Fear the serpent: A psychometric study of snake phobia

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ABSTRACT

Millions of people worldwide suffer from specific phobias. Almost any stimulus may trigger a phobic reaction, but snakes are among the most feared objects. Half of the population feel anxious about snakes and 2–3% meet the diagnostic criteria for snake phobia. Despite such a high ratio, only one instrument is commonly used, the Snake Questionnaire (SNAQ). The aim of this study was to develop a standardized Czech translation, describe its psychometric properties and analyze the distribution of snake fears. In a counter-balanced design 755 respondents were asked to complete the English and Czech SNAQ (first or last) with a 2–3 month delay; 300 of them completed both instruments. We found excellent test-retest reliability (0.94), although the total scores differed significantly when the English version was administered first. The mean score was 5.80 and Generalized Linear Models revealed significant effects of sex and field of study (women and people with no biology education scored higher than men and biologists). A cut-off point for snake phobia as derived from a previous study identified 2.6% of the subjects as phobic. Finally, the score distribution was similar to other countries supporting the view that fear of snakes is universal.

1. Introduction

Phobias, persistent and overwhelming irrational fears of people, objects, or situations, are widespread in the population and are the most common anxiety disorder. According to Doctor et al. (2008), an estimated 19.2 million adults over the age of 18 in the United States (9% of population) have experienced a specific phobia reaction at some point in their life. Andrews (2004) reviewed epidemiological studies of phobic disorders and concluded that the average prevalence rate of specific phobias is 8.8%. This is comparable to the prevalence of affective disorders and up to 20 times the prevalence of schizophrenia.

Although any object, no matter its actual fear relevancy, may trigger a phobic reaction, it seems that animals particularly stand out of the otherwise endless list of phobic stimuli as they can elicit strong fear (or disgust, which is a common component of animal phobias: Arrindell et al., 1999; Davey, 1994; Tucker and Bond, 1997) in a vast number of people (Fredrikson et al., 1996). Dysregulated, irrational fear of animals is one of the most common specific phobias in humans (Becker et al., 2007; Davey et al., 1998; Kirkpatrick, 1984) with a life-time prevalence 3.3–5.7% (LeBeau et al., 2010). However, the average rate of zoophobias can be even

higher with considerable gender differences, as Fredrikson et al. (1996) reported on the Swedish population (12.1% of women and 3.3% of men). Furthermore, of all animals snakes are feared the most. Davey (1994) reported that snakes elicited anxiety in 53.3% of subjects and ophidiophobia, a clinically relevant fear of snakes, is held to affect 2–3% of population (Klieger, 1987; Klorman et al., 1974), thus representing a half of all animal phobias. Moreover, there is an evidence nowadays that fear of snakes may have an innate component and is shared with other non-human primates (Weiss et al., 2015). Therefore, it does not necessarily require a traumatic experience to be triggered, as opposed to other specific phobias (Doctor et al., 2008; Fredrikson et al., 1997; for a review on the etiology of specific phobias see Merckelbach et al., 1996).

Despite the relatively high prevalence of snake phobia in the general population, diagnostic tools are rather scarce (Rowa et al., 2008). Until recently, only a few psychometric instruments to quantify fear of snakes have been developed. The most commonly used is the Snake Questionnaire (SNAQ; Klorman et al., 1974). This is of surprise when compared to other specific phobias whose instruments tend to be overrepresented given their actual rate, e.g. there are six standardized measures of dental phobia (Antony, 2001).

The SNAQ has been so far subjected to a few validation studies (Fredrikson, 1983; Klieger, 1987, 1994; Klieger and Siejak, 1997; Klorman et al., 1974). Although it shows good internal consistency (0.78–0.90; Klorman et al., 1974), excellent test-retest reliability ($r=0.84$: Fredrikson, 1983) and discriminates snake phobics from

those fearing spiders and from nonphobics (Fredrikson, 1983), its psychometric qualities has been questioned by others. Especially Klieger (1987, 1994) argued against using the SNAQ as a good measure of snake phobia due to its low construct and criterion validity. He performed a behavioral test in which a significant number of people who reported high fear of snakes were actually able to approach a caged snake (Klieger, 1987). Therefore, after having reviewed studies using the SNAQ, Klieger and Gallagher (1993) concluded that it is sensitive for identifying fearful individuals, but strongly biased towards false positives. According to Klieger and Siejak (1997) the low specificity (i.e. sensitivity for discriminating individuals with no fear of snakes) can be attributed to ambiguous formulation of several items. In fact, they argued that the SNAQ, one of the most researched self-report psychometric instruments, is not only a measure of respondent's fear, but higher scores may also reflect disgust. For these reasons, Klieger (1994) proposed an extensive series of follow-up questions to remove the inherent ambiguities which significantly improved the disagreement between the SNAQ and behavioral measures.

Even though it remains disputable, whether the SNAQ can accurately estimate the number of snake phobics, it is still valuable as the only self-administered and formerly standardized tool assessing a verbal-cognitive component of the widespread fear of snakes. It provides a quick evaluation of the respondent's fear of snakes that may inform initial clinical judgement. Finally, it can also serve as a useful tool in epidemiological studies and when evaluating treatment outcomes. For these reasons, it is important to study if its formerly verified translation can be used in another cultural background to allow relevant comparisons with other research on snake phobia. The SNAQ has already been translated into other languages (e.g. Swedish: Fredrikson, 1983), but a Czech version is missing. Therefore, the aim of this study was to standardize the Czech translation of SNAQ and to obtain local norms on a nonclinical sample. Here we present data on its psychometric properties together with preliminary results on the distribution of snake phobia within the Czech population.

2. Materials and methods

2.1. Snake Questionnaire

The SNAQ is a 30-item self-report scale to assess the verbal-cognitive component of snake fear. Each item is a fearful or non-fearful statement related to snakes. Participants rate each item as true or false. The instrument is scored by assigning a "1" to each true response and "0" to each false response, 9 items are reversed-scored. A total score (ranging from 0 to 30) is calculated by summing all 'true' statements and it serves as a measure of the degree of phobic fear (Wikstrom et al., 2004; Wright et al., 2002). The SNAQ takes about 5–10 min to complete. The copyright author has provided his written consent for the SNAQ to be translated to Czech.

2.2. Participants

In total, 755 subjects (245 men and 510 women), aged 12–68 years with a range of demographic and socio-economic/educational backgrounds were recruited for the study. In order to obtain a heterogeneous sample, the authors contacted young children attending a local naturalists' center ($n=12$), high school students ($n=165$), university students of psychology ($n=34$) and veterinary sciences ($n=53$), pre- and postgraduate biologists ($n=139$), psychologists, psychiatrists, researches and administrative staff working at the National Institute of Mental Health ($n=36$), members of the university choir ($n=23$) and others ($n=20$). The

rest of participants were recruited through the Internet ($n=273$), where data was collected using the Google Forms platform. Informed consent was obtained from all participants included.

2.3. Procedure

The standardization procedure followed recommendations of the American Psychological Association for developing translations (APA, 2014). First, the original English questionnaire was independently translated to Czech by two persons fluent in both languages. To identify and resolve potential discrepancies in the forward translations the two versions were then checked by a psychologist with a Master's degree experienced in test development. Subsequently, back-translation to English was developed by a third translator who had no previous knowledge of the questionnaire. Three native English speakers then compared the original and back-translated items to determine whether they were equivalent in content meaning. Any substantive differences for particular items were considered and revised by an expert panel consisting of researchers in psychology with the objective to obtain a translation most closely corresponding to the original instrument. Finally, both pen-and-paper and computer versions were created.

In order to standardize the Czech translation and evaluate its psychometric properties, a counter-balanced experimental design was adopted. After recruitment, a half of the subjects was administered the English SNAQ first, followed by the Czech translation 2–3 months later. The other half was asked to complete the questionnaires in the reverse order, i.e. first in Czech and then in English. Participants were randomly divided into these two groups. Each respondent had a brief explanation of the purpose of his/her participation and was instructed on how to complete the measure. The respondents were told that the questionnaire focused on human attitudes towards snakes and any mention of 'fear' was avoided. Before administering the SNAQ in English subjects were asked about their language proficiency and instructed not to complete the measure if they did not feel confident about the items meaning. However, as the majority of our respondents were high school or university students having been studying English for several years, it may be expected that they understood the full meaning of each item.

Prior completing the questionnaire, information on the individual's age, sex and education was collected. For statistical analyses the age was categorized into seven groups (less than 15; 15–20; 21–30; 31–40; 41–50; 51–60; and 60+). The education was divided into the following four categories: (1) high school students; (2) natural science education (biology, veterinary) (3) social science education (psychology, sociology, etc.); (4) other or unknown. Furthermore, categories 1, 3, and 4 were pooled together to create a non-biologists group and compared to the respondents with biology education as it was expected this could explain some response variability. We also recorded the method of administration, i.e. whether the subject completed the SNAQ using the pen-and paper or computer version.

The selected period length of 2–3 months between each administration is generally recommended when retesting personality questionnaires (McCrae et al., 2010). It is believed that after this time the subject can no longer remember his previous answers, thus the carry over effect is minimized (McConnell et al., 1998). For the second administration the participants filling out the pen-and-paper version were approached directly, others were asked by email to complete the questionnaire on a computer.

2.4. Statistical analysis

First, considering a non-normal distribution of the total raw