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The structure of anxiety symptoms among preschoolers

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Abstract

This study examined whether anxiety symptoms in preschoolers reflect subtypes of anxiety consistent with current diagnostic classification systems, or should be better regarded as representing a single dimension. Parents of a large community sample of preschoolers aged 2.5 to 6.5 years rated the frequency with which their children experienced a wide range of anxiety problems. Exploratory factor analysis indicated four or five factors and it was unclear whether separation anxiety and generalized anxiety represented discrete factors. Results of confirmatory factor analyses indicated a superior fit for a five-correlated-factor model, reflecting areas of social phobia, separation anxiety, generalized anxiety, obsessive–compulsive disorder and fears of physical injury, broadly consistent with DSM-IV diagnostic categories. A high level of covariation was found between factors, which could be explained by a single, higher order model, in which first order factors of anxiety subtypes loaded upon a factor of anxiety in general. No significant differences were found in prevalence of anxiety symptoms across genders. Symptoms of PTSD in this sample were rare.

Keywords: Anxiety; Preschool; Children; Confirmatory factor analysis

1. Introduction

As a consequence of lack of research, we know relatively little about anxiety problems among preschoolers (Campbell, 1995). For example, there is minimal information about the prevalence of anxiety disorders in preschoolers. Although it is widely accepted that preschoolers may manifest patterns of behaviour that meet diagnostic criteria for anxiety disorders, such as separation anxiety, social phobia and simple phobias, this has not been demonstrated conclusively with large scale preschool community samples. Despite the occasional inclusion of preschoolers in epidemiological

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studies, their data have not been analysed and reported separately (e.g., Bird et al., 1988). The minimal evidence available comes from studies that have examined fears of specific stimuli, rather than anxiety symptoms, among preschoolers. For example, Richman, Stevenson and Graham (1975) reported that 12.8% of 3-year old children in their sample were rated as showing severe fears. Ialongo, Edelsohn, Werthamer-Larsson, Crockett and Sheppard (1994, 1995) considered around 2.5% of a sample of 5-year olds to show severe anxiety symptoms, and found such problems to be relatively stable over a 4-month period. Furthermore, Ialongo et al. (1994, 1995) subsequently found that self-reported anxious symptoms at 5 years significantly predicted adaptive functioning 4 years later. Children who were in the top third of anxious symptoms in first grade were 10 times more likely to be in the bottom third of achievement in fifth grade, even after controlling for level of adaptive functioning in first grade.

Such information demonstrates the need to take anxiety problems seriously, but provides little insight into the forms that more specific types of anxiety may take. There is clearly a need for large-scale epidemiological studies with preschoolers that include a focus on specific anxiety disorders and symptoms. We also have little knowledge about the consequences being a highly anxious preschooler, and about patterns of comorbidity between specific anxiety disorders and other forms of psychopathology. Similarly, little is known about the stability of preschool anxiety problems, and the extent to which they are a precursor of anxiety disorders in later phases of life. We also have minimal data relating to the aetiology of preschool anxiety problems and factors that determine which children will continue to show anxiety problems over time, where others will "grow out" of their difficulties. Clearly, there are far more questions than answers in this area.

The few studies to date relating to preschool anxiety represent explorations of the nature and developmental differences in fears of specific objects or events among non-clinical children, although again very few have focused specifically upon preschool populations. These studies do provide some interesting insights into the nature of preschool children's anxiety. For example, Jersild and Holmes (1935) in their classic study asked mothers to report on fears in their 2–6 year old children. Mothers reported that their children showed an average of four to five fears of specific events or stimuli. In terms of content of fears, Maurer (1965) asked children aged 5–14 years to report "what are the things to be afraid of". The results were striking in that the highest level of fears reported by 5–6 year olds related to animals (particularly bears, lions, snakes and tigers) and this effect showed a marked decline with age. Bauer (1976) also reported this effect. Children aged 4–6 years reported a high level of fears of animals and imaginary creatures and both these areas of fears declined with age. In contrast, both studies showed relatively low levels of fears of natural disasters and bodily injury/physical danger in this very young age group, with these categories of fears increasing with age. Both authors noted the developmental shift from fears of imaginary and unrealistic fears towards more realistic and specific events with increasing cognitive development.

This shift in the content of children's fears is also reflected in the content of children's worries. For example, Vasey, Crnic and Carter (1994) demonstrated that preschool children are capable of reporting on the cognitive components of worry. However, Vasey et al. (1994) found that the content and complexity of worrisome thoughts increased with age and cognitive ability. In their 5–6 year old sample, worries relating to physical well-being (e.g. injury or kidnapping) predominated. With increasing cognitive and self-concept development, the worries of older children (8–12 years) related more often to behavioural competence, social evaluation and psychological well-being.

One of the main barriers to research into preschool anxiety is the lack of reliable and valid assessment devises. The majority of parent/teacher questionnaires or checklists, or clinician administered diagnostic interviews for assessment of preschool anxiety represent adaptations of measures developed, standardized and validated with much older children or adults. Examples include the Louisville Fear-Survey (Miller, Barrett, Hampe & Noble, 1972), modifications of the Fear Survey Schedule for Children-Revised (Ollendick, 1983; Bouldin & Pratt, 1998) and Anxiety Disorders Interview Schedule for Children (Silverman & Albano, 1996). Other parent and teacher reports, using child behaviour checklists (e.g., Achenbach, 1992; Quay, 1983; Behar, 1977), tend to cover more global aspects of internalizing behaviours, and patterns of anxious/withdrawn/depressive behaviour, and provide little information about specific anxiety symptoms.

A few studies have attempted to modify child self-report measures designed for older children, such as the Revised Children's Manifest Anxiety Scale (Reynolds & Richmond, 1978) or the State-Trait Anxiety Inventory for Children (Spielberger, 1973). However, it is not clear that the content is appropriate for preschool children, nor whether younger children understand the questions and the response formats. A few child-report measures have been developed specifically for preschoolers, using pictorial response formats. However, these measures examine only very narrow areas of anxiety. For example, Martini, Strayhorn and Puig-Antich (1990) developed a pictorial, self-report symptom measure for preschoolers but it was intended to assess depression, rather than anxiety disorders, and only includes four items relating to separation anxiety and fear of dogs. Pictorial methods have also been used to assess preschool children's anxiety about death or separation (Halpern, Ellis & Simon, 1990) and fears of the dark (Kelley, 1976; Giebenhain & O'Dell, 1984).

It is not possible from the evidence available to date to determine whether anxiety problems in preschoolers mirror those found in older children. In particular, it is unclear whether anxiety symptoms in preschoolers cluster according to the diagnostic subtypes of anxiety as proposed by classification systems such as DSM-IV (American Psychiatric Association, 1994). In older primary school children, factor analytic studies have supported the validity of separate subtypes of anxiety (Spence, 1997; Muris, Merckelbach, Schmidt & Mayer, 1999), although the high level of covariation between first order factors can be explained by a single higher-order factor of anxiety in general (Spence, 1997). Nevertheless, there is sufficient unique variance explained by the first order factors to justify their use in clinical practice. There is a need for similar studies with preschool children to examine the validity of subtypes of anxiety in this younger age group. Although this assumption is widely accepted in clinical practice, it remains to be determined whether anxiety symptoms in preschoolers do indeed cluster into subtypes of anxiety such as separation anxiety, social phobia, obsessive–compulsive disorder, panic disorder/agoraphobia, and generalized anxiety disorder. Indeed, there is some evidence that suggests that, in younger children, anxiety may present in a more diffuse manner, reflecting a single dimension of anxiety, rather than clear subtypes. In a recent study with primary school children, Spence (1997) noted that the percentage of variance in anxiety symptoms explained by specific first order factors (separation anxiety, social phobia, panic/agoraphobia, obsessive–compulsive, generalized anxiety and fears of physical injury) was lower in the younger compared to older primary school children.

The present study was designed to examine whether the pattern of anxiety symptoms in preschoolers is in keeping with that predicted by the DSM-IV diagnostic categories. As a means of

examining this proposition, confirmatory factor analysis was used to examine whether a model based on the DSM-IV anxiety disorder structure could explain the data. It was hypothesized that parents' responses relating to their children's anxiety symptoms would load onto five correlated factors, reflecting the DSM-IV anxiety disorders of separation anxiety, social phobia, obsessive–compulsive disorder, and generalized anxiety disorder. The fifth proposed factor related to fears of physical injury. This factor was included as it did not make sense to include multiple items relating to each possible specific simple phobia. A second reason for including this factor was the finding that feared outcomes in children are shown to cluster into two primary dimensions, relating to social and physical domains (Campbell & Rapee, 1994). Furthermore, a strong fear of physical injury factor was found with older children (Spence 1997, 1998). For reasons that will be explained in due course, the final measure did not include a panic disorder and agoraphobia sub-scale (which was included in the study with the older children). Furthermore, the data were not analysed for questions relating to post-traumatic stress disorder, given the very rare frequency of occurrence of these symptoms.

The study used confirmatory factor analysis to determine whether preschool anxiety symptoms can be best regarded as reflecting a single dimension of anxiety or whether they cluster into specific factors in keeping with subtypes of anxiety disorder as proposed by the DSM-IV diagnostic classification system. In addition to examining the structure of anxiety symptoms in children, the study also permitted examination of the relative prevalence of different anxiety symptoms and gender differences in presentation.

2. Method

2.1. Participants

Families were community volunteers who were invited to participate in a study described as a project examining social behaviour and adjustment among preschool children. Data are presented here for mothers and fathers separately. The mothers' sample represented 755 mothers who completed a preschool anxiety questionnaire. Children ranged in age from 31 to 83 months (M=55.12, SD=9.45). Responses were obtained for 379 males and 376 females. Participants were recruited from preschools and kindergartens in the major metropolitan areas of Brisbane and Sydney, Australia. Demographic information regarding mothers' ethnic background revealed that the majority were of Anglo-Saxon/Western European origin (around 80% in the Sydney sample and 90% in the Brisbane sample), with the remainder being from a range of ethnic groups of mainly Asian and Eastern European origin. Assessment of socio-economic status was conducted differently at the two sites, being based on educational level in the Sydney sample and employment category in the Brisbane sample. In the Sydney sample, around 50% of mother held some form of university degree, and at least 90% had completed 12 years of education. The Brisbane sample of mothers included 40% in management, administrative or professional occupations, 15% homemakers, 2% students, with the remainder working in paraprofessional, trades, sales, clerical or labouring positions. Only 6.5% classified themselves as unemployed.

The fathers sample was recruited from the Brisbane region only (N=383). Children in this sample ranged in age from 37 to 83 months (M=60.93 SD=5.81), and included 182 males and

201 females. Demographic information regarding fathers' ethnic origins closely resembled the backgrounds of the Brisbane mothers. Their occupational classification showed a higher proportion in higher management/administrative positions and professional groups (53%) compared to the mothers. Only 1% of fathers were unemployed.

Thus, overall the sample was predominantly from middle income, Anglo-Saxon backgrounds.

2.2. Generation of questionnaire items

Items for the questionnaire were generated to cover a wide spectrum of anxiety symptoms relevant to preschoolers. Questions were included following an extensive review of the literature relating to preschool anxiety problems, diagnostic criteria proposed by DSM-III-R (APA, 1987) and DSM-IV (APA, 1994), structured clinical interviews (e.g., Anxiety Disorders Interview Schedule for Children; Silverman & Albano, 1996), existing measures of childhood anxiety, and input from the authors, all of whom have extensive experience in research and clinical practice relating to preschool anxiety problems. Several items were drawn from the Spence Children's Anxiety Scale (Spence 1997, 1998), but reworded for preschool situations. However, items were only included if there was agreement among the four authors as to their relevance and age-appropriateness in preschoolers. Pilot versions of the questionnaire were then completed by groups of parents of preschoolers, who provided feedback about the relevance and understandability of the items. Items relating to panic disorder/agoraphobia were discarded at this point, as they were not judged by the parents or expert clinicians to be of sufficient relevance or frequency in pre-schoolers. Items relating to post-traumatic disorder were retained in subsequent versions of the questionnaire, despite the very low frequency of occurrence. The presence of PTSD symptoms is dependent upon the experience of a traumatic event. Only 13.6% of the total sample were reported by their parent to have experienced a traumatic incident.

A further trial version of the questionnaire was then piloted with a sample of 600 parents of children aged between 3 and 5 years. This version used a yes/no response format and was not found to provide sufficient variance in scores to permit valid analyses. Further items were also discarded at this point due to exceptionally rare frequency of occurrence. The final version asked parents to respond as to whether each statement is "not at all true" through to "very often true", on a five-point scale. The scale included 28 items (plus the non-scored PTSD questions), covering five hypothesized sub-scales that were designed to assess the dimensions of generalized anxiety, social phobia, separation anxiety, fears of physical injury and obsessive compulsive disorder (see Table 2).

2.3. Procedure

Parents who agreed to participate in the study and who had returned their written informed consent form were mailed their questionnaires and asked to return them to the researchers in stamped addressed envelopes or through a secured return box at their preschool. Responses were confidential to the researchers and used identifying codes rather than names. Mothers and fathers were asked not to confer in their completion of the questionnaires. A subsample of parents (N=472) were also asked to complete the Child Behaviour Checklist (CBCL, Achenbach, 1992). The CBCL was included as a indication of concurrent validity in that the preschool anxiety scale

developed for the study was predicted to correlate significantly with the internalizing scale of the CBCL. The CBCL is a highly researched instrument with well-established psychometric properties. It was designed for 4–18 year old children includes 113 items which describe children's behaviour, with a scale to which parents respond on a three point scale "not true", "somewhat true" or "very true" regarding whether the behaviour is occurring now or has occurred over the past 6 months. The Internalising scale consists of 31 items and the Externalizing scale of 33 items.

3. Results

3.1. Exploratory factor analysis (mother report)

Exploratory factor analysis was conducted with the 28 items (excluding the PTSD questions). Principal components extraction was used, with obliminal rotation. A scree test revealed between four and five factors. Rotation with five factors was examined first, given that five factors were hypothesized. The five factors accounted for 51% of variance in scores, but with one factor reflecting both generalized and separation anxiety items (eigenvalue=7.81; 28% variance) with social anxiety items splitting into two factors (eigenvalues=2.10; 1.16; 7.5%; 4.2% variance), and clear factors of obsessive–compulsive disorder (eigenvalue=1.71; 6.1%) and physical injury fears (eigenvalue=1.47; 5.3%).

Obliminal rotation with four fixed factors was then examined. This revealed a more parsimonious result, with the 4 meaningful factors accounting for 46.8% of the variance. The four factors were a combined generalized/separation anxiety factor (eigenvalue=7.813, 27.9% of variance), a social anxiety factor (eigenvalue=2.1, 7.5% of variance), a physical injury fears factor (eigenvalue=1.715, 6.1% of variance) and an obsessive–compulsive factor (eigenvalue=1.47, 5.3% of variance). Of the 28 items, 26 had a loading in excess of 0.40 on their hypothesized factor. The two items which did not load on their hypothesized factor were "Has bad or silly thoughts or images that keep coming back over and over" which loaded on the generalized/separation anxiety factor rather than the hypothesized obsessive–compulsive factor; and "Is afraid of crowded or closed-in places" which loaded on the social anxiety factor rather than the physical injury fears factor and also cross loaded on the obsessive–compulsive factor. The only other item to cross-load was a physical injury fear item "Is afraid of the dark" which also loaded on the generalized/separation anxiety factor.

3.2. Confirmatory factor analysis (mother report)

Confirmatory factor analysis provides a technique to compare different models to determine which model most fully explains the data set. This enables examination of whether preschool anxiety symptoms could best be regarded as reflecting a single dimension of anxiety, a four-factor solution (in which separation anxiety and generalized anxiety reflect a single dimension), or a five factor solution as initially hypothesized. The data were examined using EQS (Bentler, 1995) with an elliptical re-estimated least squares (ERLS) estimation using the correlation matrix. ERLS estimation was selected given that the tests for normality revealed evidence of positive kurtosis and negative skewness among many of the questionnaire items. Estimation methods such as the

maximum likelihood (ML) rely on assumptions of normality and were therefore not considered the most appropriate for the present analysis. Instead, the ERLS estimation method was considered preferable given that this form of estimation allows variables to share a common non-zero kurtosis parameter, as was evident in the present data set (Anderson & Gerbing, 1988; Bentler, 1995). The sample was not considered large enough to warrant the use of arbitrary distribution estimation methods that are able to overcome the problems of both kurtosis and skewness. The results based on ERLS estimation closely mirrored those produced by ML solution, although the goodness of fit indices were slightly lower for the ML procedure.

The first model to be examined was a 1 factor model (Model 1) in which all symptoms were predicted to load on a single factor relating to anxiety generally, with minimal clustering of symptoms. This model would be predicted if anxiety symptoms in preschoolers are relatively undifferentiated, rather than clustering according to subtypes of anxiety. Such a model would suggest that symptoms of anxiety in preschoolers reflect a single dimension of anxiety, in which all items would load strongly, with minimal variance left to be explained by separate anxiety disorder factors. This model was then compared with the four- and five-factor models described below, in order to determine which provided the most adequate fit of the data.

The second model (Model 2) involved the four, correlated factors that emerged as a possible factor structure from the exploratory factor analysis. In this model, the symptoms of anxiety were proposed to cluster into dimensions of combined separation anxiety/generalized anxiety, social phobia, obsessive–compulsive disorder and fears of physical injury. Preliminary analyses revealed that models in which factors were uncorrelated did not provide a good fit of the data, and thus these models are not reported here. Furthermore, intercorrelation between factors was predicted to occur given the considerable evidence of comorbidity of anxiety disorders among other age groups (Curry & Murphy, 1995). Although the model accepted that anxiety factors would be intercorrelated, it also assumed that anxiety symptoms would cluster onto the hypothesized factors with sufficient unique variance to justify acceptance of separate categories of anxiety disorders.

The third model (Model 3) proposed that symptoms of anxiety would cluster into five correlated dimensions of social phobia, separation anxiety, generalized anxiety, obsessive–compulsive disorder (in line with DSM-IV diagnoses) and fears of physical injury (as proposed above).

The fourth and final model (Model 4) was a higher-order model that examined the degree to which the data could be explained by five first order factors relating to specific forms of anxiety, the covariation of which can be accounted for by a higher-order factor of anxiety more generally. Such a model is actually in keeping with DSM-IV which outlines an overall category of anxiety disorder, within which lie subtypes of anxiety disorder. This model was found to provide a good fit of the data relating to anxiety symptoms among primary school children (Spence, 1997).

The EQS program produces a range of goodness of fit indices. The χ^2 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 χ^2 is large relative to the degrees of freedom and accepted if the χ^2 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 χ^2 test (Marsh, Balla & McDonald, 1988). Thus, the fit of the model should be interpreted on the basis of a range of statistics, The EQS program produces outputs for Normed Fit Index (NFI), Non-normed Fit Index (NNFI, which takes into account the degrees of freedom of the model), and the Comparative Fit Index (CFI). Values for NFI, CFI and NNFI >0.90 are generally regarded to represent

an acceptable fit of the model to the data (Bentler, 1995). The Root Mean Squared Error of Approximation (RMSEA) provides a measure of degree of discrepancy per degree of freedom. Browne and Cudeck (1993) suggest that a RMSEA value of 0.05 or lower reflects a close fit. The Root-Mean-Square Residual (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 0.05 or lower, with possible values ranging from zero to 1.00.

3.2.1. Model 1 (single factor)

Confirmatory factor analysis using the one factor model revealed that 23 of the 28 items had a loading in excess of 0.40 on the single factor, and another four items had a loading >0.30. Only the item "Is afraid of insects or spiders" did not load significantly upon the single factor. As shown in Table 1, the single factor solution is not a good fit of the data, with NFI, NNFI and CFI statistics being <0.90, RMR and RMSEA values exceeding 0.05 and the χ^2 statistic being statistically significant. Thus, it the single factor model is not a good fit of the data.

3.2.2. Model 2 (four correlated factors)

This model fixed the factor loadings so that both the generalized anxiety and separation anxiety items loaded onto one factor, with the remaining three factors (obsessive compulsive disorder, physical injury fears and social anxiety) remaining as single factors. The analysis revealed that all 28 items had loadings in excess of 0.40 on their hypothesized factors, and that the fit indices were good. Although the χ^2 results indicated a significant difference between the parameters of the data and the model, $\chi^2(344)=1133$, $p<0.001$, the NFI, NNFI and CFI values all exceeded 0.90, with RMSEA and RMR values around 0.05. Notably, Table 1 indicates that the change in χ^2 in comparison to the change in degrees of freedom between Model 1 and Model 2 was statistically significant. Thus, Model 2 provides a more adequate fit of the data than the one factor model. However, as shown below, comparison between Model 2 (four correlated factors) and Model 3 (five correlated factors) indicated a significantly better fit of the data by Model 3.

3.2.3. Model 3 (five correlated factors)

The five-factor model fixed the factor loadings so that each item was forced to load uniquely on its hypothesized dimension, with factors being allowed to inter-correlate. As shown in Table 1, the NFI, NNFI and CFI values all exceeded 0.90, with RMSEA and RMR values around 0.05, indicating a good fit of the model to the data. Although the χ^2 results indicated a significant difference between the parameters of the data and the model $\chi^2(340)=1088$, $p<0.001$, the change in the χ^2 statistic in relation to change in degrees of freedom between the five-correlated factor model and the four-correlated-factor model indicates a significantly better fit of the data by the five-factor model. Thus, the five-factor model was taken as the preferred model for further examination of the data.

The factor loadings of each item upon its hypothesized factor are shown in Table 2, and exceed 0.40 in all instances. The factors were found to be strongly inter-correlated, with all values exceeding 0.40, as shown in Table 3. When the standard errors of the covariances were considered and 95% confidence intervals were determined, only one of the confidence intervals (for the correlation between General Anxiety and Separation anxiety) included the value of unity. Thus,

Table 1
Fit indices and χ^2 statistics for the models (mother data)

Model	χ^2	df	*p*	NFI	NNFI	CFI	RMR	RMSEA	Comparison	$\chi^2\Delta$	dfΔ	*p*
Null model	1264-	378		-	–	–	–	–	–	–		
Model 1 one factor	2045	350	0.001	0.84	0.85	0.86	0.054	0.074				
Model 2 four correlated factors	1133	344	0.001	0.91	0.93	0.94	0.053	0.055	Model 2 vs Model 1	912	6	0.001
Model 3 five correlated factors	1088	340	0.001	0.91	0.93	0.94	0.052	0.054	Model 2 vs Model 3	45	4	0.001
Model 4 five first-order, one second-order	1146	345	0.001	0.91	0.93	0.94	0.053	0.056	Target co-efficient=0.95			

Table 2
Factor loadings for the five-correlated factor model for mother data (father data in parentheses)

Predicted DSM-IV category	Questionnaire items	Factor loadings				
		F1	F2	F3	F4	F5
Generalized anxiety	1. Has difficulty stopping him/herself from worrying	0.70 (0.61)				
	4. Is tense, restless or irritable due to worrying	0.75 (0.65)				
	8. Has trouble sleeping due to worrying	0.70 (0.71)				
	14. Spends a large part of each day worrying about various things	0.74 (0.73)				
	28. Asks for reassurance when it doesn't seen necessary	0.59 (0.64)				
Social anxiety	2. Worries that he/she will do something to look stupid in front of other people		0.46 (0.61)			
	5. Is scared to ask an adult for help (e.g., a preschool or school teacher)		0.67 (0.70)			
	11. Is afraid of meeting or talking to unfamiliar people		0.72 (0.64)			
	15. Is afraid of talking in front of the class/preschool group (e.g., show and tell)		0.72 (0.59)			
	19. Worries that he/she will do something embarrassing in front of other people		0.46 (0.63)			
	23. Is afraid to go up to a group of children to join their activities		0.70 (0.60)			
Obsessive–compulsive disorder	3. Keeps checking that he/she has done things right (e.g., that he/she closed a door, turned off a tap)			0.58 (0.51)		
	9. Washes his/her hands over and over many times each day			0.50 (0.49)		
	18. Has to have things in exactly the right order or position to stop bad things from happening			0.66 (0.59)		
	21. Has bad or silly thoughts or images that keep coming back over and over			0.60 (0.62)		
	27. Has to keep thinking special thoughts (e.g., numbers or words) to stop bad things from happening			0.49 (0.62)		

(continued on next page)

Table 2 (*continued*)

Predicted DSM-IV category	Questionnaire items	Factor loadings				
		F1	F2	F3	F4	F5
Physical injury fears	7. Is scared of heights (high places)				0.60 (0.45)	
	10. Is afraid of crowded or closed-in places				0.58 (0.40)	
	13. Is nervous of thunderstorms				0.43 (0.53)	
	17. Is nervous of going swimming				0.50 (0.46)	
	20. Is afraid of insects and/or spiders				0.41 (0.52)	
	24. Is frightened of dogs				0.41 (0.48)	
	26. Is afraid of the dark				0.48 (0.51)	
Separation anxiety	6. Is reluctant to go to sleep without you or to sleep away from home					0.52 (0.40)
	12. Worries that something bad will happen to his/her parents					0.63 (0.62)
	16. Worries that something bad will happen to him/her (e.g., getting lost or kidnapped) so he/she won't be able to see you again					0.64 (0.57)
	22. Becomes distressed about your leaving him/her at preschool or with a babysitter					0.55 (0.55)
	25. Has nightmares about being apart from you					0.58 (0.55)

Table 3
Factor intercorrelations for five-factor model, for mother data (father data in parentheses)

Factor	Generalized anxiety	Social phobia	Obsessive–compulsive disorder	Physical injury fears	SeparationAnxiety
Generalized anxiety	1.00				
Social anxiety	0.55 (0.64)	1.00			
Obsessive–compulsive	0.74 (0.84)	0.45 (0.50)	1.00		
Physical injury fears	0.63 (0.55)	0.66 (0.60)	0.65 (0.52)	1.00	
Separation anxiety	0.87 (0.83)	0.57 (0.57)	0.69 (0.81)	0.72 (0.73)	1.00

it is unlikely that the factors could be regarded as measuring the same dimension, with the exception of the generalized anxiety and separation anxiety factors. This finding is in keeping with the exploratory factor analysis, where it was unclear as to whether these two dimensions represent a single factor or should be regarded as highly correlated but distinct factors. However, the significantly superior fit of the five-factor compared to four-factor model suggests the validity of retaining separate generalized anxiety and separation anxiety dimensions. Nevertheless, it is clear that these dimensions are strongly related in the preschool sample.

3.2.4. Model 4 (five factors loading onto one higher-order factor)

A higher-order model was examined to determine whether the high level of covariation between the five anxiety factors could be accounted for by a higher-order factor of "anxiety". As Table 1 indicates, Model 4 also provided a good fit of the data, with NFI, NNFI, CFI values exceeding 0.90 and RMR and RMSEA values around 0.05. In order to compare the fit of the higher-order model with the first order model (Model 3) it is necessary to examine the value of the target coefficient as described by Marsh and Hocevar (1985). These authors pointed out that the fit of a second-order model can never exceed the fit of the corresponding model involving only the first order factors. Rather, the higher-order model is merely examined to determine the extent to which the covariation between the first order factors can be accounted for by a higher-order factor. In order to determine whether the second-order factor adequately explains this covariation, a target coefficient is calculated from the ratio of the χ^2 value of the first model to the χ^2 value of the more restrictive second-order model. The target coefficient has an upper limit of 1, and a value >0.90 suggests that the second-order factor provides a good explanation for the covariance between factors (Marsh & Hocevar, 1985). The comparison of the χ^2 values of Model 3 and higher-order Model 4 produced a target coefficient of 0.95, suggesting that the higher-order model provides a satisfactory explanation for the covariance between first order factors.

The standardized loadings of the first order factors upon the higher-order factor were all high, being 0.90 for generalized anxiety factor, 0.64 for social anxiety, 0.78 for obsessive–compulsive disorder, 0.78 for physical injury fears and 0.94 for separation anxiety. The percentages of unique variance accounted for by each of the first order factors were: generalized anxiety 19%; social anxiety 59%; obsessive compulsive disorder 39%; physical injury fears 39%; and separation anxiety 12%, with the remaining variance in scores for each factor being explained by the higher-order factor.

3.3. Exploratory factor analysis (father report)

Procedures for data analysis for the father-completed questionnaires (N=383) reflected those completed for the mother data. The results generally mirrored those found for the mother data. Again the PTSD items were not included in the analyses given the extremely low prevalence of these symptoms.

Exploratory factor analysis using father's responses (N=383) and the 28 items did not produce a clear solution. Six factors were evident with an eigenvalue >1, but the scree test suggested a solution between four and six factors. The five factor obliminal rotation produced factors relating to generalized anxiety (eigenvalue=7.7, 27.5% variance); social anxiety (eigenvalue=2.21, 7.9% variance); physical injury fears (eigenvalue=1.8; 6.4% variance); obsessive–compulsive disorder (eigenvalue=1.30; 4.6% variance); and separation anxiety (eigenvalue=1.17; 4.2% variance). Items that did not load on their hypothesized factor included " Worries that something bad will happen to his/her parents" which loaded on the generalized anxiety factor, "Is scared of heights" which loaded on generalized anxiety and separation anxiety dimensions, and "Worries that something bad might happen to him/her" which loaded on the generalized anxiety factor. In addition, a further eight items cross-loaded onto factors, suggesting that father responses did not factor analyse into such clear-cut factors as did responses provided by mothers.

3.4. Confirmatory factor analysis (father report)

Confirmatory factor analysis was used to compare single-, four- and five-factor models as outlined for the mother data. Again the results confirmed that the five-factor model provided a significantly better fit of the data than the one-factor or four-factor models, a shown in Table 4. The single factor model did not explain the data particularly well, with relatively poor fit indices. The four-factor model, while demonstrating good fit indices, was surpassed by the five-factor model. The changes in χ^2 in respect of changes in degrees of freedom between the four- and five-factor models was statistically significant. Furthermore, the five-factor model demonstrated good fit indices in excess of 0.90 for NFI, NNFI, and CFI, and RMR and RMSEA values of 0.05 or below. All 28 items had a loading in excess 0.40 upon their hypothesized factors, as shown in Table 2. The factor loadings for the father data were very similar to those reported for mothers, thus the actual values are not reported separately here. A similar pattern of results was also evident for father compared to mother data in terms of a high degree of inter-correlation between the factors (see Table 3), with values ranging from 0.50 to 0.83. When the standard errors of the covariances were considered and 95% confidence intervals were determined, the upper value exceeded unity for the inter-relationships between generalized anxiety, obsessive–compulsive and separation anxiety dimensions. Thus, for father report the factors are less clearly differentiated than for mother report, with the distinctions between generalized anxiety, obsessive–compulsive and separation anxiety being unclear. Fears of physical injury and social anxiety appeared to be measuring relatively unique dimensions.

When the five-first-order, single-second-order factor model was examined, a target coefficient of 0.94 was found. Thus, the higher-order factor provides a strong explanation for the covariation between factors. Factor loadings upon the second-order factor were 0.92 for generalized anxiety, 0.66 for social anxiety, 0.87 for obsessive–compulsive disorder, 0.68 for physical injury fears and

Table 4
Fit indices and χ^2 statistics for the five models using father data

Model	χ^2	df	*p*	NFI	NNFI	CFI	RMR	RMSEA	Comparison	$\chi^2\Delta$	dfΔ	*p*
Null model	6374	378										
Model 1 one factor	1098	350	0.001	0.83	0.87	0.88						
Model 2 four correlated factors	710	344	0.001	0.89	0.93	0.94	0.068	0.053	Model 2 vs Model 1	388	6	0.001
Model 3 five correlated factors	659	340	0.001	0.90	0.94	0.95	0.042	0.050	Model 3 vs Model 2	51	4	0.001
Model 4 five first-order one second order factor	704	345	0.001	0.89	0.93	0.94	0.046	0.052	Target co-efficient=0.94			

0.93 for separation anxiety. The percentages of unique variance accounted for by each of the first order factors were: generalized anxiety 16%; social anxiety 56%; obsessive compulsive disorder 24%; physical injury fears 54%; and separation anxiety 14%, with the remaining variance in scores for each factor being explained by the higher-order factor.

3.5. Age and gender effects for factor and total scores (mother report)

Table 5 shows the mean values and standard deviations by age group and gender, for mother report for a sample of 510 children aged 36–71 months. This sample included 170 children from each of three age groups, namely 3 year olds (36–47 months), 4-year olds (48–59 months) and 5-year olds (60–71 months). Children in each age group were selected at random for the total sample of 755 children, but to ensure equal numbers of boys and girls in each age range.

ANOVAs revealed no significant effects for gender or age by gender for either the total score or any of the factor scores. Table 5 reveals little difference between males and females in terms of scores across any of the age groups. There were, however, significant age effects for the total score and all factor scores. Significant differences between age groups were found for the total scores, $F(2, 507)=23.56$, $p<0.001$. Post-hoc tests revealed that 3-year olds had significantly higher total scores than both the 4-year olds and the 5-year olds. Significant main effects were found for age on dimensions of generalized anxiety, $F(2, 507)=15.17$, $p<0.001$, social anxiety, $F(2, 388)=3.48$, $p<0.05$), obsessive–compulsive, $F(2, 507)=23.24$, $p<0.001$), physical injury fears, $F(2, 507)=17.44$, $p<0.001$), and separation anxiety, $F(2, 507)=18.36$, $p<0.001$. Post-hoc comparisons between the three age groups showed that mothers rated 3-year old children as showing significantly higher levels of symptoms for the total score and all factor scores, in comparison to 4- and 5-year olds. There were minimal differences between the 4- and 5-year olds. For father report, there were no significant gender, age, or age by gender effects for the total or factor scores. Generally, fathers reported lower scores than mothers, for the total and all factor scores. The mean scores for father report were (Total score mean=14.99, SD=10.85; generalized anxiety mean=1.84, SD=2.39; social anxiety mean=4.20, SD=3.67; OCD mean=1.06, SD=1.63; physical injury fears mean=5.79; SD=4.17; separation anxiety mean=2.10; SD=2.40; N=383 in all cases).

3.6. Prevalence of anxiety symptoms

An estimate of the prevalence of each anxiety symptom is provided by the percentage of mothers (and fathers) who rated each item as either 3 (Quite Often True) or 4 (Very Often True) for their child as show in Table 6. The top 10 most common problems for each age group was extremely consistent from age 3 to 5, and across mother and father report. The most prevalent symptoms related to physical injury fears (dark, dogs, spiders, thunder storms, swimming), social fears of approaching a group of children to join in activities and meeting unfamiliar people, and separation anxiety relating to sleeping alone or away from home. Very few age differences were found, although for three year olds, two items were present in the top 10 most prevalent symptoms that were not evident for 4- and 5-year olds (“Becomes distressed about your leaving him/her at preschool/school or with a babysitter” and “Keeps checking that he/she has done things right e.g., that he/she closed a door, turned off a tap”). For 4- and 5-year olds, among the top 10 presenting problems was the item “Is afraid of talking in front of the class (preschool group) e.g., show and

Table 5
Means and standard deviations (in parentheses) for factor and total scores by age group and gender, based on mother report

Factor	3-year olds			4-year olds			5-year olds			Total sample		
	Male *N*=85	Female *N*=85	M+F *N*=170	Male *N*=85	Female *N*=85	M+F *N*=170	Male *N*=85	Female *N*=85	M+F *N*=170	Male *N*=255	Female *N*=255	M+F *N*=510
Generalized anxiety	3.11 (3.34)	2.78 (2.50)	2.94 (2.95)	1.51 (1.98)	1.14 (1.90)	1.46 (1.94)	2.08 (2.90)	2.00 (2.08)	2.04 (2.51)	2.23 (2.86)	2.06 (2.24)	2.15 (2.57)
Social anxiety	5.46 (3.42)	5.08 (3.86)	5.27 (3.65)	4.15 (3.10)	4.68 (3.81)	4.42 (3.47)	4.47 (4.33)	4.12 (3.69)	4.29 (4.02)	4.69 (3.68)	4.63 (3.80)	4.66 (3.74)
Obsessive compulsive	2.08 (2.86)	1.98 (2.63)	2.03 (2.74)	0.65 (1.30)	0.51 (0.98)	0.58 (1.15)	1.15 (1.79)	1.04 (1.72)	1.09 (1.75)	1.29 (2.16)	1.17 (1.99)	1.23 (2.08)
Physical injury fears	8.44 (4.54)	7.68 (3.95)	8.06 (4.26)	5.52 (3.78)	5.56 (3.87)	5.54 (3.81)	5.42 (4.44)	6.42 (4.72)	5.92 (4.60)	6.46 (4.48)	6.56 (4.27)	6.51 (4.37)
Separation anxiety	3.84 (3.30)	3.71 (3.05)	3.77 (3.17)	2.08 (2.31)	2.16 (2.65)	2.12 (2.48)	2.27 (2.69)	2.32 (2.47)	2.29 (2.58)	2.73 (2.89)	2.73 (2.81)	2.73 (2.85)
Total score	21.92 (13.61)	21.22 (12.10)	22.07 (12.87)	13.91 (8.88)	14.33 (8.75)	14.12 (8.79)	15.40 (13.10)	15.89 (10.74)	15.65 (11.94)	17.41 (12.63)	17.15 (10.98)	17.28 (11.83)

Table 6
Rank order percentage of children receiving mother ratings of 3 or 4 (Quite Often True and Very Often True) for each item for 3-, 4- and 5-year olds based on mother report (father report in parentheses)[a]

Item	3–5 year olds *N*=510 (383)
24. Is frightened of dogs	17.8 (16.7)[a]
26. Is afraid of the dark	17.8 (13.5)[a]
13. Is scared of thunder storms	13.2 (13.4)[a]
6. Is reluctant to go to sleep without you or to sleep away from home	12.7 (7.3)[a]
20. Is afraid of insects and/or spiders	10.6 (12.8)[a]
11. Is afraid of meeting or talking to unfamiliar people	9.8 (7.8)[a]
17. Is nervous of going swimming	8.3 (5.8)[a]
23. Is afraid to go up to group of children and join their activities	7.7 (6.5)[a]
15. Is afraid of talking in front of the class (preschool group) e.g., show and tell	5.9 (3.1)
22. Becomes distressed about your leaving him/her at preschool/school or with a babysitter	4.5 (2.6)
2. Worries that he/she will do something to look stupid in front of other people	4.3 (2.8)
3. Keeps checking that he/she has done things right (e.g., that he/she closed a door, turned off a tap)	4.0 (2.1)
7. Is scared of heights (high places)	4.0 (4.2)
1. Has difficulty stopping him/herself from worrying	3.9 (2.9)
12. Worries that something bad will happen to his/her parents	2.8 (1.6)
4. Is tense, restless or irritable due to worrying	1.2 (1.3)
5. Is scared to ask an adult for help (e.g., a preschool or school teacher)	2.4 (2.1)
28. Asks for reassurance when it doesn't seem necessary	2.4 (1.9)
8. Has trouble sleeping due to worrying	1.6 (0.0)
9. Washes his/her hands over and over many times each day	1.4 (0.8)
10. Is afraid of crowded or closed-in places	1.8 (0.5)
18. Has to have things in exactly the right order or position to stop bad things from happening	1.6 (0.6)
16. Worries that something bad might happen to him/her (e.g., getting lost or kidnapped), so he/she won't be able to see you again	1.4 (0.0)
21. Has bad or silly thoughts or images that keep coming back over and over	1.2 (0.3)
25. Has nightmares about being apart from you	1.2 (0.8)
19. Worries that he/she will do something embarrassing in front of other people	1.0 (1.6)
27. Has to keep thinking special thoughts (e.g., numbers or words) to stop bad things from happening	1.0 (0.0)
14. Spends a large part of each day worrying about various things	0.4 (0.8)

[a] Denotes items that were rated among the 10 most commonly presented problems for all three age groups.

tell". For 5-year olds, the item "Worries that he/she will do something to look stupid in front of other people" was among the top 10 presenting problems.

3.7. Post-traumatic stress disorder symptoms

As mentioned above, the post-traumatic stress symptoms were not included in the factor analysis given that their occurrence is dependent upon experience of a traumatic event. However, data regarding PTSD symptoms were obtained from 478 mothers in the Brisbane sample. Sixty-five mothers (13.6%) reported that their child had experienced something "really bad or traumatic

(e.g., severe accident, death of a family member or friend, assault, robbery, disaster)". However, among the children who had experienced a traumatic event the prevalence of PTSD symptoms was extremely low. For the PTSD items the following numbers of children were rated by their mother as being quite often or very often true for the 65 children who were reported to have experienced a traumatic event: "Has bad dreams about the event" (one child); "Remembers the event and becomes distressed" (one child); "Becomes distressed when reminded about the event" (three children); "suddenly behaves as if he/she is reliving the bad experience" (one child); " shows bodily signs of fear" (no children). Interestingly, it was one child who was rated by their mother as showing symptoms in the above categories, after being involved in a car accident 6 months previously. This child was rated as "2: sometimes true" for having bad dreams or nightmares about the event, and then "4: very often true" in terms of three questions relating to remembering the event and becoming distressed, becoming distressed when reminded about the event, and suddenly behaving as if he/she is reliving the event.

3.8. Construct validity of the measure

In order to provide support for the proposition that the preschool anxiety items selected for this study were actually measuring the construct of anxiety, scores were compared with those obtained from the CBCL (Achenbach, 1992). Although the CBCL Internalizing scale provides a broader assessment of internalizing problems, of which anxiety is just one aspect, one would expect a moderate to high correlation with the preschool anxiety scale items. The Pearson product-moment correlation between mothers' preschool anxiety scale total score and the mothers' CBCL Internalizing total score was 0.68 (N=472, $p<0.001$). Each SPAS subscale also correlated significantly with the CBCL Internalizing total score (GAD, r=0.60; Social Anxiety r=0.57; Separation Anxiety r=0.50; OCD r=0.42; and Physical Injury Fears r=0.43). The correlations between the CBCL Externalising score and preschool anxiety scale total score were much lower, albeit statistically significant (r=0.21, N=472, $p<0.001$). This was also the case for correlations between the CBCL Externalizing and factor scores (r −0.08 to 0.20).

The correlation between the fathers total preschool anxiety scale scores and CBCL Internalizing total scores was 0.59 (N=382, $p<0.001$). Each SPAS subscale also correlated significantly with the CBCL Internalizing total score (GAD, r=0.61; Social Anxiety r=0.46; Separation Anxiety r=0.45; OCD r=0.40; and Physical Injury Fears r=0.37). For fathers, correlations were much lower between preschool anxiety scale total scores and CBCL Externalizing scale scores (0.27, N=382, $p<0.001$; and subscales scores r=0.10 to 0.28).

4. Discussion

The results of this study provide some interesting insights into the nature of anxiety problems in young children. The exploratory factor analyses suggested that preschool anxiety symptoms loaded onto either four or five factors, and it was not clear whether separation anxiety and generalized represented clearly distinct factors. Confirmatory factor analyses suggested that the five-factor correlated model, reflecting dimensions of social phobia, separation anxiety, obsessive compulsive disorder, fears of physical injury and generalized anxiety, provide a good fit of the data.

All anxiety symptoms loaded strongly upon their hypothesized factor. The five-factor model provided a significantly better fit of the data than either the four-factor correlated or one-factor models.

The five factors were strongly inter-correlated and this strong covariance was well explained by a single, higher-order factor of anxiety in general. Although the five first-order factors loaded strongly upon the higher-order anxiety factor, there was sufficient unique variance (between 40 and 60%) explained by three of the first order factors (social anxiety, obsessive compulsive disorder and fears of physical injury) to justify regarding them as dimensions worthy of independent consideration. The picture was less clear for separation anxiety and generalized anxiety, as these dimensions accounted for only a small percent of unique variance in mothers' ratings of preschooler anxiety symptoms (12 and 19%, respectively). These values were even lower for the father questionnaires. In addition, the extremely strong inter-correlation between generalized anxiety and separation anxiety factors suggests that the use of these dimensions as distinct anxiety disorders in preschoolers should be approached with caution. The finding that the confidence intervals for the correlation between generalized anxiety and separation anxiety included the value of unity raises the question of whether these factors are actually measuring the same dimension in preschoolers. This finding is in keeping with the exploratory factor analysis, where it was unclear as to whether these two dimensions represent a single factor or should be regarded as highly correlated but distinct factors. Nevertheless, the confirmatory factor analysis indicated that the five-factor model did provide a significantly better fit of the data than did the four-factor model.

It is possible that distinct anxiety disorders of generalized anxiety and separation anxiety do not emerge fully until later in childhood. Alternatively, the theoretical premise of distinct disorders of generalized anxiety and separation anxiety in childhood may be spurious. A recent study with primary school-aged children also found minimal support for a separate generalized anxiety factor (Spence, 1997), with most of the variance in generalized anxiety factor being explained by the higher-order factor of anxiety in general. This relates to theoretical suggestions in adults that generalized anxiety disorder be viewed as the "basic" anxiety disorder, perhaps reflecting relatively pure, high trait anxiety (Rapee, 1991; Brown, Barlow and Liebowitz, 1994). The validity of the generalized anxiety factor among children warrants investigation in future research.

It is interesting to speculate how and why different forms of anxiety develop by adulthood. It appears that, even in preschool children, there is evidence to indicate some differentiation of anxiety disorder sub-types. Despite the overlap between generalized and separation anxiety disorder symptoms, it is evident that anxiety symptoms in preschoolers are starting to cluster into subtypes of anxiety. Research is needed to examine the premise that the presentation of anxiety becomes increasingly specific with age, with clearly delineated diagnostic categories emerging by adulthood. If this is indeed the case, then we need to identify those factors that produce this effect.

Examination of gender differences also provided an interesting result. No significant differences were found between boys and girls in a large sample of 3- to 5-year olds for the total symptom ratings or any of the factor scores. This finding contrasts with much of the literature relating to older children in whom it has been widely concluded that girls manifest higher levels of anxiety and anxiety disorders than boys (Craske & Glover, 2000). However Craske and Glover, in an extensive review of the literature relating to gender differences in anxiety, concluded that the picture varies according to the age of the children, method of assessment, the informant and aspect of anxiety examined.

Elementary school girls appear to self-report higher scores than boys on fear survey questionnaires (Ollendick, 1983; Scherer & Nakamura, 1968; Ollendick, Matson & Helsel, 1985; Ollendick, Yule & Ollier, 1991). Although the findings are not consistent, there is some suggestion that girls reported more fears of the unknown, minor injury and animals, and danger and death, whereas no gender differences are found for fears of failure and criticism, or medical fears (Ollendick et al., 1991). Girls also self-report higher levels of excessive worry than boys in both adolescent years (King, Gullone, Tonge & Ollendick, 1993) and grades 2–6 (Silverman, LaGreca & Wasserstein, 1995). Spence (1998) also found that elementary school girls reported significantly higher levels of anxious symptoms compared to boys on dimensions of panic/agoraphobia, social phobia, separation anxiety, fears of physical injury and generalized anxiety. Only the obsessive–compulsive disorder factor showed no gender difference. It appears, however, that gender differences are less likely when clinical levels of self-reported anxiety are examined (Lewinsohn, Gotlib Lewinsohn, Seeley & Allen, 1998). This finding contrasts, however, with epidemiological studies using structured clinical interviews with primary school-aged children and adolescents among whom anxiety disorders are typically found to be more prevalent in girls than boys (Anderson, Williams, McGee & Silva, 1987; Kashani & Orvaschel, 1990; McGee, Feeham, Williams & Anderson, 1992).

The picture with respect to preschool anxiety is also confused. Conflicting findings have been reported and may reflect differences in methodology, particular with respect to information source, such as child, parent, or teacher report, or direct behavioural observation. For example, LaFreniere and Dumas (1996) found no differences in teacher ratings of anxious-withdrawal among a large population of 3–6-year olds. Chazan and Jackson (1971) also found no gender differences in the proportion of children in a large community sample (N=726) of 5-year olds who were categorized by their teachers as being exceptionally quiet, timid or withdrawn. In contrast, Bouldin and Pratt (1998) found small, but significant gender differences in parent reports of preschoolers' fears, but only on dimensions relating to animal fears and fear of the unknown. This latter factor includes items relating to separation and night-time fears. They did not find gender differences on six other dimensions of feared stimuli. When clinical levels of self-reported anxiety are examined, there is also some evidence to suggest a lack of gender difference. Ialongo et al. (1994, 1995) found no significant difference in the prevalence of clinical levels of self-reported anxious symptoms in first-grade children (mean age 6.6 years).

It seems therefore, that gender differences in anxiety are not strong in young children, and may become more clear-cut with increasing age. Clearly, further research is needed into the nature and development of gender differences in anxiety. Such evidence would facilitate our understanding of the way in which anxiety problems are acquired and the relative contribution of aetiological factors that differentially impact upon the genders, such as genetic influences, early temperament, and parenting practices.

In contrast to the lack of gender differences, there were clear age differences. In particular, mother reports differed for 3-year olds compared to 4- and 5-year olds, with little difference between results for the 4- and 5-year age groups. In general, 3-year old children were reported to show significantly higher levels of anxiety symptoms for the total score and all factor scores, in comparison to 4- and 5-olds. Again, it is not clear why this should be the case. It is possible that the result indicates a genuinely greater frequency of anxious behaviours in the younger age group reflecting developmental level. Alternatively, it may reflect a greater proportion of time

spent by mothers with their 3-year olds, compared to 4- and 5-year olds, producing a greater awareness of and sensitivity to anxious behaviour in the younger children. A further possibility is that many children commence day-care for the first time at age 3 years, and elevated symptoms may be a response to this life transition. It would be interesting to examine these propositions in future research.

The present study also examined the prevalence of anxiety symptoms in preschoolers by determining the percentage of children whose mothers rated each symptom as being "quite often" or "very often" true for their child. The top 10 most prevalent symptoms related to physical injury fears (dark, dogs, spiders, thunderstorms, and swimming), social fears (approaching a group of children to join in activities and meeting unfamiliar people), and separation anxiety (sleeping alone or away from home). These problems were among the most common anxiety symptoms for all age groups from 3 to 5 years. However, becoming distressed at being left at preschool or with a babysitter was a prevalent problem among 3-year olds, but less so for their older peers. In contrast, problems relating to fear of talking in front of the class or preschool group, and worries about doing something stupid in front of others were in the top 10 issues for 4 and 5-year olds, but not for the younger children. These age-related differences suggest an increasing awareness of social performance issues during the preschool years, perhaps reflecting cognitive developmental factors relating to self-consciousness (Buss, 1980).

There are several methodological limitations of the study that warrant comment. First, all children in the study were attending preschool or day-care, and the findings may not be representative of those children in other forms of care. Second, the questionnaire focused specifically upon anxiety symptoms, and did not consider other forms of internalizing problems such as depression. Thus, we cannot draw conclusions about whether anxiety problems in preschoolers can be clearly distinguished from those of depression. Third, the study relied upon parental report and did not include any form of direct behavioural observation. The possible influences of parental bias cannot be discounted and it is not possible to determine the accuracy of parental report as an indicator of the children's anxiety problems. Parental bias has been shown to be a significant issue in the assessment of child psychopathology, particularly for mothers who are themselves depressed or highly anxious (Najman et al., 2000). It would be useful in future studies to examine the nature and structure of preschool anxiety problems using direct behavioural observation measures, the feasibility of which was demonstrated by Glennon and Weisz (1978). It would also be valuable to compare the results of parent report with those of information provided by the child regarding their experience of anxiety. A fourth methodological issue relates to the item content of the questionnaire. Items were selected to be developmentally appropriate on the basis of previous literature, clinical expertise, and parental feedback. Nevertheless, the possibility remains that other symptoms of anxiety exist that were not included in the questionnaire. As new evidence emerges relating to preschool anxiety, further studies would be useful to ensure full coverage of the spectrum of presenting anxiety problems.

5. Summary

Taken together, the results were broadly consistent with DSM-IV classification of anxiety disorders, although there was a high level of covariation between the subtypes of anxiety. The find-

ings are also consistent with research relating to the structure of anxiety symptoms among primary school children (Spence 1997, 1998; Muris et al., 1999). However, in preschoolers, it appears that subtypes of anxiety may be less differentiated than in older children, a premise that warrants further investigation. The high level of covariation suggests that, although there is sufficient unique variance in anxiety subtypes to justify their examination in clinical practice, it would be unwise to design assessments and treatments for preschool anxiety around discrete anxiety subtypes. This is particular true for separation anxiety and generalized anxiety symptoms, that were not strongly distinguished and which loaded heavily on an overall factor of anxiety in general.

The most prevalent anxiety symptoms in preschoolers related to fears of physical injury, but some separation and social anxiety symptoms were also relatively common. Post-traumatic stress disorder symptoms were relatively rare amongst those children who had experienced a traumatic event. There was little difference between genders for any of the dimensions of anxiety.

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