder or not. The accuracy of classification was lower for specific anxiety disorder diagnoses, with 51.7% of the children being classified correctly based on their SCAS-P subscale-scores. For children with primary separation anxiety, social phobia, panic/agoraphobia, and OCD this percentage was 60–72%, which is very high, considering the amount of comorbidity and overlap in symptoms between the anxiety disorders. For GAD only 31% of the children were correctly classified, with the remainder being equally categorized as separation anxiety disorder or social phobia. Further research is needed to determine whether the problems in correctly classifying GAD can be attributed to the content of the SCAS-P items or to the validity of the concept of GAD as a clinical diagnosis in children and adolescents.

The final goal of the study was to examine the effects of the child's gender and age in relation to their parent's score on the subscales or the total scale. We found no effect for gender on any of the subscales. This finding contrasts with research indicating that child self-reports of anxiety are influenced by gender, with girls typically indicating higher levels of anxiety (e.g. Spence, 1997; Birmaher et al., 1997; Muris et al., 2000). Similarly, prevalence rates of anxiety disorders are generally higher in females than in males (e.g. Weiss & Last, 2001). Studies regarding parent reports of their child's anxiety symptoms have produced conflicting results. Bouldin and Pratt (1998) and Birmaher et al. (1997) and found significant gender effects on parent measures of childhood anxiety, whereas Spence et al. (2001) found no gender differences in parent reported anxiety among preschoolers. Further studies should explore these apparently conflicting results in greater depth.

In contrast to the lack of gender effects, some age effects were noted. As expected, separation fears decreased with age, while agoraphobic fears increased with age (Halpern, Ellis, & Simon, 1990; King, Gullone, Tonge, & Ollendick, 1993). In addition, parents reported more symptoms of physical injury fears and generalized anxiety in younger children than in older children. The last finding is a little surprising: one would expect worry symptoms of generalized anxiety to be higher for adolescents than for younger children. This can be due to the contents of the items, with relatively much focus on the physical symptoms. Younger children are known to experience anxiety more physically. Another explanation could be that adolescents may less share their thoughts and feelings with their parents, and parents may be less aware of the frequency of worry in older children than in younger children. Perhaps surprisingly, social fears did not

change with age but this finding is consistent with some other research that has reported consistency in social/evaluative concerns across age (Campbell & Rapee, 1994).

Limitations to this study include some methodological issues. First, the data were not identical with regard to the informant. In the Dutch group and most of the Australian normal controls, parents filled out the questionnaires together. In the Australian anxiety disordered group, fathers and mothers each filled out the questionnaires separately. We decided to take the mean scores of father and mother if they filled out the questionnaires apart. The main reason for this was the high intercorrelation between mother and father reports. Future research could examine whether different procedures lead to different outcomes, and if so, which procedure yields the most reliable and valid answers: the report of the primary caregiver (mostly the mother), the mean of the reports of both parents separately, or the judgment from both parents together after discussion. The issue of parent bias in reporting on anxiety symptoms in children also needs to be addressed. Research has shown that the anxiety or depression level of parents can influence their judgment of the level of their child's anxiety (e.g. Najman et al., 2001).

Suggestions for future research include further examination of discriminant validity. Even though the SCAS-P appears to differentiate clearly between clinically anxious children and normal controls, it remains to be determined whether the SCAS-P can differentiate children with anxiety disorders from those with other forms of psychopathology, such as depression or ADHD. Child self-reports on general anxiety (STAIC, RCMAS, FSS) have been found to discriminate well between normals and anxiety disordered children, but not between anxious children and children with other emotional and behavioral problems (Perrin & Last, 1992). Research findings were inconclusive for a more specific measure of anxiety symptoms, the MASC. In a brief journal letter, Manassis, Tannock, Mendlowitz, Laslo, and Masellis (1997) found the MASC to show no difference between anxiety disordered children and children with ADHD, whereas March (1997) was more optimistic in his reply. From a clinical perspective it is also important to examine the extent to which the SCAS-P is sensitive to change following treatment. Some data from our clinics have shown that the SCAS-P can reflect improvements following successful treatment for child anxiety (Abbott, Gaston, & Rapee, 2002; Nauta, Scholing, Emmelkamp, & Minderaa, accepted).

In summary, the SCAS-P represents a relatively reliable and valid instrument for the assessment of anxiety among children and adolescents, especially when combined with the child version of the SCAS. In research, this new instrument can provide us with information on how the parents perceive anxiety symptoms in their child in terms of the clusters that are provided by the DSM-IV. In clinical practice, parents can be asked to fill out the questionnaire at home and take it to the intake evaluation. In this way, children can be screened for anxiety disorders in a cost-effective way. Reported anxiety symptoms by the parents may give the clinician cause to further evaluate a possible anxiety disorder in their child, for instance through a semi-structured interview. Finally, both the child and parent versions may give important information for treatment and may be used to evaluate the effects of interventions.

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