Brief Report

The Child Anxiety Scale as a potential screening device for bullying in young children[1]

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ABSTRACT

The 20 item Child Anxiety Scale (CAS) was administered to 343 elementary school children. Unweighted Least Squares extraction with oblique rotation produced 3 correlated primary factors that were interpreted as matching factors C, L and O of the Sixteen Personality Factors questionnaire for adults. Of particular interest was the factor L pattern which has never been identified before with children. Since the items most highly loading on factor L conveyed a sense of being persecuted by other children, scores on this dimension may prove useful in screening for bullying. Higher order factor analysis confirmed the hypothesis of a general anxiety factor.

INTRODUCTION

Anxiety is generally regarded as one of the most common features of psychopathology in children (Tomb & Hunter, 2004). Estimates of the prevalence of anxiety range from three to twenty percent, with an average rate of eight percent (Berstein & Borchardt, 1991; Manassis, 2000). The *Diagnostic and Statistical Manual of Mental Disorders IV* (*DSM IV*; American Psychiatric Association, 1994) describes anxiety disorders in children as involving excessive and persistent worry or suffering, which may include restlessness, avoidance, sleep and eating disturbance, affected concentration, irritability, crying or clinging. Children who experience anxiety disorders are often at greater risk for other problems such as depression (Kendall, Safford, Flannery-Schroeder & Webb 2004; Tomb & Hunter 2004), substance abuse (Kendall et al., 2004), difficult peer relations (Manassis, 2000), as well as difficulty in school (Tomb & Hunter, 2004). Studies have also demonstrated that children with an anxiety disorder are more likely than their non-anxious counterparts to develop into overanxious adults (Craske, 1997; Tomb & Hunter, 2004).

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Self-report instruments have become the most frequent way to assess child anxiety (Seligman, Ollendick, Langley, & Bechtoldt Baldacci, 2004). One of these devices, the Child Anxiety Scale (CAS) was designed for anxiety screening at the early elementary school level (Gillis, 1980). The CAS was created by means of parcel factor analyses (Aluja & Blanch, 2004; Little, Cunningham, Shahar, & Widaman, 2002) using as parcels the 12 primary factor scales of the Early School Personality Questionnaire (ESPQ) described in Cattell (1973).

The present study was undertaken to test the hypothesis that an item factor analysis of the CAS would confirm the presence of a general anxiety factor.

METHOD

Participants

The participants were 343 children in Grades 1 and 2 attending publicly funded elementary schools in two North American towns of average socioeconomic level. Their mean age was 6.5 years. There were 167 females and 176 males with a primarily Caucasian ethnic background.

Material*s*

The CAS consists of 20 brief items that can be administered individually or to groups. Questions are presented by a standardized audio recording with children indicating their responses by marking an "X" on either a blue or a red circle. To assist children in making their answers in the appropriate place, each pair of circles is accompanied by a small drawing designed to be highly interesting to young children, such as a birthday cake or lion.

Immediate test-retest reliability coefficients of the CAS have been found to range between .82 and .92 for grades one through three. Internal consistency estimates, and concept validity measures, suggest that the CAS has psychometrically acceptable characteristics in a variety of cultural settings (Argulewicz, Abel & Schuster 1985; Gillis, 1980)

Procedure

Approval for the present research was obtained from the Research Ethics Committee at the university where the project was undertaken. It was explained to principals, teachers, parents and children that the purpose of the proposed activity was "to develop a test about the feelings of children." It was stressed that the test was anonymous and that children had the right to withdraw at any time without adverse consequences.

The CAS was administered, by an undergraduate psychology honours student, to groups of up to 25 children in their homeroom classroom without teachers being present.

RESULTS

The Windows XP Professional Version 12.0 of SPSS for microcomputers, with options left at the default value level, was used for all statistical analyses. Pearson product-moment correlation coefficients were calculated between the 20 items of the CAS. With unities left in the diagonal of the CAS item correlation matrix, eigenvalues were determined by means of a Principal Components Analysis procedure. The prominent flattening (scree line) in the eigenvalue plot after component 3, as shown in Figure 1, indicated that it would be appropriate to extract 3 factors (Nelson, 2005).

An unweighted least squares (ULS) procedure was used to extract three factors. The ULS factor matrix was transformed using the orthogonal, Varimax, procedure. Then, in order to make a higher order factor analysis possible, the oblique rotation program, Promax, was used to produce the factor matrix listed in Table 1. The Promax rotation resulted in an improvement of simple structure (over the original ULS solution) from 26.7% to 41.7%, as defined by factor loadings falling within the +/- .10 hyperplane (Cattell, 1978).
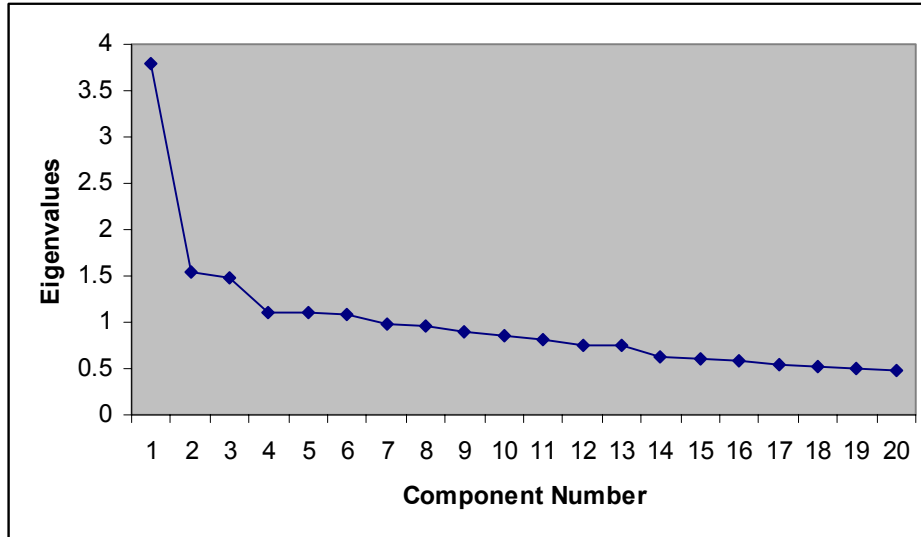
Figure 1: Scree Plot derived from initial Principal Component extraction

Using a cutoff loading value of .40, each factor appeared to be well defined by 4 items: for factor 1, items 3, 7, 14 and 18; for factor 2, items 2, 4, 9 and 16; and for factor 3, items 5, 13, 17 and 19. The Pearson correlation coefficients between the four items loading on factor one were all significant (n = 343, p<.01, two tails). For factor two, all items were significantly correlated (n = 343, p<.01, two tails), except for items 4 and 9, which were significantly related to each other (n = 343, p<.05, two tails). The four items loading on factor three were also significantly correlated (n = 343, p<.01, two tails).

Common themes were noticed between items that were loading most highly on each factor. Items loading on factor one suggest that a child's **confidence** is being measured, (e.g., a theme of "How well can you do things compared to other boys and girls?"). Items loading on factor two, seemingly reflect how **adequate** the child feels, (e.g., a theme of "How many problems do you have?"). Finally, factor three seems to indicate whether or not a child feels **bullied** (e.g., a theme of "Do other children pick on you?).

The themes outlined above were compared to the descriptions of primary factors in the Sixteen Personality Factors (16PF) questionnaire (Cattell & Schuerger, 2003). It was concluded that factor one is seemingly assessing the primary factor O (Apprehensiveness), factor two is apparently measuring the primary factor C (Emotional Stability), and factor three is best interpreted as the primary factor L (Vigilance).

In addition to the factor analysis carried out at the item level, a higher order analysis was done using the factor scores of the 343 children as a data matrix. The correlations contained in Table 2 were calculated between each of the 3 primary factors.

The Scree Test indicated one higher order factor also was present. ULS was used to extract the higher order factor and it was found that each of the 3 primary factors loaded highly (.896, .758 and .591 respectively). When the factor scores of the higher order dimension were correlated with scores obtained using the standard scoring key of the CAS, a Pearson coefficient of .95 was obtained.

Table 1: Factor Loadings Produced by ULS Extraction with Promax Rotation.

Item	Factor		
	1	2	3
1	.276	.359	.033
2	-.010	.422	.050
3	.454	-.120	.081
4	-.204	.436	.101
5	.186	-.192	.506
6	-.005	.177	.293
7	.729	-.069	-.041
8	.174	.176	.199
9	.086	.400	.033
10	.396	-.039	.210
11	.059	.136	.197
12	.281	.309	-.167
13	-.101	.103	.503
14	.534	-.093	.020
15	-.185	.369	.069
16	.144	.541	-.098
17	-.002	.112	.550
18	.526	.064	-.017
19	.014	.028	.407
20	.016	.163	.095

Table 2: Primary Factor Correlation Matrix

Factor	1	2	3
1	1.000		
2	.539	1.000	
3	.396	.303	1.000

DISCUSSION

Because the CAS was developed to measure a single dimension of general anxiety, it was anticipated that the present analysis also would provide evidence supporting such a hypothesis. An initial item factor analysis revealed three primary factors. Further factor analysis of the primary factor scores yielded a higher order anxiety factor, which correlated almost perfectly with the standard CAS scoring key measure of anxiety. Hence the basic objective of the current study was accomplished.

The unexpected finding of three primary factors, in addition to the general anxiety factor, was a bonus that appears to have some valuable implications. Of considerable practical interest was the identification of a factor which is seemingly assessing feelings of persecution. This CAS factor resembles the adult 16PF factor L, described as Vigilance or Suspiciousness (Cattell & Schuerger, 2003). Factor L has never been identified with children, but clinicians have postulated that one of the origins of adult hypervigilance and excessive suspiciousness may be hostile treatment in childhood (Cattell, 1989). Creation of a CAS subscale targeted toward this "sense of being picked on" feeling of children promises to be a way of carrying out large scale screening for bullying. At the present time the assessment of bullying at an early age requires that children be interviewed individually with highly-trained personnel, such as postgraduate students

(Crothers & Levinson, (2004); Woods & Wolke, 2004). While this expensive, time-consuming type of procedure would still be necessary as a follow up, the availability of an initial screening device may be useful in many educational and clinical situations. As with the identification of general anxiety, the earlier in life problems with bullying can be detected, the better are chances of successful intervention.

On a theoretical level, the present results are interesting from a life-span developmental perspective, as they reveal possible new links between research findings at the early childhood and adult levels. The detection of the previously "missing" 16PF factor L at the child level, just as ESPQ factor D was eventually identified with adults (Cattell & Delhees, 1973), suggests an intriguing area for future research about why some aspects of personality appear to be more difficult to measure at different times during the aging process.

Finally, of methodological significance is the finding of how an item factor analysis clearly replicated the results of earlier parcel factor analyses (Gillis, 1980; Gillis & Cattell, 1979). Hence the present research is another demonstration that both methods can converge upon the same results (e.g. Cattell, 1974), if careful attention is given to delineating the goals of the study and the nature of the measurements obtained (Little et al., 2002).

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Biographical Notes

Dr. John Gillis obtained a Ph.D. in 1974 at the University of Ottawa in clinical child psychology. His thesis focused on the nature of higher order factors in personality measurement. He worked closely for many years with Dr. Raymond Cattell and is presently completing Cattell's official biography.

Natalie Nadeau obtained a Bachelor of Arts Degree with First Class Honours in Psychology on 9 May 2005 from St.Thomas University. The topic of her thesis was: "Improving the Child Anxiety Scale." She plans to undertake graduate studies in the area of Educational Psychology.

Marvin Claybourn is a PhD candidate in the psychology department at the University of New Brunswick. Marvin's current research focuses on nonsexual harassment. In his most recent work, he examined aspects of interactions used to define harassment. He is currently conducting a study investigating relationships between workplace characteristics and harassment.