The Claustrophobia Questionnaire[☆]

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Abstract

The content and psychometric properties of the Claustrophobia Questionnaire (CLQ) are described. An earlier version of the CLQ was developed to test the hypothesis that claustrophobia is comprised of two distinct but related fears — the fear of suffocation and the fear of restriction [J. Anxiety Disord. 7 (1993) 281.]. The scale was used to assess patients undergoing the magnetic resonance imaging (MRI) procedure [J. Behav. Med. 21 (1998) 255.] and in participants with panic disorder [J. Abnorm. Psychol. 105 (1996) 146; Taylor, S., Rachman, S., & Radomsky, A. S. (1996). The prediction of panic: a comparison of suffocation false alarm and cognitive theories. Unpublished data.]. On the basis of these studies, we decided to revise and shorten the CLQ, collect normative data, and provide information on the scale's predictive and discriminant validity as well as its internal consistency and test–retest reliability. This was done through a set of four interconnected studies that included psychometric analyses of undergraduate and community adult questionnaire responses and behavioural testing. Results indicate that the CLQ has good predictive and discriminant validity as well as good internal consistency and test–retest reliability. The CLQ appears to be a reliable and sensitive measure of claustrophobia and its component fears. We encourage the use of the CLQ in a variety of clinical and research applications. The scale is provided in this paper for public use. © 2001 Elsevier Science Inc. All rights reserved.

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1. Introduction

Claustrophobia is a fear of enclosed spaces (*claustro* means closed). It can be unpleasant and distressing, but most people who experience the fear find ways to cope, usually through the deliberate avoidance of small or enclosed places. Small or locked rooms, tunnels, cellars, elevators, subway trains, and crowded places are all stimuli that can provoke the fear, and people who react to one of these situations are likely to react to them all (Rachman, 1997). Fears of restriction and of being trapped, such as sitting in a dentist's chair or waiting in a long queue, are also associated with a fear of being enclosed and usually are regarded as signs of claustrophobia.

A person who is claustrophobic is not frightened of an enclosed space per se, but is frightened of what might happen in the enclosed space. Just as agoraphobia is increasingly being regarded as a fear of what might happen in a public place (e.g., a fear of experiencing an episode of panic), so too can claustrophobia be reconceptualized in this manner (Rachman, 1990).

A subjective feeling of being trapped certainly features in the accounts of many claustrophobic people. Most closed places entail an amount of entrapment, but they also entail a restriction of movement. The fear reaction resembles the one animals display when their escape is prevented, and it is possible that the human fear of enclosed spaces is a vestigial fear of being trapped in a way that prevents escape when threatened (Rachman, 1997). Animals certainly, and people probably, are more vulnerable "in conditions of confined space"; experimental neuroses are more easily induced when an animal is confined (Wolpe, 1958).

A fear of suffocation is prominent in claustrophobia and is also reported by many people who are not troubled by enclosed spaces (Kirkpatrick, 1984). This extremely intense, but remarkably common, component of claustrophobia has evaded the attention of psychologists both in clinical practice and in research. Being confined in an enclosed space could well be interpreted as a threat to one's breathing, and it is therefore understandable that for people who have a strong fear of suffocation, enclosed spaces are interpreted as serious threats. A majority of claustrophobic people express a fear of suffocating while in an enclosed space, and in experimental investigations, this fearful cognition was closely associated with the bodily sensation of shortness of breath (Rachman, 1988). Even though this fear of suffocation is exaggerated in the large majority of claustrophobics, it is understandable given that many people, even non-fearful people, overestimate how much oxygen is needed to survive. For example, a group of highly educated students greatly overestimated how much oxygen they would need to survive in a small, enclosed room that was not airtight (Rachman, Levitt, & Lopatka, 1987,

1988); it is possible to survive indefinitely in such a room. Even in a completely airtight room, a person can survive for several days.

Attempts to elicit from claustrophobic people the fundamental basis of their fear of closed spaces are seldom rewarding. Quite soon, the affected person runs out of explanations, and expresses puzzlement about exactly what it is that is frightening about the situation: "I just feel trapped and scared" (Rachman, 1997). The difficulty in finding an explanation may be reduced through better assessment measures.

In order to test the hypothesis that claustrophobia is composed of two separate but related fears (a fear of suffocation and a fear of restriction), Rachman and Taylor (1993) developed a scale that measured claustrophobia in terms of these two components. In the development of the original scale, 179 students completed a questionnaire [the precursor to the Claustrophobia Questionnaire (CLQ)], and then completed five behavioural tests (breathing through a straw, wearing a gas mask, standing in a closet, being tied in a canvas bag, lying on a shelf), followed by a structured interview. Fear ratings were subjected to a principal components analysis with oblique transformation. A two-factor solution accounted for 58% of the variance and yielded two moderately correlated factors corresponding to fear of restriction and fear of suffocation. In subsequent analyses, questionnaire responses loaded onto these two factors as predicted (Rachman & Taylor, 1993).

The original scale and its component subscales have been applied to a variety of populations and situations including panic disorder (McNally & Eke, 1996; Taylor, Rachman, & Radomsky, 1996) and patients undergoing the magnetic resonance imaging (MRI) procedure (McIsaac, Thordarson, Shafran, Rachman, & Poole, 1998). Taylor et al. (1996) administered the CLQ to participants with panic disorder and found that both the total score and the two subscale scores significantly predicted both distress and the presence of bodily sensations during a set of breathing challenges. McNally and Eke (1996) compared the predictive ability of the Suffocation Subscale (SS) with other measures [the Anxiety Sensitivity Index (ASI) and maximum breath-holding duration] and found that only the SS was a significant predictor of anxiety and bodily sensations in response to a carbon dioxide inhalation exercise.

McIsaac et al. (1998) administered the CLQ and several other measures (the ASI, measures of pain, etc.) to people undergoing the MRI procedure and found that the CLQ was the best predictor of participants' anxiety during the scan. McIsaac et al. also found that the CLQ was able to discriminate between those participants who reported experiencing a panic episode during the MRI procedure and those who did not.

These early applications of the scale are encouraging. We decided to shorten the CLQ and to collect information on its reliability and validity. This was done through an interconnected set of several studies described below. We expect that with good information about the scale's reliability, validity, and normative data, the CLQ will be a useful tool both in clinical and research applications.

2. Study 1 — scale reduction

2.1. Aim

To reduce the number of items in the scale and confirm its factor structure.

2.2. Method

Participants were 210 psychology undergraduate students at the University of British Columbia [mean age = 20.3 (S.D. = 3.2) years, 73% female]. Participants were asked to completed the original CLQ and received course credit for their participation.

2.3. Results

Items were subjected to a principal components analysis with direct oblimin transformation. In the two-factor solution (corresponding to fears of suffocation and restriction, respectively), one item whose content did not match with its factor loading (*In the middle of a long line at a supermarket*) and three complex items (*Having a nylon stocking over your face for 15 min*; *In the back of a small two-door car with a person on either side of you and all the windows fogged up*; and *In an elevator when there is a strong likelihood of a power cut*) were removed. This yielded a 26-item scale with 14 items in the SS and 12 items in the Restriction Subscale (RS). Factor loadings for each item are displayed in Table 1.

This two-factor solution accounted for a total of 44.0% of the total variance and the two factors were moderately correlated with each other (r =.53). This final shortened scale (the CLQ; Table 2) was used in all subsequent analyses.

3. Study 2 — normative data, internal consistency, and discriminant validity

3.1. Aim

To collect information on the CLQ's internal consistency, discriminant validity, and normative properties.

3.2. Method

The CLQ was completed by 78 community adults [mean age = 40.1 (S.D. = 16.7) years, 74% female], along with the Beck Depression Inventory (BDI; Beck, Rush, Shaw, & Emery, 1979), the Beck Anxiety Inventory (BAI; Beck & Steer, 1990), the ASI, 16-item version (Reiss, Peterson, Gursky, & McNally, 1986), and the Social Phobia and Anxiety Inventory (SPAI; Turner,

Table 1
Factor loadings for CLQ items

Item	Restriction factor	Suffocation factor
Handcuffed for 15 min	0.908	− 0.106
Tied up with hands behind back for 15 min	0.878	− 0.007
Having your legs tied to an immovable chair	0.863	− 0.002
Standing for 15 min in a straightjacket	0.816	− 0.121
Lying in a tight sleeping bag enclosing legs and arms, tied at the neck, unable to get out for 15 min	0.778	− 0.003
Caught in tight clothing and unable to remove it	0.661	0.008
Lying in the trunk of a car with air flowing through freely for 15 min	0.658	0.008
Locked in a small well lit room	0.576	0.171
In a public washroom and the lock jams	0.571	0.176
In a crowded train which stops between stations	0.530	0.207
Head first into a zipped up sleeping bag, able to leave whenever you wish	0.522	− 0.004
Having a nylon stocking over your face for 15 min[a]	0.456	0.343
Locked in a small dark room for 15 minutes	0.445	0.290
In the back of a small 2-door car with a person on either side of you and all the windows fogged up[a]	0.389	0.359
Lying on a bottom bunk bed	− 0.152	0.767
Trying to catch your breath during vigorous exercise	− 0.116	0.687
Standing in an elevator on the ground floor with the doors closed	0.158	0.657
Standing in the middle of the third row at a packed concert realizing that you will be unable to leave until the end	− 0.003	0.613
In the middle of a long line at a supermarket[b]	0.249	0.612
Lying in a sauna for 15 min	− 0.141	0.606
In the centre of a full row at a cinema	− 0.005	0.567
Working under a sink for 15 min	0.008	0.564
Working under a car for 15 min	0.009	0.529
Waiting for 15 min in a plane on the ground with the door closed	0.170	0.521
Snorkeling in a safe practice tank for 15 min	0.007	0.488
Using an oxygen mask	0.260	0.423
Having a bad cold and finding it difficult to breathe	0.122	0.406
Swimming while wearing a nose plug	0.005	0.401
At the furthest point from an exit on a tour of an underground mine shaft	0.285	0.396
In an elevator at a time when there is a strong likelihood of a power cut[a]	0.332	0.394

[a] Complex items (loaded > 0.300 on both factors).
[b] Item loaded onto the wrong factor.

Beidel, Dancu, & Stanley, 1989). In addition, we defined a claustrophobic group within the participants from Study 4 (see below). Those participants who reported being extremely anxious or terrified of enclosed spaces ($n = 15$) were considered claustrophobic for the purpose of collecting normative data.

Table 2
CLQ

	Not at all anxious	Slightly anxious	Moderately anxious	Very anxious	Extremely anxious
SS					
(1) Swimming while wearing a nose plug	0	1	2	3	4
(2) Working under a sink for 15 min	0	1	2	3	4
(3) Standing in an elevator on the ground floor with the doors closed	0	1	2	3	4
(4) Trying to catch your breath during vigorous exercise	0	1	2	3	4
(5) Having a bad cold and finding it difficult to breathe through your nose	0	1	2	3	4
(6) Snorkeling in a safe practice tank for 15 min	0	1	2	3	4
(7) Using an oxygen mask	0	1	2	3	4
(8) Lying on a bottom bunk bed	0	1	2	3	4
(9) Standing in the middle of the third row at a packed concert realizing that you will be unable to leave until the end	0	1	2	3	4
(10) In the centre of a full row at a cinema	0	1	2	3	4
(11) Working under a car for 15 min	0	1	2	3	4
(12) At the furthest point from an exit on a tour of an underground mine shaft	0	1	2	3	4
(13) Lying in a sauna for 15 min	0	1	2	3	4
(14) Waiting for 15 min in a plane on the ground with the door closed	0	1	2	3	4
RS					
(1) Locked in a small DARK room without windows for 15 min	0	1	2	3	4
(2) Locked in a small WELL-LIT room without windows for 15 min	0	1	2	3	4
(3) Handcuffed for 15 min	0	1	2	3	4
(4) Tied up with hands behind back for 15 min	0	1	2	3	4
(5) Caught in tight clothing and unable to remove it	0	1	2	3	4
(6) Standing for 15 min in a straitjacket	0	1	2	3	4
(7) Lying in a tight sleeping bag enclosing legs and arms, tied at the neck, unable to get out for 15 min	0	1	2	3	4
(8) Head first into a zipped up sleeping bag, able to leave whenever you wish	0	1	2	3	4
(9) Lying in the trunk of a car with air flowing through freely for 15 min	0	1	2	3	4
(10) Having your legs tied to an immovable chair	0	1	2	3	4
(11) In a public washroom and the lock jams	0	1	2	3	4
(12) In a crowded train which stops between stations	0	1	2	3	4

How *anxious* would you feel in these places or situations? Circle the most appropriate number.

3.3. Results

3.3.1. Normative data
Normative data for the CLQ, the SS, and the RS are displayed in Table 3.

These norms demonstrate that the CLQ can discriminate between normals and claustrophobic individuals. Three independent samples t tests revealed that the means for the claustrophobic group were significantly higher than community adult means for the SS ($t_{91} = 6.28$, $P < .001$), the RS ($t_{91} = 2.68$, $P < .01$), and for CLQ total scores ($t_{91} = 7.42$, $P < .001$).

3.3.2. Internal consistency
Cronbach's α for the CLQ (26 items), SS (14 items), and RS (12 items) is high, demonstrating good internal consistency. For the CLQ, $\alpha = .95$, for the SS, $\alpha = .85$, and for the RS, $\alpha = .96$.

3.3.3. Discriminant validity
Correlations between the CLQ, its subscales, and other measures are displayed in Table 4.

These correlations are substantially lower than those obtained between the CLQ and other measures of claustrophobia (see Study 4 — Predictive Validity) and demonstrate that the CLQ has good specificity.

4. Study 3 — test–retest reliability

4.1. Aim

To collect information on the test–retest reliability of the CLQ and its component subscales.

4.2. Method

The CLQ was completed by 30 psychology undergraduate students at the University of British Columbia [mean age = 19.1 (S.D. = 1.6) years, 63% female].

Table 3
Normative data for the CLQ and its component scales

Scale	Adults M (S.D.)	Claustrophobic students M (S.D.)
CLQ total	28.9 (19.4)	51.8 (16.6)
SS	9.1 (7.9)	23.8 (8.4)
RS	19.9 (12.8)	27.6 (9.6)

Table 4
Discriminant validity (Pearson's *r*)

Measure	BDI	BAI	ASI	SPAI
CLQ total	0.25*	0.14	0.33**	0.12
SS	0.21	0.15	0.33**	0.10
RS	0.26*	0.18	0.27 *	0.16

  * $P < .05$.
  ** $P < .01$.

Students were asked to complete the CLQ a second time 2 weeks later and received course credit for their participation. The actual mean interval between visits was 14.0 (S.D. = 1.5) days.

4.3. Results

Test–retest (Pearson's) correlations were high for the SS ($r = .89$, $P < .001$), the RS ($r = .77$, $P < .001$), and the CLQ total score ($r = .89$, $P < .001$), indicating that the CLQ and its component subscales are stable instruments over a (relatively short) 2-week period.

5. Study 4 — predictive validity

5.1. Aim

To collect information on how well the CLQ and its subscales predict fear following exposure to relevant frightening stimuli.

5.2. Method

The CLQ was completed by 124 psychology undergraduate students [mean age = 19.6 (S.D. = 3.8) years, 81% female] who then participated in three behavioural tests: spending 30 s in a small, dark enclosed space (a $2' \times 3' \times 7'$ storage closet); approaching a live harmless garter snake; and standing on a fourth story walkway. The order of exposure was counter-balanced across students. Subjective measures of fear (on a 100-point scale) were taken at each exposure. After each exposure, participants also completed the Body Sensations Questionnaire (BSQ) and an adapted version of the Agoraphobic Cognitions Questionnaire (ACQ; Chambless, Caputo, Bright, & Gallagher, 1984). Additional items related to fearful cognitions specific to each stimulus situation were added to the ACQ. Participants received course credit for their participation.

Table 5
Predictive validity of the CLQ (Pearson's *r*)

| Exposure situation | | | | |
| | Enclosed space | Enclosed space | Enclosed space | Snake | Heights |
Scale	BSQ	ACQ	SUDS	SUDS	SUDS
CLQ total	0.64***	0.64***	0.52***	0.01	0.17
SS	0.63***	0.63***	0.53***	0.01	0.20*
RS	0.57***	0.58***	0.46***	0.00	0.13

* $P < .05$.
*** $P < .001$.

5.3. Results

Correlations between the CLQ and its subscales and each fear measure are presented in Table 5.

The CLQ and its component subscales were found to be excellent predictors of subjective fear, bodily sensations, and anxiety cognitions during exposure to a small enclosed space. The CLQ was not a significant predictor of fear responses to snakes or high places.

5.4. Discussion

The CLQ and its component subscales have demonstrated high test–retest reliability, internal consistency, good discriminant validity, and excellent predictive validity.

In this study and others, the CLQ has demonstrated good psychometric properties and should serve well as a measure both in clinical practice and in other studies of fear and anxiety. The scale revision described in Study 1 will strengthen the CLQ's factor structure and reduce the time required to complete the scale. This factor structure is based on an unselected sample of undergraduate students, replicating Rachman and Taylor (1993). The factor structure of the scale in other relevant populations (e.g., community adults, claustrophobic people) is unknown.

The normative data provided in Study 2 will better enable both researchers and clinicians to use the scale to assess the severity of claustrophobic fears. Its test–retest reliability (Study 3) demonstrates the stability of the scale over a fairly brief period. Establishing test–retest reliability over a longer interval would make it suitable for use in longer-term applications (e.g., treatment outcome research, establishing baselines, etc.).

The strong predictive and discriminant validity (Studies 4 and 2) are additional strengths of the scale that make it appealing for other research applications.

The CLQ is face-valid and easy to score; the subscale scores are simply the sum of scores on subscale items and the total score is the sum of scores on all CLQ items.

We encourage the use of this scale in a variety of research applications, including studies of claustrophobia, and fears of flying, suffocation, motor vehicle accidents, and medical procedures. It may be of particular value in investigations of Klein's (1993) construct of a suffocation alarm system and its relation to panic disorder. The CLQ has already been used as a screening measure for anxiety and panic while undergoing the MRI procedure (McIsaac et al., 1998). Further research into its use as a screening measure for other medical procedures, air travel, etc., is encouraged. Additionally, its use as a measure of claustrophobic fear in studies of several anxiety disorders (claustrophobia, panic disorder, post-traumatic stress disorder, social phobia, bridge phobia, etc.) is recommended.

The scale is provided here (in Table 2) for public use.

Acknowledgments

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