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Psychometric properties of the Spence Child Anxiety Scale with adolescents from five European countries

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ABSTRACT

This study examined the factor structure, reliability, and validity of the original Spence Child Anxiety Scale (SCAS) and its four translations (German, Cypriot Greek, Swedish, Italian). A total of 2558 adolescents from five European countries (Germany = 495; Cyprus = 611; UK = 469; Sweden = 484; Italy = 499), ages 12–17 years, participated in the study. In addition to the SCAS, all participants completed the Strengths and Difficulties Questionnaire, a measure of general difficulties and positive attributes. The internal consistency and validity (convergent and discriminant) of the SCAS were excellent. Multiple group confirmatory factor analysis provided strong support for the generalizability of a 6-factor inter-correlated model across five European countries. Adolescents in the UK had significantly higher anxiety levels than adolescents in four other European countries. Our findings suggest that the SCAS is suitable for assessing anxiety disorder symptoms in adolescents in Germany, the UK, Cyprus, Sweden, and in Italy.

1. Introduction

The Spence Children's Anxiety Scale (SCAS; Spence, 1998) is one of the most widely used self-report questionnaires to assess children and adolescent's perception of the frequency with which they experience symptoms relating to generalized anxiety disorder, separation anxiety disorder, social phobia, panic disorder and agoraphobia, obsessive–compulsive disorder, and fears of physical injury. The SCAS has increasingly been used in diverse settings and cultures, including in Australia (Spence, 1998), the Netherlands (Muris, Schmidt, & Merckelbach, 2000), Germany (Essau, Sakano, Ishikawa, & Sasagawa, 2004), Japan (Essau et al., 2004; Ishikawa, Sato, & Sasagawa, 2009), China (Essau, Leung, Conradt, Cheng, & Wong, 2008), Greece (Mellon & Moutavelis, 2007), South Africa (Muris, Schmidt, Engelbrecht, & Perold, 2002), Spain (Tortella-Feliu, Balle, Servera, & de la Banda, 2005), and in the United States (Whiteside & Brown, 2008).

Being a dimensional rating scale, the SCAS can be used to provide information about the severity of anxiety symptoms, which could assist with diagnosis, treatment planning and measuring treatment outcomes (Silverman & Ollendick, 2008). The advantage of this approach, in comparison to the categorical approach to classification, is that it helps to provide sufficient coverage of symptom presentation that may be of clinical significance when criteria for diagnostic categories are not met (Brown & Barlow, 2009). Brown and Barlow (2005, 2009) convincingly argue for the introduction of dimensional severity ratings to the extant diagnostic categories because such information should help to address some of the disadvantages of using only the categorical approach.

Three major types of studies have been conducted using the SCAS. The first series of studies evaluate the psychometric properties of the scale. In the original paper describing the development of SCAS (Spence, 1997), the alpha for the total score was reported to be .92; the alphas for the six subscales were .82 for panic-agoraphobic symptoms, .70 for separation anxiety, .70 for social phobia, .60 for physical injury fears, .73 for obsessive–compulsive, and .73 for generalized anxiety. Numerous other studies have similarly shown high alpha coefficients for the SCAS (e.g., Essau, Muris, & Ederer, 2002; Essau et al., 2004; Essau et al., 2008; Ishikawa et al., 2009; Mellon & Moutavelis, 2007; Spence, Barrett, & Turner, 2003; Whiteside & Brown, 2008). The 6-month and 12-week test–retest reliability among two Australian samples was .60 (Spence, 1997) and .63 (Spence et al., 2003), respectively. Higher test–retest reliability coefficients have been reported when the SCAS was administered within a shorter time period. For example, the 3-week test–retest reliability coefficient for the Hellenic

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SCAS was .83 (Mellon & Moutavelis, 2007). The test–retest reliability coefficients (2–4 weeks) of the Japanese SCAS were .76 in children and .86 in adolescents (Ishikawa et al., 2009). Collectively, these findings have provided a firm basis for the reliability and internal consistency of the scale.

The second type of studies has examined the validity of the SCAS. Spence (1998) demonstrated differences between anxious children and non-anxious children on the SCAS. A recent study by Whiteside and Brown (2008) showed significant differences in mean scores on all subscale and total scores of the SCAS between anxious and non-anxious community samples of children and adolescents. In several other studies, the correlations among the six subscales scores were lower than the correlations of each of the subscale scores with the total anxiety scores (Mellon & Moutavelis, 2007; Muris et al., 2000; Spence, 1998). The convergent validity of the SCAS has been tested by computing correlations between SCAS and other measures that purport to assess the construct of anxiety such as the Screen for Child Anxiety Related Emotional Disorders (SCARED; Birmaher et al., 1999) and the Revised Children's Manifest Anxiety Scale (RCMAS; Reynolds & Richmond, 1978). In a study by Essau et al. (2002), a significant positive correlation was found between the SCAS and the SCARED, as well as between most of the SCAS subscales and their corresponding SCARED subscales. That is, SCAS separation anxiety correlated strongly with SCARED separation anxiety, SCAS panic with SCARED panic, and so forth. The SCAS also correlated significantly with the Children's Depression Inventory (Kovacs, 1985), Depression Self-Rating Scale (Birleson, 1981), Columbia Impairment Scale and the Youth Self-Report (Essau et al., 2002; Ishikawa et al., 2009; Spence et al., 2003). These findings suggest that a high level of anxiety symptoms is associated with a high level of depression, high impairment in various life domains, and a high level of emotional and behavioral problems. As reported by numerous authors, the presence of anxiety has negative impact on various areas of children's life including academic performance, social functioning, and behavioral deportment (Essau, Conradt, & Petermann, 2000; Ollendick & Seligman, 2006). Within the Youth Self-Report scales, as expected, the SCAS total anxiety scores were most strongly associated with the anxious/depressed scale. The SCAS has also been reported to correlate significantly and negatively with teacher's evaluations of the children's school performance and adjustment (Mellon & Moutavelis, 2007). These results provide support to the validity of the SCAS.

The third type of studies examined the factor structure of SCAS. Compared to the two other types of studies, considerable controversy remains regarding the factor structure of this instrument. In the original studies, confirmatory factor analyses comparing four models (i.e., single-factor, six uncorrelated factors, six correlated factors, and six factors loading onto a single higher order factor) suggested that the six-factor, higher order model fit better than the other models (Spence, 1997, 1998). However, a subsequent study by Spence et al. (2003), based on Australian adolescents, provided strong support for a six-correlated factor model which involved six factors related to generalized anxiety disorder, separation anxiety disorder, social phobia, panic disorder and agoraphobia, obsessive–compulsive disorder, and fears of physical injury. However, these factor structures have not always fit the data based on its translated versions. For example, in Essau et al.'s study (2004), a five-factor model best accounted for the data of German children. This finding was recently replicated by Essau et al. (2008), whose study examined the psychometric properties of the Chinese SCAS among the 12–17 years old in Hong Kong. Further support for the five-factor model came from a study that used the Japanese SCAS (Ishikawa et al., 2009) in that the five-factor model with one higher order factor had a better fit for the Japanese data. In addition, data from South African youth (Muris et al., 2002) showed a four-factor structure which was different from any other country. These four factors were related to fears (i.e., fears from the physical injury subscale and panic disorder and agoraphobia subscale, and a number of separation anxiety items), social phobia (i.e., the original five social phobia items and several general worry items), panic disorder (i.e., the physical symptom items from the original panic disorder and agoraphobia subscale), and worry and compulsion (i.e., items from the original generalized anxiety and separation anxiety subscales, and 4 items of the original obsessive–compulsive disorder subscale). Differences in socialization practices and cultural values (e.g., social norms, theoretical worldviews, environmental factors, educational and parenting practice) could have contributed to differences in these findings (e.g. Essau et al., 2008). In sum, it remains unsettled at this time whether the factor structure of the SCAS as determined by Spence et al. (2003) can be applied to children and adolescents with other cultural backgrounds.

Therefore, the main aim of this study was to explore the factor structure of the SCAS and its psychometric properties and validity when used among adolescents in five European countries, as well as to compare anxiety levels across countries. The more specific aims were: (1) to investigate the psychometric properties of the four translations (German, Swedish, Italian and Greek) and the English version of the SCAS; (2) to examine whether the same factor structure fit across the 5 European countries; (3) to determine if anxiety scores correlate in the expected direction with a measure of emotional symptoms; and (4) to compare anxiety levels across the 5 European countries.

2. Method

2.1. Sample

A total of 2558 adolescents who attended urban schools in five European countries (Germany = 495; Cyprus = 611; England = 469; Sweden = 484; Italy = 499) participated in the study. To allow comparability across countries, the schools were randomly selected from cities with similar sizes. Participants' ages ranged between 12 and 17 years (mean = 14.56 years; SD = 1.6).

The British sample was recruited from schools in South West London. The British sample consisted of 218 males (46.5%) and 251 females (53.5%), with a mean age of 14.44 years (SD = 1.7). The German sample was recruited from schools in Northrhein Westfalia. The sample consisted of 216 males (43.6%) and 279 females (56.4%); the mean age was 14.6 years (SD = 1.6). The Cypriot sample was recruited from schools in the non-occupied territory of the island, and consisted of 237 males (38.8%) and 374 females (61.2%) and the mean age of the respondents was 15.53 years (SD = 1.60). The Swedish sample was recruited from schools in the south part of Stockholm. Two hundred and thirty (47.5%) of the sample were males, and 254 (52.5%) were females; the mean age was 14.51 years. The Italian sample was recruited from schools in the northern part of Milan. More than half of the Italian sample were females (N = 336; 67.3%); 163 (32.7%) were males. Their mean age was 14.74 years (SD = 1.52). An ANOVA failed to show any significant differences among the five samples in terms of age distribution ($F(4, 2557) = 2.34$, n.s.).

Except for participants in the UK, almost all (ranging from 92% to 97%) the adolescents in Germany, Cyprus, Italy, and Sweden were Caucasian; the ethnic composition of the sample therefore reflected the composition of the larger culture of each country. The ethnic composition found in the UK was somewhat more diverse but still largely Caucasian: 76% were White, 15% were Asian/Asian British, 6% were Black/Black British, 3% were Chinese or other ethnic groups. All of these adolescents were born and raised in the UK and are either second or third generation British citizens. This ethnic composition is representative for that in the UK. In all countries,