

Original article

# Validation of a French version of the Obsessive–Compulsive Inventory-Revised in a non-clinical sample

## Adaptation et validation française de l'Inventaire de compulsions et d'obsessions-révisé auprès d'un échantillon non clinique

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### Abstract

Foa et al. (2002) presented a new instrument, the Obsessive–Compulsive Inventory-Revised (OCI-R), designed to evaluate the severity of obsessive–compulsive symptoms in both clinical and non-clinical individuals. The present study investigates the psychometric properties of a French version of this scale. The OCI-R French version was completed by 583 undergraduate students. The results revealed satisfactory internal consistency as measured by Cronbach's alpha coefficients (ranging from 0.63 to 0.86). In addition, the six-factor structure found by Foa et al. (2002) was confirmed in our sample by a confirmatory factor analysis. In brief, the French version of the OCI-R seems satisfactory for measuring Obsessive–Compulsive Disorders (OCD) symptoms in non-clinical samples. Future research is, however, needed to confirm these data in a sample of OCD patients.

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### Résumé

Foa et al. (2002) ont proposé un nouvel instrument, l'Inventaire de compulsions et d'obsessions-révisé (ICO-R), destiné à évaluer la sévérité des symptômes obsessionnels-compulsifs à la fois dans une population clinique et non clinique. Notre étude avait pour but d'investiguer les propriétés psychométriques de la version française de cette échelle. Cinq cent quatre-vingt-trois étudiants ont ainsi rempli la version française de l'ICO-R. Les résultats montrent une consistance interne satisfaisante, avec des alphas de Cronbach s'échelonnant de 0,63 à 0,86. Par ailleurs, la structure factorielle à six facteurs, trouvée par Foa et al. (2002), a été confirmée dans notre échantillon à l'aide d'une analyse confirmatoire. En résumé, la version française de l'ICO-R semble être un outil satisfaisant pour évaluer les symptômes obsessionnels-compulsifs dans une population tout-venant. Ces données devront toutefois être confirmées par des travaux ultérieurs portant sur des échantillons cliniques.

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**Keywords:** Obsessive–Compulsive Disorder; Inventory; French validation

**Mots clés :** Trouble obsessionnel-compulsif ; Inventaire ; Validation française

### 1. Introduction

Several self-reporting questionnaires evaluating the severity of Obsessive–Compulsive Disorders (OCD) have been developed, such as the Maudsley Obsessive–Compulsive Inventory (MOCI, Hodgson and Rachman, 1977), the Compulsive Activ-

ity Checklist (CAC, Foa et al., 1984), the Leyton Obsessional Inventory (LOI, Cooper, 1970) and the Padua Inventory (PI, Sanavio, 1988). Although these questionnaires are commonly used to evaluate OCD, most of them were not designed to evaluate both patients and non-clinical individuals; in addition, they were constructed to capture only a subset of obsessions and compulsions.

Recently, a new instrument, the Obsessive–Compulsive Inventory (OCI, Foa et al., 1998) was developed to overcome

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these limitations. This new scale was validated not only with OCD patients, but also with non-psychiatric controls. Thus, the scale is intended to be administered to both clinical and non-clinical individuals. Moreover, this inventory was specifically developed to assess the heterogeneous symptoms of OCD. From this perspective, the authors chose the main symptoms of OCD, as described in the fourth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV, American Psychiatric Association, 1994), and constructed seven subscales: 'Washing' (eight items), 'Checking' (nine items), 'Obsessing' (eight items), 'Mental Neutralising' (six items), 'Ordering' (five items), 'Hoarding' (three items) and 'Doubting' (three items). In order to rate these 42 items, two 5-point Likert scales were constructed, one measuring the '*frequency of symptoms*' and the other measuring the '*associated distress*'. Foa et al. (1998) reported high internal consistency for the full scale and for the subscales (range 0.59–0.96 for different populations: OCD, post-traumatic stress disorder, generalised social phobia and controls), good test–retest reliability for controls ( $r$  range = 0.68–0.90) and for OCD patients ( $r$  range = 0.77–0.97), excellent discriminant validity and satisfactory convergent validity.

The psychometric properties of the OCI have also been investigated in non-clinical samples. Thus, Simonds et al. (2000) found high internal consistency across the seven subscales, good test–retest reliability and good convergent validity in a non-clinical student sample. The seven-factor structure was, however, not confirmed with two non-clinical samples in Wu and Watson's (2003) study, who found five subscales ('Checking', 'Obsessing', 'Washing', 'Ordering' and 'Hoarding') rather than seven. These authors therefore proposed a revised scale with fewer items. However, the confirmatory analysis done on these five revised subscales failed to reach the level of indices necessary to indicate a good fit for the data.

Recently, Foa et al. (2002) tried to facilitate the use of the OCI by proposing some improvements. First, in light of the high correlations (above 0.90) between the 'frequency' and 'distress' scores, they decided to retain only one of these two scales. The distress scale was selected for the new version of the OCI because of its larger between-group effect size. Second, they decided to shorten the scale by reducing the number of items per subscale. They selected an equal number of items ( $N = 3$ ) for each subscale on the basis of a principal-component analysis. This analysis revealed seven interpretable factors: 'Washing', 'Checking/Doubting', 'Obsessing', 'Mental Neutralising', 'Ordering', 'Hoarding' and 'Harming'. Items that loaded on only one factor and that presented the highest factor loadings or the highest between-group effect size were selected. A principal-component analysis was performed on these selected items and revealed six rather than seven factors; consequently, the Harming subscale was eliminated from the Obsessive–Compulsive Inventory-Revised (OCI-R). This new version was found to present a stable factor structure, high internal consistency for the full scale (range 0.81–0.93) and for the subscales (range 0.65–0.90 except alpha for Mental Neutralising in controls, which reached 0.34), good to excellent test–retest reliability ( $r$  range 0.57–0.91), good discrimi-

nant validity and satisfactory convergent validity. 'Receiver Operating Characteristic' (ROC) analyses, conducted to measure the diagnostic power of the OCI-R, revealed that it was able to discriminate between OCD patients and patients suffering from another anxiety disorder, as well as between OCD patients and non-clinical individuals. Recently, the psychometric properties of the OCI-R were also investigated in a non-clinical college sample (Hajcak et al., 2004). This study indicates adequate test–retest reliability, solid six-factor structure, high internal consistency, and good convergent and divergent validity. In summary, the OCI and the OCI-R were shown to have good psychometric properties with both clinical and non-clinical samples.

Our study was designed to validate a French version of the OCI-R in a non-clinical sample. More specifically, our goal was to examine the internal consistency and the structure of the OCI-R in a sample of university students. Several studies have shown that non-clinical obsessions and compulsions are similar in content to clinical OCD, although they are less frequent and less intense (Freeston et al., 1991; Muris et al., 1997). From this perspective, the use of non-clinical samples in the domain of OCD has been shown to be particularly useful, allowing one to examine the different dimensions and constructs in very large samples (Wu and Watson, 2003). Thus, the purpose of this study was to validate a French translation of the OCI-R with a large non-clinical sample in order to allow French-speaking researchers to assess OCD symptoms with a reliable and accurate instrument.

## 2. Method

### 2.1. Participants

The participants were 583 undergraduate student volunteers (301 females, 282 males), enrolled at the University of Geneva. Their mean age was 24.86 ( $SD = 3.85$ ) and their mean number of years of education was 15.41 ( $SD = 2.25$ ).

### 2.2. Measures

Participants were asked to complete the OCI-R. This self-reporting questionnaire consists of 18 items evaluating OCD symptoms. The revised version is composed of six subscales, each containing three items: 'Washing' (5, 11, 17), 'Obsessing' (6, 12, 18), 'Hoarding' (1, 7, 13), 'Ordering' (3, 9, 15), 'Checking' (2, 8, 14) and 'Neutralising' (4, 10, 16). Respondents were requested to self-report to what degree the situation described in each particular statement had distressed them during the past month on a 5-point scale (0 = 'not at all'; 4 = 'extremely'). Total scores may range from 0 to 72. The scale was first translated into French by one of the authors. Items were then back-translated into English by an English native-speaker, and disagreements were discussed in order to reach a consensual solution. The final French version of the scale is presented in Appendix A.

In order to validate the French version of the OCI-R, we examined the construct validity of the scale and its internal reliability by calculating Cronbach's alpha coefficients. Our results were compared with those of the original study (Foa et al., 2002).

### 2.3. Procedure

For a period of one hour, participants completed the OCI-R in an individual setting, as well as other questionnaires unrelated to the present study. The various questionnaires were completed in a pseudo-random order.

### 3. Results

Mean scores for the six subscales and total scores for the present study and the original validation study are presented in Table 1. In general, the mean total score and subscores from our sample are lower than those reported by Foa et al. (2002).

In order to evaluate the reliability of the French version of the OCI-R, internal consistency was assessed with Cronbach's alpha coefficients (Cronbach, 1956). Coefficients for the OCI-R total scale (0.86), as well as the Checking subscale (0.83), indicated an excellent internal consistency. The Ordering (0.79) and Obsessing (0.78) subscales showed good internal consistency, while the Washing (0.70), Hoarding (0.70), and Neutralising (0.63) subscales showed an acceptable internal consistency. We also calculated the inter-item correlations, which indicate medium to large effects according to Cohen (1988) (Washing:  $r = 0.45$ ; Obsessing:  $r = 0.56$ ; Hoarding:  $r = 0.43$ ; Ordering:  $r = 0.57$ ; Checking:  $r = 0.64$ ; Neutralising:  $r = 0.38$ ).

Pearson correlations between the subscales and the total score were computed (Table 2). As with the English version,

Table 1  
Means and S.D.s for subscales and total scores of the OCI-R for the present study and the original validation study

	Present study <i>N</i> = 583	Foa et al. (2002) Controls, <i>N</i> = 477
Washing	0.87 (1.55)	2.41 (2.50)
Checking	1.72 (2.29)	2.91 (2.56)
Ordering	2.84 (2.55)	4.40 (3.03)
Obsessing	1.99 (2.18)	2.86 (2.72)
Hoarding	3.11 (2.47)	4.41 (2.67)
Neutralising	0.82 (1.60)	1.82 (2.20)
Total score	11.38 (8.55)	18.82 (11.10)

Table 2  
Pearson correlations between subscales and total scores for the present study and the original validation study

	Checking		Ordering		Obsessing		Hoarding		Neutralising		Total score	
	PS	Foa	PS	Foa	PS	Foa	PS	Foa	PS	Foa	PS	Foa
Washing	0.37	0.55	0.30	0.45	0.39	0.45	0.17	0.36	0.29	0.42	0.57	0.70
Checking	–	–	0.36	0.57	0.39	0.53	0.37	0.43	0.37	0.52	0.73	0.80
Ordering			–	–	0.31	0.42	0.23	0.48	0.31	0.44	0.66	0.73
Obsessing					–	–	0.40	0.31	0.36	0.40	0.71	0.78
Hoarding							–	–	0.33	0.39	0.65	0.63
Neutralising									–	–	0.64	0.64

Note: All  $p < 0.01$ . PS: present study; Foa: Foa et al., 2002.

in our sample, correlations between subscales were significant, albeit not very high (small to medium effects,  $r = 0.17$ – $0.39$ ), while correlations between subscales and the total score indicate large effects ( $R = 0.57$ – $0.73$ ). However, our correlations were generally lower than those found by Foa et al. (2002).

In order to test the factorial structure found by Foa et al. (2002), we computed a six-factor confirmatory analysis using the program LISREL, version 8.54. As in Foa et al. (2002), we used the criteria recommended by Hu and Bentler (1999). The six-factor solution showed a significant chi-square ( $\chi^2$  (120,  $N = 583$ ) = 271.08;  $p < 0.01$ ), a Root Mean Square Error of Approximation (RMSEA) of 0.045, a Standardised Root Mean Square Residual (SRMR) of 0.044, a Comparative Fit Index (CFI) of 0.98, and a Goodness of Fit Index (GFI) of 0.95. According to Schermelleh-Engel et al. (2003), all these indices reveal a good fit for the model and thus confirm the scale's six-factor structure. In addition, the six factors were moderately intercorrelated (small to medium effects with  $r$  ranging from 0.22 to 0.53), suggesting that they were not redundant. The completely standardised factor loadings of the confirmatory factor analysis are shown in Table 3. We also tested a one-factor model for the 18 items, in order to see if it fits the data better. However, all indices suggest a poor fit in comparison with the six-factor model ( $\chi^2$  (135,  $N = 583$ ) = 1585.54;  $p < 0.001$ ; SRMR = 0.097; RMSEA = 0.14; CFI = 0.79; GFI = 0.75).

### 4. Discussion and conclusion

The aim of this study was to validate a French version of the OCI-R developed by Foa et al. (2002) in a non-clinical sample. The investigation of the psychometric properties of the French version revealed acceptable to excellent internal consistency, with Cronbach's alpha coefficients ranging from 0.63 to 0.86. Furthermore, the inter-item correlations indicated medium to large effects (Cohen, 1988) but were not high enough to postulate redundancy within the subscales. The alpha coefficients were generally comparable to coefficients found with non-clinical samples (Foa et al., 2002; Hajcak et al., 2004). It is, however, worth pointing out that all these studies showed some rather low alphas, especially for the Neutralising subscale. This may raise the question of the homogeneity of this particular subscale. It is, for example, possible that two dimensions are measured by this subscale: a compulsive aspect (the need to count while doing things: 'I feel compelled to count while I'm doing things' and 'I feel I have to repeat certain numbers')

Table 3

Completely standardised factor loadings from the confirmatory factor analysis

Items	Factor 1 Checking	Factor 2 Ordering	Factor 3 Obsessing	Factor 4 Hoarding	Factor 5 Washing	Factor 6 Neutralising
2	0.78					
8	0.84					
14	0.78					
3		0.75				
9		0.70				
15		0.82				
6			0.70			
12			0.82			
18			0.73			
1				0.49		
7				0.78		
13				0.72		
5					0.63	
11					0.79	
17					0.62	
4						0.57
10						0.82
16						0.51

and a more obsessive aspect (superstition concerning certain numbers: ‘I feel there are good and bad numbers’). More generally, one must take into account the fact that the use of only three items per subscale could be a limitation when evaluating disorders as heterogeneous as OCD.

Furthermore, intercorrelations between subscales and total score were calculated. Correlations between subscales were shown to be significant but not high, suggesting that the subscales do not evaluate the same symptoms but are also not totally independent and may reflect something in common (i.e., OCD symptoms). Finally, the six-factor model which emerged from the Foa et al. (2002) study was tested with the help of a confirmatory factor analysis, which showed an excellent fit for this model.

Some differences between our results and the English version should, however, be pointed out. First, although significant, correlations between subscales in our study were generally lower than those found by Foa et al. (2002). Sample disparities could account for this difference. In fact, in order to calculate these intercorrelations, Foa et al. (2002) integrated not only control participants (as we did in our study), but also patients suffering from OCD, post-traumatic stress disorder and social phobia. It is possible that the presence of clinical patients in their sample increased the number and range of different OCD symptoms and thus the correlations between subscales. The second difference between studies concerns mean scores, which were generally lower in our population than those obtained in non-clinical individuals by Foa et al. (2002) or Hajcak et al. (2004). We do not have any ready explanation for this discrepancy. A problem of range restriction, or more broadly the fact that our sample might not be representative of the population (Sackett and Yang, 2000), may have affected our study. However, this problem seems unlikely to explain the differences between studies: our sample was similar to those used in the two other studies, as they all were made up of university-level psychology students. As both other studies were completed in the same country, and even at the same university, another possibility is that variations in the mean

scores were due to cultural differences or unidentified contextual variables (administration conditions) that might affect the intensity with which people self-report personal characteristics.

In conclusion, the French version of the OCI-R presents the same structure as the English version, as well as a satisfactory internal reliability in a large non-clinical sample. Therefore, this version seems to allow us to measure the various symptoms of OCD in non-clinical individuals. Nevertheless, it is still necessary to confirm these data in a sample of OCD patients.

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## Appendix A

### A.1. French version of the Obsessive–Compulsive Inventory–Revised

Les énoncés suivants se rapportent à des expériences que de nombreuses personnes vivent dans leur quotidien. Entourez les chiffres qui décrivent le mieux à *quel point* l’expérience vous a *peiné* ou *dérangé* durant le *mois dernier*.

0	1	2	3	4
Pas du tout	peu	moyennement	beaucoup	extrêmement

1. J’ai conservé tellement de choses qu’elles bloquent le passage.
2. Je vérifie les choses plus souvent que nécessaire.
3. Je suis contrarié si les objets ne sont pas rangés correctement.
4. Je me sens obligé de compter pendant que je fais des choses.
5. J’éprouve de la difficulté à toucher un objet quand je sais qu’il a été touché par des étrangers ou par certaines personnes.
6. J’éprouve de la difficulté à contrôler mes propres pensées.
7. J’accumule des choses dont je n’ai pas besoin.
8. Je vérifie de manière répétée les portes, les fenêtres, les tiroirs, etc.
9. Je suis contrarié si les autres changent la manière dont j’ai rangé les choses.
10. Je sens que je dois répéter certains chiffres.
11. Je dois parfois me laver ou me nettoyer, simplement parce que je me sens contaminé.
12. Je suis contrarié par des pensées déplaisantes qui me viennent à l’esprit contre ma volonté.
13. J’évite de jeter les choses parce que je crains d’en avoir besoin plus tard.
14. Je vérifie de manière répétée les robinets de gaz et d’eau ainsi que les interrupteurs après les avoir éteints.

15. J'ai besoin que les choses soient rangées dans un ordre particulier.

16. Je sens qu'il y a de bons et de mauvais chiffres.

17. Je me lave les mains plus souvent et plus longtemps que nécessaire.

18. J'ai fréquemment des pensées malsaines et j'ai de la difficulté à m'en débarrasser.

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