The Fear of Cockroaches Questionnaire (FCQ)

MICHELE SCANDOLA, ALESSIA BASTIANELLI, ANDREA SPOTO and GIULIO VIDOTTO

The aim of this study was to validate the Fear of Cockroaches Questionnaire (FCQ) in general Italian population. The FCQ is an 18-item self-report questionnaire assessing fear of cockroaches. It was translated in Italian and modified as a cockroach adaption of the Fear of Spiders Questionnaire. Data obtained from 329 (mean age 24.21 ± 4.08 years) undergraduates revealed that the FCQ allowed discrimination between high fear and low fear subjects. Exploratory Factor Analysis revealed a mono-factorial structure. The FCQ has a good test-retest reliability (r=0.95) and a good internal consistency (α=0.95). The FCQ correlates with other measures related to fear of small animals, showing good concurrent validity. Finally, the FCQ score seems to be a measure of the fear free from disgust and anxiety caused by the cockroach exposition.

Key words: cockroach, fear, phobia, questionnaire

Studies on specific animal-phobias are typically focused on fear, despite the observation that anxiety often involves an aggregate of several emotions where fear could be the main feeling (Bartlett & Izard, 1972). Specific phobias are restricted to well-defined situations and they are not usually accompanied by the generalized anxiety, spontaneous panic, and depression that commonly trouble agoraphobic and social phobic patients (Marks, 1987).

The diagnostic features of the DSM IV TR (APA, 2000) for the specific phobia states that “the essential feature of a Specific Phobia is marked and persistent fear of clearly discernible, circumscribed objects or situations. Exposure to the phobic stimulus almost invariably provokes an immediate anxiety response”.

These focal phobias can involve virtually any situation, but in clinical practice the most common ones are fears of specific kinds of animals or insects, blood or injury, dental or medical procedures, etc. Most kinds of specific phobias are more common in women, start at any age, and may endure for several decades (Marks, 1987). As an example, animal phobias tend to start in early childhood, and blood, dental, and thunderstorm phobias before adolescence (Liddell & Lyons, 1978; Öst, Salkovski, & Hellstrom, 1986).

Animal phobias are isolated fears of animal or insects such as birds, cats, dogs, frogs, spiders, moths, bees, and cockroaches. Such phobias involve fear and avoidance of animals in their own right rather than a fear of contamination by them (Marks, 1987). Nevertheless, in recent years, there has been an increasing interest in the topic of disgust and in the role it might play in anxiety disorders. Research has shown how disgust and phobias could be linked together, especially when referred to small animals such as spiders, cockroaches, maggots and rats. For that reason, and due to the frequency of simple animal phobias in the general population, for pragmatic causes (e.g., ease of participants recruitment) the simple animal phobia became a useful model for investigating diverse facets of anxiety and psychotherapy.

The most investigated simple animal phobias were the spider phobia (e.g., de Jong & Muris, 2002; O’Donohue & Szymanski, 1993; Öst, Salkovski & Hellstrom, 1991), the snake phobia (Klieger & Siejack, 1997), and the rat phobia. In part, these animals may evoke the same kind of threatening as large animals: a physical attack may motivate fear associated with predator defense (Öhman, 1986). Nevertheless, this is no longer true for the cockroaches. These animals may be threatening because they can be carriers of harmful diseases. This threat of contamination may moti-
vate the disgust related to disease avoidance (Curtis & Biran, 2001; Matchett & Davey, 1991). For this reason, some questionnaires concerning disgust have items concerning cockroaches (e.g. Haidt, McCauley, & Rozin, 1994).

Thus, the study of the fear of cockroaches is interesting, and, it is important to have reliable and valid assessment tools. In order to develop a questionnaire with a good validity, reliability, internal consistency, and with a reasonable number of items, we adapted a small animal phobia questionnaire presenting all these properties. As proposed by Botella, Quero, Banos, Garcia-Palacios, Breton-Lopez, Alcaniz & Fabregat (2008), we selected the Fear of Spiders Questionnaire (FSQ) (Szymanski & O’Donohue, 1995) for the adaptation. It is an 18-item on a 7-point Likert scale questionnaire. It assesses participants’ avoidance and fear of harm from spiders with a very good internal consistency, reliability, validity.

METHODS

Development of the questionnaire

The questionnaire is an adaptation of the Fear of Spiders Questionnaire (FSQ) (Szymanski & O’Donohue, 1995). Three psychologists translated the questionnaire to obtain three different Italian versions. A native English speaker provided the back-translations. The results were compared in order to obtain a definitive version. A comparison between the original English language version and the back-translation made it possible to eliminate inconsistencies or significant differences in meaning. The style of test was adjusted to make the list of questions easier to read, and the word cockroach substituted the word spider. The questionnaire was tested on small groups of people drawn from general population to check ease of comprehension and readability. Adjustments were made and final touches added. The Fear of Cockroaches Questionnaire (FCQ) is an 18-item measure that assesses participants’ avoidance of and fear of harm from cockroaches.

Participants

The number of participants was 329, 171 recruited from psychology classes at the University of Padua, and 158 from other classes at the University of Padua and at the University of Verona. There were 113 (34.3%) males and 216 (65.6%) females. The age range was 18 to 30; mean (SD) age was 24.21 (4.08) years; mean (SD) age for men was 24.29 (5.79) years; mean (SD) age for women was 24.17 (2.81) years.

Procedure

The FCQ was administered as part of a battery of tests, described below. Before undergoing the tests, each partici-
ability of the FCQ questionnaire, the test was administered to 36 subjects randomly sampled from the original group of N = 329 subjects after 6 months. Test-reliability of the total FCQ score was $r = .95 (p < .01)$.

Exploratory factor analysis. Principal Components Analysis with varimax rotation was applied. Scree-plot test (Cattell, 1966) was considered to choose a mono-factorial solution (see Figure 1).

The Kaiser-Meyer-Olkin Measure of Sampling Adequacy was 0.942, a “sound” value (Kaiser, 1974) indicating that the factor structure was an appropriate model for these data. Bartlett’s Test of Sphericity was $4,630.41 (p < .001)$: an adequate value to support the model and to reject the hypothesis that the correlation matrix is an identity matrix. The anti-image correlation matrix - showing the extent items share common variance, had values between ±0.50. The partial correlations should be small if items share common factors. The squared multiple correlations between one variable and all the others indicating the strength of linear association, i.e. the communalities, were appropriately moderate-high at between 0.49 and 0.83 (see Table 1).

Concurrent validity. The correlation between FCQ and i) the animal factor of IP, ii) the item cockroaches of IP, iii) the DS, and iv) the STAI-X was calculated in order to evaluate concurrent validity. Results indicate good concurrent validity of the FCQ: a positive correlation was found between FCQ and i) the animal factor of IP ($r = .53, p < .01$), ii) the item cockroaches of IP ($r = .65, p < .01$). Results indicate that the fear of cockroaches measured with FCQ is related to the fear of specific animals, and to the fear of cockroaches measured by a single five-pointed item. There are weak correlations with the DS ($r = .38, p < .01$) and its subscales (core $r = .35, p < .01$; contamination $r = .24, p < .01$; animal $r = .27, p < .01$), and the STAI-X ($r = .26, p < .01$).

These results indicate a weak association between disgust and fear of cockroaches, and anxiety and fear of cockroaches. Table 2 shows correlations between the scales and subscales administered and the FCQ.

Gender differences. Statistical analysis was carried out for testing gender differences. We calculated means and standard deviations split by gender for each scale. T-tests were performed to verify whether gender differences exist for the questionnaires used in the study. Table 3 displays means, standard deviations (SD), and coefficients of variation (calculated through the following formula: $CV=sd/|X|$) for each questionnaire, subscale and gender. In the last column of Table 3 are reported the results of the t-tests for independent samples performed.

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**Table 1**

<table>
<thead>
<tr>
<th>Item</th>
<th>Communalities</th>
<th>Extraction method: principal component analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>FCQ 1</td>
<td>.749</td>
<td></td>
</tr>
<tr>
<td>FCQ 2</td>
<td>.486</td>
<td></td>
</tr>
<tr>
<td>FCQ 3</td>
<td>.555</td>
<td></td>
</tr>
<tr>
<td>FCQ 4</td>
<td>.617</td>
<td></td>
</tr>
<tr>
<td>FCQ 5</td>
<td>.761</td>
<td></td>
</tr>
<tr>
<td>FCQ 6</td>
<td>.739</td>
<td></td>
</tr>
<tr>
<td>FCQ 7</td>
<td>.694</td>
<td></td>
</tr>
<tr>
<td>FCQ 8</td>
<td>.658</td>
<td></td>
</tr>
<tr>
<td>FCQ 9</td>
<td>.712</td>
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<td>FCQ 10</td>
<td>.743</td>
<td></td>
</tr>
<tr>
<td>FCQ 11</td>
<td>.697</td>
<td></td>
</tr>
<tr>
<td>FCQ 12</td>
<td>.681</td>
<td></td>
</tr>
<tr>
<td>FCQ 13</td>
<td>.834</td>
<td></td>
</tr>
<tr>
<td>FCQ 14</td>
<td>.800</td>
<td></td>
</tr>
<tr>
<td>FCQ 15</td>
<td>.696</td>
<td></td>
</tr>
<tr>
<td>FCQ 16</td>
<td>.678</td>
<td></td>
</tr>
<tr>
<td>FCQ 17</td>
<td>.729</td>
<td></td>
</tr>
<tr>
<td>FCQ 18</td>
<td>.729</td>
<td></td>
</tr>
</tbody>
</table>

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**Table 2**

| Correlations |  |
|--------------|--
| IP cockroaches | .650 |
| IP total      | .531 |
| DS            | .382 |
| DS core       | .355 |
| DS contamination | .238 |
| DS animal     | .270 |
| STAI-X        | .260 |

Note: All the correlations are significant at the .01 level


Also in the other questionnaires included in the battery gender differences are statistically significant, except for the contamination subscale of Disgust Scale. This could be due either to a random effect of the sample’s characteristics or to the translation into Italian, or both.

In the most part of the questionnaires of the battery we observed a high value of standard deviation. This suggests a further line of research to investigate potential differences not only between males and females, but also between clinical and non-clinical individuals, etc. In fact, the high value is due to the presence of few “high fear-of-cockroaches” participants in our sample. FCQ scores range between 0 and 108, but in a normal population of students, randomly chosen, only few subjects present a high score (i.e., there are only 14.89% if participants who scored more than 50), and their presence actually increases the standard deviations. Another possible interpretation of the high values observed for the sd could be the high sensitivity of the instrument that seems to be able to detect and highlight even small levels of fear. All these issues have to be further investigated.

Further analysis will have to focus on: (i) reliability and validity studies on a more general sample, since this study was performed only on students, with a small age range; (ii) samples of participants with anxiety disorders; (iii) specific small animal phobias samples (cockroaches).

Moreover, studying its responsiveness could be important to assess treatment efficacy.

In conclusion, the analysis of the FCQ in a normal population provides evidence of reliability, factor and concurrent validity. Nevertheless, this tool is useful in assessment of anxiety disorders, because the fear of small harmless animals like cockroaches seems to play a role in anxiety disorders.

### REFERENCES


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**Table 3**

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>FCQ</td>
<td>26.67</td>
<td>23.56</td>
<td>-4.46**</td>
</tr>
<tr>
<td>IP cockroaches</td>
<td>2.06</td>
<td>1.27</td>
<td>-3.57**</td>
</tr>
<tr>
<td>IP total</td>
<td>6.88</td>
<td>6.77**</td>
<td></td>
</tr>
<tr>
<td>DS</td>
<td>0.15</td>
<td>0.15</td>
<td>-8.23**</td>
</tr>
<tr>
<td>DS contamination</td>
<td>0.72</td>
<td>0.99</td>
<td>-1.87*</td>
</tr>
<tr>
<td>DS animal</td>
<td>1.50</td>
<td>1.50</td>
<td>-6.44**</td>
</tr>
<tr>
<td>STAI-X</td>
<td>8.96</td>
<td>9.35</td>
<td>-3.40**</td>
</tr>
</tbody>
</table>

Note. **p<.001; *p<.063.**

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CONCLUSION

Results of this study show that the FCQ is a valid and reliable questionnaire for the measurement of fear of cockroaches in normal population. Our data indicate that the FCQ discriminates between high and low fear-of-cockroaches individuals, as the high correlation with the IP reveals. The FCQ shows a quite strong correlation with both the item cockroaches of the IP and the total score of animal factor of IP. There are weak correlations with the DS and its subscales, and the STAI-X. This reveals that the FCQ is focused on the fear, and neither on the disgust that cockroaches cause, nor on general anxiety. The reason of this can be that the items of FCQ deeply explore the behaviors and the thoughts connected to the fear of cockroaches, whereas the animal factor of the IP measures “the fear and anxiety caused by this situation” (as the Italian version reports) of a specific animal on a 5-point Likert scale. This could mean that the measure of the IP is not free from the influence of disgust and anxiety, as shown by the correlation between IP and DS, and between IP and the subscales of DS.

The FCQ presents a very good internal consistency and test-retest reliability at six months, as the original questionnaire FSQ reports. The Exploratory Factor Analysis of the FCQ showed a mono-factorial structure. Differently the FSQ presents a two factors structure: a “fear of harm” factor and an “avoidance/search of help” factor; this difference could be due to the fact that the FSQ focused on spiders, insects that can actually harm individuals. In the FCQ, since cockroaches cannot harm individual a “fear of harm” factor could be a no sense.

In the FCQ gender differences are statistically significant. This happens in the most part of questionnaires concerning anxiety or fear. In our sample the average of the males is smaller than females’.


APPENDIX

Fear of Cockroaches Questionnaire (FCQ)
Questionario sulla Paura agli Scarafaggi

Istruzioni: Le voci di questo inventario si riferiscono a atteggiamenti, sentimenti e comportamenti relativi a diverse situazioni. Leggi una voce alla volta e valuta se le affermazioni ti descrivono oppure meno. Scegli la risposta nel simbolo corrispondente che vanno da 0 a 6 tenendo presente che:

① = Completamente in disaccordo
⑥ = Completamente d’accordo

Indica con una crocetta la risposta che corrisponde al tuo modo di sentire di questo ultimo periodo di tempo, il più recentemente possibile. Basati su ciò che immagini e cerca di rispondere a tutte le domande.
Se qualcosa non ti è chiaro, chiedi pure spiegazioni e chiarimenti. Alla fine ricontrolla di aver risposto a tutte le domande.

1. Se trovassi uno scarafaggio, chiederei aiuto perché qualcuno lo rimuova.
① ② ③ ④ ⑤ ⑥

2. A volte mi guardo attorno per vedere se ci sono scarafaggi.
① ② ③ ④ ⑤ ⑥

3. Se vedessi uno scarafaggio adesso, penserei che potrebbe nuocermi.
① ② ③ ④ ⑤ ⑥

4. Adesso penso molto agli scarafaggi.
① ② ③ ④ ⑤ ⑥

5. Potrei essere un po’ spaventato ad entrare adesso in una stanza dove prima ho visto uno scarafaggio.
① ② ③ ④ ⑤ ⑥

6. Farei qualsiasi cosa per provare ad allontanarmi da uno scarafaggio.
① ② ③ ④ ⑤ ⑥

7. A volte penso riguardo al venir punto o morso da uno scarafaggio.
① ② ③ ④ ⑤ ⑥

8. Se incontrassi uno scarafaggio adesso, non potrei occuparmene efficacemente.
① ② ③ ④ ⑤ ⑥
9. Se incontrassi uno scarafaggio adesso, ci vorrebbe molto tempo prima di riuscire a togliermelo dalla testa. 

10. Se incontrassi uno scarafaggio adesso, lascerei la stanza.

11. Se vedessi uno scarafaggio adesso, penserei che potrebbe provare a saltarmi addosso.

12. Se vedessi uno scarafaggio adesso, chiederei a qualcuno di ucciderlo.

13. Se incontrassi uno scarafaggio adesso, me lo immaginerei mentre tenta di catturarmi.

14. Se vedessi uno scarafaggio adesso ne avrei paura.

15. Se vedessi uno scarafaggio adesso andrei in panico.


17. Mi sentirei molto nervoso se vedessi uno scarafaggio ora.

18. Se vedessi uno scarafaggio adesso probabilmente comincerei a sudare e il mio cuore batterebbe velocemente.