



## The Dutch Claustrophobia Questionnaire: Psychometric properties and predictive validity

Ilse Van Diest<sup>a,\*</sup>, Dirk Smits<sup>a,b</sup>, Davina Decremer<sup>a</sup>, Lori Maes<sup>a</sup>, Laurence Claes<sup>a</sup>

<sup>a</sup> Department of Psychology, University of Leuven, Tiensestraat 102, B-3000 Leuven, Belgium

<sup>b</sup> HUB, Campus Nieuwland, Nieuwland 198, 1000 Brussels, Belgium

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### ABSTRACT

Fear of suffocation and fear of restriction are thought to underlie claustrophobia and can be assessed with the Claustrophobia Questionnaire (CLQ; Radomsky et al., 2001). A first study tested the psychometric properties of a Dutch version of the CLQ. Students ( $N=363$ ) completed a Dutch translation of the CLQ and a set of other questionnaires assessing other specific fears, anxiety or depression. Results confirmed the two-factor structure and showed that the Dutch version of the CLQ has good psychometric properties. A second study tested the predictive validity of the Dutch CLQ. Participants ( $N=23$ ) were exposed each to nine claustrophobic situations with elements of suffocation, restriction or both. The Dutch CLQ was found to be a significant predictor of fear and respiratory reactivity during claustrophobic exposure. It can be concluded that the Dutch version of the CLQ is a reliable and valid instrument to assess claustrophobic fear.

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Claustrophobia, the fear of enclosed spaces, is a rather common specific phobia with a prevalence of 4% in the general population (Öst, 2007). Two major fear components are assumed to underlie the disorder: fear of restriction and fear of suffocation (Rachman & Taylor, 1993). Restriction is aversive and the fear experienced by claustrophobic patients in an enclosed space may, from an evolutionary perspective, resemble the fear that animals display when they cannot escape from a (potentially) dangerous situation (Rachman, 1997). This fear of restriction is not entirely independent from the other claustrophobic fear component, fear of suffocation. Because people need a constant supply of air to stay alive, possibility of getting an insufficient amount of air is a prominent threat. Following Rachman (1997), fear of suffocation will arise when (a) people *think* that there is insufficient air supply in the room, (b) access to air is hampered or interrupted externally, e.g., by breathing through a mask, and (c) there is sufficient air present in the room, but the air is thought to be blocked by a physiological malfunction, for example insufficient airflow through the trachea. Also a misinterpretation of bodily signals may trigger fear of suffocation (Rachman, 1997).

The two-dimensional structure of claustrophobia was confirmed by Rachman and Taylor back in 1993 (Rachman & Taylor,

1993). Participants were asked how much fear they would experience in each of 36 claustrophobic situations. A principal component analysis confirmed that two factors, interpreted as fear of restriction and fear of suffocation, were underlying self-reported claustrophobic fear. Based on this study, Rachman and Taylor (1993) developed the 'The Claustrophobia Questionnaire' (CLQ). Radomsky, Rachman, Thordarson, McIsaac, and Teachman (2001) further developed the CLQ and reduced it to 26 items. They applied a principal component analysis with direct oblimin rotation, resulting in a two-factor solution with 26 items, 14 items for the suffocation scale and 12 items for the restriction scale. Both factors were moderately correlated ( $r=.53$ ) and accounted for 44% of the total variance in self-reported fear. Also normative data, internal consistency, discriminant validity and test-retest reliability of the 26-item CLQ were investigated. Radomsky et al. (2001) concluded that the CLQ has strong psychometric properties: it discriminates between healthy and claustrophobic individuals, it has a good internal consistency with Cronbach  $\alpha$ s of .95, .85 and .96 for the CLQ total score, the suffocation scale and the restriction scale, respectively, and the test-retest reliability is high ( $r=.89$  for the suffocation scale,  $r=.77$  for the restriction scale and  $r=.89$  for the total CLQ). Finally, they showed that the CLQ predicts subjective fear, bodily sensations, and apprehensive cognitions during exposure to a small enclosed space. Also several other studies have confirmed the predictive validity of the CLQ (e.g., Harris, Robinson, & Menzies, 1999; McGlynn, Karg, & Lawyer, 2003; McGlynn, Smitherman, Hammel, & Lazarte, 2007; McIsaac, Thordarson, Shafran, Rachman, & Poole, 1998).

\* Corresponding author at: Research Group on Health Psychology, Psychology Department, University of Leuven, Tiensestraat 102, Box 3726, 3000 Leuven, Belgium. Tel.: +32 16 32 60 29; fax: +32 16 32 59 23.

E-mail address: Ilse.VanDiest@psy.kuleuven.be (I. Van Diest).

However, only a limited number of studies have addressed the question whether the suffocation and restriction scales of the CLQ can differentially predict fear experienced in restriction and suffocation situations, respectively. Whereas several studies show that the suffocation scale is predictive of anxious responding to laboratory challenges inducing breathlessness (e.g., Eifert, Zvolensky, Sorrell, Hopko, & Lejuez, 1999; Eke & McNally, 1996; Rassovsky, Kushner, Schwarze, & Wangensteen, 2000; Shipherd, Beck, & Ohtake, 2001) less is known on the specific predictive validity of the restriction scale. In a study by Van Diest et al. (2005) participants completed a Dutch ad-hoc translation of six items loading high on the restriction scale and six other items loading high on the suffocation scale of the English version of the CLQ (Radomsky et al., 2001). Next, participants had to imagine three standardized fear scripts, one depicting a situation with aspects of both restriction and risk of suffocation, one referring to restriction only, and one referring to neither claustrophobic fear components. Interestingly, participants' scores on the restriction scale predicted subjective fear, but not respiratory reactivity to imagined restriction; scores on the suffocation scale were not related to self-reported fear or respiratory reactivity during the imagined exposure.

The present studies aimed to (a) develop a validated Dutch version of the CLQ and (b) further explore the predictive validity of the CLQ. In particular, we aimed to address the question to what extent the restriction and the suffocation scales of the Dutch CLQ allow for prediction of actual fear and respiratory reactivity in claustrophobic situations with or without restriction and/or risk of suffocation.

## 1. Study 1: Validation of the Dutch CLQ

The first study aimed to develop a Dutch version of Radomsky et al.'s (2001) Claustrophobia Questionnaire.

### 1.1. Method

#### 1.1.1. Participants

Participants were 371 undergraduate, Dutch-speaking students (282 women) aged 18–23 years old. They all received course credit in return for their participation. All participants provided an informed consent. The study was approved by the Ethics Committee of the Department of Psychology (University of Leuven, Belgium).

#### 1.1.2. Procedure

The English CLQ was translated and back-translated several times until agreement was reached among three Dutch-speaking persons with a profound knowledge of English. Next, during two 1-h group sessions one week apart, participants completed the Dutch translation of the CLQ once, as well as a series of other questionnaires (see below).

#### 1.1.3. Measures

**1.1.3.1. The Claustrophobia Questionnaire (CLQ; Radomsky et al., 2001).** Participants had to rate the 26 claustrophobic items on a five-point scale ranging from 0 (not at all anxious) to 4 (extremely anxious).

**1.1.3.2. The Beck Depression Inventory-II-NL (BDI-II-NL; van der Dries, 2002).** The BDI-II (Beck, Steer, & Brown, 1996) is a frequently used questionnaire to measure self-experienced cognitive and somatic symptoms of depression. The Dutch translation of the BDI-II, the BDI-II-NL has good psychometric qualities. The internal consistency is high with Cronbach  $\alpha$ s of .92 and .88 for a patient population and a control population, respectively. Also the test-

retest reliability ( $r = .82$ ) and the convergent validity are good (van der Dries, 2002). Cronbach  $\alpha$  in our sample of students was .88.

**1.1.3.3. The Dutch NEO Five-Factor Inventory (NEO-FFI-NL; Hoekstra, Ormel, & De Fruyt, 1996).** The Dutch version of the NEO-FFI (NEO-FFI-NL) contains 60 questions assessing the big five personality traits, Neuroticism (NEO-FFI-NL-N), Extraversion, Openness to experience, Altruism and Conscientiousness. For the present study, only scores on Neuroticism were investigated. This subscale obtained a Cronbach  $\alpha$  of .86 in our sample.

**1.1.3.4. Spielberger's State-Trait Anxiety Inventory (STAI; Spielberger, 1983).** Barennes, Harp, and Jung (2002) reviewed 816 papers in which the STAI was used to measure trait and state anxiety. They report a mean internal consistency of .91 and .89 for the state and trait subscales, respectively. The mean of the test-retest reliability was .70 for the state and .88 for the trait subscale. van der Ploeg (2000) translated the STAI into Dutch. He reported Cronbach  $\alpha$ s of .92 (state) and .90 (trait). Cronbach  $\alpha$  in our student sample was .82.

**1.1.3.5. Anxiety Sensitivity Index-3 (ASI-3; Taylor et al., 2007).** The ASI-3 is a multidimensional measurement of anxiety sensitivity. It encompasses three factors: Physical Concerns, Cognitive Concerns, and Social Concerns. The validation study of the Dutch version demonstrated a good validity of the factor structure, as well as a good internal consistency for each of the three scales (Cronbach  $\alpha$ s were .80 for Physical Concerns, .81 for Cognitive Concerns, and .76 for Social Concerns; Taylor et al., 2007). Cronbach  $\alpha$  for the total scale in our student sample was .83.

**1.1.3.6. Fear of Pain Questionnaire-III (FPQ-III; McNeil & Rainwater, 1998).** The FPQ-III consists of 30 items related to the fear of severe pain, minor pain, and medical pain. These factors accounted for 51% of total variance. The scales of the questionnaire are internally consistent with Cronbach  $\alpha$ s of .88, .87, .87, and .92 for the three subscales and the total scale, respectively. The test-retest reliability is also good with correlations of .69, .73, .76, and .74 for the three subscales and the total scale, respectively (McNeil & Rainwater, 1998). Roelofs, Peters, Deutz, Spijker, and Vlaeyen (2005) translated this questionnaire into Dutch. They also found evidence for the three subscales, severe pain, minor pain, and medical pain. For a sample of first-year college students, they found Cronbach  $\alpha$ s .93, .88, .86, and .88 for the total FPQ-III and the subscales, respectively. For a sample of first-year and higher-year college students they found Cronbach  $\alpha$ s .91, .89, .82, and .85 for the total FPQ-III and the subscales, respectively. They reported a moderate to good test-retest stability and a good convergent and predictive validity. Cronbach  $\alpha$  in our sample of students was .92 for the total FPQ-III.

**1.1.3.7. The Claustrophobia Scale (CS; Öst, 2007).** The claustrophobia scale consists of two scales: one scale measuring anxiety (CSA) and one scale assessing avoidance behavior (CSB). We translated both scales ourselves, because no Dutch validated version is available. The English SC has a high reliability with Cronbach  $\alpha$ s .97 and .81 for the anxiety and avoidance subscales, respectively. In our translated Dutch version, the anxiety subscale had a Cronbach  $\alpha$  .89; Cronbach  $\alpha$  for the avoidance subscale was .80.

**1.1.3.8. Fear Survey Schedule-III (FSS-III; Wolpe & Lang, 1964).** This questionnaire assesses specific fears. Psychometric properties for a Dutch version of the FSS-III have been described by Arindell (1980) and are good, with a Cronbach  $\alpha$  of .95. Cronbach  $\alpha$  for the total scale in our sample was .97. Three items of the FSS-III involve claustrophobic fear (FSS-III-CL), such as fear of 'crowds,' 'being in an elevator,' and 'enclosed spaces.' The other 73 items are classified

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