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Structure of Anxiety Symptoms Among Children: A Confirmatory Factor-Analytic Study

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This study examined the degree to which anxiety symptoms among children cluster into subtypes of anxiety problems consistent with *Diagnostic and Statistical Manual of Mental Disorders* (4th edition) classification of anxiety disorders. Two community samples of 698 children 8–12 years of age completed a questionnaire regarding the frequency with which they experienced a wide range of anxiety symptoms. Confirmatory factor analysis of responses from Cohort 1 indicated that a model involving 6 discrete but correlated factors, reflecting the areas of panic–agoraphobia, social phobia, separation anxiety, obsessive–compulsive problems, generalized anxiety, and physical fears, provided an excellent fit of the data. The high level of covariance between latent factors was satisfactorily explained by a higher order model in which each 1st-order factor loaded on a single 2nd-order factor. The findings were replicated with Cohort 2 and were equivalent across genders.

Although anxiety disorders of childhood have received increased attention from researchers and practitioners over the past decade, there have been relatively few empirical investigations concerning diagnostic and classification issues. The *Diagnostic and Statistical Manual of Mental Disorders* (fourth edition, *DSM–IV*; American Psychiatric Association, 1994) is widely accepted as an appropriate method of categorizing anxiety disorders among children. Axis 1 (Clinical Disorders) of the *DSM–IV* assumes that emotional, behavioral, cognitive, and physiological symptoms of psychopathology cluster together to form discrete disorders that are clearly identifiable and distinct from each other. The *DSM–IV* lists a single, major category of anxiety disorder and subcategories including panic disorder or agoraphobia, specific phobia, social phobia, obsessive–compulsive disorder, generalized anxiety disorder, posttraumatic stress disorder, and acute stress disorder. In addition, separation anxiety disorder is identified as an anxiety problem of specific relevance to childhood and adolescence.

The present study examined the degree to which children's symptoms of anxiety do indeed cluster together in a manner that would be predicted by the *DSM–IV* system of classification of anxiety disorders. Surprisingly little research has been conducted to establish the validity of such a classification system for anxiety problems among children. The validity of *DSM–IV* anxiety disorders among children has typically been accepted without question. Historically, the *DSM* system developed on the basis of the clinical intuition of acknowledged experts in specific areas of psychopathology. The categories produced were based on clinical observations of repetitive patterns of behavior and emotions, the covariance of which was proposed to have meaning. This phenomenological approach was neither theoretically nor empirically based. However, as successive versions of the *DSM* were developed, increasing attempts were made to take empirical evidence into account (Carson, 1991; Millon, 1991). Although these efforts are commendable, there is still a considerable lack of empirical evidence to confirm the validity of many of the *DSM–IV* diagnostic categories, and this is particularly true for child anxiety disorders (Silverman, 1992; Werry, 1994). Indeed, Werry (1994) claimed that the major field trials to validate child anxiety disorders have not been undertaken to date, leaving the *DSM–IV* exposed.

The lack of empirical studies to validate the *DSM–IV* classification of anxiety disorders in children is particularly true for nonclinical populations. The limited evidence available to date has focused on individuals who have already been diagnosed according to *DSM* criteria. Carson (1991) was critical of this approach to the validation of diagnostic categories, in which studies commence with individuals who have already been allocated to the hypothesized diagnostic categories, a procedure that risks creating a self-fulfilling prophesy insofar as the major putative taxa are concerned (p. 303). Carson was also critical of what he described as an excessive concern of researchers with establishing reliability, particularly between diagnosticians, without first establishing the validity of the differentiations being examined. Clearly, it is possible to have a highly reliable categorical system that does not provide a valid nosology of the area of psychopathology concerned.

In the area of child anxiety disorders, there is an obvious need to examine the validity of the *DSM–IV* classification system. Examination of the validity of classification of internalizing

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problems such as anxiety has been relatively neglected in comparison with externalizing problems such as conduct disorder, oppositional defiant disorder, and attention-deficit hyperactivity disorder (e.g., Loeber, Lahey, & Thomas, 1991). In instances in which the validity of classification of internalizing problems has been considered, studies have typically involved factor analyses of extensive behavior questionnaires. Unfortunately, these measures have not generally included a wide enough range of anxiety symptoms to determine whether anxiety problems can be categorized into discrete subtypes in the manner proposed by the *DSM–IV* (Achenbach, 1985; Werry, 1994).

There have also been attempts to determine the reliability of anxiety disorder diagnoses based on *DSM–IV* categories, as indicated by interdiagnostician agreement (Rapee, Barrett, Dadds, & Evans, 1994; Silverman, 1991). However, such information indicates little about the degree to which anxiety symptoms in children really do cluster in the form suggested by the *DSM–IV*. Empirical studies relating to the validity of the *DSM* classification of anxiety disorders in children have been slow in coming; however, where evidence has become available, the results have typically had an impact on the developing *DSM* system. For example, the revised third edition of the *DSM* (*DSM–III–R*; American Psychiatric Association, 1987) included a category of avoidant disorder of childhood that, research subsequently determined, had little to distinguish it from social phobia (Francis, Last, & Strauss, 1992). The category of avoidant disorder was then dropped in the *DSM–IV*. Similarly, the *DSM–III–R* category of overanxious disorder was subsumed by generalized anxiety disorder within the *DSM–IV*, given lack of evidence to justify its retention as an independent diagnostic category (Beidel, 1991). Although these changes to the classification system reflect attention to empirical data, there is still a lack of evidence to confirm the current diagnostic categories for anxiety disorders among children. This problem is not, however, specific to anxiety problems. Achenbach (1991a) pointed out that few behavioral or emotional disorders of childhood have been validated as separate entities and emphasized the need for an empirical basis for the categories and criteria used within diagnostic systems for child psychopathology.

One particular issue that must be considered with respect to anxiety problems in children concerns the high level of comorbidity between child anxiety disorders. Anderson (1994) concluded that, in clinical samples, approximately 50% of children and adolescents have another concurrent anxiety disorder. In general population samples, comorbidity between anxiety disorders is also high (Anderson, 1994). There are several possible explanations for high levels of comorbidity between disorders. The first possibility is that the symptoms do not actually cluster in the manner assumed by the classification system and the disorders are not clearly distinct. However, it is also possible for high levels of comorbidity to occur between well-validated, separate diagnostic entities if these disorders result from common etiological factors or are reflections of some higher order pattern of co-occurring problems (Achenbach, 1991a). Although high levels of comorbidity should not automatically infer lack of discrimination between diagnostic categories, such a situation signals the need to examine the empirical basis on which the categories are founded.

The present study used a confirmatory factor analysis approach to determine the degree to which the pattern of anxiety symptoms among a community sample of children is in keeping with a model based largely on the *DSM–IV* classification of anxiety disorders. Confirmatory factor analysis is a particularly appropriate way to examine the fit and adequacy of different representations of the same set of items. The analyses included a wide range of anxiety symptoms, covering six major *DSM–IV* diagnostic categories of anxiety disorder. Children rated the frequency with which they experienced each anxiety symptom. It was predicted that anxiety symptoms in children would cluster in a manner consistent with the *DSM–IV* classification of anxiety disorders. As a means of testing this hypothesis, four models were examined and compared with a null model in which complete independence of all observed measurements is posited and all relations are constrained to be zero (Byrne, 1989). The models selected for evaluation were based on theoretical grounds. It was hypothesized that anxiety symptoms would load onto six correlated factors, reflecting the *DSM–IV* anxiety disorder categories, or onto six factors the variance of which would be accounted for by a single higher order factor of anxiety.

The first comparison model (Model 1) was a single-factor model in which all symptoms are viewed as reflecting a single, homogeneous dimension of anxiety. Model 1 examined whether the high level of comorbidity of anxiety disorders in children reflects the lack of distinct anxiety categories, with symptoms simply reflecting a single dimension of anxiety. In such a model, the data are best explained by a single factor onto which all symptoms of anxiety load strongly, with minimal variance left to be explained by separate anxiety disorder factors. However, if anxiety symptoms in children cluster within subtypes of anxiety disorders, as proposed by the *DSM–IV*, the six-correlated-factor model (see Model 3 below) or the model with six first-order factors and a single second-order factor (see Model 4 below) would provide a better fit of the data than the single-factor model (Model 1).

The second model (Model 2) to be examined was a six factor model, with factors being independent (orthogonal). This model assumed that anxiety symptoms do cluster within the factors proposed by the *DSM–IV* but that these factors are unrelated to each other. The six factors were panic disorder (with agoraphobia), social phobia, separation anxiety disorder, generalized anxiety disorder, and obsessive–compulsive disorder. A further dimension relating to fear of physical injury was included in lieu of specific phobias. There were two reasons for this, the first being that it did not make sense to include multiple items relating to any one monosymptomatic phobia when there are many possible feared stimuli. The second reason concerned recent evidence that fears in children cluster into distinct social and physical domains suggesting the possibility of a fear of physical injury dimension (Campbell & Rapee, 1994). Given the known high level of comorbidity between anxiety disorders in children, it was not predicted that this model involving six uncorrelated (orthogonal) factors would provide a good fit of the data.

The third model (Model 3) examined the degree to which children's reports of anxiety symptoms could be explained by a six-correlated-factor model. The six factors were panic disorder (with agoraphobia), social phobia, separation anxiety disorder, generalized anxiety disorder, obsessive–compulsive disorder, and fear of physical injury. In view of the known high level of comorbidity between anxiety disorders in children, the factors were allowed to be intercorrelated. However, in keeping with the *DSM–IV* classification system, the model assumed that anxiety symptoms would cluster onto the six hypothesized factors with sufficient unique variance to justify acceptance of separate categories of anxiety disorders.

The final model (Model 4) was a higher order model that examined the degree to which the data can be explained by six subcategories of anxiety problems, the covariation of which can be accounted for by a higher order factor of anxiety. This model examined whether the high levels of comorbidity in anxiety disorders may be explained by a higher order factor that strongly influences the second-order factors (Achenbach, 1991a; Tanaka & Huba, 1984). Such a model is in keeping with the *DSM–IV*, which outlines an overall category of anxiety disorder within which lie subtypes of anxiety disorders.

It is important to emphasize, at this stage, that the study did not examine the validity of the diagnostic criteria for the *DSM–IV* per se. To do so would require information about the frequency, duration, severity, and consequences of symptomatology. Rather, the study investigated whether symptoms of anxiety do indeed cluster together in a manner consistent with the *DSM–IV*.

Method

Participants

The study involved two independent cohorts of participants, all of whom attended one of six urban primary schools in the Catholic education system in Brisbane, Australia. Each cohort included 698 children 8–12 years of age (*M* age = 10.19 years, *SD* = 1.30, for Cohort 1; *M* age = 10.16 years, *SD* = 1.31, for Cohort 2). Cohort 1 included 273 boys and 425 girls, whereas Cohort 2 included 283 boys and 415 girls. This gender mix reflected the greater number of girls attending the participating schools.

The schools involved for each cohort were selected to cover the spectrum of socioeconomic status and ethnic mix representative of the general Australian population. Thus, in keeping with the general Australian population, socioeconomic status levels were wide ranging. The children came from a wide variety of ethnic backgrounds, although most were of White, Anglo-Saxon origin and from lower-to-middle socioeconomic status backgrounds. To participate, all children were required to speak English fluently, as judged by their class teacher. Written informed consent was obtained from parents and children before participation in the study; approximately 80% of those invited to take part did so.

Generation of Questionnaire Items

Initially, a list was generated that aimed to cover a wide spectrum of anxiety symptoms in children. The list, generated by a group of four clinical psychologists with specialist expertise in the area of child anxiety disorders, was based on a review of existing literature, clinical experience, existing child anxiety assessment measures, structured clinical interviews (e.g., Anxiety Disorders Schedule for Children; Silverman & Nelles, 1988), and *DSM–III–R* and *DSM–IV* diagnostic criteria and background information. Items were deleted if they clearly pertained to a specific trauma event or medical condition. This produced a pool of 80 items relating to child anxiety symptoms.

Items were then examined by six clinical psychologists who specialize in child anxiety disorders and who are highly experienced in the use of the *DSM–IV* diagnostic system. These judges were asked (a) to identify those items that clearly reflected a specific *DSM–IV* diagnostic category and allocate items to categories, and (b) to determine whether each item was readable and understandable by children 8–12 years of age. There was high agreement between judges, with 73 of the 80 items being allocated into the same specific *DSM–IV* category by at least five of the six judges. Furthermore, there were at least six anxiety symptoms allocated to each of the *DSM–IV* diagnostic categories.

However, two problems emerged. The first concerned the specific phobia items. Specific phobia, according to the definition of the *DSM–IV*, relates to a single fear stimulus; thus, it is not meaningful to search for a specific phobia factor. The specific phobia items identified by the judges concerned a wide range of specific fears, mainly relating to physical injury (e.g., dogs, dentists, doctors, and heights). Rather than abandon these items five physical fear symptoms were selected and retained in the analysis so that the validity of a factor relating to fear of physical injury could be examined. This decision was considered justified given experimental evidence suggesting that physical fears tend to cluster together within child populations (Campbell & Rapee, 1994). The second problem concerned the *DSM–IV* criteria for generalized anxiety disorder, for which symptoms relating to concentration, fatigue, irritability, restlessness, sleep disturbance, and muscle tension had not been generated as anxiety symptoms in children. As a result, there were insufficient items to justify independent examination of a generalized anxiety disorder category. However, three somatic items were included in the checklist that appeared to fit into the *DSM–III–R* category of overanxious disorder. Thus, these three items were retained in the analysis and integrated with three generalized anxiety symptoms so that a combined overanxious–generalized anxiety disorder category could be examined. It is acknowledged that this produced an unsatisfactory test of the generalized anxiety disorder category and should be regarded as a methodological problem to be corrected in future studies.

Pilot work was then conducted to confirm that children were able to understand the items. This deleted the "fear of fear" and "fear of losing control or going crazy" items relating to panic disorder, the concept of which was too complex for many of the children to understand. Items were also excluded if they were highly overlapping in content.

The final list contained 38 items, of which the independent judges considered 6 to reflect obsessive–compulsive problems, 6 to reflect separation anxiety, 6 to reflect social phobia, 6 to reflect panic, 3 to reflect agoraphobia, 6 to reflect generalized anxiety–overanxious symptoms, and 5 to reflect fear of physical injury. Six additional positively framed filler items were interspersed within the anxiety symptom questions to reduce the impact of negative bias within the problem checklist. All items were randomly allocated within the questionnaire. Children were asked to rate, on a 4-point scale ranging from *never* (0), to *always* (3), the frequency with which they experienced each symptom. The instructions stated, "Please put a circle around the word that shows how often each of these things happens to you. There are no right and wrong answers." All questionnaire items were read aloud to children and were administered on a class basis. The items for each of the six categories are shown in Table 1. This allocation of items formed the basis of the model testing for the *DSM–IV* diagnostic categories.

The questionnaire was labeled the Spence Children's Anxiety Scale. A pilot study was conducted to confirm the psychometric properties of the scale, the results of which were reported by Spence (1994). This initial study, which involved a sample of 311 children 8–12 years of age, revealed an internal reliability alpha coefficient of .93 and a Guttman

Table 1
Anxiety Symptoms Selected to Validate DSM–IV Diagnostic Categories

Predicted *DSM–IV* category	Essential *DSM–IV* features	Questionnaire items
Separation anxiety disorder	The essential feature is excessive anxiety concerning separation from the home or from those to whom the person is attached (p. 110)	5. I would feel afraid of being on my own at home 8. I worry about being away from my parents 12. I worry that something awful will happen to someone in my family 15. I feel scared if I have to sleep on my own 16. I have trouble going to school in the mornings because I feel nervous or afraid 44. I would feel scared if I had to stay away from home overnight
Social phobia	The essential feature is a marked and persistent fear of social or performance situations in which embarrassment may occur (p. 411)	6. I feel scared when I have to take a test 7. I feel afraid if I have to use public toilets or bathrooms 9. I feel afraid that I will make a fool of myself in front of people 10. I worry that I will do badly at my school work 29. I worry what other people think of me 35. I feel afraid if I have to talk in front of my class
Obsessive–compulsive disorder	The essential features are recurrent obsessions or compulsions that are severe enough to be time consuming or cause marked distress or significant impairment (p. 417). Obsessions are persistent ideas, thoughts, impulses, or images that are experienced as intrusive and inappropriate and that cause marked anxiety or distress. Compulsions are repetitive behaviors (e.g., handwashing, ordering, or checking) or mental acts (e.g., praying, counting, or repeating words silently) the goal of which is to prevent or reduce anxiety or distress rather than to produce pleasure or gratification (p. 418)	14. I have to keep checking that I have done things right (like the switch is off, or the door is locked) 19. I can't seem to get bad or silly thoughts out of my head 27. I have to think of special thoughts to stop bad things from happening (like numbers or words) 40. I have to do some things over and over again (like washing my hands, cleaning or putting things in a certain order) 41. I get bothered by bad or silly thoughts or pictures in my mind 42. I have to do some things in just the right way to stop bad things happening
Panic attack and agoraphobia	Panic attack: The essential feature is a discrete period of intense fear or discomfort that is accompanied by at least 4 somatic or cognitive symptoms (e.g., palpitations; sweating; trembling or shaking; sense of imminent danger or impending doom and urge to escape; feeling of choking, smothering, dizziness, fear, or losing control or going crazy; or fear of dying; p. 394).	13. I suddenly feel as if I can't breathe when there is no reason for this 21. I suddenly start to tremble or shake when there is no reason for this 28. I feel scared if I have to travel in the car, or on a bus or a train 30. I am afraid of being in crowded places (like shopping centers, the movies, buses, busy playgrounds)
	Agoraphobia: The essential feature is anxiety about being in places or situations from which escape might be difficult (or embarrassing) or in which help might not be available in the event of having a panic attack or paniclike symptoms. Situations include being in a crowd; traveling in an automobile, bus, or airplane; and being on a bridge or elevator (p. 396)	32. All of a sudden I feel really scared for no reason at all 34. I suddenly become dizzy or faint when there is no reason for this 36. My heart suddenly starts to beat too quickly for no reason 37. I worry that I will suddenly get a scared feeling when there is nothing to be afraid of 39. I am afraid of being in small closed places, like tunnels or small rooms
Physical injury fears (replacing specific phobias)	The essential feature is a marked and persistent fear of clearly discernible, circumscribed objects or situations. Exposure to the phobic stimulus almost invariably provokes an immediate anxiety response (p. 405). Subtypes include animals, natural environment, blood-injection injury, and situational (e.g., tunnels, bridges, driving, or flying)	2. I am scared of the dark 18. I am scared of dogs 23. I am scared of going to the doctors or dentists 25. I am scared of being in high places or lifts (elevators) 33. I am scared of insects or spiders
Generalized anxiety disorder–overanxious disorder	The essential feature of generalized anxiety disorder is excessive anxiety and worry (apprehensive expectation) about a number of events or activities (p. 432). The individual finds it difficult to control the worry. In children, one additional symptom must be present from among restlessness, being easily fatigued, difficulty concentrating, irritability, muscle tension, and sleep disturbance. The essential feature of overanxious disorder is unrealistic anxiety or worry about future events, past behavior, and personal competence. Other features may include somatic symptoms, feelings of tension, inability to relax, marked self-consciousness, and need for excessive reassurance	1. I worry about things 3. When I have a problem, I get a funny feeling in my stomach 4. I feel afraid 20. When I have a problem, my heart beats really fast 22. I worry that something bad will happen to me 24. When I have a problem, I feel shaky

Note. Page numbers refer to the relevant page in *DSM–IV. DSM–IV* = *Diagnostic and Statistical Manual of Mental Disorders* (4th ed., American Psychiatric Association, 1994). Reprinted with permission from the *Diagnostic and Statistical Manual of Mental Disorders,* 4th ed., Copyright 1994 American Psychiatric Association.

split-half reliability of .92. Total scores were normally distributed, with a mean score of 30.56 (SD = 16.75). The total score on the Spence Children's Anxiety Scale correlated highly (r = .73, p < .001, N = 311) with the Revised Children's Manifest Anxiety Scale (Reynolds & Richmond, 1978) and significantly with mothers' ratings of internalizing problems (r = .34, p < .01, N = 101), but not externalizing problems, on the Child Behavior Checklist (Achenbach, 1991b). Exploratory factor analysis with the pilot sample revealed clear factors relating to panic–agoraphobia, separation anxiety, physical fears, social anxiety, and obsessive–compulsive disorder but not generalized anxiety (Spence, 1994). A copy of the questionnaire may be obtained from the author on request.

Statistical Analyses

The data were examined with Lisrel 8 (Jöreskog & Sörbom, 1993). Unweighted least squares analyses were used based on covariance matrices. The degree to which the data were best explained by each model was determined through confirmatory factor analysis for each cohort. Subsequently, separate analyses were conducted for each gender and two age groups. The results are reported first for Cohort 1, with the means, standard deviations, and covariance matrix being shown in the Appendix. Details of means, standard deviations, and covariance matrices for Cohort 2, genders, and age groups may be obtained from the author on request. Only those items relating to anxiety symptoms were included in the analyses; the six positive filler items were omitted.

Results

Unweighted least squares factor extraction was selected given that multivariate tests of normality revealed evidence of positive skewness. This reflected the nature of the problem checklist in which there was a skew toward low frequency of problem experience. The unweighted least squares extraction was considered most appropriate for the present data set given that this method is less reliant than others, such as maximum likelihood, on multivariate normality. In all analyses reported, the iterative estimation procedure converged, no parameter estimates were out of range (negative variance estimates), and all matrices of parameter estimates were positive definite.

The LISREL program produces a range of goodness of fit indices. The chi-square value is a likelihood ratio test statistic that evaluates the fit between the restricted hypothesized model and the unrestricted sample data. The model may be rejected if the chi-square value is large relative to the degrees of freedom and accepted if the value is nonsignificant or small. However, for very large sample sizes, there is a high risk of relatively good-fitting models being rejected on the basis of the chi-square test (Marsh, 1994; Marsh, Balla, & McDonald, 1988). Thus, the fit of the model should be interpreted on the basis of a range of statistics, such as the adjusted goodness of fit index (AGFI), the root mean squared error of approximation (RMSEA), and the root mean square residual (RMR). The AGFI indicates the relative amount of variance and covariance jointly explained by the model but adjusted to take into account the degrees of freedom in the model. A value close to 1.00 indicates a good fit. The RMSEA provides a measure of degree of discrepancy per degree of freedom. Browne and Cudeck (1993) suggested that an RMSEA value of .05 or lower reflects a close fit; the LISREL program provides a 90% confidence interval for the RMSEA and the probability of the RMSEA being less than .05. The RMR is an index of the degree of discrepancy between elements in the sample and the hypothesized covariance matrix. If there is a good fit between the hypothesized model and the sample, the RMR will be small, with a good fit reflecting an RMR close to .05 or lower (possible values range from 0 to 1.00). Two additional fit indexes are reported here; the relative non-centrality index (RNI) and the normed fit index (NFI). These fit indexes were selected because they provide a relatively nonbiased indication of fit for large sample sizes (Gerbing & Anderson, 1993; McDonald & Marsh, 1990). Values for RNI and NFI greater than .90 are generally regarded to represent an acceptable fit of the model to the data (Gerbing & Anderson, 1993).

Model 1 (Single Factor)

The single-factor model examined the degree to which all symptoms can be viewed as reflecting a single, homogeneous dimension of anxiety rather than clustering into categories. All question items loaded significantly (p < .01) on the single factor; loadings were greater than .30 when the covariance matrix was analyzed (.40 for the correlation matrix), with the exception of one item (I am scared of dogs). Table 2 indicates that a single-factor model provides a good fit of the data in terms of fit indices. However, the RMSEA and RMR values were higher (indicating lower fit) for the single-factor model than those provided by the six-correlated-factor model or the higher order model. Models were compared by determining whether the change in chi-square value was significant given the change in number of degrees of freedom between two models. This approach is appropriate within the context of nested models. Table 2 shows that the six-correlated-factor model (Model 3) provided a significantly better fit than the single-factor model (Model 1), as indicated by the significance of the chi-square change.

Model 2 (Six Uncorrelated–Orthogonal Factors)

For Model 2, the confirmatory factor analysis fixed the factor loadings in the mathematical model so that questionnaire items loaded uniquely on one of the six factors as would be predicted from Table 1. However, the factors were not permitted to be intercorrelated. The goodness of fit indices shown in Table 2 indicate that the six-uncorrelated-factor model does not provide a good fit for the data. The chi-square value was highly significant, indicating strong departure of the parameters of the model from those of the data. Similarly, the goodness of fit indices were all well below .90. Table 2 shows that the six-correlated-factor model (Model 3) provided a significantly better fit than Model 2, as indicated by the significance of the chi-square change in relation to changes in the degrees of freedom.

Model 3 (Six Correlated Factors)

In Model 3, the confirmatory factor analysis again fixed the factor loadings in the mathematical model so that questionnaire items loaded uniquely on one of the six factors as would be predicted from Table 1. However, in contrast to the previous

Table 2
Fit Indexes for Each Model, With Comparisons Between Models, for Cohorts 1 and 2

Model	χ^2	*df*	*p*	RMSEA	90% CI for RMSEA	AGFI	RMR	NFI	RNI	Comparison	χ^2 change	*df* change	*p* for χ^2 change	Target coefficient
Cohort 1 (*N* = 698)														
Null	21,138	703												
Model 1 (single factor)	909	665	<.001	.020	.014–.026	.97	.042	.96	.95	Models 1 and 3	211	15	.001	
Model 2 (6 uncorrelated factors)	16,600	665	<.001	.190		.37	.180	.22	.17	Models 2 and 3	15,962	15	.001	
Model 3 (6 correlated factors)	698	650	<.092	.010	.004–.016	.97	.037	.97	.96	Null and Model 3	20,440	53	.001	
Model 4 (6 first-order factors, 1 higher order factor)	730	659	<.028	.012	.005–.018	.98	.038	.97	.96	Models 3 and 4	32	9	.001	.96
Cohort 2 (*N* = 698)														
Null	18,770	703												
Model 1 (single factor)	887	665	<.148	.022	.016–.028	.96	.041	.95	.95	Models 1 and 3	243	15	.001	
Model 2 (6 uncorrelated factors)	14,533	665	<.001	.170		.39	.170	.23	.18	Models 2 and 3	13,889	15	.001	
Model 3 (6 correlated factors)	644	650	<.550	.001	.000–.011	.97	.035	.97	.96	Null and Model 3	18,126	53	.001	
Model 4 (6 first-order factors, 1 higher order factor)	689	659	<.210	.008	.002–.014	.97	.037	.96	.96	Models 3 and 4	45	9	.001	.94

Note. RMSEA = root mean squared error of approximation; CI = confidence interval; AGFI = adjusted goodness of fit index; RMR = root mean square residual; NFI = normed fit index; RNI = relative noncentrality index.

model, the factors were allowed to be intercorrelated. The actual factor loadings of anxiety symptom items on the hypothesized latent factors are shown in Table 3 for Cohort 1. Factor loadings generated by the covariance matrix exceeded .30 (and .50 if the correlation matrix was used) in all instances other than Item 18 (I am scared of dogs). The factors were found to be strongly intercorrelated, as indicated in Table 4. This was particularly true for the generalized anxiety–overanxious factor, which correlated highly with all other latent factors. However, when the standard errors of correlations were examined and 95% confidence intervals determined, as shown in Table 4, it was clear that none of these confidence intervals included the value of unity. Thus, it is unlikely that any one of the factors should be regarded as measuring the same dimension as another (i.e., when the correlation between the two dimensions would be unity; Jöreskog & Sörbom, 1993, p. 19).

The goodness of fit indices for Model 3 are shown in Table 2. The chi-square value for the six-correlated-factor model was not statistically significant, $\chi^2(650, N = 698) = 698, p = .092$, indicating that the parameters of Model 3 were not significantly different from those of the data set. The AGFI, NFI, and RNI all exceeded .90, and the RMSEA and RMR values were less than .05, confirming that the six-correlated-factor model represents a good fit of the data for Cohort 1.

Model 4 (Six Correlated Factors Loading Onto One Higher Order Factor)

As Table 2 indicates, Model 4 also provided a good fit of the data, with an AGFI of .98 (NFI = .97, RNI = .96), and RMSEA of .012, and an RMR of .038. Although the chi-square value indicated a significant difference between the parameters of the data and the model, $\chi^2(659, N = 698) = 730, p = .028$, it is important to note that Marsh et al. (1988) stressed the difficulty in obtaining nonsignificant chi-square values with very large sample sizes. Thus, in view of the strong fit indices and the large sample size, it would be inappropriate to reject the higher order model on the basis of the chi-square statistic.

Some interesting results emerged from the testing of this model. The standardized loadings of each first-order factor on the higher order factor were all statistically significant ($p < .01$). The percentages of variance in symptom ratings for the first-order factors that could be accounted for by the higher order factor were all very high (see Table 5). This was particularly true for generalized anxiety–overanxious symptoms, for which 93% of the variance in responses was accounted for by the higher order factor. The proportion of unique variance attributed to each factor ranged from 7% for generalized anxiety–overanxious symptoms to 34% for physical fears.

In comparing the degree of fit of the higher order model with that of other models, a procedure described by Marsh and Hocevar (1985) was used. Marsh and Hocevar (1985) pointed out that higher order factors are merely attempting to explain the covariation among first-order factors in a more parsimonious way (i.e., one that requires fewer degrees of freedom). Consequently, even when the higher order model is able to explain effectively the factor covariations, the goodness of fit of the higher order model can never be better than that of the corresponding first-order model. To examine the degree to which a

Table 3
Confirmatory Factor Analysis Loadings of Anxiety Symptoms on Predicted Six Factors

Predicted *DSM–IV* category	Questionnaire item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
		Factor loading					
Panic attack and agoraphobia	13. I suddenly feel as if I can't breathe when there is no reason for this	.41 .63					
	21. I suddenly start to tremble or shake when there is no reason for this	.47 .69					
	28. I feel scared if I have to travel in the car, or on a bus or a train	.28 .62					
	3. I am afraid of being in crowded places (like shopping centers, the movies, buses, busy playgrounds)	.41 .62					
	32. All of a sudden I feel really scared for no reason at all	.52 .80					
	34. I suddenly become dizzy or faint when there is no reason for this	.37 .57					
	36. My heart suddenly starts to beat too quickly for no reason	.44 .71					
	37. I worry that I will suddenly get a scared feeling when there is nothing to be afraid of	.50 .78					
	39. I am afraid of being in small closed places, like tunnels or small rooms	.49 .60					
Separation anxiety disorder	5. I would feel afraid of being on my own at home		.60 .63				
	8. I worry about being away from my parents		.61 .64				
	12. I worry that something awful will happen to someone in my family		.52 .56				
	15. I feel scared if I have to sleep on my own		.47 .71				
	16. I have trouble going to school in the mornings because I feel nervous or afraid		.45 .73				
	44. I would feel scared if I had to stay away from home overnight		.44 .58				
Social phobia	6. I feel scared when I have to take a test			.58 .60			
	7. I feel afraid if I have to use public toilets or bathrooms			.51 .54			
	9. I feel afraid that I will make a fool of myself in front of people			.56 .65			
	1. I worry that I will do badly at my school work			.58 .62			
	29. I worry what other people think of me			.65 .70			
	35. I feel afraid if I have to talk in front of my class			.51 .52			
Physical injury fears	2. I am scared of the dark				.54 .71		
	18. I am scared of dogs				.25 .36		
	23. I am scared of going to the doctors or dentists				.49 .57		
	25. I am scared of being in high places or lifts (elevators)				.44 .59		
	33. I am scared of insects or spiders				.51 .58		
Obsessive–compulsive disorder	14. I have to keep checking that I have done things right (like the switch is off, or the door is locked)					.50 .56	
	19. I can't seem to get bad or silly thoughts out of my head					.42 .51	
	27. I have to think of special thoughts to stop bad things from happening (like numbers or words)					.54 .66	
	4. I have to do some things over and over again (like washing my hands, cleaning or putting things in a certain order)					.48 .52	
	41. I get bothered by bad or silly thoughts or pictures in my mind					.65 .79	
	42. I have to do some things in just the right way to stop bad things happening					.53 .65	
Generalized anxiety disorder–overanxious disorder	1. I worry about things						.31 .63
	3. When I have a problem, I get a funny feeling in my stomach						.46 .55
	4. I feel afraid						.35 .68
	2. When I have a problem, my heart beats really fast						.61 .62
	22. I worry that something bad will happen to me						.61 .73
	24. When I have a problem, I feel shaky						.56 .67

Note. Loadings on the left are based on covariation matrix; loadings on the right are based on correlation matrix. *DSM–IV* = *Diagnostic and Statistical Manual of Mental Disorders,* fourth edition.

Table 4
Standardized Intercorrelations Between Latent Factors Based on Covariance Matrix for Cohort 1

	1		2		3		4		5		6	
Factor	*r*	95% CI	*r*	95% CI	*r*	95% CI	*r*	95% CI	*r*	95% CI	*r*	95% CI
1. Panic–agoraphobia	—	—										
2. Separation anxiety	.80	.74–.86	—	—								
3. Social phobia	.75	.69–.81	.80	.74–.86	—	—						
4. Physical injury fears	.75	.67–.83	.82	.74–.90	.72	.64–.80	—	—				
5. Obsessive–compulsive disorder	.81	.75–.87	.72	.66–.78	.73	.67–.79	.67	.59–.75	—	—		
6. Generalized anxiety	.88	.82–.94	.84	.78–.90	.87	.81–.93	.71	.63–.79	.86	.80–.92	—	—

Note. CI = confidence interval.

higher order factor explains the covariance among first-order factors, Marsh and Hocevar (1985) developed a target coefficient that is the ratio of the chi-square value of the first-order model to the chi-square value of the more restrictive, higher order model. The target coefficient has an upper limit of 1, which would be possible only if the relations among the first-order factors could be totally accounted for in terms of the more restrictive, higher order model. A target coefficient greater than .90 suggests that the higher order model is effective in explaining the covariance between first-order factors (Marsh & Hocevar, 1985). Table 2 indicates that the target coefficient for the higher order model, in comparison with that of the first-order, six-factor solution (Model 3), was .96 for the first cohort. Thus, although there was a significant change in chi-square relative to the change in degrees of freedom between Models 3 and 4, there is strong support for the higher order model.

As a means of examining the degree to which the higher order factor was likely to be reflecting method variance within the self-report measure, a further analysis was conducted in which the six positively worded filler items ("I am popular amongst other kids my own age," "I am good at sports," "I am a good person," "I feel happy," "I like myself," and "I am proud of my school work") were included as a seventh factor in a higher order model. Five of the six positive items loaded greater than .40 on the seventh factor. This seventh factor showed a negative correlation of −.36 with the higher order factor, with 87% of the variance being unique to the positive item factor. The positive item factor correlated −.32 with the panic–agoraphobia factor, −.32 with the separation anxiety factor, −.32 with the social phobia factor, −.29 with the fear of physical injury factor, −.31 with the obsessive–compulsive factor, and −.35 with the generalized anxiety factor.

Cohort 2

The results for Cohort 1 were replicated with Cohort 2, thereby supporting the validity of the findings.

Factorial Invariance Across Cohorts 1 and 2

Tests of factorial invariance were conducted to determine whether the parameters of Model 4 (six correlated factors loading onto one higher order factor) were invariant across Cohorts 1 and 2. Jöreskog and Sörbom (1993) and Byrne (1989, 1994)

Table 5
Statistical Relationships Between First-Order and Higher Order Factors Based on Covariance Matrix for Cohort 1

Factor	Standardized loading of factor on higher order factor	95% CI for loading	% of variance accounted for by higher order factor	% of variance unique to factor
Panic–agoraphobia	.90	.88–.92	82	18
Separation anxiety	.90	.88–.92	80	20
Social phobia	.87	.85–.89	75	25
Physical injury fears	.81	.79–.83	66	34
Obsessive–compulsive disorder	.86	.84–.88	73	27
Generalized anxiety–overanxious	.97	.95–.99	93	07

Note. CI = confidence interval.

Table 6
Tests of Factorial Invariance Across Cohorts 1 and 2 Based on Covariance Matrices (N = 698 per Group)

Model	χ^2	*df*	*p*	RMSEA	90% CI for RMSEA	RMR	NFI	RNI
Model with 6 first-order factors, 1 second-order factor, factor pattern equal	1,419	1318	.027	.007	.003–.007	.037	.96	.96
Base model with first-order factor loadings invariant	1,499	1350	.003	.009	.006–.011	.038	.96	.96
Base model with first-order and second-order factor loadings invariant	1,564	1356	<.001	.011	.008–.013	.038	.96	.96
Base model with first-order and second-order factor loadings and psi matrix invariant	1,570	1362	<.001	.01	.082–.22	.038	.96	.96
Base model with first-order and second-order factor loadings, psi matrix, and error–uniqueness invariant	1,589	1400	<.001	.010	.007–.012	.039	.96	.96

Note. RMSEA = root mean squared error of approximation; CI = confidence interval; RMR = root mean square residual; NFI = normed fit index; RNI = relative noncentrality index.

suggested a sequential method of testing the equality of factor structures across groups. This method first assesses the base model with the same factor pattern applied to both groups and no invariance constraints on the parameters relating to factor loadings, matrices, or error–uniqueness. Subsequent models are then examined in which invariance constraints are sequentially and additively imposed. In the present study, factorial invariance of the higher order model (Model 4) was examined with invariance constraints being additively imposed on the first-order factor loadings, higher order factor loadings, psi matrix, and, error–uniquenesses.

Invariance is evaluated through inspection of the level of fit produced with different levels of invariance imposed on parameters within the basic model. One approach is to examine the significance of chi-square changes with respect to changes in degrees of freedom as the invariance constraints are additively increased. The chi-square value for the base model (Model 4) with the same factor pattern applied to both groups is taken as a target or optimum fit against which to compare nested models in which different invariance constraints are imposed. However, Marsh and Hocevar (1985) noted that decisions regarding invariance cannot be made purely on the basis of chi-square differences, given that trivial invariance issues may lead to significant differences in chi-square. Thus, in the present study, changes in fit indexes, (e.g., NFI and RNI) were examined as the invariance constraints increased. This approach to examination of factorial invariance across groups was recommended by Marsh (1994) and Rahim and Magner (1995).

Invariance tests were conducted with the covariance matrices from Cohorts 1 and 2. As shown in Table 6, the base model indicated a good fit of the data across the groups, $\chi^2(1318, N = 1396) = 1{,}419$, $p = .03$. Although the chi-square value indicated that the fit of the model was statistically significantly different from the data, the fit indices were good, with RNI and NFI values of .96. When the first-order factor loadings in the lambda Y matrix were constrained to be equal across Cohorts 1 and 2, the chi-square value increased significantly in comparison with the base model, although the fit indexes remained high and changed very little in comparison with the basic model with no invariance constraints. These findings were mirrored when the loadings of the first-order factors onto the higher order factor (the gamma matrix) were set invariant across the groups. Even when the psi matrix and error–uniqueness were also constrained to be equal, the fit indexes were hardly affected, although the models showed significant increases in chi-square relative to the base model. Marsh (1994) suggested that if the fit indexes of the invariance models remain high, it can be concluded, for practical purposes, that there is factorial invariance across groups.

Genders

Cohorts 1 and 2 were combined, and the models were examined for boys and girls separately. The findings indicated that the six-correlated-factor and higher order models produced an excellent fit of the data for girls and boys (see Table 7), with AGFI, NFI, and RNI values greater than .90 and RMSEA and RMR values lower than .05 for both genders.

Factorial Invariance Across Genders

Tests of factorial invariance were conducted across genders via the same methods described earlier. The base model with six first-order factors loading onto one higher order factor provided a good fit of the data across genders, $\chi^2(1318, N = 1{,}286) = 1{,}267$, $p < .84$. Table 8 shows that the fit statistics changed relatively little as invariance constraints were imposed on the first-order factor loadings, on the loadings onto the second-order factor, and, finally, on the psi matrix and error–uniqueness. In each invariance test, the NFI and RNI exceeded .90 and the RMR and RMSEA values remained below .05, suggesting factorial invariance across genders. However, the changes in the chi-square value relative to changes in the degrees of freedom indicated a statistically significant reduction in fit as the invariance constraints were successively increased.

Table 7
Fit Indexes for Each Model, With Comparisons Between Models, for Boys and Girls Separately

Model	χ^2	*df*	*p*	RMSEA	90% CI for RMSEA	AGFI	RMR	NFI	RNI	Comparison	χ^2 change	*df* change	*p* for χ^2 change	Target coefficient
Girls (n = 840)														
Null	24,054	703												
Model 1 (single factor)	1,001	665	<.001	.126	.020–.032	.97	.042	.96	.96	Models 1 and 3	274	15	.001	
Model 2 (6 uncorrelated factors)	18,661	665	<.001	.19		.37	.180	.18	.22	Models 2 and 3	17,934	15	.001	
Model 3 (6 correlated factors)	727	650	.02	.012	.006–.017	.97	.036	.97	.97	Null and Model 3	23,327	53	.001	
Model 4 (6 first-order factors, 1 higher order factor)	772	659	.002	.015	.009–.019	.97	.037	.96	.97	Models 3 and 4	45	9	.001	.94
Boys (n = 556)														
Null	10,177	703												
Model 1 (single factor)	584	665	.99	.001	.000–.011	.96	.039	.94	.94	Models 1 and 3	108	15	.001	
Model 2 (6 uncorrelated factors)	8,011	665	<.001	.15		.31	.150	.17	.21	Models 2 and 3	7,535	15	.001	
Model 3 (6 correlated factors)	476	650	>.99	<.001		>.99	<.001	>.99	>.99	Null and Model 3	9,701	53	.001	
Model 4 (6 first-order factors, 1 higher order factor)	494	659	>.99	<.001		>.99	<.001	>.99	>.99	Models 3 and 4	18	9	.001	.96

Note. RMSEA = root mean squared error of approximation; CI = confidence interval; AGFI = adjusted goodness of fit index; RMR = root mean square residual; NFI = normed fit index; RNI = relative noncentrality index.

Factorial Invariance Across Age

Tests of factorial invariance were also conducted across age groups. The sample was divided into two groups: children 10 years of age or younger (n = 787) and children 11 years of age or older: (n = 610). As shown in Table 9, the base model (Model 4) with the factor pattern equal provided a good fit of the data across age groups, $\chi^2(1318, N = 1{,}397) = 1{,}352$, $p < .25$. When invariance constraints were placed on the first-order factor loadings, a significant increase in the chi-square value relative to the change in degrees of freedom occurred. However, the goodness of fit indexes remained high. In the next step, the loadings onto the higher order factor were constrained to be equal across age groups. A significant increase in chi-square relative to the change in degrees of freedom occurred; however, all of the goodness of fit indexes remained within the range required for satisfactory fit. However, when the invariance constraints were extended to include the psi matrix, the RMR index rose above the acceptable level of .05, suggesting a lack of factorial invariance within the psi matrix across the age groups.

Table 8
Tests of Factorial Invariance Across Genders (512 Boys and 774 Girls)

Model	χ^2	*df*	*p*	RMSEA	90% CI for RMSEA	RMR	NFI	RNI
Mode with 6 first-order factors, 1 second-order factor, factor pattern equal	1,267	1318	.84	.000	.000–.027	.037	.96	.96
Base model with first-order factor loadings invariant	1,426	1350	.07	.007	.000–.010	.038	.96	.96
Base model with first-order and second-order factor loadings invariant	1,791	1356	<.001	.016	.013–.018	.041	.95	.95
Base model with first-order and second-order factor loadings and psi matrix invariant	1,908	1362	<.001	.018	.015–.020	.042	.94	.94
Base model with first-order and second-order factor loadings, psi matrix, and error–uniqueness invariant	1,993	1400	<.001	.018	.015–.020	.044	.94	.94

Note. RMSEA = root mean squared error of approximation; CI = confidence interval; RMR = root mean square residual; NFI = normed fit index; RNI = relative noncentrality index.

Table 9
Tests of Factorial Invariance Across Age Groups: 10 Years of Age and Younger Versus 11 Years of Age and Older

Model	χ^2	*df*	*p*	RMSEA	90% CI for RMSEA	RMR	NFI	RNI
Model with 6 first-order factors, 1 second-order factor, factor pattern equal	1,352	1318	.25	.004	.001–.006	.035	.97	.96
Base model with first-order factor loadings invariant	1,679	1350	<.001	.013	.010–.015	.042	.96	.96
Base model with first-order and second-order factor loadings invariant	2,388	1356	<.001	.023	.020–.023	.050	.94	.94
Base model with first-order and second-order factor loadings and psi matrix invariant	2,492	1362	<.001	.024	.021–.027	.052	.94	.94
Base model with first-order and second-order factor loadings, psi matrix, and error–uniqueness invariant	2,616	1400	.025	.025	.022–.028	.054	.94	.94

Note. RMSEA = root mean squared error of approximation; CI = confidence interval; RMR = root mean square residual; NFI = normed fit index; RNI = relative noncentrality index.

Further analyses were conducted to clarify the source of invariance. When Model 4 was run separately for the two age groups, the model provided an excellent fit of the data for younger and older children. However, one interesting finding was noted. The intercorrelations between the first-order factors were higher for the younger children than for the older children. For example, for the younger children, the intercorrelations between the social anxiety factor and other factors were .82 for panic, .82 for separation anxiety, .74 for physical injury fears, .80 for obsessive–compulsive disorder, and .88 for generalized anxiety symptoms. In contrast, for the older children, the intercorrelations between the social anxiety factor and other factors were .72 for panic, .71 for separation anxiety, .65 for physical injury fears, .71 for obsessive–compulsive disorder, and .80 for generalized anxiety symptoms. This suggests that the different factors of anxiety may become more differentiated with age. Further support for this suggestion could be seen in the percentage of unique variance accounted for by the first-order factors. Across all factors, this percentage was lower for the younger children (panic–agoraphobia, 18%; separation anxiety, 17%; social phobia, 19%; physical injury fears, 33%; obsessive–compulsive symptoms, 20%; and generalized–overanxious disorder, 4%) than for the older children (panic–agoraphobia, 28%; separation anxiety, 28%; social phobia, 29%; physical injury fears, 42%; obsessive–compulsive problems, 29%; and generalized–overanxious disorder, 11%).

Mean Factor Scores

The mean scores for children on each factor were calculated for the combined Cohorts 1 and 2. Given the unequal number of items that composed the factors, the total score was divided by the number of items to provide an averaged score, as outlined in Table 10. An arbitrary cutoff point was established for each factor to examine those children who reported "high" scores. The cutoff points were 12 out of 18 on a six-item factor, 18 out of 27 on the nine-item factor, and 10 out of 15 on the five-item factor. These scores were taken as reflecting the score equivalent to an average rating of 2 ("often") for the occurrence of each symptom within a factor or a pattern of 3 ("always") on more than half of the items in the factor. As Table 10 shows, the problem area most commonly reported as highly problematic related to social phobia, with 14% of children reporting a score of 12 out of 18 or higher. It was interesting to note that obsessive–compulsive problems were also relatively common. The least frequently reported area of anxiety concerned panic and agoraphobic symptoms.

Age and gender differences were then examined for those children who reported high scores on the various factors. Girls were more likely to report high scores than boys on all factors other than obsessive–compulsive symptoms. The percentages of boys and girls, respectively, who exceeded the cutoff points for each problem area were as follows: separation anxiety, 3.1% and 6.7%; social phobia, 6.8% and 17.7%; obsessive–compulsive problems, 8.5% and 8.4%; panic–agoraphobia, 0.7% and 1.9%; physical injury fears, 2.9% and 4.5%; and generalized anxiety, 4.1% and 8.2%. Younger children were more likely than older children to report high scores on the factors relating to separation anxiety and obsessive–compulsive problems, with little change across the age groups for social anxiety, physical injury fears, and generalized anxiety. For separation anxiety symptoms, high scores were reported as follows: 8-year-olds, 9.5%; 9-year-olds, 6.7%; 10-year-olds, 5.2%; 11-year-olds, 2.7%; and 12-year-olds, 4.5%. For obsessive–compulsive symptoms, high scores were reported as follows: 8-year-olds, 12.2%; 9-year-olds, 10.7%; 10-year-olds, 7.4%; 11-year-olds, 6.3%; and 12-year-olds, 7.3%. For panic–agoraphobic symptoms, there was an unusual pattern of age differences; 4.7% of the 8-year-olds reported total scores exceeding 18 out of 27, whereas only 0.9%, 1.6%, 0.5%, and 1.3% of the children 9, 10, 11, and 12 years old, respectively, did so.

Discussion

The present study examined whether anxiety symptoms in children are structured within categories indicative of discrete

Table 10
Mean Scores for Each Factor and Percentage of Children Scoring a Mean of Greater Than 2 per Item

Factor	Raw total score		Number of items	Total/number of items		% of children exceeding high cutoff point
	M	*SD*		*M*	*SD*	
Panic–agoraphobia	4.23	4.24	9	0.47	0.47	1.5
Separation anxiety	4.90	3.51	6	0.82	0.58	5.4
Social phobia	6.92	3.89	6	1.15	0.65	14.0
Physical injury fears	3.68	2.77	5	0.73	0.55	3.9
Obsessive–compulsive disorder	6.01	3.67	6	1.00	0.62	8.6
Generalized anxiety	6.17	3.34	6	1.03	0.56	6.8

anxiety disorders in keeping with the *DSM–IV* diagnostic classification system. A confirmatory factor analysis approach was used to determine which of four models best explained the data (i.e., a single-factor model, a six-uncorrelated-factor model, a six-correlated-factor model, and a higher order model with six first-order factors loading onto a single second-order factor).

Strong support was found for the six-correlated-factor model involving six factors related to panic–agoraphobia, social phobia, separation anxiety, obsessive–compulsive problems, generalized anxiety, and fear of physical injury. For Cohort 1, all items loaded significantly on their hypothesized factor, with high factor loadings for almost all items. Thus, the data were consistent with the structure outlined within the *DSM–IV*, which assumes that specific subtypes of anxiety disorder can be identified in children. As predicted, the fit of the six-correlated-factor model was significantly better than that produced by the uncorrelated six-factor model, confirming strong interrelationships among subtypes of anxiety.

The high correlations among the oblique factors and the finding of particularly strong correlations between the generalized–overanxious factor and the other dimensions suggested the existence of a higher order factor. It was important to determine whether anxiety problems are so heavily dominated by a "general" anxiety factor that the data would be better explained by a single anxiety factor or by a model in which specific anxiety disorders can be discriminated but are strongly driven by a global anxiety factor. The single-factor model produced a reasonably good fit of the data but was statistically less satisfactory than the six-correlated-factor model. In contrast, there was considerable support for the higher order model, consistent with an overall anxiety factor underlying the specific anxiety disorders. These results suggest that the high degree of covariance observed among the first-order anxiety factors can be explained by a single second-order factor. Given that the data relied solely on self-report, it was important to determine whether the higher order factor was simply a reflection of common method variance or whether it genuinely reflected a general anxiety dimension. When the six positively worded filler items were included as a separate factor, this dimension was correlated negatively with the first-order factors but shared only about 10% of the variance with each of the first-order factors. When the higher order model was examined, 87% of the variance was unique to the positive item factor. Thus, although there was some evidence of common method variance, this variable was unlikely to have accounted for the higher order factor.

In contrast to the positive item factor, the percentage of variance unique to the first-order factors was relatively small, ranging from 7% to 34%, indicating that the major proportion of variance in anxiety symptoms was explained by the higher order anxiety factor. The physical fear factor demonstrated the highest unique variance. It was interesting to note that the smallest percentage of variance explained was found for the generalized–overanxious factor. This is perhaps not surprising given the relatively general nature of the items involved. Furthermore, it was stressed previously that the items predicted to lie on a generalized anxiety–overanxious dimension did not adequately reflect the *DSM–IV* diagnostic criteria for generalized anxiety disorder. Thus, it is important to treat this finding with considerable caution. However, the result is consistent with Beidel's (1991) study, which failed to support overanxious disorder as a distinct diagnostic category in children. Indeed, Beidel (1991) suggested that overanxious disorder may represent a "prodromal" anxious state underlying the development of anxiety disorders in children and adolescents. Further studies are clearly needed to determine whether overanxious–generalized anxiety disorder represents a valid diagnostic category for children.

It was particularly interesting to find support for a panic–agoraphobia factor among the 8–12-year age group. These symptoms related to unexpected physiological and affective fear responses in the absence of obvious threat and fear of situations in which escape might be difficult. The panic and agoraphobia items loaded together on the same latent factor, providing support for the view that children in this age range do indeed experience anxiety symptoms that resemble panic–agoraphobia problems in adults.

Overall, the data were consistent with a model based largely on *DSM–IV* diagnostic categories of anxiety disorders in children. The higher order factor model provided an excellent fit of the data. In practical terms, this model can be regarded as consisting of a strong second-order factor related to anxiety in general, within which specific categories of anxiety can be identified. However, these first-order factors are strongly intercorrelated, which would explain the high level of comorbidity found among anxiety disorders in children. Support was also found for the physical fears factor, in line with the finding of Campbell and Rapee (1994) of a distinct physical fear dimension among children. Their study, however, was limited to children's fears of specific social and physical aversive outcomes and did not consider the wide range of anxiety symptoms examined here. The results of the present study, in combination with those of Campbell and Rapee (1994), suggest that there may be a subtype of anxiety disorder among children in which the primary focus is on the fear of physical injury from a wide range of physical threat stimuli. It is possible that these children include those who are frequently referred to as experiencing multiple specific phobias relating to a range of physical stimuli such as storms, dogs, insects, dentists, doctors, injections, heights, and blood, all of which relate to the potential threat of physical injury. The suggestion of a subtype of anxiety disorder based on fear of physical injury is certainly worth examining, but it must be stressed that the present results, and those of Campbell and Rapee (1994), were based on community samples. It remains to be determined whether this anxiety problem subtype is evident among clinical samples and whether fears of physical injury are sufficiently severe and disruptive to be regarded as a clinical disorder.

Having found support for the 6 correlated factor and higher-order models, the analyses were conducted on a second cohort of children. The findings were replicated with Cohort 2, and were evident for boys and girls. Tests of factorial invariance were conducted to provide further validity for the results from Cohort 1. Tests of factorial invariance between Cohorts 1 and 2 and between genders generally supported invariance in the factor structure and loadings between these groups. Thus, there was little difference in the factor structure of anxiety problems between cohorts or between genders, with both boys and girls presenting a pattern of anxiety symptoms resembling that predicted by the *DSM–IV*.

The tests of factorial invariance were less conclusive across age groups, with some evidence of factorial invariance in the psi matrix. Further analyses revealed that the intercorrelations between the first-order factors were higher for the younger children than for the older children, suggesting that specific anxiety disorders may become more differentiated with age. It is important that further studies of this type be conducted with adolescents to clarify whether this apparent increase in differentiation among anxiety disorders continues through adolescence into adulthood. However, although increasing differentiation may occur with increasing age, it is likely that the overlying anxiety factor will still be found in adult populations, given the high level of comorbidity among anxiety disorders in clinically anxious adults (de Ruiter, Rijken, Garssen, & Van-Schaik, 1989; Wittchen, Essau, & Krieg, 1991). These issues warrant examination in future studies.

The data were examined to determine the proportion of children who reported high scores on each of the anxiety factors. High scores were most commonly reported for social phobia and obsessive–compulsive dimensions, with the panic–agoraphobic factor being least prevalent. Although it is tempting to compare the findings of the present study with those of epidemiological surveys of childhood anxiety disorders, one should be cautious in doing so. No assessment was made regarding the level of interference in daily living or personal adjustment caused by the problem, and the questionnaire was not designed to provide a clinical diagnosis. However, the few epidemiological studies that have examined childhood anxiety disorders among community samples of children in the 8–12-year age range suggest both similarities and differences with respect to the present findings. Generally, panic–agoraphobic disorders have been found to be the least common anxiety disorder category among children, and this was reflected in the current study (see Costello & Angold, 1995, for a review of epidemiological studies). However, the high prevalence of social phobic symptoms found in the present study contrasts with the relatively low prevalence of clinically diagnosed social phobia found in epidemiological studies involving children (approximately 1% to 2%; Costello & Angold, 1995). The differences in method of reporting and criteria are likely to explain these different findings. It is possible that social anxiety symptoms are relatively common among children but that these features are not sufficiently severe and do not negatively affect personal functioning to a degree that warrants a clinical diagnosis.

Age and gender differences were noted in the proportion of children reporting high scores on the anxiety factors. Girls were more likely than boys to report high scores on all factors, with the exception of the obsessive–compulsive symptom cluster. The finding of higher rates of anxiety problems among girls is in keeping with recent general population studies of the prevalence of clinically significant anxiety disorders (Anderson, 1994). Interestingly, the finding that obsessive–compulsive problems represented the only cluster to be equally prevalent in boys and girls is in keeping with an epidemiological study of adolescents reported by Flament, Whitaker, Rapoport, and Davies (1988). Obsessive–compulsive disorder appears to stand out from other anxiety disorders in that its symptomatology is not more prevalent in girls than in boys (March, Leonard, & Swedo, 1995).

Younger children were more likely than older children to report high scores on separation anxiety and obsessive–compulsive problems. An unusual pattern of age differences was found for the panic–agoraphobia factor, with high scores being much more common in the 8-year-olds than in the older age groups. It is unclear what this age effect means, and further research is needed to clarify whether it reflects difficulty in comprehension of question items among the 8-year-olds or whether it is a real effect in symptom prevalence.

Several methodological limitations of this study warrant discussion. First, the study involved a community sample, and thus the findings cannot be generalized to clinical samples. However, it was appropriate to investigate a community sample initially, given that diagnostic decisions are applied in the first instance to nondiagnosed children. It remains for future studies to determine whether the factor structure identified among the community sample is applicable to a clinically referred group of children or to those who have already been diagnosed as experiencing a clinically significant anxiety disorder.

Second, the reliance on child self-report was also a limitation. Research is now needed with alternative data sources (e.g., parents or teachers) to determine whether the findings will be replicated with data from other informants. It is important to take into account that any self-report questionnaire will inevitably involve measurement error. This is likely to be of particular significance in work with children, in which factors such as attention, memory, and question understanding are likely to influence the results. In such circumstances, it would be unreasonable to expect any model to provide a perfect fit of the data. Thus, the clear findings of the present study are impressive when measurement error is taken into account.

Third, the study was limited by its focus solely on anxiety symptoms and failure to include items relating to other problem areas such as depression or attention-deficit–hyperactivity. Thus, it is not possible to determine whether the anxiety factor structure supported here would be retained when examined in association with a broad range of presenting child behavior problems. However, the restricted focus in the present study was justified so as to provide a detailed examination of anxiety problems in children. Previous studies that have examined a wide spectrum of presenting problems (e.g., Achenbach, Conners, Quay, Verhulst, & Howell, 1989) have not been able to include a sufficient number of questions relating to anxiety disorders to permit a valid examination of the taxonomy of anxiety problems in children. The ensuing results from such studies tend to be limited to broader dimensions of psychopathology such as a combined anxious–depressed factor (Achenbach et al., 1989). The present study aimed to go beyond these broad dimensions to examine specific areas of anxiety disorder.

A fourth limitation is that the outcome of any study of this type is inherently determined by the input and by asking the right questions in the first place. Clearly, other anxiety symptoms not included in the present study could potentially influence the structure of child anxiety problems. For example, the items allocated to the social phobia category focused on fears of negative evaluation rather than the avoidant aspects of social anxiety. In retrospect, it would have been valuable to include items relating to fears of strangers and other aspects of what was previously termed avoidant disorder. Similarly, as mentioned earlier, the items relating to generalized anxiety did not adequately reflect the *DSM–IV* criteria for this disorder. These issues should be considered in future research.

Finally, although the results are consistent with the structure of *DSM–IV* anxiety disorders, it is important to note that the study did not aim to validate the actual clinical diagnoses produced by the *DSM–IV*. To do so would require information about the length of time that symptoms had been occurring and the number of symptoms experienced simultaneously. The present study was limited to the frequency with which specific symptoms were experienced and the degree to which anxiety problems tend to co-occur as predicted by the *DSM–IV* structure of anxiety disorders.

In summary, the confirmatory factor analyses provided support for the a priori factor structure proposed to underlie child anxiety problems according to *DSM–IV* diagnostic categories. Anxiety symptoms were found to load onto correlated factors relating to panic–agoraphobia, separation anxiety, social phobia, obsessive–compulsive disorder, generalized–overanxious problems, and physical fears. The high level of covariance between these factors was satisfactorily explained by a strong second-order anxiety factor. This higher order factor accounted for a high proportion of the variance in children's anxiety symptom responses. However, there was sufficient unique variance in the first-order factor to justify differentiation of subtypes of anxiety problems, with the exception of generalized–overanxious problems. Unfortunately, the item content suggested to reflect the generalized–overanxious dimension was not adequate to provide a satisfactory test of the validity of this subtype of anxiety.

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Appendix

Means, Standard Deviations, and Covariance Matrix for All Variables (Cohort 1)

Table A1
Means and Standard Deviations

Questionnaire item	*M*	*SD*
1. I worry about things	1.179	0.575
2. I am scared of the dark	0.685	0.834
3. When I have a problem, I get a funny feeling in my stomach	0.954	0.920
4. I feel afraid	0.874	0.602
5. I would feel afraid of being on my own at home	0.913	1.037
6. I feel scared when I have to take a test	1.179	1.018
7. I feel afraid if I have to use public toilets or bathrooms	0.904	1.024
8. I worry about being away from my parents	1.073	0.983
9. I feel afraid that I will make a fool of myself in front of people	1.202	0.916
10. I worry that I will do badly at my school work	1.305	0.992
11. I am popular amongst other kids my own age	1.285	1.007
12. I worry that something awful will happen to someone in my family	1.467	0.990
13. I suddenly feel as if I can't breathe when there is no reason for this	0.466	0.750
14. I have to keep checking that I have done things right (like the switch is off, or the door is locked)	1.060	0.974
15. I feel scared if I have to sleep on my own	0.433	0.770
16. I have trouble going to school in the mornings because I feel nervous or afraid	0.427	0.703
17. I am good at sports	2.034	0.915
18. I am scared of dogs	0.605	0.802
19. I can't seem to get bad or silly thoughts out of my head	1.160	0.875
20. When I have a problem, my heart beats really fast	1.178	1.032
21. I suddenly start to tremble or shake when there is no reason for this	0.529	0.776
22. I worry that something bad will happen to me	1.105	0.894
23. I am scared of going to the doctors or dentists	0.765	0.944
24. When I have a problem, I feel shaky	0.904	0.892
25. I am scared of being in high places or lifts (elevators)	0.573	0.878
26. I am a good person	1.692	0.737
27. I have to think of special thoughts to stop bad things from happening (like numbers or words)	0.835	0.909
28. I feel scared if I have to travel in the car, or on a bus or a train	0.272	0.580
29. I worry what other people think of me	1.274	0.998
30. I am afraid of being in crowded places (like shopping centers, the movies, buses, busy playgrounds)	0.496	0.758
31. I feel happy	1.953	0.746
32. All of a sudden I feel really scared for no reason at all	0.490	0.729
33. I am scared of insects or spiders	1.040	0.956
34. I suddenly become dizzy or faint when there is no reason for this	0.471	0.789
35. I feel afraid if I have to talk in front of my class	1.245	1.000
36. My heart suddenly starts to beat too quickly for no reason	0.431	0.710
37. I worry that I will suddently get a scared feeling when there is nothing to be afraid of	0.486	0.727
38. I like myself	1.818	0.991
39. I am afraid of being in small closed places, like tunnels or small rooms	0.650	0.890
40. I have to do some things over and over again (like washing my hands, cleaning or putting things in a certain order)	1.011	0.998
41. I get bothered by bad or silly thoughts or pictures in my mind	1.052	0.906
42. I have to do some things in just the right way to stop bad things happening	0.867	0.876
43. I am proud of my school work	1.762	0.939
44. I would feel scared if I had to stay away from home overnight	0.566	0.873
45. Is there something else that you are really afraid of? Yes ______ No ______ Please write down what it is: ____________ How often are you afraid of this thing?		

(Appendix continues)

Table A2
Covariance Matrix for Cohort 1

Item	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1	0.331																					
2	0.153	0.695																				
3	0.153	0.172	0.847																			
4	0.150	0.200	0.156	0.363																		
5	0.181	0.348	0.213	0.252	1.076																	
6	0.170	0.219	0.249	0.175	0.283	1.037																
7	0.122	0.194	0.189	0.147	0.251	0.240	1.048															
8	0.162	0.261	0.264	0.167	0.447	0.230	0.359	0.966														
9	0.170	0.246	0.306	0.140	0.236	0.310	0.217	0.289	0.839													
10	0.186	0.197	0.241	0.148	0.266	0.452	0.220	0.259	0.393	0.984												
11	−0.051	−0.131	−0.039	−0.099	−0.169	−0.126	0.014	−0.060	−0.168	−0.203	1.013											
12	0.153	0.168	0.209	0.139	0.217	0.239	0.313	0.379	0.291	0.319	−0.060	0.981										
13	0.107	0.166	0.214	0.092	0.163	0.169	0.144	0.190	0.171	0.179	−0.070	0.171	0.562									
14	0.151	0.158	0.102	0.120	0.218	0.285	0.169	0.234	0.180	0.292	−0.077	0.240	0.187	0.949								
15	0.139	0.309	0.143	0.152	0.326	0.201	0.230	0.258	0.184	0.192	−0.072	0.196	0.150	0.181	0.593							
16	0.142	0.182	0.176	0.151	0.222	0.251	0.166	0.207	0.205	0.268	−0.076	0.156	0.144	0.198	0.198	0.495						
17	−0.078	−0.135	−0.077	−0.102	−0.153	−0.095	−0.034	−0.058	−0.205	−0.157	0.264	−0.051	−0.026	−0.025	−0.068	−0.063	0.837					
18	0.035	0.112	0.059	0.099	0.142	0.104	0.090	0.101	0.087	0.030	−0.015	0.086	0.061	0.119	0.102	0.071	−0.065	0.644				
19	0.118	0.187	0.162	0.116	0.126	0.211	0.156	0.160	0.237	0.176	−0.020	0.203	0.156	0.195	0.140	0.132	−0.072	0.095	0.766			
20	0.146	0.155	0.342	0.159	0.265	0.297	0.267	0.293	0.297	0.287	−0.134	0.266	0.256	0.238	0.216	0.222	−0.006	0.093	0.230	1.065		
21	0.120	0.198	0.206	0.144	0.184	0.181	0.224	0.202	0.236	0.213	−0.118	0.160	0.223	0.158	0.158	0.189	−0.097	0.064	0.146	0.265	0.602	
22	0.189	0.291	0.221	0.195	0.298	0.245	0.287	0.322	0.296	0.330	−0.084	0.447	0.230	0.268	0.262	0.226	−0.097	0.129	0.221	0.319	0.237	0.800
23	0.082	0.220	0.105	0.135	0.249	0.309	0.187	0.182	0.175	0.240	−0.107	0.143	0.141	0.228	0.174	0.161	−0.114	0.132	0.127	0.200	0.140	0.204
24	0.176	0.178	0.340	0.160	0.225	0.257	0.233	0.294	0.291	0.272	−0.066	0.264	0.197	0.228	0.188	0.233	−0.094	0.094	0.186	0.425	0.262	0.326
25	0.078	0.198	0.114	0.135	0.229	0.128	0.135	0.192	0.118	0.085	−0.027	0.161	0.132	0.141	0.186	0.139	−0.046	0.134	0.106	0.189	0.133	0.220
26	0.001	−0.017	−0.006	−0.006	0.059	−0.044	0.018	0.037	−0.024	−0.081	0.022	−0.017	0.007	−0.024	−0.006	0.005	0.105	−0.011	0.001	0.030	0.010	−0.012
27	0.108	0.228	0.254	0.137	0.185	0.203	0.197	0.273	0.195	0.187	−0.062	0.231	0.213	0.301	0.226	0.162	−0.016	0.123	0.212	0.313	0.226	0.287
28	0.083	0.109	0.104	0.103	0.172	0.122	0.148	0.151	0.101	0.108	−0.010	0.111	0.060	0.139	0.127	0.135	−0.024	0.060	0.068	0.105	0.143	0.134
29	0.203	0.248	0.318	0.197	0.289	0.325	0.243	0.286	0.450	0.360	−0.181	0.287	0.255	0.179	0.177	0.279	−0.108	0.088	0.303	0.342	0.235	0.367
30	0.106	0.187	0.103	0.137	0.261	0.208	0.256	0.233	0.135	0.134	−0.081	0.141	0.126	0.188	0.207	0.144	−0.050	0.090	0.100	0.196	0.158	0.216
31	−0.053	−0.072	−0.085	−0.076	−0.034	−0.148	−0.053	−0.088	−0.091	−0.125	0.095	−0.107	−0.093	−0.086	−0.054	−0.106	0.136	−0.036	−0.057	−0.066	−0.038	−0.108
32	0.139	0.245	0.213	0.164	0.242	0.209	0.228	0.221	0.208	0.223	−0.081	0.188	0.201	0.200	0.208	0.230	−0.077	0.112	0.159	0.253	0.284	0.289
33	0.136	0.201	0.121	0.189	0.318	0.230	0.173	0.222	0.210	0.177	−0.153	0.191	0.090	0.173	0.209	0.138	−0.143	0.197	0.085	0.224	0.155	0.250
34	0.102	0.101	0.202	0.121	0.129	0.155	0.180	0.119	0.149	0.139	−0.066	0.110	0.224	0.101	0.137	0.160	−0.071	0.053	0.177	0.239	0.235	0.179
35	0.115	0.162	0.215	0.157	0.225	0.375	0.161	0.192	0.288	0.376	−0.239	0.142	0.157	0.226	0.151	0.208	−0.142	0.097	0.126	0.249	0.177	0.237
36	0.131	0.129	0.185	0.123	0.148	0.165	0.171	0.174	0.181	0.188	−0.103	0.150	0.202	0.166	0.133	0.176	−0.041	0.017	0.190	0.328	0.262	0.207
37	0.144	0.216	0.192	0.169	0.286	0.191	0.173	0.228	0.192	0.192	−0.107	0.208	0.211	0.186	0.210	0.218	−0.068	0.098	0.136	0.255	0.234	0.258
38	−0.055	−0.050	−0.093	−0.056	0.056	−0.180	0.005	0.052	−0.160	−0.194	0.161	−0.051	−0.044	−0.049	0.020	−0.060	0.174	0.023	−0.156	−0.006	−0.067	−0.074
39	0.123	0.247	0.150	0.164	0.305	0.216	0.253	0.294	0.154	0.196	−0.074	0.222	0.139	0.149	0.236	0.151	−0.051	0.134	0.138	0.239	0.158	0.249
40	0.107	0.160	0.140	0.115	0.160	0.210	0.205	0.180	0.199	0.206	−0.174	0.160	0.130	0.336	0.159	0.213	−0.076	0.071	0.231	0.286	0.201	0.250
41	0.154	0.262	0.268	0.212	0.290	0.239	0.252	0.272	0.274	0.242	−0.122	0.256	0.234	0.248	0.217	0.236	−0.068	0.063	0.290	0.378	0.273	0.372
42	0.139	0.155	0.203	0.140	0.183	0.225	0.230	0.239	0.179	0.167	−0.090	0.243	0.178	0.301	0.170	0.163	−0.037	0.109	0.185	0.324	0.205	0.248
43	−0.055	−0.061	−0.068	−0.042	−0.005	−0.191	−0.001	0.053	−0.110	−0.293	0.132	−0.031	−0.053	−0.079	−0.035	−0.108	0.189	−0.020	−0.097	0.014	−0.049	−0.037
44	0.069	0.214	0.135	0.140	0.324	0.171	0.258	0.402	0.129	0.120	−0.124	0.200	0.106	0.155	0.243	0.121	−0.042	0.139	0.103	0.181	0.128	0.192

Table A2 (*continued*)

23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
0.892																					
0.181	0.796																				
0.240	0.222	0.770																			
−0.067	0.006	0.035	0.543																		
0.162	0.271	0.028	0.035	0.826																	
0.119	0.134	0.142	0.028	0.124	0.336																
0.206	0.302	0.190	0.023	0.227	0.119	0.997															
0.180	0.171	0.133	−0.001	0.125	0.172	0.165	0.575														
−0.079	−0.068	−0.036	0.160	−0.016	−0.006	−0.085	−0.043	0.556													
0.173	0.271	0.149	−0.007	0.231	0.146	0.290	0.183	−0.060	0.531												
0.308	0.182	0.262	0.011	0.187	0.135	0.240	0.214	−0.020	0.165	0.914											
0.115	0.206	0.114	0.000	0.164	0.090	0.219	0.161	−0.065	0.196	0.127	0.623										
0.335	0.234	0.182	−0.046	0.191	0.100	0.342	0.115	−0.095	0.161	0.257	0.141	1.000									
0.112	0.238	0.144	0.008	0.203	0.125	0.225	0.143	−0.040	0.260	0.109	0.233	0.178	0.504								
0.172	0.216	0.203	−0.007	0.226	0.126	0.261	0.181	−0.075	0.293	0.170	0.200	0.182	0.254	0.528							
−0.053	−0.098	0.011	0.168	−0.023	0.009	−0.167	0.023	0.174	−0.071	0.012	−0.122	−0.135	−0.066	−0.018	0.981						
0.226	0.219	0.218	0.018	0.206	0.154	0.225	0.264	−0.031	0.223	0.235	0.090	0.185	0.162	0.214	0.018	0.793					
0.162	0.231	0.104	−0.009	0.273	0.076	0.196	0.172	−0.053	0.207	0.167	0.151	0.179	0.210	0.188	−0.047	0.162	0.996				
0.171	0.335	0.201	−0.019	0.283	0.138	0.360	0.237	−0.082	0.313	0.219	0.198	0.251	0.266	0.289	−0.087	0.235	0.312	0.821			
0.134	0.278	0.177	0.032	0.365	0.099	0.250	0.169	−0.058	0.202	0.180	0.156	0.139	0.225	0.231	0.025	0.227	0.263	0.307	0.767		
−0.075	−0.090	0.003	0.225	−0.045	−0.011	−0.088	−0.030	0.178	−0.053	0.034	−0.083	−0.177	−0.021	−0.051	0.353	−0.010	−0.052	−0.090	0.017	0.882	
0.169	0.178	0.213	−0.009	0.182	0.128	0.178	0.204	−0.097	0.128	0.191	0.120	0.205	0.103	0.191	0.076	0.291	0.114	0.203	0.193	0.026	0.763

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