Shorter Communication

The structure of specific phobia symptoms among children and adolescents

Peter Muris*, Henk Schmidt, Harald Merckelbach

Department of Psychology, Maastricht University, P.O. Box 616, 6200 MD Maastricht, The Netherlands

Received 5 November 1998

Abstract

Previous research [Frederikson, M., Annas, P., Fisher, H. & Wik, G. (1996). Gender and age differences in the prevalence of specific fears and phobias. Behaviour Research and Therapy, 34, 33–39.] has shown that specific phobia symptoms of adults cluster into three subtypes: animal phobia, blood-injection-injury phobia and environmental–situational phobia. The present study examined whether these specific phobia subtypes can also be found in children. 996 children aged between 7 and 19 years completed a brief questionnaire regarding the frequency with which they experienced specific phobia symptoms. Confirmatory factor analysis was employed to examine the structure of these data. Results showed that childhood specific phobia symptoms indeed cluster into the three subtypes as described by Frederikson et al. and that these subtypes are either intercorrelated or the product of a single higher order factor. This structure appeared to be largely invariant across genders and age groups. © 1999 Elsevier Science Ltd. All rights reserved.

Keywords: Specific phobia; Subtypes; Children and adolescents

1. Introduction

The essential feature of specific phobia is marked and persistent fear of clearly discernable, circumscribed objects or situations (APA, 1994, p. 405).

The latest edition of the DSM, i.e. the DSM-IV, distinguishes the following subtypes of specific phobias: animal type (e.g. spiders, insects), natural environment type (e.g. storms, heights), blood–injection–injury type (e.g. seeing blood, receiving injections) and situational type (e.g. flying, enclosed spaces). The DSM-IV further notes that specific phobias frequently co-occur: “In many cases, more than one subtype of specific phobia is present” (APA, 1994, p.
Taken together, the DSM-IV posits that specific phobias form a heterogeneous class of anxiety disorders that frequently occur comorbidly.

The empirical support for the separate categories of specific phobias is still meager. To the present authors’ knowledge, there is only one study that has examined the structure of specific phobia symptoms. In that study, Frederikson, Annas, Fisher and Wik (1996) carried out an exploratory factor analysis on adults’ fear ratings of potentially phobogenic objects and situations. Results showed that specific phobia symptoms clustered into three factors: animal phobia, blood–injection–injury phobia and a third factor combining natural environment and situational phobias. Although the DSM-IV suggests that natural environment and situational phobias are distinct types of specific phobias, the finding that these types loaded on one factor is hardly surprising. Note that both types bear strong resemblance. For example, ‘fear of heights’ which is considered as a natural environment phobia comes close to ‘fear of elevators’ and ‘fear of flying’ which belong to the situational phobias. All in all, the study by Frederikson et al. (1996) should be taken as tentative evidence for the validity of the differentiation of specific phobia types as proposed by the DSM-IV.

Specific phobias are quite common among children. Most studies have reported prevalence rates of about 5% (see, for a review, Costello & Angold, 1995) indicating that specific phobias are one of the most prevalent childhood anxiety disorders. The paucity of empirical studies which validate the DSM-IV differentiation of specific phobia types is especially true for child populations. So far, no study has directly investigated this issue. The present study was carried out in an attempt to fill up this gap. A large sample of normal school children aged 7 to 19 years completed a brief questionnaire regarding the frequency with which they experienced specific phobia symptoms. Confirmatory factor analyses were carried out to examine the structure of these data. This type of analysis is particularly suitable to investigate the adequacy of different hypothetical models that may underlie a set of items. In the current study, the following models were tested. The first model was a single-factor model in which all symptoms would load on a single homogeneous dimension of phobia. The second model was a 3-uncorrelated-factors model in which specific phobia symptoms cluster into separate factors that correspond with the types as found by Frederikson et al. (1996). The third model was also a 3-factors model but assumed that the clusters of specific phobia symptoms are intercorrelated. The fourth and final model assumed 3 clusters of specific phobia symptoms which load on one higher order factor. In keeping with the Frederikson et al. (1996) findings and the proposal of the DSM-IV that different types of specific phobias do exist and acknowledging the fact that types of specific phobias frequently co-occur, it was hypothesized that either the third or the fourth model would provide the most adequate representation of the data.

2. Method

2.1. Sample

More than thousand normal children of 3 primary and 1 secondary schools in the Heerlen area, The Netherlands, completed a brief questionnaire listing 15 specific phobia symptoms (see Table 2). This was done in their classroom in the presence of the teacher and a research
The questionnaire was developed for the purpose of the present study. Items were inspired by the taxonomy of specific phobias as described in the DSM-IV and by prevalence rates of specific fears and phobias in children (e.g., Silverman & Rabian, 1993; Muris, Merckelbach & Collaris, 1997). Thus, the 15 items intended to cover a broad range of specific phobia symptoms. Children were asked to indicate how frequently they had each symptom using a 4-point scale with 1 = never, 2 = sometimes, 3 = often and 4 = always. The questionnaires of 996 children did not contain missing values and these were used for the data analysis. The final sample consisted of 513 boys and 483 girls with a mean age of 12.84 years (SD = 2.48; range 7–19 years).

2.2. Statistical analysis

The confirmatory factor analyses were carried out by means of EQS, the structural equations modeling approach (Bentler, 1989). With this approach, it is possible to test plausible alternative models that may underlie a data set. EQS produces a wide range of goodness-of-fit indexes. In the present study, the following indexes were used: (1) chi square divided by degrees of freedom (this value should be about 2.00 or lower; the lower this value, the better the fit), (2) the average absolute standardized residuals (AASR; this value should be lower than 0.05; the lower this value, the better the fit), (3) the comparative fit index (CFI; this value should be 0.90 or higher for a good fit; the higher this value, the better the fit) and (4) Akaike’s information criterion (AIC; this is a relative measure: the model with the smallest value has the best fit).

3. Results

Table 1 shows the goodness-of-fit indexes for the various models that were tested by means of confirmatory factor analysis. As can be seen, none of the models had a satisfactory \( \chi^2 \) per df ratio (i.e. <2.00). However, for large sample sizes (like the present study), there is a high risk of relatively good-fitting models being rejected on the basis of the \( \chi^2:df \) test (Marsh, Balla & McDonald, 1988). The other goodness-of-fit indexes indicated that the 3-correlated-factors model and the 3-factors-loading-on-1-higher-order-factor model provided good fits for the data. For these two models, AASR was below 0.05, CFI was greater than 0.90 and AIC was relatively small.

A 2 (gender)×2 (age groups: younger versus older children) analysis of variance revealed significant main effects for gender and age level. Girls reported a higher level of specific phobia symptoms than boys: means being 25.98 (S.D. = 6.73) versus 22.03 (S.D. = 5.91), respectively (\( F(1, 992) = 96.80, P < 0.001 \)). Furthermore, younger children (i.e. with age ≤13) reported a higher frequency of specific phobia symptoms compared to older children (i.e. with age ≥14): means were 25.10 (S.D. = 7.08) versus 22.43 (S.D. = 5.61), respectively (\( F(1, 992) = 38.38, P < 0.001 \)). Similar age and gender effects were obtained when analyzing each of the specific phobia clusters separately. For animal phobia symptoms, mean scores were 4.89 (S.D. = 2.10) for girls versus 3.88 (S.D. = 1.37) for boys (\( F(1, 992) = 83.78, P < 0.001 \)) and 4.51 (S.D. = 1.89) for younger children versus 4.18 (S.D. = 1.74) for older children (\( F(1, 992) = 43.93, P < 0.001 \)).
992) = 5.46, \( P < 0.05 \)). For blood–injection–injury phobia symptoms, means were 12.75 (S.D. = 3.86) for girls versus 10.97 (S.D. = 3.43) for boys (\( F(1, 992) = 56.79, P < 0.001 \)) and 12.31 (S.D. = 3.82) for younger children versus 11.18 (S.D. = 3.55) for older children (\( F(1, 992) = 20.18, P < 0.001 \)). For environmental–situational phobia symptoms, means were 8.36 (S.D. = 2.83) for girls versus 7.17 (S.D. = 2.34) for boys (\( F(1, 992) = 51.30, P < 0.001 \)) and 8.25 (S.D. = 2.91) for younger children versus 7.07 (S.D. = 2.08) for older children (\( F(1, 992) = 46.62, P < 0.001 \)).

Additional confirmatory factor analyses revealed that the 3-correlated-factors model and the 3-factors-loading-on-1-higher-order-factor model produced good fits of the data of boys, girls, younger and older children. Table 2 presents standardized factor loadings of the specific phobia symptoms obtained with confirmatory factor analysis. As can be seen, all symptoms loaded convincingly (i.e. 0.40 or higher) on their respective factor.

4. Discussion

In a previous study, Frederikson et al. (1996) carried out an exploratory factor analysis on adults’ fear ratings of potentially phobogenic objects and situations. Results suggested that there were three specific phobia factors: animal phobia, blood–injection–injury phobia and a third factor combining natural environment and situational phobias. Interestingly, these empirically derived types of specific phobias are largely in keeping with the typology as proposed by the DSM-IV.

The present study examined the structure of specific phobia symptoms in a sample of children and adolescents. This was done by means of confirmatory factor analysis, a technique which enables us to test the adequacy of different hypothetical models that may underlie a data set. Results showed that the specific phobia data can best be explained by a 3-correlated-factors model or a model with three factors loading onto a single higher order factor. Note that these findings are well in line with the typology of specific phobias (see APA, 1994; Frederikson et al., 1996) and the notion that specific phobias frequently co-occur (see APA, 1994).

Girls and younger children reported a higher frequency of specific phobia symptoms than respectively boys and older children. This result is in agreement with previous studies which
have generally found that girls exhibit higher levels of fear and anxiety symptoms and that such symptoms tend to decline with age (see, for a review, Ollendick, Hagopian & King, 1997). The results of additional factor analyses revealed that the structure of specific phobia symptoms was largely invariant across genders and age groups. In all analyses, the 3-correlated-factors model and the 3-factors-loading-on-1-higher-order-factor model provided good fits.

The current findings add to the growing body of evidence for the validity of the classification of childhood anxiety disorders as proposed by the DSM. For example, in a recent study by Spence (1997), normal children completed the Children’s Anxiety Scale (CAS), a self-report questionnaire that taps symptoms of a number of DSM-defined anxiety disorders, namely panic disorder, separation anxiety disorder, social phobia, obsessive–compulsive disorder, generalized anxiety disorder and physical injury fears (replacing specific phobias). Factor analysis showed that anxiety symptoms as listed in the CAS indeed cluster into subtypes of anxiety problems that are largely consistent with the anxiety disorders that are mentioned in the DSM.

The subdivision of specific phobias into different subtypes seems to be relevant for clinical practice. Several authors (Hugdahl & Öst, 1985; Himle, McPhee, Cameron & Curtis, 1989; Antony, Brown & Barlow, 1997) have noted that each specific phobia subtype has its typical manifestation in terms of physical and cognitive symptomatology. For example, confrontation with the phobic stimulus elicits sympathetic activation (e.g. tachycardia) in animal phobia, but parasympathetic activation (e.g. bradycardia) in blood–injection–injury phobia. Thus, while exposure to the phobic stimulus produces heightened arousal in animal phobics, lowered

<table>
<thead>
<tr>
<th>Table 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factor loadings of specific phobia symptoms on their respective factor obtained with confirmatory factor analysis</td>
</tr>
</tbody>
</table>

**Animal phobia**
- I am afraid of an animal that is not really dangerous 0.85
- I am so scared of a harmless animal that I do not dare to touch it 0.79
- I am afraid of an animal that most children do not fear 0.71

**Blood–injection–injury phobia**
- I am scared when I get an injection 0.64
- I am afraid to visit the doctor 0.63
- I feel scared when I watch an operation 0.55
- I don’t like being in a hospital 0.54
- I am afraid to visit the dentist 0.53
- I am afraid to get a serious disease 0.40
- When I see blood, I get dizzy 0.40

**Environmental–situational phobia**
- I am afraid of the dark 0.60
- I get scared when there is thunder in the air 0.59
- I get scared in small, closed places 0.58
- I feel scared when I have to fly in an airplane 0.49
- I am afraid of heights 0.46

arousal that may result in fainting is seen in blood–injection–injury phobia. Furthermore, anxiety expectancies (e.g. fear of going crazy) and misinterpretation of bodily symptoms seem to be more prominent in environmental and/or situational phobias (e.g. height phobia, claustrophobia) than in other types of phobias. Clearly, each subtype requires a somewhat different therapeutical approach. Although exposure generally is treatment of choice, it is often combined with other techniques: modeling by the therapist in case of animal phobias, applied tension to prevent fainting in the case of blood–injection–injury phobias and cognitive interventions to correct faulty expectancies and misinterpretations in environmental–situational phobias (see, for a review, Muris & Merckelbach, 1998).

Acknowledgements

Petra Körver is thanked for her assistance in the data collection.

References


