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Temporal Stability of Obsessive-Compulsive Symptom Dimensions in an Undergraduate Sample

A Prospective 2-Year Follow-Up Study

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The temporal stability of obsessive-compulsive symptom dimensions was studied in a nonclinical student sample. The Obsessive-Compulsive Inventory-Revised was administered twice to 132 undergraduate students during a 2-year period. There were no significant changes in symptom dimension scores between the baseline and follow-up, except for the Obsessing scale. The score of each dimension at follow-up was strongly and uniquely predicted from the score on the same dimension at baseline. The results indicate that obsessive-compulsive symptom dimensions tend to be temporally stable in nonclinical participants, replicating similar studies in clinical populations.

Keywords: *obsessive-compulsive disorder; assessment; symptom dimensions*

Obsessive-compulsive disorder (OCD) is a compendium of multiple, potentially overlapping syndromes rather than a unitary entity (Mataix-Cols, Rosario-Campos, & Leckman, 2005a). Although there is some methodological debate regarding the best way to account for the phenotypic

heterogeneity of the disorder (Calamari, 2005; Mataix-Cols et al., 2005a; McKay et al., 2004), both factor and cluster analytic studies of OCD symptoms have found remarkably similar symptom structures or patient clusters, namely (a) symmetry obsessions and repeating, counting, and ordering compulsions; (b) hoarding obsessions and compulsions; (c) contamination obsessions and cleaning compulsions; (d) obsessions of harm and checking; and (e) sexual or religious obsessions (Mataix-Cols et al., 2005a; Rosario-Campos et al., 2006). More importantly, these symptom dimensions have been found to correlate with different neurobiological, genetic, comorbidity, and treatment response findings (for reviews, see Mataix-Cols, Rosario-Campos, & Leckman, 2005b; McKay et al., 2004; Miguel et al., 2005). However, the validity of a symptom-based classification of OCD would be compromised if these symptom dimensions or clusters were not temporally stable, that is, if the content of the patients' symptoms dramatically changed over time. It is often assumed that OCD patients' symptoms fluctuate both in severity and content, but to date only four longitudinal studies have empirically examined this important question using modern psychometric instruments, two in adults (Mataix-Cols, Rauch, et al., 2002; Rufer, Grothusen, Mass, Peter, & Hand, 2005) and two in children or adolescents (Delorme et al., 2006; Rettew, Swedo, Leonard, Lenane, & Rapoport, 1992).

Mataix-Cols, Rauch, et al. (2002) prospectively followed 117 adult OCD outpatients during 2 years using the Yale-Brown Obsessive Compulsive Scale symptom checklist (Y-BOCS-SC; Goodman et al., 1989) and found that, for the most part, patients maintained their symptoms at follow-up, although some symptoms were more stable than others. Although the hoarding and sexual or religious dimensions tended to remain unchanged, significant decreases within symptom dimensions were observed in the contamination or cleaning, aggressive or checking, and symmetry or ordering dimensions. More importantly, changes between symptom dimensions were rare and nonsignificant, and the strongest predictor of the presence of a given symptom was having had the same symptom in the past. Recently, Rufer et al. (2005) replicated these findings in an adult sample of 54 OCD inpatients who were reassessed with the Y-BOCS-SC after 6 years, on average.

In contrast, Rettew et al. (1992) reported significant changes in the content of obsessive-compulsive (OC) symptoms over time in a sample of 79 children and adolescents with OCD who were followed up with the Y-BOCS-SC during a 2- to 16-year period. However, this study examined changes of individual symptoms rather than symptom categories or dimensions. The authors acknowledged that "many patients dramatically changed their ritualistic behavior without changing [symptom] categories" (p. 1054).

Indeed, it is not unusual to find patients whose symptoms slightly change within their main theme (e.g., a patient who is initially concerned about dirt and subsequently concerned about contracting an infectious disease, within the contamination and washing dimension). In support of this idea, another recent pediatric study that followed up 42 children or adolescents found that the content of factor-analyzed symptom dimensions remained stable during a 4-year period (Delorme et al., 2006).

In sum, 3 of the 4 studies that have examined the question of symptom stability in OCD suggest that although symptoms of both adult and pediatric patients with OCD fluctuate in severity, changes in symptom content over time are rarer.

The multidimensional model of OCD proposes that OC phenomena are normally distributed in the general population (Mataix-Cols et al., 2005b), and this is supported by numerous studies demonstrating that both obsessions (Freeston, Ladouceur, Thibodeau, & Gagnon, 1991; Rachman & de Silva, 1978; Salkovskis & Harrison, 1984) and compulsions (Muris, Merckelbach, & Clavan, 1997) are frequent in healthy individuals. However, the stability of OC symptom dimensions in nonclinical samples has not been studied so far. From a theoretical point of view, the utilization of nonpatient samples in the study of OCD is well supported (Gibbs, 1996). Furthermore, some practical aspects make the use of nonclinical samples advantageous in comparison to clinical samples, the most important of which in this context is the lack of treatment confounds. In the above clinical studies, patients received treatment during the follow-up period, and therefore some of the observed changes within symptom dimensions could have been because of the effects of treatment. The main goal of the study was to prospectively assess the temporal stability (2 years) of OC symptom dimensions in an undergraduate sample. Based on previous research (Delorme et al., 2006; Mataix-Cols, Rauch, et al., 2002; Rettew et al., 1992; Rufer et al., 2005), we expected OC symptom dimensions to show some regression to the mean (i.e., changes within symptom dimensions) but to be uniquely predicted by the baseline scores on the same scales (i.e., no changes between symptom dimensions).

Method

Participants and Procedure

A total of 381 undergraduates from two different universities (University of Balearic Islands and Autonomous University of Barcelona) were

administered the Obsessive-Compulsive Inventory–Revised (OCI-R; Foa et al., 2002) in October 2003 and asked whether they could be approached 2 years later for a follow-up study. Those who agreed to participate in the follow-up ($n = 231$) were contacted by mail or telephone and sent a letter with the OCI-R and a self-addressed, stamped envelope. The final sample consisted of 132 participants (114 women, 17 men, 1 unknown sex). Their mean age was 23.57 years ($SD = 2.14$).

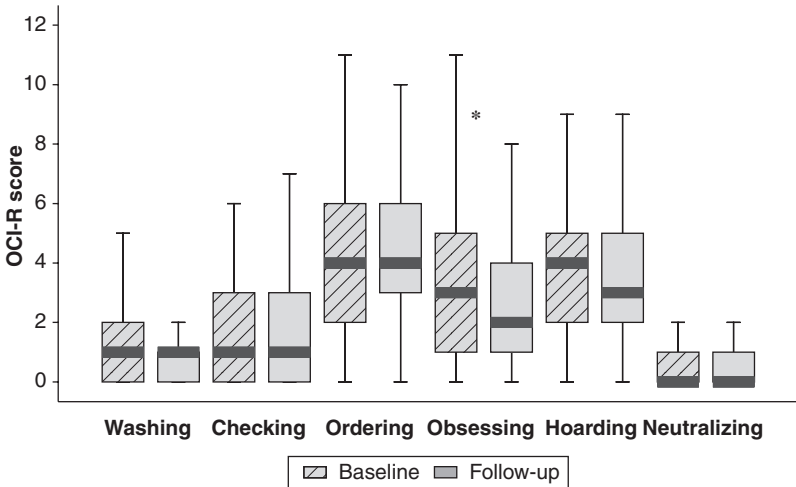
Measures

The Spanish version (Fullana et al., 2005) of the OCI-R (Foa et al., 2002) is an 18-item, self-administered questionnaire designed to assess distress associated with OC symptoms. It requests a response on a 0 to 4 scale. The total OCI-R score is the sum of all items, and it ranges from 0 to 72. It consists of six 0 to 12 subscales, Washing, Checking, Ordering, Hoarding, Obsessing, and Neutralizing, which largely correspond with the symptom dimensions identified in factor-cluster analytical studies of the Y-BOCS-SC (Mataix-Cols et al., 2005b). The OCI-R has shown to have excellent psychometric properties (Abramowitz & Deacon, in press; Foa et al., 2002; Hajcak, Huppert, Simons, & Foa, 2004), and its Spanish version retains the sound psychometric properties of the original version (Fullana et al., 2005). In brief, the Spanish version of the OCI-R has the same factor structure as the original version, good internal consistency and 1-month test-retest reliability, moderate convergent validity, and good divergent validity. In the present study, internal consistency (Cronbach's α) of the OCI-R total score was good on both administrations (.86 and .87, respectively).

Results

Kolmogorov-Smirnov tests of the distribution of scores indicated that most measures were not normally distributed. Therefore, we used nonparametric statistics whenever appropriate. There were no differences between the students who returned the OCI-R at follow-up and those who did not in terms of age, $t(371) = 1.13$, $p > .1$, baseline OCI-R total, and baseline OCI-R symptom dimension scores (in all cases, p values $> .1$ after Mann-Whitney U test). However, among the nonresponders, there was a significantly higher proportion of males (80%) than of females (61%), $\chi^2(1) = 10.66$, $p < .005$.

Figure 1
Changes Within Obsessive-Compulsive Inventory–Revised (OCI-R)
Symptom Dimensions From Baseline to 2-Year Follow-Up



Note: $N = 132$.

* $p < .005$.

Changes Within Symptom Dimensions

To analyze changes within symptom dimensions, we compared the scores on each symptom dimension at baseline and at 2-year follow-up using a repeated measures Wilcoxon nonparametric test. There were no differences in any of the OC symptom dimensions (Hoarding showing the highest z , $z = 1.81$, $n = 132$, $p > .05$, and Washing the smallest z , $z = 0.17$, $n = 131$, $p > .1$), except for the Obsessing dimension, which significantly dropped from baseline to follow-up ($z = 3.24$, $n = 129$, $p < .005$; see Figure 1).

Because several participants scored zero on some of the OCI-R subscales at both time points, the above results could have been artificially stable because of floor effects. To avoid this problem, we next repeated the same analysis excluding all participants who scored zero at both OCI-R administrations. Again, there were no significant differences between baseline and follow-up scores on any of the symptom dimensions (Hoarding showing the highest z , $z = 1.35$, $n = 108$, $p > .1$, and Neutralizing the smallest z , $z = 0.62$,

Table 1
Partial Correlations Between Each of the Obsessive-Compulsive Inventory-Revised Subscales at Baseline and Follow-Up, Determined by Multiple Regression Analyses

Obsessive-Compulsive Dimension at Baseline	Obsessive-Compulsive Dimension at Follow-Up					
	Washing	Checking	Ordering	Obsessing	Hoarding	Neutralizing
Washing	.308**	.100	.133	.061	.002	.135
Checking	-.222*	.241**	-.170	-.068	-.082	-.001
Ordering	.118	-.046	.404**	-.023	.025	.022
Obsessing	-.027	-.043	-.012	.299**	-.037	-.081
Hoarding	-.008	.066	.111	.041	.414**	.079
Neutralizing	.089	.051	.141	.137	.098	.236**

Note: R^2 ranged from .14 to .31.

* $p < .05$. ** $p < .01$.

$n = 27$, $p > .1$), with the exception of the Obsessing dimension, which showed a higher score at baseline than at follow-up ($z = 2.85$, $n = 88$, $p < .005$).

Changes Between Symptom Dimensions

We next conducted separated regression analysis for each OC symptom dimension, including its follow-up score as dependent variable and the baseline scores of all six dimensions as predictors. All the predictors were initially included in the model, and the p value was considered significant at $p < .01$ to control for multiple testing. For each OCI-R score at follow-up, the only significant predictor was the score on the same scale at baseline, with the only exception of a negative correlation (significant only at $p < .05$) between the Washing score at follow-up and the Checking score at baseline (see Table 1).

Discussion

This prospective follow-up study examined the temporal stability of OC symptom dimensions in a nonclinical sample. We predicted that there would be some decreases in the scores from the first to the second administration of the OCI-R (i.e., regression to the mean). However, we found no significant differences in the scores of the various OCI-R subscales

between baseline and 2-year follow-up, with the exception of the Obsessing subscale. Thus, OC phenomena seem to be remarkably stable over time in healthy individuals.

Because several participants scored zero on some of the OCI-R subscales at both time points, the above results could have been artificially stable because of floor effects. However, we think this is unlikely for several reasons. First, the results remained unchanged when participants who scored zero on both occasions were excluded from the analyses. Second, as seen in Figure 1, 2 of the 3 OCI-R subscales (Ordering, Obsessing, and Hoarding) that had elevated scores at baseline still showed no significant changes across time, therefore ruling out any floor effects.

The reasons why the Obsessing subscale of the OCI-R appeared to be less temporally stable than the other symptom dimensions are unclear. This could simply reflect the hypothesized regression to the mean. Alternatively, because this OCI-R subscale showed the highest correlations with depressive symptoms in previous studies (Fullana et al., 2005; Hajcak et al., 2004), these OC symptoms may be more likely to fluctuate alongside mood changes.

Studies in clinical samples also found that some OCD symptom dimensions are more stable than others. The two studies in adult samples (Mataix-Cols, Rauch, et al., 2002; Rufer et al., 2005) found that changes within symptom dimensions were more likely to occur in the aggressive and checking, symmetry and ordering, and contamination and cleaning dimensions, whereas one of the pediatric studies (Delorme et al., 2006) found that changes were more likely in the contamination and cleaning dimension. Although these studies tried to statistically control for the effects of treatment during follow-up, it is still possible that the observed changes within some symptom dimensions could be partially attributed to treatment effects. This is plausible because the symptoms that remained more stable in the above clinical studies (i.e., hoarding and sexual or religious obsessions) have been strongly associated with poor treatment response in previous studies and may therefore be less amenable to change (Mataix-Cols, Marks, Greist, Kobak, & Baer, 2002; Mataix-Cols, Rauch, Manzo, Jenike, & Baer, 1999). The use of a nonclinical sample allowed us to examine the question of symptom stability without the potential confounds of treatment.

Another possible explanation for greater temporal stability within symptom dimensions in this study compared to the above clinical studies is the use of different instruments (OCI-R vs. Y-BOCS-SC). The current results provide strong evidence for the excellent long-term test-retest validity of the OCI-R. Future studies would benefit from using several measures of OC symptoms, especially because the correspondence between self- and

clinician-administered instruments is moderate (Mataix-Cols, Fullana, Alonso, Menchon, & Vallejo, 2004). In this regard, the Dimensional Y-BOCS (Rosario-Campos et al., 2006) is a promising new instrument that will allow for a comprehensive assessment of OC symptom dimensions and that has self- and clinician-administered versions.

The second key finding of the current study was that the score of each dimension at follow-up was strongly and uniquely predicted from the score of the same dimension at baseline; that is, there were no significant shifts *between* symptom dimensions from baseline to follow-up. These results are highly consistent with previous studies in clinical samples that had demonstrated that the content of OC symptoms tends to remain stable across time (Delorme et al., 2006; Mataix-Cols, Rauch, et al., 2002; Rufer et al., 2005).

One potential limitation of our study is that we were unable to completely rule out floor effects for the Washing, Checking, and Neutralizing factors of the OCI-R because the mean baseline scores were close to zero. One way to address this potential problem in future studies would be to select healthy individuals with higher baseline scores on these scales (i.e., subclinical OC individuals).

Some crucial questions in this field still remain unanswered. How do OC phenomena evolve across the life span, both in healthy individuals and in OCD patients? Are the symptoms of OCD unstable in childhood and then stabilize in early adulthood? Developmental studies indicate that young children engage in a significant amount of ritualistic, repetitive, and compulsive-like activities, part of their normal behavioral repertoire, which peaks around the age of 2 (Gesell & Ilg, 1943). Why in some cases do these “normal” rituals become disabling OCD symptoms? Although direct evidence linking the emergence of these behaviors to the later development of OCD is lacking, preliminary research shows that aspects of these ritualistic and compulsive-like behaviors are correlated with children’s fears and phobias (Evans, Gray, & Leckman, 1999; Evans, Leckman, Carter, & Reznick, 1997; Zohar & Felz, 2001). Further exploration of the factors that underlie the emergence and resolution of these behaviors in normally developing children may provide valuable insights into these important questions. This ambitious endeavor will require large-scale prospective follow-up studies across the life span.

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