Measurement Issues: Assessing Anxiety Disorders in Children and Adolescents

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Background: Given the relatively high prevalence of anxiety problems among young people and their adverse consequences if left untreated, it is important that clinicians and researchers have access to reliable and valid assessment tools to facilitate early detection, case formulation, treatment design, and evaluation of outcomes.

Method: This paper presents the findings of a pragmatic review of the literature regarding the assessment of anxiety in young people in multiple contexts, including mental health services, school-based screening, and research trials.

Results: Commonly used diagnostic interviews, questionnaire measures and alternative assessment methods are described, along with psychometric properties and practical issues. The review indicates the complexities of assessing anxiety problems given the high level of comorbidity between anxiety disorders and with depression. It also highlights the different approaches required for assessment across different age groups, the need for multiple informants, and issues relating to the lack of agreement between reporters. There is a strong evidence-base for several diagnostic instruments and anxiety scales, although the accuracy of youth and parent report scales in forming clinical diagnoses is not sufficiently strong to justify their use in isolation for diagnostic purposes.

Conclusions: The assessment of youth anxiety should ideally include a multi-informant, multi-method approach, with measures tailored to the age of the child, and the purpose of the evaluation. There is now a sufficiently strong research base to enable clinicians and researchers to ensure that they select evidence-based instruments.

Key Practitioner Messages

- The assessment of anxiety in children and adolescents needs to take a multi-informant approach, but we need to recognise that there is often weak agreement between parents, teachers and youth.
- Assessment needs to examine the different types of anxiety disorder and potential comorbidity between them and other disorders
- A developmental approach is required, to ensure that measures are appropriate for the age of the child.
- Multi-dimensional anxiety scales completed by parent and youth provide a strong supplement to diagnostic interviews in the assessment process, to inform the case formulation and treatment planning, but should not be used in isolation to provide clinical diagnoses
- More detailed measures for specific types of anxiety may be used, in addition to scales suitable to specific sub-populations.

1. Introduction

Anxiety disorders are among the most common mental health problems of childhood and adolescence, with a recent meta-analysis from 41 studies, 27 countries, and 63,130 young people suggesting a prevalence rate of 6.5% over the past 1-12 months (Polanczyk, Salum, Sugaya, Caye, & Rohde, 2015). They are associated with a range of adverse psychosocial consequences in terms of functioning within the family, peer relationships, and school outcomes (Lawrence et al., 2016). If left untreated, young people with anxiety disorders are at increased risk for continued mental health problems in adulthood, including other anxiety disorders, depression and substance misuse, and the majority of anxious adults report onset of anxiety prior to the age of 15 (Kessler et al., 2007). Furthermore, anxiety disorders are one the top 10 contributors to the global burden of disease for young people (Kyu et al., 2016). Thus, there is a strong case for early identification of and intervention for anxious youth. This paper provides a pragmatic review of the literature relating to the assessment of anxiety in children and adolescents in order to inform early detection, case formulation, treatment planning and evaluation of outcome.

Diagnostic classification systems such as DSM5 (American Psychiatric Association, 2013) indicate that children can present with different forms of anxiety disorder similar to adults, including Separation (SEP), Social (SOC), and Generalized Anxiety disorder (GAD), Panic, Agoraphobia, and Specific Phobias. The DSM5 also classifies selective mutism, substance/medication induced anxiety and anxiety due to another medical condition among the anxiety disorders, but no longer includes obsessive compulsive disorder. In all instances, a diagnosis of an anxiety disorder requires persistence of symptoms over a specified period, evidence that the fear or anxiety is out of proportion with reality, cannot be regarded as a normal part of the child's developmental period, and causes clinically significant distress or impairment to functioning in social, academic, occupational or other areas of life.

Comorbidity between the anxiety disorders is extremely common (Costello, Egger, Copeland, Erkanli, & Angold, 2011) and tends to increase with age (Beesdo, Knappe, & Pine, 2009). Factor analytic studies demonstrate a high level of co-variation between anxiety symptoms, supporting a clear, higher-order factor of "anxiousness" in general and yet there is also sufficient shared variation between clusters of symptoms to justify reference to specific anxiety disorders (Brown et al., 2013; Spence, 1997). There is also a significant proportion of children who report elevated but subclinical levels of anxiety but do not meet full diagnostic criteria for any anxiety

disorder. These children still show impairment in functioning at home, school and other domains and are at increased risk for progression to a clinical anxiety disorder and/or other disorders (Costello, Angold, & Keeler, 1999). Targeted prevention approaches for these young people are warranted and thus we need measures that enable early detection of those with subclinical anxiety symptoms. Anxiety screening is also important among young people who have experienced or are experiencing distressing or challenging life situations, such as painful or debilitating illnesses, painful medical procedures, family break-up, natural disasters, or war, where such a response would be relatively normal. This would enable clinicians to identify those who would be likely to benefit from interventions to help them to cope better with such situations.

One of the challenges in the assessment of youth anxiety concerns the particularly high level of comorbidity with depression (Cummings, Caporino, & Kendall, 2014; Garber & Weersing, 2010). While evidence supports the view that there is some distinction between anxiety and depressive disorders, there is also a good deal of overlap in symptoms. Indeed, recent studies confirm a bi-factor model involving an overarching general distress factor (often referred to as an “internalizing” concept) accounting for a large proportion of the commonality between anxiety and depression symptoms, with a smaller but still significant degree of variance in symptoms being explained by the anxiety disorders and depression (Brodbeck, Abbott, Goodyer, & Croudace, 2011; Brown et al., 2013). Thus, we expect to find that clinically anxious youth will frequently present with comorbid symptoms of depression, although they may not necessarily meet full diagnostic criteria for depression. The high level of overlap does, however, have implications for tailoring of treatment to the needs of the young person depending on the degree of comorbidity with depression.

2. The Purpose of the Assessment, Practical Considerations and Clinical Utility

Different assessment measures for youth anxiety have been developed for different contexts and purposes, such as:-

- i. screening in schools for early intervention and targeted prevention of those with elevated symptoms in comparison with the normative population;
- ii. identifying those with elevated symptoms in a clinical context who require more in-depth assessment;
- iii. assessing the nature and severity of symptoms and determining whether there is a clinical diagnosis, to inform the case formulation, the decision to treat, and the form of treatment;

- iv. establishing a baseline from which to a) monitor anxiety symptoms during therapy to inform whether changes in treatment are required and b) compare the post-treatment and follow-up results to determine the effectiveness of the intervention; and
- v. forming a component of clinical service or system evaluation (Sattler et al., 2016; Whiteside, Sattler, Hathaway, & Douglas, 2016).

The purpose of the assessment obviously influences the type of measure selected, such as its length, focus (broad range versus specific mental health problems), and the informant (youth, parents, teachers or clinicians). In some instances, measures that were designed for intensive research studies are less practical for clinical contexts where less time is available for their completion. Similarly, it is often impractical to use long, comprehensive assessment batteries with multiple informants to screen for anxiety problems in school settings.

In clinical contexts, the assessment process typically requires a clinical diagnosis using an evidence-based clinical interview, in addition to questionnaire reports that contribute to the case formulation. The choice of diagnostic interview will be influenced by the extent of specialist training required for administration and whether staff have the appropriate expertise. For example, administration of the Schedule for Affective Disorders and Schizophrenia for School-Age Children (KSADS; Kaufman et al., 1997) is restricted to mental health clinicians who have completed appropriate training in order to enhance the reliability of the measure. Further discussion of clinical interviews is provided below and in Table 1.

3. Elements of Anxiety and Different Informants

Anxiety can be regarded as including emotional/affective, cognitive, behavioural and physiological components. Information about these aspects can variably be obtained through questionnaires/surveys/rating scales, clinical interviews, direct behavioural observation (in naturalistic settings or the lab/clinic), monitoring/recording protocols, and physiological recordings. The most commonly used anxiety assessment measures provide data about how the child feels, what they think/worry about, what they do, and how their body reacts in trigger situations. Others aim to provide a more in-depth assessment of specific components of anxiety. For example, approach/avoidance tests may be used to evaluate the level of avoidance behaviour in specific feared situations, and typically ratings of subjective units of distress (SUDS) are used to assess the child's emotions in terms of level of fear experienced during exposure to such situations. In laboratory contexts, generally for research purposes, physiological recordings of responses such as heart rate and galvanic skin response can be used to evaluate anxious responding to specific stimuli.

Children can also vary in the locations in which they experience anxiety, such as home versus school, and again this influences the form of assessment that can best evaluate anxiety in these situations. Various informants can be used to elicit information, such as the child, parent (mother or father), teacher, clinician and/or researcher. However, the level of agreement between different informants and types of measures regarding the presence and severity of anxiety problems tends to be relatively weak (Becker, Jensen-Doss, Kendall, Birmaher, & Ginsburg, 2016; Hamblin et al., 2016; Weems, Feaster, Horigian, & Robbins, 2011). Various reasons have been proposed to explain such discrepancies. For example, parents and teachers may be relatively unaware of the internal cognitive and emotional experience of young people who, in turn, may be reluctant to respond honestly about their anxiety symptoms for fear of stigma or negative reactions from others (Headley & Campbell, 2011). Parents may also be unaware of their child's anxious presentation at school and similarly teachers will tend to have limited knowledge of a child's anxiety outside the school. Mothers and fathers may also have different perceptions of their child's behaviour depending on factors such as their level of contact with the child and their expectations regarding what is "normal" child behaviour, but overall the evidence suggests a moderate level of agreement between mothers and fathers regarding their child's anxiety (Moreno, Silverman, Saavedra, & Phares, 2008). Parents' own mental health problems may also contribute to a bias in their reporting, with negative affectivity leading to an over-estimation of their child's anxiety symptoms (Fjermestad et al 2017). Social stereotyping is a further factor that may influence parents' and teachers' tendencies to regard anxiety as a problem or not, with anxiety symptoms being more likely to be seen as problematic when they occur in boys than girls, for whom anxiety may be regarded as a more "normal" occurrence (Headley & Campbell, 2011). Notwithstanding the problem of weak agreement between informants, ideally, the assessment of anxiety should include data from multiple sources, with the clinician being required to use their judgement to integrate the information to produce a better understanding of the child's anxious emotions, cognitions, behaviours and physiological components.

The age of the child is a further variable that must be considered to ensure that content of the measure is developmentally appropriate and that normative data are available for the age range concerned. It is well-established that normal patterns of fears and worry change in childhood, shifting from infancy fears of strangers, to preschool fears of imaginary creatures (ghosts, witches, monsters), animals, and the natural environment (e.g., the dark, thunderstorms), to middle childhood emerging social fears, fears of physical danger, bodily injury, to adolescent fears and worries about tests, social affairs, death, and illness (Bauer, 1976; Muris, Merckelbach, Gadet, & Moulaert, 2000).

Thus, the assessment process needs to distinguish normal from abnormal fears at particular stages of a child's development. The assessment method chosen must also take into account the child's cognitive capacity to understand the assessment questions. For example, with preschool children, parents are typically used as the informant, although young children can also contribute to the assessment process through measures that include pictorial rating scales (e.g. Dubi & Schneider, 2009; Measelle, Ablow, Cowan, & Cowan, 1998; Muris et al., 2003).

4. Evidence-based Measures /Psychometric criteria – what do we look for?

It is important that measures are selected on the basis of strong evidence supporting their psychometric properties. Hunsley and Mash (2008) outlined the specific types of psychometric properties that should be considered. In terms of validity, there needs to be evidence that the measure assesses the construct that it purports to measure, and not other constructs. This is normally considered in terms of convergent validity (in that the measure produces results that correlate highly with other measures of that same construct) and divergent validity (that the results do not correlate so strongly with other constructs). There should also be evidence of good construct validity as reflected by factor analytic data, showing that the items within the scale (or subscales) cluster together in the manner predicted by the theoretical underpinnings of the scale(s). The measure should also show strong internal consistency, indicating that items within the scale are measuring the same construct and have good test-retest reliability over time and yet be sufficiently sensitive to change in anxiety that it can be used to detect changes in response to effective treatment. If the measure is to be used to make decisions about clinical diagnoses, then one would expect the scale to show high levels of sensitivity and specificity in relation to the gold-standard derived clinical diagnoses. That is, the scale should have a high level of accuracy in correctly identifying those who do have the disorder of concern (sensitivity) and yet should also be accurate in not identifying those who do not have the disorder (specificity) with a low false alarm rate.

If a measure is designed to detect individuals with a particular disorder, then it is important that evidence demonstrates that it has sufficient sensitivity and specificity to make correct judgements. The area under the curve (AUC) statistic quantifies the degree of diagnostic accuracy, with high sensitivity and high specificity being reflected in values around 0.90. A value of 0.50 indicates chance and no discrimination, with values below 0.70 representing low accuracy, and between 0.70 to 0.90 indicating useful discrimination for some purposes and above 0.90 excellent discrimination (Swets, 1988). Youngstrom (2014), however, pointed out that it is unrealistic to expect values of 0.90 and above in evaluating the diagnostic accuracy of clinical measures, as the

gold standard against which they are compared (diagnostic interviews) have a degree of unreliability themselves. He stated “in practice, many of the best-performing behavior checklists and inventories currently available deliver AUC estimates in the 0.7–0.8 range under clinically realistic conditions and with valid reference standard diagnoses”. These points should be born in mind in interpreting the sensitivity and specificity data for measures outlined in Table 2.

5. Diagnostic interviews

Ideally, the process of diagnosis should be informed by an evidence-based structured or semi-structured clinical interview. Given the high level of comorbidity between anxiety disorders and other mental health conditions, it is important that the interview assesses whether other disorders are present (including conduct disorders and substance abuse), plus developmental disorders, physical disabilities, and medical conditions, all of which will need to be addressed or considered in the treatment plan. The diagnostic decisions generated by such interviews have typically been regarded as the gold-standard against which the validity of other measures is tested. The validity of such clinical interviews themselves is rarely challenged despite some key limitations. For example, they assume that mental health symptoms do cluster together into categories in a reliable way, so that firm decisions can be made about the presence or absence of a particular disorder. Furthermore, the decision typically requires that a specific (and arbitrarily determined) level of severity/impairment is reached in order for a diagnosis to be given. Questions also remain about inter-interviewer agreement for clinical interviews. A true test of inter-assessor agreement should use interviewers who interview the child separately and independently at a point close in time and then compare judgements. This differs from approaches frequently used that involve having an independent assessor watching an interview conducted by another assessor, either live or videotaped, and then forming judgements about diagnoses (eg., Lyneham, Abbott, & Rapee, 2007; Silverman & Nelles, 1988). This latter approach is questionable in that it assumes that both interviewers would have asked the same questions, and followed the same decision making tree, and thereby elicited the same information. Despite these concerns, diagnostic interviews continue to play an important role in research into and treatment of youth anxiety disorders.

There are a variety of such interviews but the most commonly used ones that also have well-researched psychometric properties are the Anxiety Disorders Interview Schedule for Children/Parents (ADIS-C/P, Silverman & Albano, 1996), the Schedule for Affective Disorders and Schizophrenia for School-Age Children (K-SADS, Kaufman, Birmaher, Axleson, et al., 2016; Kaufman et al., 1997) and the NIMH Diagnostic Interview Schedule for Children-IV (NIHM DISC-

IV, Shaffer, Fisher, Lucas, Dulcan, & Schwab-Stone, 2000). Table 1 provides a summary of key properties relating to these interviews. The change from DSM-IV to DSM5 has meant that some changes are required to these measures to bring them into line with the most recent version of this diagnostic classification system. To date, only the K-SADS has been adapted for DSM-5, but no doubt work is in progress for the ADIS-C/P and DISC-IV.

The K-SADS, ADIS-C/P and DISC-IV all have parent and youth versions. The concordance between parent and youth report on these interviews is typically low to moderate (Grills & Ollendick, 2002; Popp, Neuschwander, Mannstadt, In-Albon, & Schneider, 2017). There is some evidence that agreement regarding anxiety disorders tends to be higher between parents and adolescents than between parents and children (Grills & Ollendick, 2003). Parent-youth agreement also tends to vary according to the type of anxiety disorder, being higher for SEP than for SOC or SpPh (Popp et al., 2017). Some differences exist in the way in which diagnostic instruments take parent and youth report into account in formulating a composite diagnosis. Kaufman, Birmaher, Axelson, et al. (2016), for the K-SADS, notes that all sources of information, including responses from parents, youth, and the school, should be considered. These authors suggest that, where discrepancies between informants are found, the interviewer should use his or her “best clinical judgement” regarding the presence or absence of symptoms. They propose that most discrepancies between parent and child report occur in relation to subjective phenomena reported by the child, about which the parents are unaware. For the ADIS-C/P, separate diagnoses are obtained for the parent and child and then a composite diagnosis is derived. If one or both interviews yield a diagnosis of clinical severity, the child is given a diagnosis aligned to the most severely rated diagnosis, be it from the parent or child interview. Although clear decision making rules are provided, the authors note that flexibility and clinical judgement are needed in deciding the composite diagnoses (Silverman & Albano, 1996). For the DISC-IV, in contrast, diagnoses are generated by computer algorithms and can be based on youth, parent or combined data (Shaffer et al., 2000). Interestingly, a review of parent-child informant agreement for diagnoses found low to moderate agreement irrespective of the level of structure or the interview and capacity for the clinician to use clinical judgement (Grills & Ollendick, 2002).

The K-SADS, ADIS-C/P and DISC-IV have advantages and disadvantages. The ADIS-C/P has been the interview of choice in the majority of research studies that relate to specifically to anxiety disorders. In contrast, the K-SADS has been more widely used throughout the clinical literature where the focus has been on depression or a wider range of disorders. As interviewers are expected to be clinicians who have completed KSADS training, it is less suitable for large-

scale, epidemiological research studies, for which the DISC-IV is frequently preferred. The DISC-IV has the advantage of computer scoring and strict algorithms and can be administered by non-clinicians. However, the very tight structure of the DISC-IV can be a disadvantage in clinical contexts where clinical judgement might indicate a deviation from the strictly controlled questioning. The greater flexibility provided by semi-structured interviews in which clinical judgement and expertise can be used, is of particular value in the assessment of anxiety disorders where the differential diagnosis often requires analysis of underlying cognitions.

Other measures that may be of interest to the reader include the Mini-International Neuropsychiatric Interview for Children and Adolescents (MINI-KID, Sheehan et al., 2009), The Diagnostic Interview for Children and Adolescents (DICA, Reich, 2000), the Children's Interview for Psychiatric Syndromes (ChIPS, Teare, Fristad, Weller, Weller, & Salmon, 1998) and the Child and Adolescent Psychiatric Assessment (CAPA, Angold & Costello, 2000) to mention just a few. Leffler, Riebel, and Hughes (2015) presented an excellent practical review of the main clinical diagnostic interviews currently in use, but this did not include the ADIS-C/P.

7. Questionnaires and rating scales (Youth, parent and teacher)

There are numerous rating scales to assess anxiety in young people that can be completed by youth, parents and/or teachers. These vary in terms of the degree of specificity, assessing either (i) the construct of anxiety more broadly, (ii) the multi-dimensional constructs of anxiety, covering symptoms across a range of disorders, with a total score plus subscale scores associated with specific anxiety disorders, or (iii) a specific type of anxiety problem, such as social, separation, generalized anxiety or panic disorder. As such, the different types of scales play different roles in the assessment process.

Multi-dimensional scales.

The multi-dimensional measures include subscales that relate to specific anxiety disorders, in addition to providing a total anxiety scale that recognises the high level of comorbidity between disorders. The most well-researched multi-dimensional anxiety scales are the Multidimensional Anxiety Scale for Children (MASC: March, Parker, Sullivan, Stallings, & Conners, 1997), the Spence Children's Anxiety Scale (SCAS: Spence, 1998), and the Screen for Child Anxiety-Related Emotional Disorders (SCARED: Birmaher et al., 1997). Table 2 presents a brief summary of the research relating to these three measures. Some key points are evident. All align with key DSM-IV diagnostic categories of anxiety (although they vary in terms of the disorders included), all have

parent and child versions, all have strong internal reliability in terms of total scores and to a varying degree for subscales. All have good test-retest reliability over periods of around 4 weeks, declining over time. Confirmatory factor analyses studies have generally supported the proposed factor structure of each measure, and studies have demonstrated good convergent validity with other measures of anxiety and divergent validity with respect to externalizing problems. Generally, there is a strong correlation between each of the measures and depression (Muris, Merckelbach, Ollendick, King, & Bogie, 2002) but a weaker correlation with the externalizing disorders (Delvecchio, Mabilia, Di Riso, Miconi, & Li, 2015; Monga et al., 2000; Thaler, Kazemi, & Wood, 2010). All measures have been translated into other languages. For example, the SCAS has been translated into over 20 languages and can be downloaded from www.scaswebsite.com.

Studies have demonstrated significant differences between scores of clinically anxious and non-anxious youth on these multi-dimensional scales. However, the sensitivity and specificity of the scales suggest low to moderate capacity to accurately identify clinically anxious from non-anxious youth in community populations or from those with other forms of mental health problem in clinical samples (Rey, Marin, & Silverman, 2013). Although evidence indicates that the multidimensional measures are more accurate in identifying clinically anxious cases than traditional measures such as CBCL, RCMAS or STAIC (Rey et al., 2013), none are sufficiently accurate to justify their use as clinical diagnostic instruments in isolation. Rather, they provide valuable information to identify potentially anxious children and to form hypotheses about presenting clinical problems that then should be supported by clinical interview and more in-depth assessment of specific areas (Grills-Taquechel, Ollendick, & Fisak, 2008). All three measures have been used in clinical trials in the evaluation for changes in anxiety symptoms and have been shown to be sensitive to treatment effects. Tentatively, the data in Table 2 suggests that parent report may be more sensitive to treatment effects than child report (See Table 2). Consistent with the proposition, Caporino et al. (2017) found the percentage change in SCARED scores to be greater for parent (mean of 58%) than youth (43%) report following treatment. Also, whereas optimal scores were identified for the percent change and absolute value (at post-treatment) of parent SCARED scores in the prediction of treatment response and remission, the quality of efficiency values for prediction were stronger for parent than youth report on the SCARED. Future meta-analyses may enable us to examine more closely whether parent report of anxiety symptoms is more sensitive than child report to treatment effects. It would also be valuable to determine whether this varies according to the age of the child.

Taken together, the evidence outlined in Table 2 suggests a good deal of similarity in psychometric properties for the MASC, SCAS and SCARED. All three measures have a strong role to play in the assessment of youth anxiety, in providing data to identify youth with elevated anxiety

symptoms for whom more in-depth and diagnostic interview is justified, to inform the case formulation, and to provide a baseline against which to monitor and assess change in response to treatment (particularly for parent report). However, as noted above these instruments are not sufficiently sensitive and specific to justify their use for diagnostic purposes. Nevertheless, they provide valuable information not only about anxiety levels in general but also about the type of anxiety symptoms experienced by the young person.

Two further measures should be mentioned at this point. The first is the Revised Children's Anxiety and Depression Scales (RCADS: Chorpita, Yim, Moffitt, Umemoto, & Francis, 2000), a modification of the SCAS (Spence, 1998). It includes 47 items of which 37 relate to anxiety and 10 to depression, with anxiety subscales covering OCD, GAD, SEP, Panic, and SOC. The RCADS has proved popular given its inclusion of the depression subscale. A recent meta-analysis involving 146 articles reporting on 192 studies (Piqueras, Martín-Vivar, Sandin, San Luis, & Pineda) reported high internal reliability for the anxiety scale (mean $\alpha = .93$) with subscale alphas ranging from .74 to .85. However, the RCADS consistent with its parent scale, the SCAS, and other multidimensional anxiety questionnaires is still of only low to moderate accuracy in diagnosing youth with anxiety disorders (Chorpita, Moffitt, & Gray, 2005), although accuracy was better for parent than child report (Ebesutani et al., 2010).

The second measure to mention is the Youth Anxiety Measure for DSM-5 (YAM-5: Muris et al., 2017). This scale was developed to align the symptom content more closely to the DSM-5, excluding OCD symptoms, distinguishing panic from agoraphobia, including selective mutism, and separating out specific phobias (of which there are many) into a separate scale. Part 1 of the YAM-5 consists of 28 items that assess separation anxiety disorder, selective mutism, social anxiety disorder, panic disorder, and generalized anxiety disorder, and Part 2 contains 22 items covering specific phobias and agoraphobia (given its overlap with situational phobias). To date, there is limited research into the psychometric and clinical properties of this new scale, although the first study shows good internal reliability (Muris et al., 2017).

Finally, there are numerous short-forms of the measures outlined above, but none of these have been subject to sufficient research to enable a thorough review. Nevertheless, they are likely to have a role to play in practice where a quick scan of anxiety symptoms is sufficient, and the aim is to identify those for whom more in-depth assessment is warranted.

General measures of anxiety and brief screening tools

Prior to the advent of multi-dimensional anxiety scales, the main measures used to assess anxiety in clinical practice and research covered the broader tendency to experience anxiety symptoms, for

example with the Revised Children's Manifest Anxiety Scale (Reynolds & Richmond, 1978) or the State-Trait Anxiety Inventory for Children (STAIC: Spielberger, Edwards, Lushene, Montuori, & Platzeck, 1973). The Fear Survey Schedule for Children – Revised (Ollendick, 1983) has also been widely used to assess the degree of children's fears associated with 80 potentially fearful situations (fear of failure and criticism, the unknown, minor injury and small animals, danger and death, and medical procedures). All three measures have satisfactory psychometric properties (Muris et al., 2002; Rey et al., 2013; Seligman, Ollendick, Langley, & Baldacci, 2004). They remain of value where the aim is to evaluate children's overall level of fearfulness or anxiety. However, they provide less information about specific types of anxiety aligned with DSM diagnoses, and it has been suggested that they are less accurate in discriminating anxious from non-anxious children than the multi-dimensional scales (Myers & Winters, 2002; Rey et al., 2013).

Subscales of broader child mental health questionnaires have also been used as indicators of anxiety. Stone, Otten, Engels, Vermulst, and Janssens (2010) present an excellent review of the psychometric properties of the Strengths and Difficulties Questionnaire (SDQ: Goodman, 1997) and noted the relatively weak internal reliability of the 5-item emotional symptoms subscale. These authors also pointed out that the SDQ was never developed as a diagnostic instrument and should not be used as such, but they supported its use as a screening tool. Youth, parent and teacher versions of the Child Behaviour Checklist (CBCL: Achenbach, 1991) internalizing scale (CBCL-INT) have also been widely used, and its anxiety subscale has been shown to be sensitive to treatment changes (Kendall et al., 2007). However, the original internalizing and anxious-depressed (CBCL-AD) subscales have been found to have only weak accuracy in detecting youth with anxiety disorders (Ferdinand, 2008; Pauschardt, Remschmidt, & Mattejat, 2010). A new scoring approach for assessing anxiety with the CBCL was developed by Achenbach, Dumenci, and Rescorla (2003) aligned with DSM-IV, using a 6-item anxiety problems subscale (CBCL-AP). Then, in response to concerns about the omission of physiological symptoms of anxiety in this new scale, Kendall et al. (2007) added in relevant items from the CBCL to form a 16-item anxiety measure (CBCL-A). In a comparison of the various versions for the CBCL anxiety-related subscales, (Read et al., 2015) found reduced internal reliability for the shorter subscales (alphas = .67, .75, .83, and .93 for the CBCL-AP, CBCL-A, CBCL-AD, and CBCL-Int scores respectively). These authors then examined the capacity of the various versions to correctly identify clinical diagnoses of anxiety within a large sample of clinically anxious youth. The results indicated that the CBCL-A was superior to CBCL-Int and CBCL-AD, but not CBCL-AP, in correctly identifying the presence of an anxiety disorder (any one of GAD, SOC or SEP). The capacity of all versions to correctly identify the specific type of anxiety problem was weak (Read et al., 2015). They concluded that the CBCL (and its many

anxiety-oriented subscales) may not provide a sensitive screener for specific anxiety disorders, and elevated scores tend to reflect high symptoms of anxiety more generally. Similar findings were reported by Pauschardt et al. (2010), with all four CBCL scoring systems showing weak capacity to accurately identify the presence of any anxiety disorder in a large sample of inpatient and outpatient clinical referrals with varying types of mental health or medical conditions. The greatest accuracy was shown by the 6-item CBCL-AP ($AUC = .70$) consistent with a study with a clinical sample reported by (Ferdinand, 2008) with $AUC = .70$ (parent) and $.76$ (youth) for detection of SEP, GAD or Specific Phobia. Together, the findings suggest relatively weak capacity of the CBCL to detect specific types of anxiety problems in youth. However, whether this performance is significantly lower than that found for multi-dimensional anxiety scales remains to be conclusively determined. As further research studies emerge it may be possible to conduct meta-analyses to answer this question. Meanwhile, it has been recommended to include further anxiety-specific measures such as SCAS, SCARED or MASC where the CBCL is used to assess anxiety (Ferdinand, 2008; Pauschardt et al., 2010).

Scales for assessing specific types of anxiety

Questionnaire measures to assess specific types of anxiety are of value in providing more in-depth assessment of a disorder in clinical contexts where initial screening or multi-dimensional measures suggest elevated scores in an area that warrant further investigation. They are also used in research studies in which the focus is upon a specific type of anxiety problem. As noted above, a large number of scales have been developed to assess specific types of anxiety and it is beyond the scope of this paper to review them all. For example, Tulbure, Szentagotai, Doborean, and David (2012) reviewed 13 measures just for social anxiety and concluded that four of them met criteria for evidence-based assessment, namely the Social Phobia and Anxiety Scale for Children (Beidel, Turner, & Morris, 1995), the Social Anxiety Scale for Adolescents (La Greca & Lopez, 1998), the Social Phobia Inventory (Connor et al., 2000), and the Liebowitz Social Anxiety Scale for Children and Adolescent (Masia-Warner et al., 2003). There are also various scales developed to assess separation anxiety, such as the Separation Anxiety Assessment Scale, Parent and Child Versions (Eisen & Schaefer, 2005) and the Children's Separation Anxiety Scale (Méndez, Espada, Orgilés, Llavona, & García-Fernández, 2014). Although a detailed scale for assessment of GAD in child and adolescents appears to be lacking, measures exist that assess its core constructs. For example, the Penn State Worry Questionnaire (Meyer, Miller, Metzger, & Borkovec, 1990) was adapted for

young people (Chorpita, Tracey, Brown, Collica, & Barlow, 1997) to assess the intensity, frequency, uncontrollability and pervasiveness of worry.

While some measures focussed on a specific anxiety disorder, others have been designed to assess fear in particular situations or towards certain objects. As an illustration, several measures have been developed to assess test anxiety such as the Test Anxiety Measure for Adolescents (Lowe, 2014), the Test Anxiety Inventory for Children and Adolescents (Lowe et al., 2008), the Test Anxiety Inventory (Spielberger, 1980), the Children's Test Anxiety Scale (Wren & Benson, 2004) and the Test Anxiety Scale for Children (Sarason, 1978). Scales also exist for assessing specific types of fears, such as spiders (Kindt, Brosschot, & Muris, 1996), the dark (Cornwall, Spence, & Schotte, 1996), dental procedures (Buchanan, 2005) and painful medical procedures (McMurtry, Noel, Chambers, & McGrath, 2011), to mention just a few. Such measures are typically used for obtaining a more detailed clinical evaluation of a particular anxiety disorder during the assessment process, for monitoring fear during specific situations, or for research studies.

Assessing anxiety in sub-populations

Clinicians and researchers have acknowledged the need to ensure that anxiety measures are appropriate to the needs of particular groups of children in terms of age, gender, culture, country, other comorbid mental health conditions, learning difficulties, and physical impairments. As a consequence, there is a good deal of research examining the construct validity and psychometric properties of anxiety measures when used with specific sub-populations, to ensure that the properties generalize from youth in the general population for whom such measures were typically developed initially. For example, research has demonstrated that the SCAS-P has strong psychometric properties when used with children with autism spectrum disorders, including the capacity to identify youth with anxiety disorders (Jitlina et al., 2017; Russell & Sofronoff, 2005; Wigham & McConachie, 2014; Zainal et al., 2014). However, there is some evidence that the factor structure of the SCAS-P may differ for children with ASD compared to the general population (Glod et al., 2017) indicating the need for caution and further research. In some instances, the original scale may be adapted slightly to meet the needs of the sub-population. For example, Rodgers et al. (2016) adapted the RCADS for youth with Autism Spectrum Disorders. Population-specific scales or adaptations have the advantage of including content of specific relevance to the group being assessed, but have the limitation of the results not being comparable with the general population of youth. There is a need for similar research to determine appropriate measures for

assessment of anxiety in other sub-groups, such as those with hearing and vision impairments, learning difficulties, and those who have experienced trauma or abuse. Infants and preschool children are a further population that need specific consideration in the assessment of anxiety. However, the topic could fill a research review on its own and it is beyond the scope of the present paper.

In terms of cultural differences, there is a rapidly expanding evidence-base relating to assessment of anxiety in youth from countries around the world. For example, as mentioned above, the SCAS has been translated into many languages and Orgiles, Fernandez-Martinez, Guillen-Riquelme, Espada, and Essau (2016) included studies from 18 different countries in their meta-analysis of the psychometric properties of the SCAS. Similar studies have also been conducted with other youth assessment measures. Although the measures generally show strong and consistent reliability across different countries and cultures, there are also differences that need to be taken into account. Again, using the SCAS as an illustration, the underlying factor model relating to social anxiety, separation anxiety, generalized anxiety, OCD, panic/agoraphobia and physical injury fears has been supported by the vast majority of studies. However, differences have been noted in the frequency with which specific symptoms are experienced, for example in comparing children from Japan with those from Western cultures (Ishikawa, Sato, & Sasagawa, 2009). Fears of spiders and the dark were particularly prevalent among Japanese children, who also reported more frequent checking that they had done things right and having to do some things in just the right way to stop bad things happening (from the OCD subscale). Ishikawa et al discussed possible explanations for such differences and also note the need for different norms across countries given variation in total mean and subscale scores.

6. Direct Observation

Behavioural observation can provide valuable information in the assessment of children's fear and anxiety problems. It relates to an approach to the collection of information rather than to standardized tests with interpretable norms. In clinical practice, behavioural observation plays an important part in the assessment of specific phobias in order to establish the exact nature of the child's fears and to inform the development of a treatment exposure hierarchy. The Behavioural Approach Task (BAT), for example, assesses the level of approach, avoidance and distress associated with specific real, virtual or simulated fear stimuli (Ollendick, Allen, Benoit, & Cowart, 2011). The BAT is individualized and administered according to each child's particular fear, and records the child's tolerance for proximity and duration of contact, their cognitions, emotions, and

ratings of subjective units of distress (SUDS; the degree of fear experienced) in response to exposure to situations associated with a feared stimulus. The data can then be used to inform the design of a child-specific exposure hierarchy and also to provide a baseline against which to monitor treatment progress. During the BAT, data can also be collected about children's physiological reactions to the feared stimuli, although this is generally more feasible in research studies than in regular clinical practice.

Behavioural observation in the clinic, home, or research laboratory is also useful in the assessment of other types of anxiety disorder, in addition to specific phobias. For example, it has been used to identify patterns of parent-child interaction that may contribute to the maintenance of anxiety. Hudson and Rapee (2001) developed a parent-child interaction task involving a tangram puzzle to observe and record parenting styles of intrusiveness and criticism. Where time and resources permit, behavioural observation can also be valuable in home and school contexts to identify antecedents, children's anxious responding, and consequences that could be modified as an element of treatment. For example, it can be used to monitor children's socially anxious behaviour at school, in different contexts (class versus playground), and the responses of peers and teachers.

7. Assessment of Impact

A final but important aspect of the assessment process is determination of the impact of the child's anxiety in terms of impairment in functioning across key domains of life, and also the adverse effects upon the parents and family functioning. Various scales can be used to assess children's adaptive functioning across a range of domains, such as the Barkley Functional Impairment Scale (Barkley, 2012), the Child and Adolescent Social and Adaptive Functioning Scale (Price, Spence, Sheffield, & Donovan, 2002) and the Sheehan Disability Scale (Sheehan, 1983). However, recent scales have been developed that focus more specifically upon the impact of child anxiety, to inform treatment decisions and contribute to the evaluation of treatment outcome. For example, Lyneham et al. (2013) developed the parent and child versions of the Child Anxiety Life Interference Scale (CALIS). Another option is the Child Anxiety Impact Scale (CAIS) with parent and child versions (Langley et al., 2014), assessing impact upon functioning in school, social and home/family domains. Both measures have good psychometric properties but require ongoing evaluation into their validity as tools to assess degree of impairment. The CALIS has the advantage of being shorter and including the impact upon the parents as well as on children, but the CAIS provides more in-depth consideration of impact upon the child. A recent study (Evans, Thirlwall, Cooper, & Creswell, 2016) demonstrated the value of the CAIS as an indicator of clinical improvement. A

post-treatment parent-reported CAIS cut-off score of 7 was a good predictor of remission in terms of absence of any anxiety disorder following treatment.

8. Cognitive processing, physiological and neuro-imaging measures

Gradually, researchers are developing new approaches to the assessment of anxiety in youth that include measurement of bias in cognitive processing (e.g. attention bias), physiological indicators (e.g. skin conductance, heart rate, and electromyography) and neuroimaging of brain structures and neural processes associated with anxiety (eg. functional magnetic resonance imaging). To date, such measures are predominantly used in research studies and require specialist training and equipment that preclude their use in routine clinical practice. Furthermore, the evidence base is not yet at a stage to demonstrate their reliability and validity in the assessment of youth anxiety. This is likely to change in the future and a review in ten years' time is likely to draw a very different conclusion.

9. Discussion

This review has highlighted the burgeoning number of measures for assessing anxiety in children and adolescents. Gradually evidence is emerging to guide practitioners and researchers in the selection of those that have strong psychometric properties, are developmentally appropriate, and are fit for purpose. There is now a good range of instruments that have been designed specifically for use with children and adolescents, rather than being simple downward extensions of measures that were created for adults. This review has highlighted that different measures are appropriate for different purposes, and thus the selection of instruments will vary according to whether the aim is one of initial screening, more in-depth assessment of a specific disorder, diagnosis, or treatment evaluation.

In addition to emphasizing the need to ensure that assessment methods are evidence-based, this review stressed the importance of obtaining information from multiple informants where possible. It was recognised, however, that the information obtained tends to differ according to the perspective of the reporter, with only moderate agreement between youth, parents and teachers. The clinician will need to use their skills, knowledge and experience to bring the information together from different measures and sources to create the case formulation and treatment plan.

A key point emerging from this review is that current questionnaires, whether completed by parents and/or youth, are insufficient to provide a reliable and valid clinical diagnosis. Indeed, they were not intended as such and were designed as instruments to identify those with a “probable” anxiety problem, to supplement information from a clinical diagnosis or to track changes in anxiety symptoms over time. The issue of comorbidity was acknowledged, and in clinical practice it is

likely that young people will present with multiple anxiety disorders or other forms of mental health problem. Thus, anxiety instruments need to be integrated with those for assessing other presenting issues.

10. Acknowledgements

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Table 1

Examples of Diagnostic Interviews Used in the Assessment of Anxiety in Children and Adolescents

Title and Key Reference	Brief Description	Informants	Age range	
Anxiety Disorders Interview Schedule for Children/Parents (Silverman & Albano, 1996)	<ul style="list-style-type: none"> Semi-structured interview, Current version based on DSM-IV-TR (American Psychiatric Association, 1994). Covers all DSM-IV-TR anxiety disorders. Assesses anxiety, mood and externalizing disorders, with particularly strong assessment of anxiety disorders. Parent(s) and child are interviewed separately with guidelines for generating a composite diagnosis. Includes screening questions and skip options that enable shorter administration time (Around 60-90 mins per informant). Includes clinician severity ratings for degree of impairment and interference in functioning, plus ratings of youth's fear and avoidance of situations relating to anxiety disorder. Intended for use by mental health clinicians. 	Parent and/or Child	6-17 years	<p>Inter-assessor agreement: From direct observation of interviewers: overall kappa for all DSM-III-R diagnoses = 0.87 (Silverman & Nelles, 1988); From taped interviews: individual anxiety disorders, kappa = 0.82 -0.96 for individual disorders (Lyneham et al., 2007); overall agreement across disorders, kappa = 0.71 (child); 0.77 (parent) (Grills & Ollendick, 2003)</p> <p>Test-retest reliability: For individual anxiety disorders Kappa = 0.80 - 0.92 from 7-14 days (Silverman, Saavedra, & Pina, 2001)</p> <p>Construct validity: Good evidence of agreement with youth and parent anxiety scales (Brooks & Kutcher, 2003; Wood, Piacentini, Bergman, McCracken, & Barrios, 2002)</p> <p>Sensitivity to treatment effects: Strong evidence of capacity to detect treatment effects (Brooks & Kutcher, 2003)</p>
NIMH Diagnostic Interview Schedule for Children-IV	<ul style="list-style-type: none"> Highly structured, standardized clinical interview Assesses over 30 psychiatric diagnoses based on DSM-IV and ICD-10 criteria. 	Parents/caregivers and/or Child	Parent version 6-17 years, but can	<p>Inter-assessor agreement: As administration is fully structured and scoring determined by computer-based rules inter-assessor agreement is not generally assessed.</p> <p>Test-retest reliability</p>

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<p>(Shaffer et al., 2000) (Shaffer et al., 2000)</p>	<ul style="list-style-type: none"> • Questions are fixed and read aloud by the interviewer. • Assesses symptoms over past 4 weeks and past 12-months. The lifetime modules are optional. • Responses scored using a computer algorithm and a computer-administered version is available. • Length (~90 - 120 mins per informant), depending upon client responses to stem questions. • Interviewers are not expected to be clinicians. 		<p>be used with 4-5 years. Youth version 9-17 years</p>	<p>Average of 7-day interval - for individual anxiety disorders, kappa = 0.48 - 0.86 (Shaffer et al., 2000) Average of 12 days, Spanish version - for any anxiety disorder in past month, kappa = 0.47 (range 0.27 to 0.66 for individual anxiety disorders) (Bravo et al., 2001) Construct validity: Weak to moderate agreement with other clinical diagnostic interviews and clinician judgement (Angold et al., 2012; Lewczyk, Garland, Hurlburt, Gearity, & Hough, 2003; Luby et al., 2002) Sensitivity to treatment effects: Evidence of capacity to detect treatment effects (Southam-Gerow, 2010)</p>
<p>The Schedule for Affective Disorders and Schizophrenia for School-Age Children – Present and Lifetime Version (K-SADS-PL) (Kaufman et al., 1997)</p>	<ul style="list-style-type: none"> • Recently adapted for DSM5 (Kaufman, Birmaher, Axelson, et al., 2016). • Anxiety diagnoses cover Panic, Agoraphobia, SEP, SpecPh, SOC, Selective Mutism and GAD. • Semi-structured interview using a modular approach, with screening questions and skip options that enable shorter administration time (Around 60-90 mins per informant). • Prior to interview, parents and youth complete the 25-item DSM5 symptom scale. • Interviewers are expected to be clinicians who have completed KSADS training. 	<p>Parent and Child</p>	<p>6 – 18 years</p>	<p>Inter-Assessor Agreement: From direct observation and videotapes of interviewers, kappa = 0.57 – 1.00 for individual anxiety disorders (Lauth, Magnússon, Ferrari, & Pétursson, 2008), for KSADS-III-R, kappa = 0.75 – 0.92 for individual anxiety disorders based on parent-youth composite (Ambrosini, Metz, Prabucki, & Lee, 1989). Test-retest reliability: Any anxiety diagnosis Kappa = .80 (Kaufman et al., 1997) Inter-assessor agreement for any anxiety disorder kappa = 0.84 (Ulloa et al., 2006) and kappa = 0.75 - 0.92 for specific disorders (Ambrosini, 2000). Construct validity: Significant associations with SCARED and CBCL Internalizing scales (Kaufman et al., 1997) and 0.89 agreement for any anxiety diagnosis and World Health Organization Composite International Diagnostic Interview (CIDI) (Kessler, 2009) Sensitivity to treatment effects:</p>

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				Evidence of capacity to detect treatment effects (Hirshfeld-Becker et al., 2010)
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Table 2

Examples of Multi-Dimensional Questionnaires Used in the Assessment of Anxiety in Children and Adolescents

Title and Key Reference	Brief Description	Informants	Age Range	Reliability and Validity
<p>Spence Children's Anxiety Scale (Child version - SCAS-C Spence, 1998)</p> <p>(Parent version - SCAS-P Nauta et al., 2004)</p>	<ul style="list-style-type: none"> 38 anxiety items, 6 optional positive filler items reflecting DSM-IV anxiety disorders. Provides total anxiety score and 6 subscales: social anxiety, separation anxiety, generalized anxiety, obsessive compulsive disorder, panic/agoraphobia and physical injury fears. Can be accessed free of charge for research and non-commercial clinical purposes at:- www.scaswebsite.com 	<p>Parent</p> <p>Child</p>	<p>7-17 years</p>	<p>Internal consistency: Child report- Orgiles et al. (2016)⁴ reports meta- (Langley et al., 2014) analysis of 32 studies (29,350 children) mean alpha of .92 for total score. Subscale reliability alphas = 0.70 to 0.80 except physical injury fears (.64). Parent report- Total score: alpha = 0.89 - 0.90 (subscales = 0.63 - 0.81 (Nauta et al., 2004; Wang, Meng, Liu, & Liu, 2016)</p> <p>Test-retest reliability: SCAS-C: 2-weeks- Total score = 0.84 (range 0.61 to 0.82 for subscales) (Kristian Arendt, Hougaard, & Thastum, 2014); 8-weeks Total score = 0.94 (range 0.70 to 0.84 for subscales) (Essau, Anastassiou-Hadjicharalambous, & Munoz, 2011); 12 weeks Total score = 0.63 (0.51 - 0.75 for subscales) (Spence, Barrett, & Turner, 2003); SCAS-P: 2-weeks Total score = 0.88 (0.60 - 0.87 for subscales) (Kristian Arendt et al., 2014).</p> <p>Construct validity: 21 studies out of 25 using confirmatory factor analysis supported the original 6-factor model with children (Orgiles et al., 2016)</p> <p>Sensitivity and specificity for detection of diagnosed anxiety disorders: low to moderate diagnostic accuracy in identifying children with anxiety disorders. SCAS-C Sensitivity = 0.64, Specificity = 0.62, SCAS-P Sensitivity = 0.74, Specificity = 0.55, at cut of 1.5 SDs above mean (Brown-Jacobsen, Wallace, & Whiteside, 2011). AUC = 0.89 (Child); 0.86 (parent), SCAS-C Sensitivity = 0.91/0.62, Specificity = 0.53/0.94, SCAS-P Sensitivity = 0.91/0.64, Specificity = 0.73/0.94 at cuts for total score of 22 and 33 respectively (Olofsdotter, Sonnbly, Vadlin, Furmark, & Nilsson, 2016). SCAS-P 86% of the anxiety disordered and 71% of the normal controls correctly identified (Nauta et al., 2004); See</p>

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				<p>original papers for details re: individual subscales and specific disorders.</p> <p>Convergent and divergent validity: SCAS-P –significant associations with CBCL internalizing scale and RCMAS (Nauta et al., 2004), SCAS-C – significant associations with MASC, SCARED, STAIC, RCMAS, FSSCR (Baldwin & Dadds, 2007; Essau, Muris, & Ederer, 2002; Muris et al., 2002). Lower association of child and parent SCAS with externalizing problems (Delvecchio et al., 2015; Nauta et al., 2004)</p> <p>Sensitivity to treatment effects: Significant effect for treatment versus wait list control or treatment as usual for SCAS-C and SCAS-P (K. Arendt, Thastum, & Hougaard, 2016; Cobham, 2012; Wuthrich et al., 2012). SCAS-C (Barrett, Farrell, Ollendick, & Dadds, 2006); Child but not parent effects (van Starrenburg, Kuijpers, Kleinjan, Hutschemaekers, & Engels, 2017). Parent but not child effects (Donovan, Cobham, Waters, & Occhipinti, 2015; Vigerland et al., 2016)</p>
<p>Multidimensional Anxiety Scale for Children (MASC March et al., 1997)</p>	<ul style="list-style-type: none"> • 39 anxiety items • Provides total anxiety score and 4 subscales: physical symptoms, social anxiety, separation/panic and harm avoidance. • Note: MASC-2 (March, 2012) is a revision of the MASC with 50 items that, in addition to the original subscales, also cover generalized anxiety, obsessions and compulsions, physical symptoms and an inconsistency index. The majority of research to date has used the original MASC 	<p>Parent</p> <p>Child</p>	<p>8 – 18 years</p>	<p>Internal consistency: Child Report Total: alphas = 0.87 - 0.93 (subscales = 0.64 - 0.90) (see Grills-Taquichel et al., 2008 for a summary). Parent Report: Total alphas = 0.87–0.90 (subscales = 0.71 - 0.90) (Baldwin & Dadds, 2007; Villabo, Gere, Torgersen, March, & Kendall, 2012)</p> <p>Test-retest reliability:- 1-month Total score (ICCs) = .73-.86 (.60 -.90) subscales (See Rey et al., 2013 for a review); 12-months: parent .70 (.47 - .55 subscales); child 0.52 (0.56 - 0.70 subscales) (Baldwin & Dadds, 2007)</p> <p>Construct validity: Good support for the original 4 factor model (e.g. Baldwin & Dadds, 2007; Brown et al., 2013; Grills-Taquichel et al., 2008; March et al., 1997)</p> <p>Sensitivity and specificity for detection of diagnosed anxiety disorders:- Rey et al. (2013), in a review of studies, concluded that child and parent MASC total scores have low to moderate diagnostic accuracy in identifying children with anxiety disorders (AUCs: 0.60–0.82) and child and parent MASC subscales also have shown low to moderate</p>

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	and thus this review has not covered MASC-2.			<p>diagnostic accuracy in identifying children with specific anxiety disorders corresponding to the respective subscales (AUCs: 0.51–0.84). Clinical sample - (anxious vs non-anxious) 61% accuracy (Grills-Taquechel et al., 2008).</p> <p>Convergent and divergent validity:- Good convergent validity with SCAS for parent and child versions (Baldwin & Dadds, 2007) and with SCAS-C, SCARED, STAIC, RCMAS, FSSCR (Muris et al., 2002). Divergent validity with externalizing problems in children with learning difficulties (Thaler et al., 2010).</p> <p>Sensitivity to treatment effects:- Significant effect for treatment versus wait list control or treatment as usual for MASC-child (Hancock et al., 2016; Ost, Cederlund, & Reuterskiold, 2015), for MASC-parent not child (Chiu et al., 2013). Not for MASC-Child (Cartwright-Hatton et al., 2011; Storch et al., 2015) nor for MASC-Child or MASC-parent (Smith, Flannery-Schroeder, Gorman, & Cook, 2014) where other measures indicate significant improvements</p>
<p>Screen for Child Anxiety-Related Emotional Disorders (SCARED)</p> <p>38 items (Birmaher et al., 1997)</p> <p>41 items (Birmaher et al., 1999)</p>	<ul style="list-style-type: none"> • 38 and 41 item versions) • Total score and 5 subscales: separation anxiety, generalized anxiety, social anxiety, panic/somatic, and school phobia. • 66 item version reported by Muris et al. (1998) covering symptoms of panic, separation anxiety, generalized anxiety, social anxiety, OCD, Traumatic Stress Disorder, Specific Phobias (Animal type, Blood-Injection-Injury and 	<p>Parent</p> <p>Child</p>	<p>9-18 years</p>	<p>Internal consistency:- Child Report: meta-analysis of 20 studies alpha = 0.91 for total score; subscale alphas = 0.62 - 0.84 (DeSousa, Salum, Isolan, & Manfro, 2013)</p> <p>Parent Report - alphas = 0.90 (Birmaher et al., 1999), 0.88 (Canals, Hernández-Martínez, Cosi, & Domènech, 2012), 0.93 subscales = 0.72 to 0.91 (Gonzalez, Weersing, Warnick, Scahill, & Woolston, 2012)</p> <p>Test-retest reliability:- 5-weeks Total Score ICC=0.86 (subscales = 0.70-0.90) (Birmaher et al., 1997), 3-months Total Score ICC = .50 (subscales = 0.24 – 0.67) (Linyan, Kai, Fang, Yi, & Xueping, 2008)</p> <p>Construct validity:- 4 out of 5 confirmatory factor analytic studies supported the original 5 factor model (Hale, Crocetti, Raaijmakers, & Meeus, 2011)</p> <p>Sensitivity and specificity for detection of an diagnosed anxiety disorder:- low to moderate diagnostic accuracy in identifying children with anxiety disorders in community and clinical contexts- SCARED-Child – 41 items, community sample) AUC = 0.50, Sensitivity = 0.81,</p>

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	Situational-Environmental type)			<p>Specificity = 0.52 (DeSousa et al., 2013); SCARED-Child (Community sample) African Americans, Sensitivity = 0.60, Specificity = 0.88, Non-Hispanic (white) Sensitivity = 0.68, Specificity = 0.77 (Gonzalez et al., 2012); SCARED-parent total score (at risk sample) AUC = 0.69, Specificity = 0.56, Sensitivity = 0.81 (Van Meter et al., 2016); SCARED-child (community sample) AUC = 0.80, Sensitivity = 0.76, Specificity = 0.68; SCARED-parent AUC = 0.69, Sensitivity = 0.66, Specificity = 0.60 (Canals et al., 2012); SCARED-child (clinical sample) AUC = 0.67 (Monga et al., 2000); SCARED-child (41 items; clinical sample) sensitivity = 0.71, specificity = 0.67 (Birmaher et al., 1999)</p> <p>Convergent and divergent validity:- The SCARED-Child – showed strong correlations with MASC, SCAS-C, STAIC, RCMAS, FSSCR (Muris et al., 2002), SCARED-Parent – strong correlation with CBCL Internalizing but not externalizing (Monga et al., 2000)</p> <p>Sensitivity to treatment effects:- Significant effect for treatment versus wait list control or treatment as usual for parent and child SCARED (Birmaher et al., 2003; Bodden et al., 2008), SCARED- parent (Cartwright-Hatton et al., 2011), parent but not child SCARED (Ginsburg, 2009; Goldbeck, Muche, Sachser, Tutus, & Rosner, 2016)</p>
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