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Identifying children with anxiety disorders using brief versions of the Spence Children's

Anxiety Scale for children, parents, and teachers.

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Abstract

Anxiety disorders are among the most prevalent mental health disorders experienced by

children, and are associated with significant negative outcomes. Only a minority of affected

children, however, access professional help, and a failure to identify children with anxiety

disorders presents a key barrier to treatment access. Existing child anxiety questionnaire

measures are long and time consuming to complete, limiting their potential for widespread

use as identification tools in community settings. We developed a brief questionnaire for

parents, children and teachers using items from the Spence Children's Anxiety Scale (SCAS);

and evaluated the new measure's psychometric properties, capacity to discriminate between a

community (n=361) and clinic-referred sample (n=338) of children aged 7-11, and identified

optimal cut-off scores for accurate identification of pre-adolescent children experiencing

clinically significant levels of anxiety. The findings provided support for the reliability and

validity of 8-item versions of the SCAS, with the brief questionnaire scores displaying

comparable internal consistency, agreement among reporters, and convergent/divergent

validity to the full-length SCAS scores. The brief SCAS scores also discriminated between

the community and clinic-referred samples, and identified children in the clinic-referred

sample with a moderate-good level of accuracy, and acceptable sensitivity and specificity.

Combining reporters improved sensitivity, but at the expense of specificity; and findings

suggested parent report should be prioritised. This new brief questionnaire has potential for

use in community settings as a tool to improve identification of children who are

experiencing clinically significant levels of anxiety and warrant further assessment and

potential support.

Word count: 245

Key words: anxiety; child; identification; brief measure

Public Significance Statement

We developed and evaluated brief versions of the Spence Children's Anxiety Scale for parents, children and teachers. Results provide support for the potential application of this new brief questionnaire in community settings to improve identification of children with anxiety disorders.

Identifying children with anxiety disorders using brief versions of the Spence Children's

Anxiety Scale for children, parents, and teachers

Anxiety disorders are the most common mental health disorders experienced by

children and young people (Polanczyk, Salum, Sugaya, Caye, & Rohde, 2015), with half of

all lifetime anxiety disorders emerging by age 11 (Kessler, Chiu, Demler, & Walters, 2005).

Anxiety disorders during childhood are associated with impaired academic, financial, social

and health functioning; and place an individual at increased risk for continued or recurring

anxiety and other mental health disorders later in life (Copeland, Angold, Shanahan &

Costello, 2014; Essau, Lewinsohn, Olaya, & Seeley, 2014). The high prevalence and

significant negative outcomes associated with child anxiety disorders, coupled with the

associated economic burden for society (Fineberg et al., 2013), highlight the importance of

effective early intervention. However, while effective child anxiety treatments exist (James,

James, Cowdrey, Soler, & Choke, 2013), only a minority of children affected by anxiety

disorders access treatment (Chavira, Stein, Bailey, & Stein, 2004; Merikangas et al., 2011).

In order for a child to access anxiety treatment, they need to be identified as

experiencing a clinically significant anxiety problem; and recent reviews of barriers to child

mental health treatment illustrate the difficulties that both parents (Reardon et al., 2017) and

primary care practitioners (O'Brien, Harvey, Howse, Reardon, & Creswell, 2016) face

identifying mental health difficulties in children. In particular, parents report that difficulties

recognising a child's mental health problem, and difficulties recognising the severity and

impact of a problem are barriers to help-seeking (Reardon, et al.,2017); and primary care

practitioners report that a lack of confidence in identification, time restrictions, and a lack of

tools and resources hinders recognition of child mental health problems (O'Brien, et al.,

2016). The availability of accurate identification tools could help overcome these barriers and

improve identification of children with anxiety disorders in community settings.

A number of questionnaires designed to assess anxiety in children exist, typically consisting of corresponding child and parent report questionnaires (e.g. Spence Children's Anxiety Scale, SCAS; Revised Depression and Anxiety Scale, RCADS [a derivative of the SCAS]; Screen for Child Anxiety Related Disorders, SCARED; Multidimensional Anxiety Scale for Children, MASC 2). As a potential tool for identifying children with clinically significant levels of anxiety, the SCAS, has the following strengths: i) it was designed specifically to assess symptoms of DSM-IV anxiety disorders in children, ii) it was developed within a community (rather than clinical) population, and iii) it is available free of charge. Indeed, both the child and parent report versions of the SCAS (SCAS-C/P) have been well evaluated in community and clinical samples of children and young people with evidence to support their internal consistency, test-retest reliability, convergent and divergent validity, and capacity to discriminate between children with anxiety disorders versus community samples (e.g. Arendt, Hougaard, & Thastum, 2014; DeSousa et al., 2014; Nauta et al., 2004; Orgilés, Fernández-Martínez, Guillén-Riquelme, Espada, & Essau, 2016; Spence, Barrett, & Turner, 2003; Whiteside & Brown, 2008). A few studies have also examined the capacity of the SCAS-C/P and their subscales to identify specific anxiety diagnoses (Brown-Jacobsen, Wallace, & Whiteside, 2011; Whiteside, Gryczkowski, Biggs, Fagen, & Owusu, 2012), and to discriminate between those with anxiety versus non-anxiety psychiatric diagnoses (Olofsdotter, Sonnby, Vadlin, Furmark, & Nilsson, 2015). However, data relating to optimal cut-off scores on the SCAS-C/P that maximise sensitivity (correct classification of children with anxiety disorders) and specificity (correct classification children without anxiety disorders) among pre-adolescent children are not currently available. Furthermore, the SCAS-C/P consists of 38-items and as such is time consuming to complete, limiting its potential for widespread application as a tool for identifying children with clinically significant levels of anxiety in community settings. Validated brief questionnaires designed

to identify anxiety and depressive disorders in adults are widely used in primary care settings (GAD-7; Spitzer, Kroenke, Williams, & Löwe, 2006; PHQ-9; Kroenke, Spitzer, & Williams, 2001), but corresponding, well-evaluated, brief questionnaires to assess anxiety in children are yet to be developed despite their clear utility in both primary care and school settings. Shorter versions of the RCADS have been developed (including a 20-item anxiety scale (Muris, Meesters, & Schouten, 2002) and 15-item anxiety scale (Ebesutani et al., 2012), but these are not as brief as the adult equivalents and may be too long for routine use in, for example, primary care settings where time constraints are a particular concern (Klinkman, 1997; O'Brien et al., 2016). Primary care appointments are short, typically lasting less than 10 minutes (Hobbs, et al, 2016), making questionnaire length and completion time key determinants of the acceptability of identification tools (Kroenke, Monahan, & Kean, 2015; Mitchell & Coyne, 2007). Indeed, brevity has been prioritised in the development of adult mental health screening tools, with a focus on minimising the number of items required for accurate identification (Spitzer, et al., 2006) and ensuring completion time of less than 5 minutes (Mitchell & Coyne, 2007), with typically fewer than 10 items (Kroenke, Monahan, & Kean, 2015). Moreover, there is evidence to support the potential role of teachers in identifying mental health problems in children, and the benefit of adopting a multiple informant approach to child mental health screening, particularly where difficulties may be context-dependent (De Los Reyes, et al., 2015; Goodman, Ford, Simmons, Gatward & Meltzer, 2000). The evidence base surrounding teacher-report questionnaires designed to assess symptoms of anxiety disorders in children is however limited. There have been promising findings from an initial evaluation of a 16-item teacher questionnaire that includes some SCAS items together with new items (Lyneham, Street, Abbott, & Rapee, 2008). However, similar to primary care settings, questionnaire length and completion time are key determinants of the acceptability of mental health screening questionnaires in school settings

(Levitt, Saka, Romanelli, & Hoagwood, 2007), indicating the need to prioritise brevity and minimise the number of items in teacher-report questionnaires. A brief teacher-report questionnaire (with <10 items), including data relating to optimal cut-off scores to identify children with clinically significant levels of anxiety in children, is not currently available.

The aims of this study were to develop a brief questionnaire (child, parent and teacher versions) designed to assess symptoms of DSM child anxiety disorders using items from the SCAS-C/P among 7 – 11 year olds; and i) to evaluate the reliability and validity of the brief SCAS scores (child, parent, teacher versions) in a community and clinic-referred sample of children; ii) to establish the capacity of the brief SCAS scores (child, parent, teacher versions) to discriminate between a community and clinic-referred sample of clinically anxious children, including the relative contribution of each reporter and the optimal combination of reporters; and iii) to identify optimal cut-off scores on the brief SCAS (child, parent, teacher versions) for accurate identification of children with elevated anxiety symptoms for whom further clinical investigation is warranted.

Method

Participants

Participants included a community sample and a clinic-referred sample of children, and their parent/carer and class teacher. Characteristics of each sample are detailed in Table 1.

The community sample were recruited as part of a wider study of parental perceived barriers and facilitators to seeking and accessing professional help for anxiety disorders in children (see [removed for blind review], for full study details). The study was approved by the [removed for blind review] Ethics Committee (reference [removed for blind review]). As displayed in Table 1, this sample consisted of 361 children (192 female, 169 male) recruited

from 10 primary/junior schools in England.   Children were aged 7-11 years (mean age 9.50,

standard deviation [SD] 1.09), and 46.5% were from families classed as 'higher/

professional'. Details of the number of parents, children and teachers who completed the

SCAS adequately (>75% items complete) are provided in Table 1.

The clinic-referred sample consisted of 338 children (170 female, 168 male) with a

primary anxiety disorder recruited as part of two randomised controlled trials (RCT)

conducted within the [removed for blind review]. The trials were approved by [removed for

blind review] Ethics Committee (reference [removed for blind review]) and [removed for

blind review] Ethics Committee (reference [removed for blind review]). All 338 children

were referrals to [removed for blind review], and 175 participated in an RCT comparing

Child Cognitive Behavioural Therapy (CCBT) alone, with CCBT supplemented by either

CBT to target maternal anxiety or an intervention to target mother-child interactions

[reference removed for blind review]; and 163 participated in an RCT comparing two guided

parent-delivered CBT groups to a wait-list control [reference removed for blind review]. Full

details of the recruitment procedure for these trials are reported elsewhere [references

removed for blind review] children were aged 7-11 years at the time of the pre-treatment

assessment. The clinic-referred sample had a mean age of 9.70 years (SD 1.36), and 57.7%

were from families classed as 'higher/ professional'. Diagnostic profiles for the clinic-

referred sample and details of the number of parents, children and teachers who completed

the SCAS adequately (>75% items complete) are provided in Table 1.

Differences between the demographic profiles of the two samples were examined.

There was no significant difference between the samples on gender ($X^2 = .71$, $p = .40$). The

community and clinic-referred samples did differ significantly on child age (mean age 9.50

and 9.70 years respectively; $t[674] = 2.11$, $p = .04$) and socio-economic status (frequencies

higher/ professional; $X^2 = 10.79$, $p = .001$, $d = .27$), however in the case of age this reflected

a negligible effect size ($d = .16$).[1]

<center>*[Insert Table 1 about here]*</center>

Procedure

Community sample.

Primary and junior schools from different geographic locations in England were

approached and invited to take part in the study. Recruited schools distributed study

materials to all parents/carers of children in UK school years 3 to 6 (aged 7-11 years); and

parents/carers were asked to provide consent for their child to participate in the study, and to

complete questionnaire measures (Spence Children's Anxiety Scale-Parent Version; SCAS-P;

Strengths and Difficulties Questionnaire-Parent; SDQ-P). Consent was obtained from 361

(16.2%) of the 2223 parents/carers invited to take part in the study. Corresponding

questionnaires (Spence Children's Anxiety Scale-Child Version; SCAS-C; Strengths and

Difficulties Questionnaires-Child; SDQ-C) were administered by a member of the research

team with the children during a visit to the school; and class teachers were asked to complete

corresponding questionnaires about the children whose parent provided consent (Spence

Children's Anxiety Scale-Teacher Version; SCAS-T; Strengths and Difficulties

Questionnaire-Teacher; SDQ-T).

Clinic-referred sample.

Children in both trials were assessed prior to randomisation and treatment group

allocation, and this data was used in the current study. As part of this assessment, parents and

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[1] Differences on SCAS-P/C/T total scores among those classed as 'higher/professional' compared with other socio-economic groups, and among 7-8 year olds compared with 9-11 year olds were examined. No significant differences on SCAS total scores were found among those classed as 'higher/professional' compared with other socio-economic groups. No significant age effects were found on SCAS-P/T total scores, although significant age effects were found on the SCAS-C within the community sample, with total scores significantly higher among 7-8 year olds than 9-11 years (t[301] = 3.59, $p<.001$, $d = .42$), with the highest mean scores among 8 year olds. Given the narrow age range of participants included in this study, however, subsequent analyses were not conducted separately for different age groups. With the aim of developing a brief measure, together with optimal cut-off scores for use in primary care and school settings, it would be impractical to provide gender differentiated cut-off scores for very narrow age bands.

children completed the ADIS-IV-C/P and the SCAS-C/P and SDQ-C/P, and teachers were

asked to complete the SCAS-T and SDQ-T.

Measures

Spence Children's Anxiety Scale (SCAS-C, SCAS-P, SCAS-T).

The SCAS is a 38-item questionnaire designed to assess a child's anxiety symptoms,

and includes corresponding child (SCAS-C; Spence, 1997, 1998) and parent report (SCAS-P;

Nauta et al., 2004) versions. Items address symptoms of DSM-IV anxiety disorders,

including separation anxiety, generalised anxiety, social phobia, obsessive compulsive

behaviours, panic and agoraphobia, and physical injuries fears. Items are rated on a four

point scale (0-3; never-always) and total scores reflect the sum of responses to the 38 items.

SCAS-C/P total scores were calculated if >75% of items were complete, and in cases with

missing data, the average total score using completed items was calculated. The reliability

and validity of the SCAS-C/P scores have been reported in community and clinical samples

(Arendt et al., 2014; Nauta et al., 2004; Whiteside & Brown, 2008).

A teacher report version of the SCAS (SCAS-T) was developed by the research team,

and includes 30 items from the SCAS rated on the same four point rating scale. Items were

reworded to account for the change in reporter and eight SCAS-C/P items relating to

symptoms that teachers would not be able to observe were omitted (e.g. items relating to

sleep, animal fears). No new items were added. SCAS-T total scores reflect the sum of

responses to the 30 items, and were calculated if >75% of items were complete, and in cases

with missing data, the average across completed items was used.

Strengths and Difficulties Questionnaires (SDQ-C; SDQ-P/T).

The Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997) provides a

broad-based measure of a child's emotional and behavioural difficulties. The child (SDQ-C)

and parent/teacher (SDQ-P/T) report versions include corresponding items addressing a

child's emotional symptoms (5 items), peer relationship problems (5 items), conduct

problems (5 items) and hyperactivity/inattention (5 items), with strong evidence in support of

its psychometric properties both in community (Goodman, et al., 2000) and clinic-referred

samples (Goodman, Renfrew, & Mullick, 2000). In this study the SDQ-emotional problems

scale, internalising problems scale (emotional + peer relationship problems), conduct

problems scale, and externalising problems scale (conduct+ hyperactivity/inattention) were

used to examine the convergent and divergent validity of scores on the new brief anxiety

measure. The internal consistency for the SDQ scale scores were acceptable-good in the

current samples (SDQ-emotional problems scale, child α = .76 , parent α = .84, teacher α =

.85; SDQ-internalising problems scale, child α = .76, parent α = .82, teacher α = .82; SDQ-

conduct problems scale, child α = .60, parent α = .65, teacher α = .70; SDQ-externalising

problems scale, child α = .74, parent α = .82, teacher α = .85).

Anxiety Disorders Interview Schedule-Child and Parent Interviews (ADIS-C/P).

The ADIS-C/P was administered with the clinic-referred sample to assess the child's

diagnostic status, including the assessment of DSM-IV anxiety, mood and externalising

disorders. The reliability and validity of the ADIS has been widely reported (Silverman,

Saavedra, & Pina, 2001). As per the standard guidelines, overall diagnoses and Clinical

Severity Ratings (CSRs) (4-8) were assigned if the child met diagnostic criteria based on

either the child or parent report, and the higher of the two CSRs was assigned. The disorder

with the highest CSR was assigned as the primary disorder. Assessors were psychology

graduates in both trials, and all assessments were discussed with a consensus team for at least

the first 20 interviews for each assessor, at which stage the assessor's reliability was checked

(minimum kappa = .85). After this point, at least one in six interviews were discussed with a

consensus team; and overall reliability within the assessment team in both trials was excellent

(child-report diagnosis: kappa = 0.98; CSR: ICC = 0.98-0.99; parent-report diagnosis: kappa = 0.98; CSR: ICC = 0.97-0.99).

Data analytic approach

Development of brief versions of the SCAS.

The following procedure was used to develop a brief version of the SCAS (parent, child and teacher report versions). 1) The functioning of SCAS-P/C/T items was examined in the two samples combined, including item-differential functioning (Univariate Logistic Regression; SCAS item score = independent variable, sample=dependent variable) and item-total correlations (Pearson's r correlation coefficient). Additionally, as the SCAS-T is a new measure, response rates for each item were examined and items with a very high proportion (> 97%) of 'never' responses in the community sample (suggesting the item is not appropriate for teachers) were not considered for inclusion in the brief questionnaire. 2) Alternative potential versions of brief parent/child/teacher questionnaires (including varying combinations of 6-10 items) were developed, prioritising items that showed significant prediction of community/clinic-referred sample membership (Odds Ratio >2.00), with at least moderate item-total correlation (r >.50). Content of items was also considered in order to: i) minimise overlap between items, ii) include items that address symptoms of a range of types of anxiety disorders (excluding the obsessive compulsive items to reflect the change in the DSM5 classification of anxiety disorders), and iii) where possible to maximise the number of common items across the parent/child/teacher questionnaire. 3) ROC (Receiver Operating Characteristics) analyses were used to compare the capacity of alternative potential versions of parent/child/teacher brief questionnaires to identify children with anxiety disorders (i.e. the clinic-referred sample). The Area Under the Curve (AUC) statistic was examined, and as per previous studies examining the AUC statistic associated with anxiety screening tools (van Gastel & Ferdinand, 2008; Villabø, Gere, Torgersen, March, & Kendall, 2012), AUC = .70

was taken as the minimum threshold to indicate that the measure was moderately accurate at identifying children in the clinic-referred sample. The sensitivity and specificity values for alternative cut-off scores were also examined. Given the purpose of the measure is to identify children with anxiety disorders, sensitivity was prioritised, with the optimal cut-off score reflecting sensitivity values >.80 and specificity >.70. In cases where it was not possible to achieve sensitivity/specificity values of .80/.70 respectively, cut-off scores with lower sensitivity/specificity values (>.60) were considered (where possible selecting cut-off values with sensitivity >.70). Findings from the ROC analyses for the brief parent/child/teacher SCAS with the optimal capacity to identify children with anxiety disorders are reported below.

Evaluation of the brief questionnaires.

Total scores on the optimal brief versions of the parent/child/teacher SCAS were calculated using the same procedure to deal with missing data as detailed above for the full length SCAS (total scores reflect the sum of responses to all included items). The following psychometric properties of scores on the optimal brief versions of the parent/child/teacher SCAS were examined in each sample and compared with scores on the full length SCAS-P/C/T: i) internal consistency (Cronbach alpha coefficients); ii) agreement between reporters (Pearson's *r* correlation coefficients); iii) convergent and divergent validity (Pearson's *r* correlation coefficient between full/brief SCAS scores and SDQ internalising/emotional/externalising/conduct scale scores). The capacity of the optimal brief parent/child/teacher SCAS scores to discriminate between children in the clinic-referred sample and children in the community sample was examined for the total sample, and for gender groups using i) independent sample *t*-tests (and cohen's *d*), and ii) ROC analyses (as detailed above, examining both the AUC and the sensitivity/specificity values associated with optimal cut-off scores on the parent/child/teacher brief SCAS). In order to compare the

functioning of the brief SCAS with the full-length SCAS, the capacity of the full-length

SCAS to discriminate between the two samples was also analysed. A series of Logistic

Regressions were used to examine the contribution of each reporter (parent, child, teacher), to

determine if using multiple informants improves the capacity of the brief SCAS scores to

identify children in the clinic-referred sample. Using optimal cut-off scores identified in the

ROC analyses, the sensitivity and specificity values associated with each combination of

reporters (parent+child, parent+teacher, teacher+child, parent+child+teacher) were examined.

For each combination of reporters, the sensitivity value reflected the proportion of children in

the clinic-referred sample who scored above the optimal cut-off score based one at least one

of reporter; and specificity value reflected the proportion of children in the community

sample who scored below the optimal cut-off for each reporter. Gender differences on total

scores on the brief (and full length SCAS) within each sample (independent samples t-tests)

were also examined.

As the sample sizes were large (>330 in each sample), a conservative p-value ($p<.01$)

was used to indicate a statistical significance. All analyses were conducted using IBM SPSS

(Version 21).

Results

Development of brief parent/child/teacher SCAS

Rank ordered item-total correlations for SCAS-P items in the two samples combined,

together with item differential functioning statistics are detailed in Table 2. Items selected

for the brief parent questionnaire (SCAS-P-8) are also displayed in Table 2, with item-total

correlations ranging from .56-.70, and all items were significant predictors of sample

($p<.001$), with higher scores among the clinic-referred sample (Odds Ratio, 1.94-6.87). As

Obsessive Compulsive Disorder is no longer classed as an anxiety disorders within DSM5,

two items addressing obsessive compulsive behaviours (item 17 and 36), with strong item-

total correlations were not considered for inclusion in the brief measure. The selected items addressed generalised anxiety (3 items), social anxiety (2 items), separation anxiety (2 items), and panic/agoraphobia (1 item).

[Insert Table 2 about here]

Table 3 details the SCAS-C rank ordered item-total correlations, and associated differential functioning statistics associated with each item, together with items selected for the brief child questionnaire (SCAS-C-8). The predictive values associated with SCAS-C item scores were notably smaller than for SCAS-P items. Item-total correlations for SCAS-C-8 items ranged from .52-.68, and selected items significantly predicted the sample ($p<.001$), with higher item scores among the clinic-referred sample (Odds Ratio, 1.39-2.00). As for the SCAS-P-8, items addressing obsessive compulsive behaviour were not considered for inclusion in SCAS-C-8 (item 41 and 19). The two social anxiety items from the SCAS-P-8 (item 9 and item 29) were not selected for inclusion in the SCAS-C-8 as neither were significant predictors of community/clinic-referred sample, and including these items reduced the overall capacity of the brief child questionnaires to discriminate between the two groups. Item 22 ('I worry something bad will happen to me') and item 32 ('all of a sudden I feel really scared for no reason at all') from the SCAS-P-8 were also less strongly associated with the clinic-referred sample based on child-report (Odds Ratio, 1.29 and 1.31 respectively) than alternative SCAS-C items, and were therefore also not selected for inclusion in the SCAS-C-8. Final selected SCAS-C-8 items address generalised anxiety (2 items), separation anxiety (4 items), and panic/agoraphobia (2 items), and 4 of these items appear on the SCAS-P-8.

[Insert Table 3 about here]

Table 4 displays the rank ordered item-total correlations, and associated item functioning for 20 items included in the SCAS-T. Ten SCAS-T items were not considered for inclusion in the brief measure because they were associated with very low response rates

(7 items; >97% 'never' response in the community sample) or addressed obsessive compulsive behaviour (3 items). Items selected for the SCAS-T-8 are identified in Table 4, with item-total correlations ranging from .56-.75, and all items were significant predictors of sample (p<.001), with higher scores among the clinic-referred sample (Odds Ratio, 1.89-5.35). Three SCAS-T-8 items appear on both the SCAS-P-8 and SCAS-C-8 (item 1, item 6, item 12), and a further 3 items appear on the SCAS-P-8 (item 7. item, 16, item 22). The social anxiety item addressing worries about school ('worries that he/she will do badly at school') had the second highest item-total correlation (.74) among SCAS-T items and, with its focus on school, appears particularly relevant to teachers so was selected to replace 'worries what others think' from the SCAS-P-8. Item 15 ('suddenly starts to tremble or shake') from the SCAS-C-8 was also selected for the brief teacher questionnaires as scores on this item were more strongly associated with sample than the SCAS-P-8/SCAS-C-8 item 'feels afraid' (Odds Ratio, 3.67 compared to 1.58). Selected SCAS-T-8 items address generalised anxiety (2 items), social anxiety (2 items), separation anxiety (2 items), and panic/agoraphobia (2 item).

[Insert Table 4 about here]

Evaluation of SCAS-P-8, SCAS-C-8 and SCAS-T-8

Internal consistency.

Internal consistency for the brief and full SCAS within each sample are provided in Online Supplement 1. Cronbach alpha coefficients for the brief questionnaires ranged from .80-.84 in the community sample, and .73-.85 in the clinic-referred sample, indicating items have an acceptable-good level of internal consistency.

Agreement between reporters.

Agreement between reporters within each sample are provided in Online Supplement 2, indicating similar levels of agreement on the brief SCAS as the full SCAS. For the brief

questionnaires, parent-child agreement was the highest (community sample, $r = .40$, $p<.001$; clinic-referred sample, $r = .34$, $p<.001$) and teacher-child agreement the lowest (community sample, $r = .25$, $p<.001$, clinic-referred sample, $r = .05$, $p = .46$).

Convergent and divergent validity.

Convergent and divergent validity indices for the brief and full SCAS scores within each sample are provided in Online Supplement 3. Similar patterns were observed for the brief SCAS scores as for the full SCAS scores, with significantly higher correlations between the brief parent/child/teacher SCAS scores and the SDQ-emotional problems scale scores ($r = .62-.76$) and the SDQ-internalising scale scores ($r = .58-.70$), than between the brief parent/child/teacher SCAS scores and the SDQ-conduct problems scale scores ($r = .08-.32$) and SDQ-externalising problems scale scores ($r = .10-.34$) ($z = 4.91-9.16$, $p < .0001$).

Discriminating between community sample and clinic-referred sample.

Sample differences on questionnaires.

As displayed in Table 5, mean SCAS-P-8 scores were significantly higher in the clinic-referred sample than the community sample (t [671] $= 19.51$, $p<.001$), with a large effect size ($d = 1.49$). This finding was replicated among gender differentiated groups ($d = 1.50-1.51$), and similar sample differences were observed for the full SCAS-P scores ($d = 1.39-1.54$).

As displayed in Table 5, Mean SCAS-C-8 scores were also significantly higher in the clinic-referred sample than the community sample (t [647] $= 8.73$, $p<.001$), with a medium effect size (total sample, $d = 0.69$; boys, $d = 0.77$; girls, $d = 0.67$). Sample differences for the full child SCAS scores represented small-medium effect sizes (total sample, $d = 0.41$; boys, $d = 0.51$; girls; $d = 0.38$).

Sample differences on the teacher questionnaires are also displayed in Table 5. Mean SCAS-T-8 scores were significantly higher in the clinic-referred sample than the community

sample (t [568] = 12.43, $p<.001$), with a large effect size (d = 1.01). This finding was

replicated among gender differentiated groups (boys, d = 0.93; girls, d = 1.10), and similar

sample differences were observed for the SCAS-T-20 scores (d = 0.86-1.01).

[Insert Table 5 about here]

ROC analyses.

As displayed in Table 6, the SCAS-P-8 was able to accurately identify children in the

clinic-referred sample with an AUC of .86; and using an optimal cut-off score of 7.5,

achieved .85 sensitivity and .75 specificity overall (with sensitivity/specificity values of

.81/.79 for boys; and .89/.71 for girls). Corresponding sensitivity/specificity values for

optimal cut-off scores on the full SCAS-P were 82/.78 (boys, .83/.80; girls, .82/.77).

The SCAS-C-8 also achieved an AUC >.70, both in the total sample and the gender

differentiated groups (boys, .74; girls, .70). ROC analyses examining the SCAS-C-8 in the

total sample indicated that the optimal cut-off score was 6.5, achieving a sensitivity value of

.67, and specificity of .64 (it was not possible to achieve sensitivity >.70, with specificity

>.60 for the total sample). The ROC analyses among the gender differentiated groups,

however, indicated that the optimal cut-off scores among boys was 5.5, and among girls was

7.5, with respective sensitivity/specificity values of .73/.70, and .64/.63. The full child SCAS

failed to achieve an AUC >.70 in the total sample or among gender differentiated groups, and

the optimal cut-off scores on full child SCAS achieved similar sensitivity to the SCAS-C-8

(boys, .71; girls, .61), but with lower specificity (boys, .61; girls, .55).

The SCAS-T-8 achieved an AUC of .76, and the optimal cut-off score of 4.5 in the

total sample was associated with a sensitivity value of .70, and specificity of .73. Analyses

among gender differentiated groups indicated the optimal cut-off score on the SCAS-T-8

among boys was 3.5 (sensitivity/specificity, .74/.64), and among girls was 4.5

(sensitivity/specificity, .73/.69). Optimal cut-off scores on the SCAS-T-20 achieved

sensitivity/specificity values of .71/.71 among boys, and .74/.64 among girls.

[Insert Table 6 about here]

Using multiple reporters and the contribution of each reporter.

Findings from the series of Logistic Regressions using different combinations of the

SCAS-P-8, SCAS-C-8 and SCAS-T-8 scores to predict whether the child was in the

community or clinic-referred sample are displayed in Table 7. Among the models including

two reporters, using parent report (SCAS-P-8) and teacher report (SCAS-T-8) explained the

most variance (Nagelkerk, .54, Cox & Snell, .40); and scores on both the SCAS-P-8 and

SCAS-T-8 were uniquely associated with sample (Odds Ratio, 1.40 and 1.18, respectively).

Replacing the teacher report (SCAS-T-8) with the child report (SCAS-C-8) only slightly

reduced the total amount of variance explained (Nagelkerk, .47, Cox & Snell, .35), although

in this parent+child model, the SCAS-C-8 score was not significantly associated with the

sample. Using teacher report (SCAS-T-8) and child report (SCAS-C-8) explained the least

variance of all of the models (Nagelkerk, .33, Cox & Snell, .24), but both the SCAS-T-8

score and SCAS-C-8 score made small significant contributions (Odds Ratio, 1.28 and 1.12

respectively).   In the model including all three reporters, higher scores on the SCAS-P-8 best

predicted whether participants were in the community or clinic-referred sample (Odds Ratio,

1.39), and the SCAS-T-8 score also made a significant unique contribution (Odds Ratio,

1.17), but the SCAS-C-8 did not (Odds Ratio, 1.02).

[Insert Table 7 about here]

As displayed in Online Supplement 4, the brief SCAS scores accurately identified

>89% of children in the clinic-referred sample when multiple reporters were used, with the

highest sensitivity achieved when all three brief questionnaires are combined (.97), and

lowest when teacher and child report are combined (.89). The brief SCAS specificity was

reduced when multiple reporters were combined; ranging from .54 (parent+teacher and

parent+child) to .42 (parent+teacher+child) based on the optimal cut-off points identified in

Table 6.

Gender differences.

Gender means for the brief and full length SCAS scores are displayed in Online

Supplement 5. Significant gender effects were found for the SCAS-C-8, with significantly

higher scores among girls than boys both in the community sample (t[322] = 3.78, p<.001, d

= .42) and clinic-referred sample (t[323] = 2.90, p<.001, d = .32); and this same pattern was

observed on the full length SCAS-C. No significant gender differences were found on either

the SCAS-P-8 scores or SCAS-T-8 scores; although scores on the full length SCAS-P were

significantly higher among girls than boys within the community sample (t[355] = 2.91,

p<.001, d = .31).

Discussion

In this study we developed a brief questionnaire (parent, child and teacher report

versions) designed to assess symptoms of DSM5 anxiety disorders. Each version of the brief

questionnaire (SCAS-P-8, SCAS-T-8, SCAS-C-8) includes 8 SCAS items. Item functioning

and the content of items were considered to select items for inclusion in the brief

questionnaire. Item functioning varied across reporters, and in order to maximise

performance of each version of the questionnaire, the selected items varied across reporters

(with 3 common items across the SCAS-P-8, SCAS-T-8, and SCAS-C-8). Each version of

the brief questionnaire includes items that address generalised anxiety, separation anxiety and

panic/agoraphobia; and the SCAS-P-8 and SCAS-T-8 also includes items that address social

anxiety.

The findings provide support for the reliability and validity of the SCAS-P-8, SCAS-

C-8, and SCAS-T-8 scores in a community and clinical sample of children with anxiety

disorders. In line with previous studies of the full length SCAS (Arendt et al., 2014; Nauta et al., 2004; Spence, 1998; Whiteside & Brown, 2008), the brief questionnaire scores displayed acceptable to good internal consistency in both samples, although not as strong as the full-length SCAS scores. Similar levels of agreement among reporters were observed for the brief SCAS scores as the full-length SCAS scores, with highest agreement between parent and child and lowest between teacher and child. In relation to convergent and divergent validity, the brief questionnaire also displayed similar patterns to the full-length SCAS, with the SCAS-P-8, SCAS-C-8, and SCAS-T-8 scores each significantly correlated with the SDQ-internalising and emotional problems scale scores, and weakly correlated with SDQ-externalising and conduct problems scale scores.

The findings also illustrated the capacity of the SCAS-P-8, SCAS-C-8 and SCAS-T-8 scores to discriminate between the clinic-referred sample and the community sample. As previously reported for the full length SCAS (Arendt et al., 2014; Nauta et al., 2004; Spence, 1998; Whiteside & Brown, 2008), scores on each version of the brief questionnaire were significantly higher among the clinic-referred sample than the community sample. ROC analyses also indicated that the SCAS-P-8, SCAS-C-8 and SCAS-T scores were each able to identify children in the clinic-referred sample with at least a moderate level of accuracy (AUC > .70) with an acceptable level of sensitivity and specificity. The SCAS-P-8 score identified children in the clinic-referred sample with a good level of accuracy (AUC = .86), and the optimal cut-off score of 7.5, achieved sensitivity/specificity values > .80/.70 respectively (.85/.75 for the total sample; .81/.79 for boys; and .89/.71 for girls). Optimal cut-off scores on the SCAS-C-8 (5.5 for boys; 7.5 for girls) achieved sensitivity/specificity values >. 70 among boys (.73/.70), and >.60 among girls (.64/.63); and optimal cut-off scores on the SCAS-T-8 (3.5 for boys; 4.5 for girls) achieved sensitivity/specificity values > .70/.60 respectively (.74/.64 for boys; .73/.69 for girls). SCAS-C-8 total scores were significantly

higher among girls than boys, thus accounting for gender differentiated optimal cut-off scores; although interestingly, there were not significant difference between boys and girls on the SCAS-T-8 (or SCAS-P-8), despite the gender differentiated optimal cut-off scores on the brief teacher questionnaire.

Encouragingly, the ROC analyses also indicted that the SCAS-P-8 and SCAS-T-8 scores were able to identify children in the clinic-referred sample with a similar level of accuracy as the full length SCAS scores, suggesting reducing the SCAS-P/T to 8 items does not reduce its capacity to discriminate clinically anxious children from children in the community. Furthermore, the SCAS-C-8 score displayed a higher level of accuracy than the full-length SCAS score which did not achieve an AUC > .70 in the total sample or among gender groups. The optimal cut-off scores on the full length SCAS-C were also associated with lower specificity values (.55- .61) than the SCAS-C-8, thus illustrating the advantage of using a sub-set of optimally functioning SCAS-C items. Interestingly, the capacity of the individual SCAS-C items to discriminate between the community and clinic-referred sample was notably lower than that for the SCAS-P items and the SCAS-T items; and this was particularly marked for social anxiety items, suggesting that it may be difficult for pre-adolescent children to differentiate between developmentally appropriate and clinically significant levels of social anxiety.

Findings indicated some benefit to adopting a multi-informant approach, suggesting that a combined parent plus teacher score provides the optimal combination for the detection of children with an anxiety disorder of reporters, although parent report should be prioritised above either child or teacher. Interestingly, previous studies examining the use of child and parent report to identify particular anxiety disorders among clinical samples suggest each reporter does provide unique information (Villabø, et al,. 2012; Wei, et al, 2014), but that there may be variation in the capacity of each reporter to identify particular types of anxiety

disorders, and with different patterns among children versus adolescents (Wei, et al, 2014).

Indeed, while our findings suggest parent report should be prioritised above child (or teacher)

report to identify pre-adolescent children with clinically significant levels of anxiety, this

may not extend to older children and adolescents, or to situations where the aim is to identify

particular anxiety disorders within a clinical population. Moreover, the stronger capacity for

the parent report questionnaire to identify children in the clinic-referred sample than either

the child or teacher report questionnaire may, however, at least in part reflect a dominant

influence of parent report in the diagnostic assessment. Diagnostic outcomes derived from

the ADIS among pre-adolescent children show higher levels of agreement with parent report

than child report (Evans, Thirlwall, Cooper, & Creswell, 2016; Grills & Ollendick, 2003),

and therefore it may not be surprising that the parent report questionnaire score is the best

predictor of sample in this study. Using multiple reporters improved the capacity of the brief

questionnaire to correctly identify children in the clinic-referred sample (increased

sensitivity), but this advantage would need to be weighed up against the reduced specificity

associated with using multiple reporters unless alternative cut-off points are used to optimize

specificity and sensitivity when multiple informants are used.

Implications

This new brief anxiety questionnaire has potential for use in schools and primary care

settings as a tool to improve identification of children who are experiencing high levels of

anxiety and for whom a clinical diagnostic assessment may be warranted. With only 8 items,

the questionnaire is very quick to administer, providing a more time efficient alternative to

existing questionnaires (e.g. the 38-item SCAS, the 47-item RCADS, the adapted 15 item and

20 item RCADS anxiety scales). Moreover, the availability of parent, child and teacher

report versions maximises potential application across situations where only one particular

reporter may be available (e.g. teachers in schools), and where multiple reporters may be

available (e.g. parents and children in a primary care settings). The GAD-7 is widely used in primary care settings to aid identification of anxiety disorders in adults, and is recommended as an initial screening tool where an anxiety disorder is suspected to determine if further assessment is required (National Institute for Clinical Excellence, 2011). This new brief questionnaire provides an equivalent tool for use with children, parents and teachers, to aid identification of potential cases of clinically significant levels of anxiety, and to help determine if further assessment and support is needed.

Limitations

It is important to note several limitations associated with this study. The study examined the capacity of the new brief questionnaire scores to discriminate between a community sample and a clinic-referred sample of children who met criteria for an anxiety disorder. Diagnostic assessments, however, were not administered with the community sample, and given the prevalence rates of anxiety disorders, it can be assumed that the community sample also included some children who would have met criteria for an anxiety disorder. This would have reduced the capacity of the brief questionnaire scores to discriminate between the two samples. Future research should examine the capacity of the measure to discriminate between clinically anxious and non-anxious children where this status has been established through a diagnostic interview. It is also likely that there was a degree of participation bias in the community sample given that parents were informed that the wider study was also examining barriers to accessing anxiety treatment, and the response rate was relatively low (16.2%), thus those who were concerned about their child's anxiety may have been more likely to take part in the study. As a result, the community sample may have included more anxious children than the general population. In fact, among boys the mean score on the full SCAS-C (26.12) and full SCAS-P (16.23) were similar to published norms (26.65 and 16.0 respectively; available at www.scaswebsite.com), but among girls the mean scores (SCAS-C,

36.18; SCAS-P, 20.13) were higher than reported elsewhere (34.02 and 15.9 respectively; available at www.scaswebsite.com), indicating that the community sample may have included more anxious girls than the general population. Thus, again the results from the present study may have underestimated the capacity of the brief questionnaire scores to discriminate between children with and without anxiety disorders.

It is also important to acknowledge that the proportion of teachers who completed SCAS questionnaires in the clinic-referred sample (63%) was relatively low compared with the proportion of teachers in the community sample (94%), and the proportion of parents and children in both samples (>89%). It is likely that the lower return rate among teachers in the clinic-referred sample is due to methodological differences in questionnaire administration across reporters and samples. In the clinic-referred sample, teacher questionnaires were administered by post, whereas children and parents completed questionnaires as part of face-to-face assessment sessions; and the community sample were recruited through schools as part of a wider study that involved researchers visiting schools to administer questionnaires. It will be important for future studies to consider methods that maximise teacher response rates among samples recruited in clinical settings.

This study also examined a number of other reliability and validity indices (internal consistency, agreement among reporters, convergent/divergent validity), but it will be important for future evaluations of the new brief questionnaire to examine its test-retest reliability. Moreover, we developed and evaluated the new questionnaire in a single study in which participants completed the full version of the SCAS. Thus, further research is now needed to evaluate the new measure in an independent sample that completes the abbreviated form the SCAS.

It is also important to note that this new brief questionnaire is designed to identify children with an anxiety disorder, but it does not include a sufficient number of items

addressing any particular anxiety disorder to provide detailed information about specific

anxiety disorders. As such this measure should be considered an initial tool to identify

children who have elevated symptoms of anxiety, and for whom a more in-depth assessment

is needed. This issue also applies to full-length anxiety questionnaires for children and youth.

McLeod, Jensen-Doss, Wheat, & Becker (2013) cautioned against using anxiety rating scales,

both general and multi-dimensional, as stand-alone diagnostic instruments, but noted their

value in screening to identify children who warrant further assessment. Also, although the

items address a range of types of anxiety, no items specifically address selective mutism or

specific phobias, and the SCAS-C-8 items do not ask about social anxiety as these items did

not discriminate between the clinical and non-clinical groups (although 64% of the clinical

sample had social anxiety disorder). It is also noteworthy that the SCAS-P-8 does not include

items that ask about physical symptoms, and the SCAS-C-8 and SCAS-T-8 both only include

one such item (suddenly starts to tremble or shake), indicating that items relating to other

non-physical symptoms may be better able to identify children with clinically significant

levels of anxiety. Given the capacity of the brief questionnaire scores to discriminate between

children in a clinic-referred sample (who had a range of different types of anxiety disorders)

and a community sample, it is likely that the items relate to symptoms that are common

across anxiety disorders (e.g. general worry, feeling afraid, trouble going to school);

however, the capacity of the new brief questionnaire scores to identify particular anxiety

disorders is not yet known. Future research is needed to establish whether the brief

questionnaire scores have greater capacity to detect some anxiety disorders (e.g. Generalised

Anxiety Disorder), than others (e.g. Social Anxiety Disorder). Similarly, this study did not

examine the capacity of the brief SCAS scores to discriminate between children with anxiety

disorders and those with non-anxiety psychiatric diagnoses. The GAD-7 has reduced

specificity within psychiatric samples compared to its ability to discriminate between adults

with anxiety disorders and non-clinical groups (Beard & Björgvinsson, 2014; Kertz, Bigda-Peyton, & Bjorgvinsson, 2014); and it will be important for future research to examine the sensitivity/specificity associated with optimal cut-off scores on the brief SCAS in mental health service use settings.

This study provides support for this multi-informant 8-item questionnaire as a tool to identify children with anxiety disorders, together with data relating to optimal cut-off scores. Further research is needed to evaluate the ability of the brief questionnaire to identify specific anxiety disorders; and to evaluate its capacity to discriminate between children with and without any anxiety disorders in community settings in which diagnostic assessments confirm both the presence and the absence of anxiety disorders. This study focuses on identifying anxiety disorders in pre-adolescent children, and a corresponding brief questionnaire for adolescents should be developed and evaluated. It will also be important for future evaluations to examine the capacity of the brief questionnaire to be sensitive to changes in symptoms and functioning over time in response to treatment, and to discriminate between children with anxiety disorders and other non-anxiety psychiatric disorders.

References

Arendt, K., Hougaard, E., & Thastum, M. (2014). Psychometric properties of the child and

parent versions of Spence Children's Anxiety Scale in a Danish community and

clinical sample. *Journal of Anxiety Disorders*, *28*(8), 947–956.

https://doi.org/10.1016/j.janxdis.2014.09.021

Beard, C., & Björgvinsson, T. (2014). Beyond generalized anxiety disorder: Psychometric

properties of the GAD-7 in a heterogeneous psychiatric sample. *Journal of Anxiety

Disorders*, *28*(6), 547–552. https://doi.org/10.1016/j.janxdis.2014.06.002

Brown-Jacobsen, A. M., Wallace, D. P., & Whiteside, S. P. H. (2011). Multimethod, multi-

informant agreement, and positive predictive value in the identification of child

anxiety disorders using the SCAS and ADIS-C. *Assessment*, *18*(3), 382–392.

https://doi.org/10.1177/1073191110375792

Chavira, D. A., Stein, M. B., Bailey, K., & Stein, M. T. (2004). Child anxiety in primary care:

Prevalent but untreated. *Depression and Anxiety*, *20*(4), 155–164.

https://doi.org/10.1002/da.20039

Copeland, W. E., Angold, A., Shanahan, L., & Costello, E. J. (2014). Longitudinal patterns of

anxiety from childhood to adulthood: the Great Smoky Mountains Study. *Journal of

the American Academy of Child & Adolescent Psychiatry*, *53*(1), 21-33.

De Los Reyes, A., Augenstein, T. M., Wang, M., Thomas, S. A., Drabick, D. A. G., Burgers,

D. E., & Rabinowitz, J. (2015). The validity of the multi-informant approach to

assessing child and adolescent mental health. *Psychological Bulletin, 141*(4), 858-

900. http://dx.doi.org/10.1037/a0038498

DeSousa, D. A., Pereira, A. S., Petersen, C. S., Manfro, G. G., Salum, G. A., & Koller, S. H.

(2014). Psychometric properties of the Brazilian-Portuguese version of the Spence

Children's Anxiety Scale (SCAS): Self- and parent-report versions. *Journal of Anxiety Disorders*, *28*(5), 427–436. https://doi.org/10.1016/j.janxdis.2014.03.006

Ebesutani, C., Reise, S. P., Chorpita, B. F., Ale, C., Regan, J., Young, J., … Weisz, J. R. (2012). The Revised Child Anxiety and Depression Scale-Short Version: Scale reduction via exploratory bifactor modeling of the broad anxiety factor. *Psychological Assessment*, *24*(4), 833–845. https://doi.org/10.1037/a0027283

Essau, C. A., Lewinsohn, P. M., Olaya, B., & Seeley, J. R. (2014). Anxiety disorders in adolescents and psychosocial outcomes at age 30. *Journal of affective disorders*, *163*, 125-132.

Evans, R., Thirlwall, K., Cooper, P., & Creswell, C. (2016). Using symptom and interference questionnaires to identify recovery among children with anxiety disorders. *Psychological Assessment*. Retrieved from doi: 10.1037/pas0000375

Fineberg, N. A., Haddad, P. M., Carpenter, L., Gannon, B., Sharpe, R., Young, A. H., … Sahakian, B. J. (2013). The size, burden and cost of disorders of the brain in the UK. *Journal of Psychopharmacology*, *27*(9), 761–70. https://doi.org/10.1177/0269881113495118

Goodman, R. (1997). The Strengths and Difficulties Questionnaire: a research note. *Journal of Child Psychology and Psychiatry*, *38*(5), 581–6. https://doi.org/10.1111/j.1469-7610.1997.tb01545.x

Goodman, R., Ford, T., Simmons, H., Gatward, R., & Meltzer, H. (2000). Using the Strengths and Difficulties Questionnaire (SDQ) to screen for child psychiatric disorders in a community sample. *The British Journal of Psychiatry*, *177*(6), 534–539. https://doi.org/10.1192/bjp.177.6.534

Goodman, R., Renfrew, D., & Mullick, M. (2000). Predicting type of psychiatric disorder from Strengths and Difficulties Questionnaire (SDQ) scores in child mental health

clinics in London and Dhaka. *European Child & Adolescent Psychiatry*, *9*(2), 129–
134. https://doi.org/10.1007/s007870050008

Grills, A. E., & Ollendick, T. H. (2003). Multiple informant agreement and the Anxiety
Disorders Interview Schedule for parents and children. *Journal of the American
Academy of Child & Adolescent Psychiatry*, *42*(1), 30–40.
https://doi.org/10.1097/00004583-200301000-00008

Hobbs, F. R., Bankhead, C., Mukhtar, T., Stevens, S., Perera-Salazar, R., Holt, T., &
Salisbury, C. (2016). Clinical workload in UK primary care: a retrospective analysis
of 100 million consultations in England, 2007–14. *The Lancet*, *387*(10035), 2323-
2330.

James, A. C., James, G., Cowdrey, F. A., Soler, A., & Choke, A. (2013). Cognitive
behavioural therapy for anxiety disorders in children and adolescents. *The Cochrane
Database of Systematic Reviews*, *6*(2), CD004690.
https://doi.org/10.1002/14651858.CD004690.pub3

Kertz, S., Bigda-Peyton, J., & Bjorgvinsson, T. (2014). Validity of the Generalized Anxiety
Disorder-7 Scale in an acute psychiatric sample. *Clinical Psychology &
Psychotherapy*, *20*(5), 456–464.

Kessler, R. C., Chiu, W. T., Demler, O., & Walters, E. E. (2005). Prevalence, severity and
comorbidity of 12 month DSMIV disorders. *Archives of General Psychiatry*, *62*(6),
617–627.

Klinkman, M. S. (1997). Competing demands in psychosocial care. *General Hospital
Psychiatry*, *19*(2), 98–111. https://doi.org/10.1016/S0163-8343(96)00145-4

Kroenke, K., Spitzer, R. L., & Williams, J. B. W. (2001). The PHQ-9: Validity of a brief
depression severity measure. *Journal of General Internal Medicine*, *16*(9), 606–613.
https://doi.org/10.1046/j.1525-1497.2001.016009606.x

Kroenke, K., Monahan, P. O., & Kean, J. (2015). Pragmatic characteristics of patient-

>   reported outcome measures are important for use in clinical practice. *Journal of*

>   *Clinical Epidemiology*, *68*(9), 1085-1092.

Levitt, J. M., Saka, N., Romanelli, L. H., & Hoagwood, K. (2007). Early identification of

>   mental health problems in schools: The status of instrumentation. *Journal of School*

>   *Psychology*, *45*(2), 163-191.

Lyneham, H. J., Street, A. K., Abbott, M. J., & Rapee, R. M. (2008). Psychometric properties

>   of the school anxiety scale-Teacher report (SAS-TR). *Journal of Anxiety Disorders*,

>   *22*(2), 292–300. https://doi.org/10.1016/j.janxdis.2007.02.001

McLeod, B. D., Jensen-Doss, A., Wheat, E., & Becker, E. M. (2013). Evidence-Based

>   assessment and case formulation for childhood anxiety disorders. In *The Wiley-*

>   *Blackwell Handbook of The Treatment of Childhood and Adolescent Anxiety.* (pp.

>   177–206). John Wiley & Sons, Ltd.

Merikangas, K. R., He, J., Burstein, M., Swendsen, J., Avenevoli, S., Case, B., … Olfson, M.

>   (2011). Service utilization for lifetime mental disorders in U.S. adolescents: results of

>   the National Comorbidity Survey-Adolescent Supplement (NCS-A). *Journal of the*

>   *American Academy of Child and Adolescent Psychiatry*, *50*(1), 32–45.

>   https://doi.org/10.1016/j.jaac.2010.10.006

Mitchell, A. J., & Coyne, J. C. (2007). Do ultra-short screening instruments accurately detect

>   depression in primary care?. *Br J Gen Pract*, *57*(535), 144-151.

Muris, P., Meesters, C., & Schouten, E. (2002). A brief questionnaire of DSM-IV-defined

>   anxiety and depression symptoms among children. *Clinical Psychology and*

>   *Psychotherapy*, *9*(6), 430–442. https://doi.org/10.1002/cpp.347

National Institute for Clinical Excellence. (2011). Common mental health problems:

>   identification and pathways to care. Retrieved from

https://www.nice.org.uk/guidance/cg123/chapter/1-Guidance#step-1-identification-and-assessment

Nauta, M. H., Scholing, A., Rapee, R. M., Abbott, M., Spence, S. H., & Waters, A. (2004). A parent-report measure of children's anxiety: Psychometric properties and comparison with child-report in a clinic and normal sample. *Behaviour Research and Therapy*, *42*(7), 813–839. https://doi.org/10.1016/S0005-7967(03)00200-6

O'Brien, D., Harvey, K., Howse, J., Reardon, T., & Creswell, C. (2016). Barriers to managing child and adolescent mental health problems: a systematic review of primary care practitioners' perceptions. *British Journal of General Practice*. Retrieved from bjgpoct-2016

Olofsdotter, S., Sonnby, K., Vadlin, S., Furmark, T., & Nilsson, K. W. (2015). Assessing Adolescent Anxiety in General Psychiatric Care: Diagnostic Accuracy of the Swedish Self-Report and Parent Versions of the Spence Children's Anxiety Scale. *Assessment*, 1–14. https://doi.org/10.1177/1073191115583858

Orgilés, M., Fernández-Martínez, I., Guillén-Riquelme, A., Espada, J. P., & Essau, C. A. (2016). A systematic review of the factor structure and reliability of the Spence Children's Anxiety Scale. *Journal of Affective Disorders*, *190*, 333–340. https://doi.org/10.1016/j.jad.2015.09.055

Polanczyk, G. V., Salum, G. A., Sugaya, L. S., Caye, A., & Rohde, L. A. (2015). Annual research review: A meta-analysis of the worldwide prevalence of mental disorders in children and adolescents. *Journal of Child Psychology and Psychiatry*, *56*(3), 345–365. https://doi.org/10.1111/jcpp.12381

Reardon, T., Harvey, K., Baranowska, M., O'Brien, D., Smith, L., & Creswell, C. (2017). What do parents perceive are the barriers and facilitators to accessing psychological treatment for mental health problems in children and adolescents? A systematic

review of qualitative and quantitative studies. *European Child and Adolescent Psychiatry*. Retrieved from doi:10.1007/s00787-016-0930-6

Silverman, W. K., Saavedra, L. M., & Pina, A. A. (2001). Test-retest reliability of anxiety symptoms and diagnoses with the Anxiety Disorders Interview Schedule for DSM-IV: child and parent versions. *Journal of the American Academy of Child and Adolescent Psychiatry*, *40*(8), 937–44. https://doi.org/10.1097/00004583-200108000-00016

Spence, S. H. (1997). Structure of anxiety symptoms among children: a confirmatory factor-analytic study. *Journal of Abnormal Psychology*, *106*(2), 280–297. https://doi.org/10.1037/0021-843X.106.2.280

Spence, S. H. (1998). A measure of anxiety symptoms among children. *Behaviour Research and Therapy*, *36*(5), 545–566. https://doi.org/10.1016/S0005-7967(98)00034-5

Spence, S. H., Barrett, P. M., & Turner, C. M. (2003). Psychometric properties of the Spence Children's Anxiety Scale with young adolescents. *Journal of Anxiety Disorders*, *17*(6), 605–625. https://doi.org/10.1016/S0887-6185(02)00236-0

Spitzer, R. L., Kroenke, K., Williams, J. B. W., & Löwe, B. (2006). A brief measure for assessing generalized anxiety disorder: the GAD-7. *Archives of Internal Medicine*, *166*(10), 1092–1097. https://doi.org/10.1001/archinte.166.10.1092

van Gastel, W., & Ferdinand, R. F. (2008). Screening capacity of the Multidimensional Anxiety Scale for Children (MASC) for DSM-IV anxiety disorders. *Depression and Anxiety*, *25*(12), 1046–52. https://doi.org/10.1002/da.20452

Villabø, M., Gere, M., Torgersen, S., March, J. S., & Kendall, P. C. (2012). Diagnostic efficiency of the child and parent versions of the Multidimensional Anxiety Scale for Children. *Journal of Clinical Child & Adolescent Psychology*, *41*(1), 75–85. https://doi.org/10.1080/15374416.2012.632350

Wei, C., Hoff, A., Villabø, M. A., Peterman, J., Kendall, P. C., Piacentini, J., ... & Sherrill, J.

    (2014). Assessing anxiety in youth with the multidimensional anxiety scale for

    children. *Journal of Clinical Child & Adolescent Psychology*, *43*(4), 566-578.

Whiteside, S., & Brown, A. (2008). Exploring the utility of the Spence Children's Anxiety

    Scales parent- and child-report forms in a North American sample. *Journal of Anxiety*

    Disorders, *22*(8), 1440–1446. https://doi.org/10.1016/j.janxdis.2008.02.006

Whiteside, S., Gryczkowski, M., Biggs, B., Fagen, R., & Owusu, D. (2012). Validation of the

    Spence Children's Anxiety Scale's obsessive compulsive subscale in a clinical and

    community sample. *Journal of Anxiety Disorders*, *26*(1), 111–116.

    https://doi.org/10.1016/j.janxdis.2011.10.002

Table 1

Sample characteristics

	Community sample (*n* = 361)	Clinic-referred sample (*n* = 338)
Gender Female, *n* (%)	192 (53.2%)[b]	170 (50.3%)
Age mean (SD) 7-8 year olds 9-11 year olds	9.50 (1.09)[c] 126 (34.9%) 212 (58.7%)	9.70 (1.36) 99 (29.3%) 239 (70.7%)
SES higher/professional[a] other employed unemployed	168 (46.5%)[d] 133 (36.8%) 22 (6.1%)	195 (57.7%)[e] 93 (27.5%) 12 (3.6%)
Ethnicity White British, *n* (%)	277 (76.7%)[f]	287 (84.9%)[g]
SCAS-P (total score), *n(%)*	359 (99.4%)	312 (92.3%)
SCAS-P-8 (total score), *n (%)*	360 (99.7%)	313 (92.6%)
SCAS-C (total score), *n (%)*	322 (89.2%)	323(95.6%)
SCAS-C-8 (total score), *n (%)*	324 (89.8%)	325 (96.1%)
SCAS-T (total score), *n (%)*	340 (94.2%)	214 (63.3%)
SCAS-T-20 (total score), *n(%)*	340 (94.2%)	227 (67.2%)
SCAS-T-8 (total score), *n (%)*	340 (94.2%)	230 (68.0%)
Primary anxiety diagnosis. *n* (%) Separation anxiety disorder Social anxiety disorder Generalised anxiety disorder Specific phobia Panic disorder with Agoraphobia Panic disorder without Agoraphobia Agoraphobia without Panic disorder Selective Mutism Anxiety NOS		91 (26.9%) 64 (18.9%) 99 (29.3%) 59 (17.6%) 3 (0.9%) 3 (0.9%) 9 (2.7%) 1 (0.3%) 9 (2.7%)
Primary anxiety disorder, CSR mean (SD)		5.59 (0.79)
Presence anxiety diagnosis. *n* (%) Separation anxiety disorder Social anxiety disorder Generalised anxiety disorder Specific phobia Panic disorder with Agoraphobia Panic disorder without Agoraphobia Agoraphobia without Panic disorder Selective Mutism Anxiety NOS		199 (58.9%) 213 (63.0%) 215 (63.6%) 152 (45.0%) 3 (0.9%) 7 (2.1%) 17 (5.0%) 1 (0.3%) 12 (3.6%)
Presence of other diagnoses, *n* (%) OCD Major Depressive Disorder or Dysthymia ADHD ODD		9 (2.7%) 42 (12.4%) 51 (15.1%) 62 (18.3%)

Note. SES = socioeconomic status; CSR = Clinical Severity Rating; Anxiety NOS = Anxiety Disorder Not Otherwise Stated; OCD = Obsessive compulsive disorder; PTSD = Post traumatic stress disorder; ADHD = Attention Deficit Hyperactivity Disorder; ODD = Oppositional Defiant Disorder

[a] higher / professional = managers, directors, senior officials, professional occupations
Missing data: [b] $n = 2$ (0.6%); [c] $n = 23$ (6.4%); [d] $n = 38$ (10.5%); [e] $n = 38$ (11.2%); [f] $n = 22$ (6.1%); [g] $n = 10$ (3.0%)

Table 2

SCAS-P rank ordered item-total correlations and item differential functioning

Item	Abbreviated SCAS-P item	Subscale	Item-total correlation[a]	Estimated coefficient	Wald statistic	Odds Ratio
17	can't get bad or silly thoughts out of head	OC	.72**	1.25	131.19**	3.49
20[b]	**worries something bad happen to him/her**	**GA**	**.70****	**1.10**	**93.98****	**3.01**
4[b]	**feeling afraid**	**GA**	**.70****	**1.53**	**132.55****	**4.62**
36	bothered by bad or silly thoughts	OC	.69**	1.02	92.70**	2.77
33	worries will suddenly get scared feeling	P/A	.66**	1.38	94.59**	3.98
28[b]	**all of a sudden feels really scared for no reason**	**P/A**	**.66****	**1.56**	**92.44****	**4.75**
8[b]	**worries about being away from us**	**SEP**	**.66****	**1.09**	**120.97****	**2.96**
11	worries something awful happen to family	SEP	.65**	.85	85.62**	2.34
26[b]	**worries what others think of him/her**	**SOC**	**.62****	**.70**	**57.83****	**2.01**
15[b]	**trouble going to school in mornings**	**SEP**	**.61****	**1.20**	**108.23****	**3.32**
18	complains heart beating really fast	GA	.61**	.92	54.82**	2.50
22	feels shaky	GA	.61**	1.25	74.97**	3.48
3	funny feeling in stomach	GA	.61**	.88	105.50**	2.42
38	scared if stay away from home overnight	SEP	.61**	1.10	105.37**	2.99
6	scared when has to take a test	SOC	.60**	.62	53.38**	1.86
9[b]	**afraid will make fool of self**	**SOC**	**.57****	**.66**	**53.21****	**1.94**
10	worries will do badly at school	SOC	.57**	.65	57.04**	1.92
1[b]	**worries about things**	**GA**	**.56****	**1.93**	**168.36****	**6.87**
12	suddenly can't breathe	P/A	.55**	1.00	40.84**	2.71
19	suddenly starts tremble or shake	P/A	.54**	1.32	36.13**	3.73
14	scared if has to sleep on own	SEP	.54**	1.02	104.81**	2.77
30	suddenly becomes dizzy or faint	P/A	.54**	1.26	43.22**	3.52
24	special thoughts stop bad things happening	OC	.54**	.92	25.84**	2.50
32	heart suddenly starting to beat too quickly	P/A	.53**	.94	35.62**	2.57
7	afraid when has to use public toilets	SOC	.53**	.93	59.01**	2.53
31	afraid when has to talk in front of class	SOC	.52**	.59	44.70**	1.80
2	scared of the dark	PHY	.51**	.70	75.43**	2.00
21	scared of going to doctor or dentist	PHY	.51**	.65	44.39**	1.92
5	afraid of being on own at home	SEP	.51**	.68	83.76**	1.97
37	has to do certain things in just right way	OC	.47**	.64	16.97**	1.89
13	has to keep checking has done things right	OC	.47**	.70	29.21**	2.01
27	afraid of being in crowded place	P/A	.47**	.59	24.80**	1.81
25	scared if has to travel in car, bus or train	P/A	.43**	.97	32.25**	2.63
35	has to do same things over and over	OC	.41**	.51	13.89**	1.67
34	afraid of being in small closed places	P/A	.41**	.65	26.27**	1.92
29	scared of insects or spiders	PHY	.33**	.21	6.55*	1.23
23	scared of heights	PHY	.33**	.07	.64	1.07
16	scared of dogs	PHY	.23**	.34	16.98**	1.41

Note. OC = obsessive-compulsive; GA = generalised anxiety; P/A = panic and agoraphobia; SOC = social phobia; SEP = separation anxiety; PHY = physical injuries fear.

[a] Use combined community sample and clinic-referred sample.

[b] Proposed SCAS-P-8 items

** = $p<.001$

* = $p<.01$

Table 3

SCAS-C rank ordered item-total correlations and item differential functioning

Item	Abbreviated SCAS-C item	Subscale	Item-total correlation[a]	Estimated coefficient	Wald statistic	Odds Ratio
22	worry something bad will happen to me	GA	.72**	.26	9.97*	1.29
37[b]	**worry will suddenly get scared feeling**	**P/A**	**.68****	**.54**	**32.03****	**1.72**
32	all of a sudden feel really scared for no reason	P/A	.67**	.27	8.47*	1.31
41	bad or silly pictures or thoughts in mind	OC	.67**	.18	5.81	1.20
29	worry what other people think of me	SOC	.65**	.07	.88	1.08
24	feel shaky	GA	.65**	.18	4.26	1.19
12	worry something awful happen to family	SEP	.64**	.12	2.73	1.13
36	heart suddenly starts to beat too quickly	P/A	.63**	.13	1.95	1.14
9	afraid will make fool self	SOC	.62**	.09	1.17	1.09
4[b]	**feel afraid**	**GA**	**.62****	**.66**	**34.60****	**1.94**
20	heart beats really fast	GA	.62**	.00	.00	1.00
8[b]	**worry about being away from my parents**	**SEP**	**.62****	**.40**	**26.16****	**1.49**
1[b]	**worry about things**	**GA**	**.62****	**.69**	**39.44****	**2.00**
19	can't get bad or silly thoughts out of head	OC	.61**	.28	13.23**	1.33
21[b]	**suddenly start to tremble or shake**	**P/A**	**.59****	**.33**	**11.67****	**1.39**
16[b]	**trouble going to school in the mornings**	**SEP**	**.57****	**.45**	**24.43****	**1.57**
39	afraid small closed places	P/A	.57**	.11	2.24	1.12
13	suddenly feel as if can't breathe	P/A	.56**	.21	5.28	1.23
30	afraid of being in crowded places	P/A	.56**	.17	3.77	1.18
35	afraid if have to talk in front of class	SOC	.56**	.25	10.30**	1.28
42	have to do some things in just right way	OC	.56**	.06	0.50	1.06
10	worry will do badly at schoolwork	SOC	.53**	.23	7.01*	1.26
6	feel scared when have to take a test	SOC	.53**	.19	6.02	1.21
34	suddenly become dizzy or faint	P/A	.52**	.08	.54	1.08
44[b]	**scared if had to stay away overnight**	**SEP**	**.52****	**.43**	**29.59****	**1.53**
15[b]	**feel scared if have to sleep on own**	**SEP**	**.52****	**.56**	**40.39****	**1.76**
5	afraid to be at home alone	SEP	.52**	.35	25.53**	1.42
3	funny feeling in stomach	GA	.52**	.28	12.76**	1.32
27	special thoughts stop bad things happening	OC	.50**	.17	5.03	1.19
7	feel afraid to use public bathrooms	SOC	.49**	.21	5.63	1.23
14	keep checking that done things right	OC	.47**	.04	.25	1.04
28	scared if have to travel in car bus or train	P/A	.46**	.29	6.73*	1.34
23	scared of going to doctors or dentist	PHY	.45**	.24	7.95*	1.27
2	scared of the dark	PHY	.43**	.26	13.24**	1.30
25	scared of high places or lifts	PHY	.39**	.17	4.84	1.18
40	have to do some things over and over	OC	.38**	.02	.07	1.02
33	scared of insects and spiders	PHY	.35**	.03	.20	1.03
18	scared of dogs	PHY	.20**	.19	4.93	1.21

Note. OC = obsessive-compulsive; GA = generalised anxiety; P/A = panic and agoraphobia; SOC = social phobia; SEP = separation anxiety; PHY = physical injuries fear.

[a] Use combined community sample and clinic-referred sample.

[b] Proposed SCAS-C-8 items

** = $p<.001$

* = $p<.01$

Table 4

SCAS-T rank ordered item-total correlations and item differential functioning

Item	Abbreviated SCAS-T item[a]	SCAS-P/C subscale	Item-total correlation[b]	Estimated coefficient	Wald statistic	Odds Ratio
16[c]	**worries something bad will happen to him/her**	**GA**	**.75****	**1.30**	**60.31****	**3.66**
8[c]	**worries that he/she will do badly at school**	**SOC**	**.74****	**.69**	**37.96****	**2.00**
1[c]	**worries about things**	**GA**	**.74****	**.92**	**58.97****	**2.51**
4	scared when takes test	SOC	.73**	.71	41.32**	2.03
17	feels shaky when has a problem	GA	.72**	1.32	57.19**	3.76
22[c]	**all of sudden feels scared for no reason**	**P/A**	**.71****	**1.21**	**36.56****	**3.35**
7[c]	**afraid make fool self**	**SOC**	**.70****	**.64**	**31.59****	**1.89**
6[c]	**worries about being away from parents**	**SEP**	**.70****	**1.00**	**60.58****	**2.73**
12[c]	**trouble going to school in mornings**	**SEP**	**.69****	**1.68**	**90.65****	**5.35**
26	worries will suddenly get a scared feeling	P/A	.67**	1.19	30.05**	3.27
20	worries what others think	SOC	.67**	.68	38.10**	1.98
9	worries something awful will happen to family	SEP	.66**	1.02	54.09**	2.77
3	feeling afraid	GA	.65**	.46	11.64*	1.58
24	afraid when has to talk in front of class	SOC	.63**	.42	14.70**	1.53
21	afraid of crowded places	P/A	.59**	.73	16.09**	2.08
15[c]	**suddenly starts to tremble or shake**	**P/A**	**.56****	**1.30**	**22.26****	**3.67**
2	tummy aches	GA	.55**	.48	15.40**	1.62
14	complains heart beating really fast	GA	.47**	1.08	16.02**	2.94
23	suddenly becomes dizzy or faint	P/A	.44**	.81	9.93**	2.25
10	suddenly can't breathe	P/A	.40**	.88	12.70**	2.40

Note. GA = generalised anxiety; P/A = panic and agoraphobia; SOC = social phobia; SEP = separation anxiety;

[a] Item functioning reported for 20 SCAS-T items considered for inclusion in brief questionnaire

[b] Use combined community sample and clinic-referred sample.

[c] Proposed SCAS-T-8 items

** = *p*<.001

* = *p*<.01

Table 5

Differences between community sample and clinic-referred sample on brief SCAS and full-length SCAS (parent, child, teacher report)

	Parent report			Child report			Teacher report		
	Community Mean (SD)	Clinic-referred Mean (SD)	*t* test (Cohen's *d*)	Community Mean (SD)	Clinic-referred Mean (SD)	*t* test (Cohen's *d*)	Community Mean (SD)	Clinic-referred Mean (SD)	*t* test (Cohen's *d*)
Total sample									
Brief SCAS	5.68 (3.68)	11.86 (4.53)	$t(671)= 19.51**$ $(d = 1.49)$	5.97 (4.70)	9.18 (4.67)	$t(647) = 8.73**$ $(d = 0.69)$	3.39 (2.92)	7.34 (4.67)	$t(568) = 12.43**$ $(d = 1.01)$
SCAS (full)	18.28 (12.73)	39.45 (16.31)	$t(669)= 18.85**$ $(d = 1.45)$	31.68 (21.02)	39.76 (18.47)	$t(643) = 5.19**$ $(d = 0.41)$	6.84 (6.17)	14.61 (10.05)	$t(565) = 11.40**$ $(d = 0.93)$
Boys									
Brief SCAS	5.33 (3.35)	11.36 (4.58)	$t(317)= 13.47**$ $(d = 1.50)$	4.90 (4.47)	8.44 (4.70)	$t(305) = 6.74**$ $(d = 0.77)$	3.19 (2.98)	6.67 (4.38)	$t(261) = 7.69**$ $(d = 0.93)$
SCAS (full)	16.23 (10.85)	37.93 (16.64)	$t(317)= 13.90**$ $(d = 1.54)$	26.12 (20.43)	35.93 (17.85)	$t(303) = 4.48**$ $(d = 0.51)$	6.19 (6.20)	13.12 (9.53)	$t(262) = 7.16**$ $(d = 0.86)$
Girls									
Brief SCAS	6.03 (3.91)	12.33 (4.43)	$t(350)= 14.17**$ $(d = 1.51)$	6.84 (4.71)	9.93 (4.53)	$t(340) = 6.15**$ $(d = 0.67)$	3.56 (2.86)	7.92 (4.85)	$t(305) = 9.89**$ $(d = 1.10)$
SCAS (full)	20.13 (13.97)	40.90 (15.90)	$t(348)= 13.00**$ $(d = 1.39)$	36.18 (20.45)	43.57 (18.33)	$t(338) = 3.49**$ $(d = 0.38)$	7.39 (6.11)	15.96 (10.34)	$t(301) = 9.06**$ $(d = 1.01)$

Note. Brief SCAS = SCAS-P-8/SCAS-C-8/SCAS-T-8. SCAS (full) = SCAS-P/SCAS-C/SCAS-T-20.

** = $p<.001$

Table 6

Receiver Operating Characteristics for parent, teacher and child questionnaires

		Brief SCAS	SCAS (full)
Parent report	Total sample		
	n (positive; negative)	313; 360	312; 359
	AUC	.86	.86
	Optimal cut score	7.5	24.5
	Sensitivity	.85	.82
	Specificity	.75	.78
	Boys		
	n (positive; negative)	153; 166	153; 166
	AUC	.86	.88
	Optimal cut score	7.5	23.5
	Sensitivity	.81	.83
	Specificity	.79	.80
	Girls		
	n (positive; negative)	160; 192	159; 191
	AUC	.86	.85
	Optimal cut score	7.5	26.5
	Sensitivity	.89	.82
	Specificity	.71	.77
Child report	Total sample		
	n (positive; negative)	325; 324	323; 322
	AUC	.71	.63
	Optimal Cut score	6.5	32.50*
	Sensitivity	.67	.61
	Specificity	.64	.58
	Boys		
	n (positive; negative)	162; 145	161;144
	AUC	.74	.68
	Optimal cut score	5.5.	24.5
	Sensitivity	.73	.71
	Specificity	.70	.61
	Girls		
	n (positive; negative)	163; 179	162; 178
	AUC	.70	.62
	Optimal cut score	7.5	36.5*
	Sensitivity	.64	.61
	Specificity	.63	.55
Teacher report	Total		
	n (positive; negative)	230; 340	227; 340
	AUC	.76	.75
	Optimal cut score	4.5	8.5
	Sensitivity	.70	.71
	Specificity	.73	.68
	Boys		
	n (positive; negative)	107; 156	108; 156
	AUC	.76	.75
	Optimal cut score	3.5	7.5
	Sensitivity	.74	.71
	Specificity	.64	.71
	Girls		
	n (positive; negative)	123; 184	119; 184
	AUC	.77	.76
	Optimal cut score	4.5	8.5
	Sensitivity	.73	.74
	Specificity	.69	.64

Note. Brief SCAS = SCAS-P-8/SCAS-C-8/SCAS-T-8. SCAS (full) = SCAS-P/SCAS-C/SCAS-T-20.
*Not possible to achieve .60/.60 sensitivity/specificity balance

Table 7

Logistic regressions examining the contribution of each reporter using the brief SCAS

Note. CI=Confidence Interval

	b (Wald statistic)	Odds Ratio (95% CI)	R^2	Model
Parent+teacher model				
Constant	-4.23 (153.39**)			
SCAS-P-8 (total score)	.34 (103.44**)	1.40 (1.31-1.49)	.40 (Cox&Snell)	$X^2(2) =$
SCAS-T-8 (total score)	.17 (24.63**)	1.18 (1.11-1.26)	.54 (Nagelkerk)	278.07**
Parent+child model				
Constant	-3.19 (135.60**)			
SCAS-P-8 (total score)	.34 (128.97**)	1.40 (1.32-1.48)	.35 (Cox&Snell)	$X^2(2) =$
SCAS-C-8 (total score)	.03 (2.20, *p* = .14)	1.03 (.99-1.08)	.47 (Nagelkerk)	273.23**
Teacher+child model				
Constant	-2.44 (106.49**)			
SCAS-T-8 (total score)	.25 (69.72**)	1.28 (1.21-1.35)	.24 (Cox&Snell)	$X^2(2) =$
SCAS-C-8 (total score)	.11 (25.75**)	1.12 (1.07-1.16)	.33 (Nagelkerk)	148.63**
Parent+child+teacher model				
Constant	-4.24 (136.26**)			
SCAS-P-8 (total score)	.33 (85.76**)	1.39 (1.29-1.48)		
SCAS-C-8 (total score)	.02 (.71, *p* = .40)	1.02 (.97-1.08)	.40 (Cox&Snell)	$X^2(3) =$
SCAS-T-8 (total score)	.16 (21.28**)	1.17 (1.09-1.25)	.54 (Nagelkerk)	261.40**

**p<.001
*p<.01

Online Supplements

Online Supplement 1

Internal consistency (Cronbach's alpha) for brief and full versions of the SCAS in the two samples

	Community sample	Clinic-referred sample
SCAS-P-8	.82	.73
SCAS-P	.91	.89
SCAS-C-8	.84	.77
SCAS-C	.95	.91
SCAS-T-8	.80	.85
SCAS-T-20	.89	.92

Online Supplement 2

Agreement between reporters (Pearson's *r*) on the brief and full versions of the SCAS in the two samples

	Community sample	Clinic-referred sample
Parent-Child		
SCAS-P 8-SCAS-C-8	.40**	.34**
SCAS-P-SCAS-C	.42**	.34**
Parent-Teacher		
SCAS-P-8-SCAS-T-8	.32**	.28**
SCAS-P-	.29**	.21*

SCAS-T-20

Teacher-Child

SCAS-T-8   .25**   .05, *p* = .46

SCAS-C-8

SCAS-T-20-   .21**   .06, *p* =.39

SCAS-C

**p<.001
*p<.01

Online Supplement 3

Convergent and Divergent validity indices for the brief and full SCAS

		Community sample	Clinic-referred sample
	Parent report		
Convergent validity	SCAS-P-8– SDQ-P-emotion	.76**	.62**
	SCAS-P-8 SDQ-P-internalising	.70**	.58**
	SCAS-P-SDQ-P-emotion	.76**	.59**
	SCAS-P -SDQ-P internalising	.70**	.53**
Divergent validity	SCAS-P-8 -SDQ-conduct	.32**	.14*
	SCAS-P-8 -SDQ-P-externalising	.34**	.10, $p = .07$
	SCAS-P - SDQ-P-conduct	33**	.20**
	SCAS-P - SDQ-P-externalising	34**	.15*
	Child report		
Convergent Validity	SCAS-C-8– SDQ-C-emotion	.73**	.65**
	SCAS-C-8- SDQ-C-internalising	.68**	.62**
	SCAS-C- SDQ-C-emotion	.81**	.72**
	SCAS-C- SDQ-C-internalising	.75**	.69**
Divergent validity	SCAS-C-8- SDQ-C-conduct	.24**	.27**
	SCAS-C-8-SDQ-C-externalising	.33**	.31**
	SCAS-C-SDQ-C-conduct	.31**	.29**
	SCAS-C - SDQ-C-externalising	.40**	.34**
	Teacher report		
Convergent Validity	SCAS-T-8–SDQ-emotion	.74**	.73**
	SCAS-T-8- SDQ-T-internalising	.64**	.65**
	SCAS-T-20– SDQ-T-emotion	.76**	.75**
	SCAS-T-20- SDQ-T-internalising	.65**	.68**
Divergent validity	SCAS-T-8-SDQ-T-conduct	.26**	.08, $p = .22$
	SCAS-T-8 -SDQ-T-externalising	.21**	.11, $p = .10$

SCAS-T-20-SDQ-T conduct	.26**	.09, *p* = .18
SCAS-T-20-SDQ-T externalising	.22**	.12, *p* = .08

SDQ-P/C/T-emotion = SDQ-P/T/C- emotional problems scale; SDQ-P/C/T-internalising = SDQ-P/T/C-internalising problems scale; SDQ-P/C/T-conduct = SDQ-P/T/C-conduct problems scale; SDQ-P/T/C-externalising = SDQ-P/T/C-externalising problems scale
**p<.001*
p<.01

Online Supplement 4

Sensitivity and specificity when using multiple informant versions of the brief SCAS

	Sensitivity	Specificity
SCAS-P-8 + SCAS-T-8 (parent+teacher)	.93	.54
SCAS-P-8+ SCAS-C-8 (parent+child)	.95	.54
SCAS-P-T+ SCAS-C- (teacher+child)	.89	.48
SCAS-P-8+SCAS-T-8+SCAS-C-8 (parent+teacher+child)	.97	.42

Note.

Sensitivity/specificity values calculated using optimal cut-off scores for boys/girls identified in Table 6: SCAS-P-8, 7.5 (boys & girls); SCAS-C-8, 5.5 (boys), 7.5 (girls); SCAS-T-8, 3.5 (boys), 4.5 (girls).

n = 518 (i.e. participants with SCAS-P-8, SCAS-T-8, and SCAS-C-8 data available)

Online Supplement 5

Gender differences on the brief and full length SCAS

	Community sample			Clinic-referred sample		
	Boys	Girls	*t* test (Cohen's *d*)	Boys	Girls	*t* test (Cohen's *d*)
	Mean (SD)	Mean (SD)		Mean (SD)	Mean (SD)	
SCAS-P-8	5.33 (3.35)	6.03 (3.91)	$t(356) = 1.79, p = .07$	11.36 (4.58)	12.33(4.43)	$t(311) = 1.91, p = .06$
SCAS-P	16.23 (10.85)	20.13 (13.99)	$t(355) = 2.91^{**} (d = 0.31)$	37.93 (16.64)	40.90 (15.90)	$t(310) = 1.61, p = .11$
SCAS-C-8	4.90 (4.47)	6.84 (4.71)	$t(322) = 3.78^{**} (d = 0.42)$	8.44 (4.70)	9.93 (4.53)	$t(323) = 2.90^{*} (d = 0.32)$
SCAS-C	26.12 (20.43)	36.18 (20.45)	$t(320) = 4.39^{**} (d = 0.49)$	35.93 (17.85)	43.57 (18.33)	$t(321) = 3.79^{**} (d = 0.42)$
SCAS-T-8	3.19 (2.98)	3.56 (2.86)	$t(338) = 1.18, p = .24$	6.67 (4.38)	7.92 (4.85)	$t(228) = 2.03, p = .04$
SCAS-T-20	6.19 (6.20)	7.39 (6.11)	$t(338) = 1.80\ p = .07$	13.12 (9.53)	15.96 (10.34)	$t(225) = 2.14, p = .03$

**p<.001
*p<.01