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Short versions of two specific phobia measures: The snake and the spider questionnaires

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ABSTRACT

Zoophobias are the most prevalent form of specific phobia worldwide. Two of the most widely used measures, the Snake Questionnaire (SNAQ) and Spider Questionnaire (SPQ) are good indicators of specific fears, but researchers have recognised that shorter, yet nevertheless reliable measures are needed. Hence the aims of this research were to develop short forms of the SNAQ and SPQ using item response theory and to use receiver operating characteristic (ROC) curve analyses to determine cut-offs for use in future research. Twelve-item versions of both scales (SNAQ-12 and SPQ-12) demonstrated excellent discrimination along the latent continuum in a sample of 1354 people. The SNAQ-12 and SPQ-12 showed excellent reliability and were highly correlated with the corresponding full-length scale. The scales discriminated between participants who reported snake (3.25%) or spider (8.05%) phobia and those who did not. Further analyses revealed that non-phobic women report higher fear of both snakes and spiders than do men, but this difference was not present in phobics. These findings suggest that the SNAQ-12 and SPQ-12 have considerable strengths, including shorter assessment and scoring times, whilst retaining high reliability and potential utility as a clinical screening tool.

1. Introduction

Specific phobia is an anxiety disorder that is characterised by a persistent, excessive and unrealistic fear in the presence of the object of the phobia which is sufficient to impair functioning. Thus specific phobia leads to avoidance of situations and places where the object of the phobia might be encountered (American Psychiatric Association, 2013). Specific phobias can have fairly dramatic health consequences. They have been associated with cardiac disease, arthritic conditions, migraine and thyroid disease; moreover, repeatedly feeling anxious and stressed may weaken the immune system, leading to a general feeling of ill health and perhaps even reduced vaccine efficacy. The excretory and digestive systems may also suffer (Aquin, El-Gabalawy, Sala, & Sareen, 2017; Barlow, 2002; Roy-Byrne et al., 2008; Witthauer et al., 2016).

A recent World Health Organisation (WHO) survey (Wardenaar et al., 2017) of the lifetime prevalence of specific phobias in 22 countries found that rates range from 2.6% to as high as 12.5%, with a cross-national average prevalence of 7.4%. Animal phobia was found to be the most prevalent form of specific phobia, with a cross-national average lifetime prevalence of 3.8% (range: 1.4% to 8.1%). The WHO survey did not report the prevalence of subcategories of specific phobias, but a Dutch survey (Oosterink, De Jongh, & Hoogstraten, 2009) indicated that snake and spider phobias, with lifetime prevalences of 5.4% and 11.4% respectively, were amongst the most common phobias. Despite their high prevalence and the potentially severe health consequences, snake and spider phobia are among the least investigated anxiety disorders. Further research is needed to provide a clearer picture on their epidemiology and improve clinical treatments and prevention initiatives.

Amongst the measures most widely used to assess snake and spider phobia are the Snake Questionnaire (SNAQ) and the Spider Questionnaire (SPQ; Klorman, Weerts, Hastings, Melamed, & Lang, 1974). There is a body of research (Fredrikson, 1983; Hunt et al., 2006; Johnsen & Hugdahl, 1990; Olatunji et al., 2009; Polák, Sedláčková, Nácar, Landová, & Frynta, 2016; Zsido, 2017) demonstrating that the SNAQ and SPQ have adequate psychometric properties in nonclinical and clinical populations: both scales have excellent internal consistency, test-retest reliability and convergent validity. Furthermore, they can discriminate between individuals diagnosed with phobia and nonclinical controls (Åhs et al., 2011; Kopp, Schlimm, & Hermann,

Abbreviations: 2PL, the unidimensional two parameter logistic item response model; AUC, area under the ROC curve; CFA, confirmatory factor analysis; IRT, item response theory; ROC, receiver operating characteristic curve analysis; SNAQ, snake questionnaire; SPQ, spider questionnaire; WHO, World Health Organisation

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2005; Pissiota et al., 2003) and are sensitive to treatment effects (Hunt et al., 2006; Olatunji et al., 2009; Teachman et al., 2003) and thus are reliable indicators of change in the strength of implicit fear associations.

One of the potential drawbacks of the SNAQ and SPQ is scale length, as they consist of 30 and 31 items respectively, nine of which are reverse-scored. It has already been pointed out (Berzins, Garcia, Acosta, & Osman, 2016; Fergus, Valentiner, McGrath, Gier-Lonsway, & Kim, 2012; Roberson-Nay, Strong, Nay, Beidel, & Turner, 2007) that researchers and clinicians frequently face the problem that although an assessment battery is becoming too long, in terms of total number of items, they would like to include more scales. In other words there is a growing need for shorter measures that are nevertheless reliable (Wong, Gregory, & McLellan, 2016). Furthermore, concerns have been raised about reverse-scored items in personality assessment - it has been suggested that participants might find them unclear and that as a result they reduce the reliability and validity of questionnaires (Cordery & Sevastos, 1993; Lindwall et al., 2012). This had led some researchers to argue that reverse-scored items should be avoided (Crego & Widiger, 2014; Zhang & Savalei, 2016). It has also been recognised that item response theory (IRT) can be used to refine existing clinical instruments (see e.g. Thomas, 2010), for example it can be used to reduce instrument length and error, to provide objective calibration and to evaluate model and personal fit. Importantly it can also be used to improve the diagnostic accuracy of measures and their sensitivity to changes due to therapeutic intervention.

The overarching goal of this study was to use IRT to refine the SNAQ and the SPQ and create shorter, more economical instruments for assessing snake and spider fear. A further goal was to determine cut-off scores by collecting data from a subsample of individuals with spider and snake phobias. Separate IRT analyses of the SNAQ and SPQ were conducted in order to determine the items that best discriminated between various levels of fear. In order to demonstrate that the short versions retained the excellent psychometric properties of the original questionnaires we carried out assessments of reliability and construct validity in groups with the target phobias, a sample of undergraduate students, with a subgroup of biology related studies serving as positive control group, as well as calculating descriptive statistics and the proportion of variance shared by the long and short versions.

2. Methods

2.1. Participants

The sample comprised 1354 Hungarian subjects (332 men), aged 16–65 years (M = 25.64, SD = 9.51). Thirty-nine (2.88%, 6 men) claimed to have snake phobia; and 104 (7.69%, 15 men, 89 women) reported having spider phobia; a further 5 people reported having both phobias (0.37%, 1 man, 4 women). Self-reported phobias were not confirmed by focused clinical interview.

One hundred and fifty-six (11.52%, 67 men) respondents reportedly studied biology or other biology related discipline. None of them had a phobia. This group was included as a positive control group as a previous study (Polák et al., 2016) showed that people with biology-related education score lower on the SNAQ than the general population without snake phobia.

Nine hundred and seventy-five (233 men, 742 women, M age = 24.76 years, SD = 7.27, range: 18–52) participants were recruited from undergraduate courses and participated on a voluntary basis. The rest of the sample was recruited through the Internet by posting invitations on various forums and mailing lists covering people from a variety of demographic, socio-economic and educational backgrounds. Our goal was to obtain a heterogeneous sample and so we deliberately made the survey accessible to different strata of the population. All respondents filled out the questionnaires online, using Google Forms.

The research was approved by the Hungarian United Ethical Review Committee for Research in Psychology and was carried out in accordance with the Code of Ethics of the World Medical Association (Declaration of Helsinki). Informed consent was obtained from all participants.

2.2. Questionnaires

2.2.1. Snake questionnaire (SNAQ)

The Snake Questionnaire (Klorman et al., 1974) is a 30-item self-report measure of fear and phobia of snakes. It is a one-factor scale and has 9 reverse-scored items. It uses a dichotomous response format (true; false). 'True' responses are summed to yield a score ranging from 0 to 30. The Hungarian version used in this study has been shown to have excellent psychometric properties (Cronbach's alpha = 0.93; high test-retest stability: r = 0.95 (Zsido, 2017).

2.2.2. Spider questionnaire (SPQ)

The Spider Phobia Questionnaire (Klorman et al., 1974) is a 31-item scale which requires respondents to rate the fear and anxiety they would experience in a variety of situations involving spiders using a dichotomous (true; false) response format. The SPQ is a one factor questionnaire and has 9 reverse-scored items. The number of 'true' responses (range: 0–31) indicates the level of phobic fear. We used the Hungarian SPQ, which has been shown to have excellent psychometric properties (Cronbach's alpha = 0.94; high test-retest stability: r = 0.94 (Zsido, 2017).

2.2.3. Construct validity

There is a large body of research (Åhs et al., 2011; Fredrikson, 1983; Kopp et al., 2005; Muris & Merckelbach, 1996; Pissiota et al., 2003; Teachman et al., 2003) demonstrating that individuals scoring high on SNAQ or SPQ fulfil the DSM-IV criteria (assessed by telephone or face-to-face structured clinical diagnostic interview) for the corresponding phobia and, furthermore that both the SNAQ and SPQ can differentiate between individuals with and without a DSM spider or snake phobia diagnosis.

2.3. Data analyses

2.3.1. Item selection

Most self-report measures include negatively worded items, i.e. items that are phrased so that a positive response represents a relatively low level of the attribute being measured. Research on self-report questionnaires in a variety of domains–posttraumatic stress disorder (Conrad et al., 2004), social anxiety (Motl, Conroy, & Horan, 2000; Rodebaugh, Woods, Heimberg, Liebowitz, & Schneier, 2006), loneliness (Miller & Cleary, 1993), self-esteem, central life interest, administrative skills, interpersonal skills and activity level (Schmitt & Stults, 1985) –has shown that negatively worded items usually tap a single factor that is hard to interpret. Moreover negatively worded items sometimes reduce the internal consistency, reliability and validity of the scale (Cordery & Sevastos, 1993; Lindwall et al., 2012). In other words, not only are reverse-coded items apparently harder to answer correctly, they do not appear to measure the same phenomenon (Ahlawat, 1985; Zhang & Savalei, 2016). Given these findings the first step in our scale reduction procedure was to remove the reverse-scored SNAQ and SPQ items (numbers 6, 12, 14, 16, 17, 20, 25, 27 and 28 in both cases).

2.3.2. Item response analyses

An important prerequisite (Reise, Widaman, & Pugh, 1993) for use of IRT is the unidimensionality of the latent variable (here, spider snake phobia). We used CFA to check that this assumption was met.

The unidimensional two parameter logistic (2PL) item response model (Birnbaum, 1968) was used to explore the measurement properties of individual questionnaire items. This model specifies a

discrimination parameter (*a*) and a difficulty parameter (*b*) for each item. The *a* parameter shows how strongly the item is related to the latent variable, i.e. specific phobia in this case, whilst the *b* parameter indicates where on the latent continuum the discrimination occurs, i.e. the probability of a positive answer is 0.5 (Baker, 2001).

These parameters were used to select items that discriminated clearly between people with different levels of snake or spider phobia for inclusion in short versions of the two questionnaires. Two criteria were used to select items. First, only items with very high ($a > 1.7$; threshold recommended by Baker, 2001) discrimination values. Second, as it is also important that a diagnostic questionnaire can discriminate between levels of the specific phobia represented by the underlying latent variable (e.g. low, moderate, high fear), we sorted the subset of items with high *a* values according to their *b* value. We then selected the four items with the highest and lowest *b* values and the four items closest to the median, so as to cover the whole spectrum of the latent variable.

2.3.3. Receiver operating characteristic curve (ROC) analysis

Previous research (Åhs et al., 2011; Mats Fredrikson, 1983; Kopp et al., 2005; Pissiota et al., 2003) has shown that both the SNAQ and SPQ may be useful for diagnosing phobias in the clinic, so we used ROC curve analysis to evaluate the diagnostic performance of the SNAQ and SPQ. The ROC analysis specifies sensitivity (i.e. true positives) and specificity (i.e. true negatives), but these values depend on the threshold chosen and so determination of a cut-off score is always a trade-off between sensitivity and specificity. Ideally the cut-off value should optimise both sensitivity and specificity (Fan, Upadhye, & Worster, 2006).

Another important measure is the area under the ROC curve (AUC), this constitutes a measure of diagnostic accuracy and has a value between 0 and 1, with 1 representing perfect test performance (Faraggi, Reiser, & Worster, 2002). The lower AUC limit for a diagnostic test is 0.5 and tests with an AUC value greater than 0.75 are widely considered as clinically useful (Chapman et al., 2016; Jutzeler et al., 2017).

Data analysis was performed using SPSS® version 22.0 (IBM Corp., NY.).

3. Results

3.1. CFA of the total scales

Confirmatory factor analyses were run on SNAQ and SPQ data after deleting the reversed scored items (leaving 21 and 22 items respectively). In both cases the results indicated that a one-factor model provided an acceptable fit (SNAQ: CFI = 0.942, TLI = 0.943, RMSEA = 0.052 [90% CI: 0.048–0.056], SRMR = 0.042; SPQ: CFI = 0.948, TLI = 0.948, RMSEA = 0.054 [90% CI: = 0.050–0.057], SRMR = 0.038). This indicates that both scales have a single underlying latent variable and hence are suitable for IRT analysis.

3.2. IRT analyses

As the CFA confirmed that both scales had a single latent variable, the 21-item SNAQ and 22-item SPQ were analysed using 2PL IRT. Tables 1 and 2 show the *a* and *b* values for the SNAQ and SPQ respectively.

3.2.1. SNAQ-12

Fourteen items met the *a priori* threshold (> 1.7) for the *a* parameter (2, 3, 4, 7, 8, 11, 13, 15, 19, 21, 22, 26, 29 and 30). Within this subset the items with the lowest *b* values were 7, 8, 11 and 21. The four items with *b* values closest to the median were 4, 19, 22 and 30 and those with the highest *b* values were 2, 3, 13 and 29.

Table 1
Discrimination (*a*) and difficulty (*b*) parameters for Snake Questionnaire (SNAQ) items. The 12 items retained in the short version are printed in bold.

Item	*a*	*b*
1	1.49	2.11
2	**2.67**	**1.35**
3	**4.09**	**1.39**
4	**2.75**	**0.73**
5	1.56	0.49
7	**3.14**	**0.41**
8	**2.05**	**0.08**
9	1.56	0.64
10	0.19	−4.91
11	**3.10**	**0.33**
13	**1.96**	**1.35**
15	2.33	1.25
18	0.87	1.47
19	**2.06**	**0.84**
21	**1.71**	**−0.31**
22	**2.64**	**1.18**
23	1.48	1.44
24	1.51	0.93
26	1.99	0.57
29	**3.05**	**1.68**
30	**2.09**	**0.99**

3.2.2. SPQ-12

Twenty of the items of the 22-item SPQ met the *a priori* threshold (> 1.7) for the *a* parameter (1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 13, 15, 19, 21, 22, 23, 26, 29, 30 and 31). Within this subset the items with the lowest *b* value were 4, 5, 7 and 10. The four items with the *b* values closest to the median were 3, 9, 21 and 26 and those with the highest *b* value were 1, 13, 29 and 30.

3.3. Reliability and internal consistency

The total scores of the SNAQ-12 and SPQ-12 showed excellent internal consistency (Cronbach's alpha = 0.88 and 0.90 respectively). The reliability of the original scales was also measured (SNAQ: Cronbach's alpha = 0.92, SPQ: Cronbach's alpha = 0.94): the values for the shortened versions were comparable to that of those of the original scales (Tables 1 and 2).

Table 2
Discrimination (*a*) and difficulty (*b*) parameters for Spider Phobia Questionnaire (SPQ) items. The 12 items retained in the short version are printed in bold.

Item	a	b
1	2.25	1.42
2	2.47	0.86
3	**2.69**	**0.72**
4	**1.93**	**0.12**
5	**2.99**	**0.20**
7	**3.29**	**−0.11**
8	3.95	0.28
9	**4.45**	**0.71**
10	**2.99**	**−0.50**
11	4.75	0.28
13	**2.78**	**0.95**
15	3.46	0.89
18	1.06	1.22
19	2.07	0.48
21	**4.16**	**0.63**
22	3.19	0.82
23	1.74	0.95
24	1.56	1.85
26	**1.98**	**0.76**
29	**3.42**	**1.27**
30	**3.63**	**0.96**
31	1.93	0.36

Table 3
Descriptive statistics for both the short and original versions of the Spider Phobia Questionnaire (SPQ) and Snake Questionnaire (SNAQ).

Scale	*M* (*SD*)	Median	α	Item-total correlation (range)	Correlation with original scale	Women: *M* (*SD*)	Men: *M* (*SD*)
SNAQ-12	3.21 (3.15)	3	0.88	.44 - 0.67	0.89	3.56 (3.24)	2.13 (2.56)
SPQ-12	3.95 (3.63)	3	0.90	.48 - 0.73	0.91	4.54 (3.68)	2.15 (2.80)
original SNAQ	9.40 (7.05)	8	0.92	.07 - 0.70	–	10.14 (7.22)	7.13 (5.96)
original SPQ	11.16 (8.51)	9	0.94	.35 - 0.74	–	12.42 (8.57)	7.29 (7.07)

3.4. Descriptive statistics

The descriptive statistics, i.e. mean scores, medians and standard deviations for the total scores, of the total scores of the SNAQ-12 and SPQ-12 were compared with those of the original SNAQ and SPQ. In both cases the short version was highly correlated with the original after correcting for redundancy due to the shared items (Levy, 1967). Furthermore, all the items included in the SNAQ-12 and SPQ-12 demonstrated good corrected item-total correlations. One SNAQ item (no. 10) had a very low item-total correlation ($r = 0.07$) that prompted a call for it to be removed from the questionnaire in subsequent research (Zsido, 2017), but this items was not included in the shortened version of SNAQ. All the other items of the original SNAQ had acceptable item-total correlations ($r \geq 0.3$). Finally, as expected, women scored higher on both the SNAQ ($t = 8.23$, $p < 0.01$, $d = 0.49$) and SPQ ($t = 12.45$, $p < 0.01$, $d = 0.73$) than men. See Table 3 for descriptive data for both versions of both scales.

3.4.1. Group comparisons

First, groupwise comparisons showed there were no differences between participants with a biology-related education ($n = 154$) and other non-phobics ($n = 1052$) with respect to total scores on the SNAQ-12 ($t < 2, p > 0.1$) and SPQ-12 ($t < 2, p > 0.1$), so these subgroups were combined in subsequent analyses.

The groups with snake phobia ($n = 44$) and spider phobia ($n = 109$) were also compared with the rest of the sample. Respondents who claimed to have both phobias ($n = 5$) were included in both groups. Participants who reportedly had snake phobia had higher scores on the SNAQ-12 ($t = 24.04$, $p < 0.01$, $d = 2.91$) but not the SPQ-12 ($t < 2$, $p > 0.1$). Similarly, the spider phobia group had higher scores on the SPQ-12 ($t = 17.36$, $p < 0.01$, $d = 1.58$) but not the SNAQ-12 ($t < 2$, $p > 0.1$). See Table 4 for descriptive statistics for the snake, spider and non-phobic groups.

There was a sex difference in scores when data from the whole sample ($N = 1354$) were analysed, with women scoring higher on both scales; but as this could be due to women being more willing to report phobia than men we also looked for sex differences in the combined group of people without phobia. Once again women had higher scores on both the SNAQ-12 ($t = 7.11$, $p < 0.01$, $d = 0.50$) and SPQ-12 ($t = 10.23$, $p < 0.01$, $d = 0.73$).

Sex differences were also examined separately in each group. In the snake phobia group there was no sex difference in SNAQ-12 score ($t < 2$, $p > 0.1$). A similar result was found in the spider phobia group, where there was no sex difference in SPQ-12 scores ($t < 2, p > 0.1$). It is important to note, however, that the low number of men in these groups - especially in the snake phobia group - may have biased these results.

Table 4
Descriptive statistics for shortened versions of the Spider Phobia Questionnaire (SPQ-12) and Snake Questionnaire (SNAQ-12) organised by group.

Variable	Snake phobia	Spider phobia	Biology-related education	No phobia
Number	44	109	154	1052
M age in years (*SD*)	27.39 (11.78)	25.65 (7.85)	26.88 (11.32)	25.40 (9.29)
SNAQ-12				
M (*SD*)	10.11 (1.89)	3.10 (3.17)	3.36 (2.31)	2.94 (2.99)
Median	10.5	2	3	2
Women: *M* (*SD*)	10.27 (1.59)	3.26 (3.13)	3.72 (2.69)	3.30 (3.06)
Men: *M* (*SD*)	9.29 (3.09)	2.19 (3.37)	2.88 (1.57)	1.76 (2.45)
SPQ-12				
M (*SD*)	4.86 (3.95)	8.48 (2.78)	3.32 (3.63)	3.56 (3.38)
Median	3,5	9	2	3
Women: *M* (*SD*)	5.27 (3.83)	8.65 (2.56)	4.69 (3.71)	4.03 (3.48)
Men: *M* (*SD*)	2.71 (4.19)	7.50 (3.76)	1.57 (2.64)	1.89 (2.42)

3.5. ROC analyses

3.5.1. SNAQ-12

The optimal balance between sensitivity and specificity for SNAQ-12 was achieved using a cut-off score of > 7.5, which yielded sensitivity of 0.909 and specificity of 0.905. This suggests that someone scoring ≥8 on the SNAQ-12 should be considered potentially snake phobic. The AUC for the SNAQ-12 was 0.96 (95% CI: 0.94–0.98), demonstrating that it has excellent discriminatory power and, therefore, is potentially useful as a diagnostic test for snake phobia.

3.5.2. SPQ-12

The optimal balance between sensitivity and specificity was harder to determine for the SPQ-12 than for the SNAQ-12. With a cut-off value of > 6.5 the sensitivity was 0.761 and the specificity of 0.782. This suggests that a person scoring > 7 on the SPQ-12 might be at a risk developing spider phobia. The AUC for the SPQ-12 was 0.85 (95% CI: 0.82–0.88), demonstrating that it has good discriminatory power and, therefore, is potentially useful as a diagnostic test for spider phobia.

4. Discussion

Previous research suggests that the SNAQ and SPQ are valid, reliable quantitative indicators of two specific phobias, snake and spider phobia respectively. However both questionnaires are rather long (30 and 31 items) and thus cannot feasibly be used as a screening tool in many clinical and research settings. Hence the aims of the research reported here was to produce short forms of the SNAQ and SPQ. IRT was used to identify the items with the best discrimination parameters and from this subset we selected items to represent the full range of the latent continuum in each case. .The short forms of the SNAQ and SPQ both consist of 12 items and both demonstrated excellent reliability and internal consistency as well as discriminating between phobics and non-phobics. The high correlations between the original and shortened scales show that the new 12-item versions are good alternatives to the longer originals. We also used ROC analyses to propose cut-off scores for future use. Moreover, the items included in the short forms appear comparably representative of the original full-length questionnaires.

In accordance with previous studies (Fredrikson, Annas, Fischer, & Wik, 1996; Oosterink et al., 2009; Polák et al., 2016; Wardenaar et al., 2017; Zsido, 2017) we found sex differences in scores on both scales, with women scoring higher on both scales than men. Interestingly, however, this sex difference was not present in those who reported having snake or spider phobia, a result which is also line with previous

research (Fredrikson, 1983; Hilbert, Evens, Isabel Maslowski, Wittchen, & Lueken, 2015; Muris & Merckelbach, 1996). Previous research (Fredrikson et al., 1996) on sex differences in specific fears concluded that the finding that women are more vulnerable to phobias was not due to measurement precision problems, but rather due to sex differences in fear acquisition. A more recent study (Campbell et al., 2016) suggested that sex differences in emotional sensitivity and tendency to expose oneself to risky situations might underlie sex differences in phobias. It seems plausible that women are more prone to developing snake or spider phobia than men and, therefore, have higher average scores on scales measuring these phobias. This conclusion is consistent with a recent WHO survey (Wardenaar et al., 2017) that found that women had a higher lifetime risk of developing a specific phobia than men.

A strong point of this study is the use of ROC curve analyses to determine cut-off scores for the SNAQ-12 and SPQ-12 (8 and 7 respectively) and show that they have good discriminatory power. Although we relied on self-report measures to determine the presence of snake and spider phobia in our sample the prevalence figures (3.25% for snake and 8.05% for spider phobia) are similar to those reported in previous studies (Agras, Sylvester, & Oliveau, 1969; Depla, ten Have, van Balkom, & de Graaf, 2008; Oosterink et al., 2009; Polák et al., 2016). Importantly, it has been shown that the overestimation of fear is a universal phenomenon (Rachman, 1994; Thorpe & Salkovskis, 1995). More research, including research with a clinically diagnosed sample, is needed to establish firm cut-off scores for the SNAQ-12 and SPQ-12, nevertheless the analyses carried out thus far suggest that the SNAQ-12 and SPQ-12 are potential useful as diagnostic tools.

The limitations of this study include the lack of verification of self-reports of phobia. This means that, our encouraging findings notwithstanding, there is a need for further research into the psychometric properties of the SNAQ-12 and SPQ-12 in a sample diagnosed with the target phobias by trained clinicians using structured clinical interviews. It is worth noting, however, that the prevalence figures for both phobias were similar in our sample to those reported in earlier studies (Johnsen & Hugdahl, 1990; Polák et al., 2016; Wardenaar et al., 2017; Zsido, 2017). Although the large sample is a strength of our study, the sex imbalance may have biased the results, given that women tended to score higher on both scales. The large sex imbalance also made comparison of men and women within phobic subgroups problematic and may have confounded the results. It is, therefore, important to verify these results in a more balanced sample. Finally, whilst SNAQ-12 and SPQ-12 showed good psychometric properties in the Hungarian sample used in this research they are yet to be tested in other populations.

These shortcomings notwithstanding, this study has yielded short forms of two commonly used self-report measures of specific phobias, namely the SNAQ and SPQ. The short forms both consist of 12 items, representing a substantial reduction in the length of the 30- and 31-item originals. The SNAQ-12 and SPQ-12 could be used in clinical screening and in behavioural research on the basis of these phobias. The short forms will be particularly attractive in situations where practical considerations preclude the use of a longer questionnaire and they should allow researchers to gain greater insight into snake and spider phobias.

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Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at https://doi.org/10.1016/j.janxdis.2017.12.002.

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