The facets of anxiety sensitivity in adolescents

Cecilia A. Essau [a,*], Satoko Sasagawa [b], Thomas H. Ollendick [c]

[a] School of Human and Life Sciences, Roehampton University, Whitelands College, Holybourne Avenue, London SW15 4JD, UK
[b] Faculty of Human Sciences, Mejiro University, 4-31-1 Naka-Ochiai, Shinjuku-ku, Tokyo 161-8539, Japan
[c] Child Study Center, Department of Psychology, Virginia Tech, Blacksburg, VA 24060, USA

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ABSTRACT

This study examined the factor structure, reliability, and validity of the German translation of the Childhood Anxiety Sensitivity Index (CASI). A total of 1292 adolescents participated in the study. Analyses using the Schmid-Leiman solution showed the CASI to have one higher order factor and three orthogonal lower order factors. CASI scores correlated significantly with anxiety symptoms and with general difficulties. Hierarchical multiple regression showed CASI to make a significant contribution in predicting anxiety even after controlling for variance due to general difficulties, thus giving further support to the incremental validity of the CASI. The CASI is a potentially useful measure to include in longitudinal studies that examine the development of childhood and adolescent anxiety disorders.

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1. Introduction

Anxiety sensitivity (AS) is the belief that the experience of anxiety or anxiety-related bodily sensations, such as increased heart rate, trembling, and derealization have negative social, psychological, or physical consequences (Taylor, 1995). Individuals with a high level of AS, for example, fear having heart palpitations because they believe they will suffer from a heart attack, whereas those with low levels of AS perceive such sensations to be transient and relatively harmless. According to Barlow, Chorpita, and Turovsky (1996), AS enhances anxiety responses since the awareness of anxiety symptoms leads to increased anxiety related to detrimental consequences, which in turn serves to enhance the anxiety symptoms themselves and contributes to a vicious cycle of escalating anxiety.

AS has been studied extensively in adults since the early 1980s. Most findings show AS to be an important risk factor for the development and maintenance of anxiety disorders, particularly panic disorder (Maller & Reiss, 1992). However, studies on AS in children and adolescents are relatively rare and have only begun in earnest in recent years, a development linked with the development of the Childhood Anxiety Sensitivity Index (CASI; Silverman, Fleisig, Rabian, & Peterson, 1991). The CASI is a modified version of the Anxiety Sensitivity Index (ASI; Peterson & Reiss, 1987), with 16 of its 18 items paralleling those on the ASI.

Four major types of studies have been conducted using the CASI. The first series of studies evaluate the psychometric properties of the scale. In their initial development of the CASI, Silverman et al. (1991) reported a test–retest reliability of $r = .76$ for a non-clinical sample and $r = .79$ for a clinical sample. Alpha coefficients for both samples were .87, providing a firm basis for the reliability and internal consistency of the scale. Correlations between the CASI and the Fear Survey Schedule for Children-Revised (FSSC-R; Ollendick, 1983) and the State-Trait Anxiety Inventory for Children, A-Trait form (STAIC-T; Spielberger, 1973) were .74 and .64, respectively. These high correlations gave preliminary support to the validity of the scale.

Further research replicated these findings, all consistently showing that anxiety measures, especially those measuring panic disorder symptoms, correlated strongly with the CASI (e.g. Lau, Calamari, & Waraczynski, 1996; Weems, Hammond-Laurence, Silverman, & Ginsburg, 1998). For example, in a study by Lau et al. (1996), a significant correlation was found between adolescent CASI scores and panic symptoms, as well as the number of panic attacks, the distress the panic attacks caused, and the seriousness of the panic attacks. Kearney, Albano, Eisen, Allan, and Barlow (1997) replicated this in a younger sample, showing that children with panic disorder reported higher CASI scores than children with other anxiety disorders. In a study by Mattis and Ollendick (1997), CASI scores predicted children's tendency to make internal catastrophic attributions such as thoughts of going crazy and losing control when in panic-like situations.

Measures other than self-report questionnaires have also been used in establishing the validity of the CASI as well. Rabian, Embry, and MacIntyre (1999), through use of a stair-stepping task designed to increase physiological arousal, showed that CASI predicted the degree of state anxiety and subjective fear of the task, even after controlling for pretask levels of state anxiety and fear.

* Corresponding author. Tel.: +44 0 20 8392 3647; fax: +44 0 20 8392 3527.
E-mail address: C.Essau@roehampton.ac.uk (C.A. Essau).

Together, these studies provide a background for the sound psychometric properties of the scale.

The second series of studies has to do with the theoretical distinction between anxiety sensitivity and anxiety frequency. The Silverman et al. (1991) study was the first to establish in a childhood sample that anxiety sensitivity can explain a significant portion of variance on fear and anxiety scales, even after controlling for the anxiety frequency variance. Numerous researchers have replicated this study, including Chorpita, Albano, and Barlow (1996), who found that this relationship held true for children 12 years and older, but not for 7- to 11-year olds. Based on this finding, Chorpita, Albano, and Barlow (1996) asserted that a certain level of cognitive maturation may be a prerequisite for the development of anxiety sensitivity. However, this notion was not supported by Weems et al. (1998), who found in a larger sample of clinic-referred children and adolescents that CASI's incremental validity was not compromised in children aged 6–11.

The third type of studies examines discriminative validity and clinical utility of childhood anxiety sensitivity. In the original Silverman et al. (1991) study, the authors failed to find a difference in the CASI score of clinical and non-clinical samples. This was attributed mainly to the heterogeneity and the limited sample size of the clinical sample. Rabian, Peterson, Richters, and Jensen (1993) overcame these methodological limits by recruiting a larger sample and using structured interviews to classify children into three groups: those with anxiety disorders, those with externalizing disorders (i.e., ADHD, oppositional defiant disorder, or conduct disorder), and those without any psychiatric disorders. Children with anxiety disorders and externalizing disorders had significantly higher scores on the CASI than those with no disorders. The high levels of anxiety sensitivity in the externalizing group of children were interpreted in terms of the high level of anxiety symptoms co-occurring with externalizing symptoms.

More recently, the scope of clinical interest has expanded to include the relationship between anxiety sensitivity and childhood depression. In the adult anxiety sensitivity literature, considerable evidence exists regarding the relationship between depression and anxiety sensitivity (e.g., Otto, Pollack, Fava, Uccello, & Rosenbaum, 1995; Taylor & Cox, 1998). Similar findings were reported for children by Weems, Hammond-Laurence, Silverman, and Ferguson (1997), who reported significant positive correlations between CASI scores, clinician ratings of severity of primary anxiety diagnoses, and anxiety and depressive symptoms among clinic-referred children and adolescents. The significant correlation between anxiety sensitivity and depression remained when controlling for other aspects of anxiety. Contradictory findings were obtained by Muris, Schmidt, Merckelbach, and Schouten (2001), who found a significant correlation between CASI and depression but found that the statistical significance disappeared after controlling for levels of trait anxiety. Muris et al. (2001) speculated that divergence in the results may have been due to sample differences; the children recruited for the Weems et al. (1997) study were a clinical sample, whereas the youth in the Muris et al. (2001) study were normal adolescents with relatively low levels of depression.

The last series of studies examines the factor structure of childhood anxiety sensitivity. Compared to the three other types of studies, considerable controversy remains regarding the factor structure of this instrument. In the adult anxiety sensitivity literature, evidence suggests that anxiety sensitivity has a hierarchical structure, consisting of multiple lower order factors, loading on a single higher order factor (Taylor & Cox, 1998). However, the evidence is mixed as to how many lower order factors exist (Laurent, Schmidt, Catanzaro, Joiner, & Kelley, 1998).

A similar debate has been going on in the child and adolescent population as well. Silverman, Ginsburg, and Goedhart (1999) were the first to report the factor structure of the CASI using both a clinical and a non-clinical sample. Their results suggested a hierarchical model possessing three or four first-order factors. Factors in the 3-factor solution were labeled "physical concerns," "mental incapacitation concerns," and "concerns about publicly observable symptoms." An unresolved question was whether the "concerns about publicly observable symptoms" factor could further be divided into "social concerns" and "control" factors. The authors, at this time, favored to retain the factor as one, since there were only two items that loaded predominantly onto the "social concerns" factor.

Subsequent research has found support for two, three, and four factor models. The 2-factor model has been supported by Chorpita and Daleiden (2000). In this study, the scree test suggested a 1-factor solution, suggesting that the CASI possesses a unidimensional structure. Nevertheless, results of confirmatory factor analysis showed better fit when the CASI items were split to comprise autonomic (i.e., physical concerns) and non-autonomic (i.e., mental incapacity concerns and concerns about publicly observable symptoms) factors. Improved fit may have been obtained had the authors assumed a hierarchical structure consisting of a single, higher order factor and two lower order factors.

Support for the 3-factor model came from Van Widenfelt, Siebelink, Goedhart, and Treffers (2002), whose study examined the psychometric properties of the Dutch CASI among 8- to 16-year-old children. Confirmatory factor analysis showed acceptable fit for the 3-factor model with one higher order factor, previously reported by Silverman et al. (1999). The authors concluded that the study provided a cross-validation of the Silverman et al. (1999) model in a larger sample derived from a different cultural background.

Finally, in their most recent study, Silverman, Goedhart, Barrett, and Turner (2003) reported the best fit for a 4-factor model with one higher order factor. Four lower order factors were named disease concerns (i.e., physical concerns), unsteady concerns (i.e., control), mental incapacitation concerns, and social concerns. This model has subsequently been cross-validated by Bernstein, Zvolensky, Stewart, and Comeau (2007). Using a taxometric approach, these authors found the model to fit well among the normative form of anxiety sensitivity but a unidimensional structure held better for more extreme forms of anxiety sensitivity. Adornetto et al. (2008) recently examined the factor structure of two versions (i.e., the 13- and the 18-item) of the German translation of the CASI in non-clinical samples of 8–16 year old German youth. Regardless of the version used, the best fit was found for a 4-factor solution (unsteady concerns, disease concerns, mental incapacitation concerns, and social concerns). In sum, the factor structure of anxiety sensitivity still remains unsettled, apart from the fact that there seems to exist a strong unidimensional background.

In addition to the controversial nature of the factor structure of the CASI, our knowledge on the CASI comes mostly from American and Dutch studies. This has been criticized by Lambert, Cooley, Campbell, Benoit, and Stansbury (2004), who found a distinct factor structure for a sample of African-American children. In their study, results of exploratory factor analyses suggested a 2-factor solution of physical concerns and mental incapacitation concerns, different from the trend found in a sample of Caucasian children. Consequently, the literature on CASI will benefit from studies conducted in other cultures and countries to determine the generalizability of the findings.

In the present study, we examined the factor structures of the German CASI and its incremental validity. The main aim of our study was to examine the extent to which the factor structures reported in previous studies (e.g., Silverman et al., 1999) could be replicated in a large sample of adolescents in Germany. The factorial structure of the CASI was examined using exploratory factor analyses. Thereupon, the incremental validity of the CASI was examined to explore its association with measures of anxiety and general adolescent difficulties.