“Not just right experiences” predict obsessive-compulsive symptoms in non-clinical Italian individuals: A one-year longitudinal study

Article in Journal of Obsessive-Compulsive and Related Disorders · July 2012
DOI: 10.1016/j.jocrd.2012.03.006

5 authors, including:

Claudio Sica
University of Florence
81 PUBLICATIONS 1,819 CITATIONS
SEE PROFILE

Corrado Caudek
University of Florence
90 PUBLICATIONS 655 CITATIONS
SEE PROFILE

Marta Ghisi
University of Padova
70 PUBLICATIONS 380 CITATIONS
SEE PROFILE

Igor Marchetti
Ghent University
21 PUBLICATIONS 250 CITATIONS
SEE PROFILE

All in-text references underlined in blue are linked to publications on ResearchGate, letting you access and read them immediately.
ABSTRACT

The cognitive model of obsessive compulsive disorder (OCD) proposes that certain beliefs may contribute to the development and maintenance of this disorder. However, the role of such beliefs in OCD symptomatology is not clear, despite many investigations conducted so far. In the effort to identify other constructs and processes related to OCD, the phenomenon labeled “not just right experiences” (NJREs) has been receiving increasing attention. NJREs can be defined as “the subjective sense that something isn’t just as it should be”, an unsettled feeling because something in the individuals or in the world around them is not right. In the current research, measures of NJREs, OC symptoms, general distress (i.e., anxiety, depression), and looming maladaptive style were administered to 187 college students on three occasions six months apart (baseline, six-months, and one-year later). Linear mixed effects regression models indicated that NJREs explained OC symptoms variation over time even when general distress and looming style were accounted for. Investigation of distinct OC symptoms indicated that NJREs were associated also with washing, ordering and obsessing symptoms, but not with checking ones. These findings suggest that the concept of NJREs may contribute to improve current psychological and biological models of OCD.

Keywords: Not-just-right experiences; psychological processes; obsessive-compulsive disorder; longitudinal study.
INTRODUCTION

Obsessive compulsive disorder (OCD) is characterized by persistent, intrusive, and distressing obsessions (persistent thoughts, impulses, or images) or compulsions (repetitive, excessive behaviors or mental acts), with marked impairments in quality of life (Eisen et al., 2006; Parkin, 1997). Experts have recognized that the manifestations of the condition may be marked by a heterogeneous set of dimensions; for example, in their review McKay et al. (2004) have identified as many as nine subtypes or replicable dimensions of OCD: contamination/washing, harming/checking, hoarding, symmetry/ordering, obsessionals, sexual and religious, certainty, sexual-somatic, and contamination/harming. Patients with OCD may report one (Stein, Forde, Anderson & Walker, 1997) or, more typically, multiple symptoms (Antony, Downie & Swinson, 1998).

OCD has a chronic course, with symptom intensity that usually remains elevated once it has reached clinical levels (e.g., Mataix-Cols et al., 2002). The World Health Organization rated OCD as the world's fourth most common mental disorder and one of the top 10 worldwide causes of “years lived with illness-related disability” (Murray & Lopez, 1996).

Among etiological theories, early behavioral perspectives on OCD emphasized learning theory and conditioning as the basis for the development of the condition. These theories led to the development of the dominant psychosocial approach to treatment, exposure with response prevention. However, important limitations in a purely learning theory based perspective on OCD have led to the inclusion of cognitive perspectives on the disorder (see Sica, Chiri, McKay, & Ghisi, 2010).

These perspectives suggest that individuals with OCD tend to evaluate their thoughts according an inflated sense of personal responsibility (Salkovskis, 1985). For example, an unwanted thought of harming another individual would be appraised as (a) a result of a personal defect reflecting an underlying desire to actually commit harm and (b) a personal responsibility to correct this defect or to avoid any potentially harm. The original model based on inflated responsibility has been expanded to include a set of OC-related beliefs thought to contribute to the development and maintenance of this disorder by facilitating maladaptive interpretations of common intrusive thoughts (Frost & Steketee, 2002; Salkovskis, 1985, 1996).

Whereas early experimental work has shown that manipulating OC-related beliefs leads to changes in OC behavior (e.g., Bouchard, Rheaume, & Ladouceur, 1999; Jones & Menzies, 1998; Ladouceur,
Rheaume, & Aublet, 1997; Lopatka & Rachman, 1995; Rassin, Merckelbach, Muris, & Spaan, 1999), other studies report inconsistent results regarding the relationship between OC beliefs and OC symptoms (Belloch, Morillo & Garcia-Soriano, 2007; Myers, Fisher & Wells, 2008; Sica et al., 2004; Sica, Taylor, Arrindell & Sanavio, 2006). For instance, a recent study failed to support the hypothesis that OCD patients endorse obsessive beliefs more strongly than patients with generalized anxiety disorder (Viar, Bilsky, Armstrong & Olatunji, 2011). Jónsson, Hougaard and Bennedsen (2011) investigated OC beliefs in the form of inflated responsibility (IR) and thought action fusion (TAF) as predictive and mediating variables in individual and group cognitive behavioral therapy outcome for obsessive compulsive disorder. In this study, only change in IR remained significantly associated with OC symptoms change. Recently, Fergus and Wu (2011), found that perfectionism/certainty, responsibility/threat estimation and importance/control of thoughts inconsistently related to OC symptoms scores in two large nonclinical samples.

In addition, the causal role of OC beliefs in producing OC symptoms has yet to be established (Calamari et al., 2006; Steketee, Frost, & Wilson, 2002; Taylor et al., 2006; Tolin, Worhunsky, & Maltby, 2006; see also Julien et al., 2006; Julien, O'Connor & Aardema, 2007; Ghisi et al., 2010). In a recent prospective study, university students completed measures of OC symptoms, OC beliefs, and general distress, three and five years after baseline administration. The OC cognitions did not predict OC symptoms over time (Novara et al., 2011).

Given the unclear role of OC beliefs on OC symptoms, some scholars have turned their attention to the phenomenon labeled “not just right experiences” (NJREs) in an effort to identify other constructs and processes relevant to OCD. The NJREs phenomenon is defined as “the subjective sense that something isn’t just as it should be”, an unsettled feeling because something in the individuals or in the world around them is not right (Coles, Frost, Heimberg, & Rhéaume, 2003, p.684). This construct fits well clients’ and clinicians’ descriptions of OCD symptoms, bears resemblance to many other descriptions proposed by OCD experts (e.g., sense of incompleteness, just right perceptions, sensory phenomena), and it also seems to capture the perfectionistic-like quality of OCD (see Summerfeldt, 2004, for an introduction to this concept).

Concepts similar to NJREs have been included in broad theoretical models of OCD. For instance, Pitman (1987) proposed that the core problem in OCD is a mismatch between the perceptual input and internal reference signals (i.e., expectations). The intriguing model by Szechtmn and Woody (2004)
contends that OCD stems from an inability to generate the normal “feeling of knowing” that would otherwise signal task completion and terminate the expression of a security motivational system.

Indeed, biological models of OCD are compatible with the concept of NJREs. The enhanced response monitoring often observed in patients with OCD has been attributed to the deregulated activity in the frontostriatal system (e.g., Brieter et al., 1996; Gehring, Himle & Nisenson, 2000) which may produce persistent “error signals”, erroneously prompting the individual to start (fruitless) corrective action (for a comprehensive review see Sica et al., 2010).

Lastly, the NJREs phenomenon can be useful to clarify some puzzling findings that have emerged in the OCD literature. For instance, NJREs may explain the well-known association between thought strategies focused on punishment and OC symptoms (Abramowitz et al., 2003; Rassin & Diepstraten, 2003; Sica et al., 2007). In fact, the tendency to react to one’s own mental activity by engaging in punishing behavior may be understood as a sign of frustration and anger when the person realizes that he/she is not able to reach a state of “internal rightness”.

The existing data on NJREs support the putative role of this process in OCD. In one study, 63% of 40 individuals with OCD with or without Tourette’s Disorder endorsed repetitive behaviors preceded by feelings of “things not being just right” (Miguel et al., 2000). In two studies with large undergraduate samples, Coles et al. (2003) reported that NJREs were significantly related to OC features. Further, NJREs have been found to be more strongly correlated with OC symptoms than other domains of psychopathology (e.g., social anxiety, worry, depression). In undergraduate students, experimentally induced NJREs produced distress and urges to change something, but did not produce feared consequences (Coles, Heimberg, Frost, & Steketee, 2005). In the same study, significant relationships were found between NJREs and OC-related constructs, but not between NJREs and non-OC-related constructs (Coles et al., 2005).

Lastly, Ghisi et al., (2010) examined the relation between NJREs and OC symptoms in non-clinical and clinical samples. They found a specific association between severity of NJREs and OC symptoms in a non-clinical sample, after controlling for anxiety, depression, and perfectionism. In addition, NJREs sharply discriminated OCD patients from patients with other anxiety disorders or depression. Interestingly, in the same study NJREs severity differentiated OCD patients from patients with other disorders when OC beliefs
were controlled, whereas OC beliefs did not discriminate among the clinical groups if NJREs severity was controlled.

The putative role of NJREs in OCD appears therefore promising both from a theoretical and empirical perspective and requires further study. Accordingly, the Yale-Brown Obsessive-Compulsive scale, which is the most widely used clinician-administered measure to assess the presence and severity of OC symptoms, has recently been modified to include this concept, thereby facilitating empirical research aimed at understanding the clinical significance of NJREs in OCD (Storch et al., 2010).

The Current Study

The present study sought to add to the limited evidence regarding the association between NJREs and obsessive-compulsive features. We tested two hypotheses: 1) NJREs severity predicts OC symptoms variation over time, after the general distress and looming style are taken into account; 2) NJREs is associated with the most common subtypes of OC symptoms (e.g., washing, checking, ordering, etc.). In fact, recent cross-sectional data found that NJREs severity was equally related to the various types of OC symptoms (Ghisi et al., 2010).

For this purpose, measures of NJREs, OC symptoms, general distress (anxiety, depression), and looming maladaptive style were administered to a sample of college students on three occasions six-months apart. We chose an undergraduate nonclinical sample rather than a clinical one to provide a large range of scores on measures of OC symptoms (Coles et al., 2008; OCCWG, 2005), given theoretical assumptions that OC phenomena lie on a continuum from normality to psychopathology (e.g., Burns, Formea, Keortge, & Sternberger, 1995; García-Soriano, Belloch, Morillo, & Clark, 2011; Olatunji, Williams, Haslam, Abramowitz, & Tolin, 2008; Sternberger & Burns, 1990). Moreover, previous research has demonstrated the utility of student samples in advancing theories of OC (see Gibbs, 1996, for a review).

To our knowledge, this is the first attempt to examine the relation between NJREs and OC symptoms prospectively. In fact, a longitudinal design allows us to examine whether NJREs are related to etiology and/or maintenance of OC symptoms, since it can tell us whether NJREs exist prior to onset or if they are a byproduct of OC symptoms. Establishing that NJREs are not a simply epiphenomenon of OC symptoms would deepen our understanding of OCD and permits to include such construct in OCD models.
METHOD

Participants and Procedures

The initial student sample contained 187 undergraduate students (24% males) recruited at the University of Padova in northern Italy. All participants were Caucasian and single, and appeared representative of the university population. The mean age of the sample was 22.2 years (SD=3; range=18-30) and the mean years of education was 17 (SD=1.7; range= 13-20). Undergraduates were recruited during public lectures by Psychology faculty. The study was described as an investigation of college students’ thought processes and mental health. This resulted in a high average participation rate of 82%, similar to rates in our previous studies with other college-recruited samples.

At baseline (Time 0) participants completed self-report measures in groups with a psychologist who circulated among the students answering questions before, during, and after questionnaire administration. All individuals participated on a voluntary basis and gave their written consent before taking part in the study. Moreover, at T0, participants gave also informed consent to being contacted six-months (T1) and one-year (T2) later. After being contacted at T1 and T2, students completed individually the self-report measures used at baseline. On each occasion, the sequence of self-report measures was rotated to control for order effects. Students were enrolled in the study at different times throughout the academic year to avoid effects due to timing of the assessments.

At the end of the study, each student was thanked and encouraged to express any opinion about his/her experience as participant. This study was approved by the human subjects review committee of the University of Padova.

Attrition

Of the 187 individuals who completed an initial interview, 169 (90%) completed 6-month follow-up interviews and 146 (78%) completed 12-month follow-up interviews. Attrition analyses showed that students who dropped out during the study did not differ significantly from remaining participants on demographic characteristics (age, percentage of women, education levels) or on any of the variables examined in this study (all \( p > .05 \)). We then explored the possibility of imputing missing data, since the main consequence
of missingness is loss of statistical power, a relevant issue in relatively small samples like the present one. Little’s missing completely at random test (MCAR) yielded non-significant results, supporting the imputation of missing data (Little & Rubin, 2002).

According Graham (2009), researchers should use Multiple Imputation procedures since they are good procedures that are based on strong statistical traditions; moreover, in case of missing completely at random data the data set as a whole can be estimated from any of the missing data patterns, including the pattern in which data exist for all variables, that is, for complete cases. Therefore, maximum likelihood estimates of the missing data (EM algorithm) were computed with PASW Statistics 18 and utilized for the subsequent analyses (technical treatments of various EM algorithms are given in Little & Rubin (2002) and Schafer, (1997)).

**Measures**

The *Not Just Right Experiences-Questionnaire-Revised (NJRE-Q-R; Coles et al., 2005)* is composed of three parts (19 items on the whole). The first part (10 items) presents sample NJREs (e.g., “I have had the sensation after getting dressed that parts of my clothes did not feel just right.” “I have had the sensation while organizing my desk that my papers and other things didn’t look just right.”) and instruct respondents to indicate whether they experienced these within the past month. The second part (2 items) asks respondents to indicate which NJRE occurred most recently and when it last occurred (past few hours to past month). In the third part (7 items), respondents rate frequency, intensity, immediate distress, delayed distress, rumination, urge to respond, and sense of responsibility associated with the most recent NJRE on a scale from 1 (absence) to 7 (extreme). The sum of ratings for these last seven items comprises the *NJRE-Q-R severity scale* and represents the measure of NJREs utilized in the current study.

The Italian version of the NJRE-Q-R was administered to 412 undergraduate students. The NJRE-Q-R severity scale demonstrated unidimensionality, excellent internal homogeneity and good temporal stability. The correlations between NJRE-Q-R severity and OC symptoms were significantly higher than correlations with general distress; moreover, after controlling for anxiety, depression and perfectionism, the NJRE-Q-R severity remained significantly associated with OC symptoms (Ghisi et al., 2010). In the present study, the alpha coefficient for the NJRE-Q-R Severity was .90.
The *Looming Maladaptive Style Questionnaire* (LMSQ; Riskind, Williams, Gessner, Chrosniak, & Cortina, 2000) is a validated measure of individuals’ tendency to generate mental representations or expectations of potentially threatening situations that are rapidly escalating in risk and danger as they unfold or are advancing toward some dreaded outcome (i.e., the Looming Cognitive Style: LCS). LCS is considered in the current study because it has been suggested that it may play a role as a cognitive antecedent or maintenance factor in anxiety disorders and OCD (Rachman, Shafran, & Riskind, 2005; Riskind, Williams, & Kyrios, 2002). Since we wanted to ascertain the predictive power of NJREs on OC symptoms over and above variables commonly associated with psychopathology, we deemed important to take in account a well-known cognitive style (i.e., LCS) usually associated with anxiety disorders.

LMSQ requires participants to read six brief vignettes describing potentially stressful situations (e.g., hearing odd sounds from one’s automobile engine, perceiving odd looks from a lover) and then complete three questions for each vignette using a five-point Likert scale (i.e., “In this scene are the chances of your having difficulty decreasing or expanding with each moment? Is the level of threat in the encounter staying fairly constant or is it growing rapidly larger with each passing moment? How much do you visualize your problem as in the act of becoming progressively worse?”). A total LCS score is calculated by aggregating responses to these three items across the six vignettes. Riskind and colleagues (2000) provided evidence for the predictive, convergent, and discriminant validity of the measure, as well as its internal consistency and test-retest stability, as well as test-retest stability of .72 over 7-months.

Standard steps outlined in the psychology literature guided the translation process for the LMSQ (e.g., Brislin, 1986). In the first step, three independent researchers translated the questionnaire from English to Italian and then reached agreement on a common version. Idiomatic Italian at the sixth-grade level was used for this step. In addition, they reviewed the common version to ensure there were no colloquialisms, slang, or esoteric phrases that would make interpretation difficult. The shared form was then back-translated by a bilingual person with an extensive knowledge of psychological research. The back-translation proved to be nearly identical to the original one. As a final step, the LMSQ items of the Italian version were rated by 3 experts in anxiety disorders. Each expert rated the items on a 5-point scale (1=not at all, 5= extremely) for clarity (the extent to which the item is clearly described). As experts’ ratings indicated excellent clarity...
(mean across all items=4.3; DS=0.8), no further item refinement was necessary. In the present study, the alpha coefficient for the LMSQ was .91.

The *Obsessive Compulsive Inventory-Revised* (OCI-R; Foa et al., 2002) is a widely used 18-item self-report questionnaire assessing the severity of OC symptoms on 5-point Likert scale. Items are grouped into six subscales (washing, checking, ordering, obsessing, hoarding, and mental neutralizing). Initial reports supported the reliability and validity of this instrument, and showed strong convergence with established measures of OCD, moderate to high internal consistency across the six subscales, and adequate to high test-retest stability (Foa et al., 2002). The Italian version of OCI-R was administered to 340 community controls, 52 OCD patients, and 36 anxious patients. The findings indicated good internal consistency and a 30-day retest reliability ranged from .76 to .99, as well as good convergent, divergent, and criterion validity (Sica et al., 2009).

In the present study, the alpha coefficient for the total OCI-R was .84. Consistent with the Italian validation study, alpha coefficients for the OCI-R subscales exceed .70 except mental neutralizing (alpha=.50) which was therefore excluded from the study. The hoarding subscale was also excluded in the present research since many studies have raised questions about whether hoarding symptoms represent a ‘‘pure’’ dimension of OCD or a separate type of mental health problem (e.g., Pertusa et al., 2010).

The *Beck Anxiety Inventory* (*BAI*; Beck Epstein, Brown, & Steer, 1988) is a 21-item self-report with excellent psychometric properties that measures the severity of anxiety. The Italian version of the BAI has shown good internal consistency (Cronbach’s alpha = .89) and a 30-day retest reliability of .62, as well as good convergent, divergent, and criterion validity (Sica, Coradeschi, Ghisi, & Sanavio, 2006; Sica & Ghisi, 2007). In the present study, the alpha coefficient for the BAI was .89.

The *Beck Depression Inventory-Second Edition* (*BDI-II*; Beck, Steer, & Brown, 1996). The BDI-II is a 21-item self-report scale that assesses the severity of affective, cognitive, motivational, vegetative, and psychomotor components of depression. The BDI-II has excellent reliability and validity and is widely used in clinical research. The Italian version of the BDI-II indicated good internal consistency (Cronbach’s alpha = .80) and a 30-day retest reliability of .76, as well as good convergent, divergent, and criterion validity (Ghisi, Flebus, Montano, Sanavio, & Sica 2006; Sica & Ghisi, 2007). In the present study, the alpha coefficient for the BDI-II was .88.
Statistical analyses

Linear Mixed-Effects Regression Models

In contrast to cross-sectional studies in which it is reasonable to assume that there are random fluctuations at each measurement occasion, when the same subjects are repeatedly measured over time, their responses are correlated over time, and their estimated trend line or curve can be expected to deviate systematically from the overall mean trend line. For example, behavioral and/or biological subject-level characteristics can increase the likelihood of a favorable response to a particular experimental intervention (e.g., a new treatment for OCD), leading subjects with those characteristics to have a trend with higher slope (i.e., rate of change) than the overall average rate of change for the sample as a whole.

In many cases these personal characteristics may be unobservable, leading to unexplained heterogeneity in the population. Modeling this unobserved heterogeneity in terms of variance components that describe subject-level effects is one way to accommodate the correlation of the repeated responses over time and to better describe individual differences in the statistical characterization of the observed data. These variance components are often termed “random effects,” leading to terms like random-effects or mixed-effects regression models (LME; see Baayen, Davidson, & Bates, 2008; Gibbons, Hedeker & DuToit, 2010).

LME offer several advantages over general linear models. Specifically, they do not require subjects to be measured on the same number of time-points; moreover, they drop the assumptions of independence and homoscedasticity. For regression and analysis of covariance, LME protect against inflated significance for data sets with significant by-item random effects structure. Other advantages of LME are the principled way in which non-independence (asphericity) is handled through the variance-covariance structure of the model, and the provision of shrinkage estimates for the by-subject and by-item adjustments to intercept and slopes, which allows enhanced precision in prediction (Baayen et al., 2008).

Mixed-effects modeling are among the most general of the methods for analysis of longitudinal data. As such, we fitted LME to our data, with subject as random effect and NJRE-Q-R, BAI, BDI-II, and LMSQ as fixed-effect predictors. The LME were fitted using restricted maximum likelihood estimation (REML), a modification of maximum likelihood estimation that is more precise for mixed-effects modeling. For these
analyses, the program lmer in the R package lme4 (Bates & Sarkar, 2007) was utilized. We evaluate significance with the help of 10,000 samples from the posterior distributions of the coefficients using Markov chain Monte Carlo (MCMC) sampling. From these samples, we obtained the 95% Highest Posterior Density (HPD) confidence intervals, and the corresponding two-tailed p-values.

RESULTS

Preliminary analyses

Eighty-seven percent of the undergraduate sample reported having experienced at least one of the 10 NJREs described in the NJRE-Q-R. Percentage of undergraduates experiencing at least one of the 10 NJREs was 13.8% within the past few hours, 28.1% within the past day, 40.1% within the past week, and 18% within the past month. The most common were: “When talking to people, I have had the sensation that my words did not sound just right” (67.9% of participants), “I have had the sensation while writing something down that the words did not look just how I wanted them to look” (48%) and “I have had the sensation while folding my clothes that they did not look the way folded clothes should look” (37.4%).

The bivariate correlations for NJREs and OC symptoms are reported in table 1. At a group level, NJREs were significantly correlated with OC symptoms at each time point with the only exception of the subscale measuring washing compulsions. Retest stabilities of OC symptoms variables ranged typically from .51 to .77 over 6 months (T0–T1) and from .60 to .98 over 12 months (T0–T2), indicating a good stability of our measures. The only exception was the washing subscale of the OCI-R: the value for six-months retest was .51 and for 12 months .30. Also the NJRE-Q-R proved to be a stable measure (six-months retest=.70; 12 months=.75).

Means, standard deviations and range of scores for all measures are reported in Table 2. Inspection of means revealed a decline with passage of time for all measures (Table 2). According to Cohen (1988), $\eta^2 = .01$ corresponds to a small effect size, $\eta^2 = .06$ to a medium effect and $\eta^2 = .14$ to a large effect size. The magnitude of such decline was large for the NJRE-Q-R, BDI-II, OCI-R Total, OCI-R Checking, and OCI-R Obsessing (Table 2).
Lastly, according the Italian norms of the OCI-R (Marchetti, Chiri, Ghisi & Sica, 2010) the percentage of participants who surpassed the threshold for clinical OC at baseline (T0) were the following: OCI-R Total= 14%; OCI-R Washing= 4%; OCI-R Checking= 6%; OCI-R Ordering= 10%; OCI-R Obsessing= 8%.

**NJREs as predictor of OC symptoms variation over time**

For all analyses, inspection of the residuals of our initial model revealed a moderate departure from normality which was alleviated substantially by removing data points with outlier residuals, defined as absolute standardized residuals exceeding 2.5 (the number of outliers never exceeded the 3% of the total sample).

Table 3 lists the fixed-effects coefficients and their associated statistics for all predictors in a mixed-effect regression analysis for the OCI-R total and for the OCI-R subscales. The coefficient for a predictor (labeled as “estimate” in table 3) specifies the unit increase (or decrease, if negative) in the dependent variable corresponding to a unit increase in the value of that predictor, when all other predictors in the model are held constant.

As illustrated, NJREs, anxiety and depression symptoms significantly explained OC symptoms variation over time. Partial effects of NJREs, looming maladaptive style, anxiety and depressive symptoms for the OCI-R Total are also depicted in figure 1.

In partial accord to our second hypothesis, NJREs were associated also with washing, ordering, and obsessing symptoms, but not with checking ones.

Not surprisingly, in most analyses anxiety, depression and/or looming maladaptive style had predictive power for OC symptoms too.

**DISCUSSION**

The aim of the present study was to further explore the role of NJREs in obsessive-compulsive symptoms using a longitudinal design that would supplement findings from cross-sectional studies.

Consistent with our first hypothesis, NJREs predicted OC symptoms variation over one-year period even after general distress was accounted for. Moreover, NJREs severity was associated with washing,
ordering, and obsessing symptoms. We can exclude that such last result is due to correlations among OC symptom measures (i.e., a statistical artifact) because the correlations among the OC dimensions of the OCI-R are in general low (in the present sample: mean $r = 0.27$, i.e., 7% of common variance; see also Sica et al., 2009).

Lastly, the NJRE-Q-R predicted OC symptoms variation even when looming style (which is a specific cognitive mechanism for anxiety, Rachman et al., 2005), was accounted for.

Taken together, the present results suggest that NJREs are not an epiphenomenon of OC symptoms and give consistency to the hypothesis that a “lack of rightness” sensation play a role in OCD.

Our results are consistent with previous reports showing a specific relation between NJREs and OC dimensions. For example, Cougle, Goetz, Fitch and Hawkins (2011), asked non-clinical participants to complete a measure of NJREs along with other self-report measures. Participants were then asked to immerse their hands in a dirt mixture, and afterwards to wash their hands. Cougle and colleagues found that number and intensity of NJREs predicted hand-washing duration.

Surprisingly, in our study we did not find an association between the NJRE-Q-R score and checking symptoms. This may be due to the substantial decline of checking scores over time in our sample, that was more marked than for the washing and ordering subscales. By being so low, the OCI-R checking score had a limited variability in our sample, and this might have hampered the possibility to detect an effect of the NJREs. Furthermore, we also speculate that OCI-R checking subscale may not capture all forms of checking. No doubt that the absence of association between NJREs and checking symptoms warrants more investigation, given that previous research has demonstrated a relationship between these two variables (Ghisi et al., 2010).

In summary, we interpret our results as indicating that 1) not just right experiences may have a role in predicting OC symptoms and 2) their role may apply to an array of OC symptoms. These findings are consistent with previous empirical work (Coles et al., 2003, 2005; Ghisi et al., 2010) and suggest the inclusion of NJREs in models of OCD (Ghisi et al., 2010). According to Wahl, Salkovskis and Cotter (2008), for instance, the difficulty of OCD patients to stop their compulsive behaviours may be understood as a problem of decision making. Perhaps OCD patients adopt the achievement of a specific subjective or emotional sensation (feeling of rightness; Wahl et al., 2008) as the stopping criterion; however, OCD patients
might find more difficult to evaluate their “feeling of rightness” thus requiring more time to determine if the threshold has been reached.

Summerfeldt, Richter, Antony, and Swinson (1999) remarked that many compulsions seem aimed at reducing distress rather than avoiding feared consequences. Likewise, Feinstein, Faloon, Petkova, and Liebowitz (2003) found evidence distinguishing washing compulsions that reduce “uncomfortable feelings” of contamination from those that reduce fears of harm. Therefore, a better understanding of the motivations that lie behind OC symptoms may help clarify the heterogeneous nature of OCD and may help to better define the possible clinical interventions for OCD.

NJREs may also play an important role in predicting treatment outcome. Foa and Kozak (1986) proposed that reductions in OCD symptoms are moderated by reductions in estimates of probability of feared consequences, which are achieved via repeated disconfirmations of the expected outcome. Accordingly, when a feared consequence is not clearly articulated, the efficacy of the corrective exposures may be compromised (Foa, Abramowitz, Franklin, & Kozak, 1999; Rasmussen & Eisen, 1992). It is possible that patients who do not articulate their feared consequences may have been distressed by NJREs.

Furthermore, an intriguing possibility is to consider NJREs as a putative marker for OCD, a psychological endophenotype, so to speak. In biological research, an endophenotype is an objective measurable trait that decomposes top-level phenotypes into meaningful markers more proximally related to the etiology of a disorder (e.g., Chamberlain et al., 2008). In the case of OCD, NJREs may reflect an underlying dysfunction of the Central Nervous System. Similarly to a glucose tolerance test, or measurements of serum cholesterol levels, NJREs may represent a relatively straightforward way to detect a possible vulnerability for OCD, in the same way that the Anxiety Sensitivity is a psychological marker of anxiety disorders in general and panic in particular (e.g., Brown, Smits, Powers, & Telch, 2003; Rapee & Medoro, 1994; Schmidt, Lerew, & Jackson, 1997).

Of course, more research is needed to further inquire the role of NJREs in the development of OCD. For example, it may be interesting to further inquire into the specificity of NJREs by evaluating this construct in different clinical conditions such as hypochondriasis or eating disorders. Since orbital frontal cortex and basal ganglia dysfunctions have been hypothesized to play a key role in the pathophysiology of
OCD (e.g., Insel 1992; Saxena et al., 1999), a study of association between such dysfunctions and NJREs could help ascertain a possible role of NJREs in OCD.

The current study has a number of limitations. First of all, one may wonder whether the NJRE-Q-R score adequately represent the average intensity of NJREs, because this instrument asks participants to rate the severity of only one type of NJRE (i.e. their most recent NJRE experience). We justify our choice in two ways. Coles et al., (2003) found the 10 sample NJRE items to have good internal consistency (alpha= 0.79). In the present study, for the 10 sample NJREs item alpha value was 0.70. One can thus argue that the different NJREs types tends to be associated among each other and, therefore, the NJRE-Q-R scores can be taken to represent NJREs in general rather than just one single and isolated experience. Even more to the point, Coles et al. (2005), showed that what it is important for OC symptoms is not the number or duration of NJREs occurrences, but rather one’s reactions to them (distress, urges). These findings are similar to those showing that intrusive thoughts are common in nonclinical samples (e.g., Salkovskis & Harrison, 1984) and that reactions to these thoughts (e.g., interpretations of responsibility for harm) distinguish clinical and nonclinical samples.

Some of our results may be due to the limited variability of the OCI-R scores in our sample. Moreover, our sample was relatively restricted in educational level, ethnic background, and socio-economic status. Therefore, our findings need to be replicated in larger samples with broader demographic characteristics and also with clinical individuals, preferably in prospective studies with longer temporal intervals.

In the present study, test-retest correlation for the washing subscale was less than optimal, whereas the validation study of the Italian translation of this scale reports one month test-retest correlation of 0.81 (Sica et al., 2009). We speculate that this result may be due to the fact that the washing subscale score is not stable over long temporal intervals (i.e., six months or more). In fact, washing behavior is a very common habit which is affected by various environmental influences (e.g., the presence of dirty, the need to be particularly clean for various reasons, etc.). Because of this, the washing behaviors may vary substantially over time and, as a consequence, the washing subscale might have a poor temporal stability. In any case, to clarify the reasons of the low temporal stability of the washing subscale, additional studies, both on clinical and nonclinical individuals, are required.
Consistently with Coles et al. (2008), we found that OC symptoms scores decrease over time. For some OCI-R scales such decline was large in magnitude. As discussed previously, this decline may have affected the observed relationships between the NJREs and OC symptoms, because the decline of OC symptoms caused the restriction of score range. Such decline could be explained by merely a regression toward the mean that occurs in college student samples as they mature.

Lastly, attrition rate was relatively high, although lower than in a previous study employing Italian college students (Sica et al., 2007) and comparable to other research on OC symptoms (e.g., Coles et al., 2008). To minimize the impact of missing data in our longitudinal design, we used the methods recommended by Graham (2009), even though we cannot exclude that one reason of dropout might have been a high level of NJREs or severe OC symptoms.

As noted by Taylor in his excellent review (2011), OC symptoms have a complex etiologic architecture, which does not appear to be adequately captured by contemporary psychosocial or biological models. We are confident that further investigation of processes such as NJREs will advance our knowledge of vulnerability for OCD and related psychopathology.
Acknowledgements

The authors are grateful to Gail Steketee for advice on revision of the manuscript.

Notes:

1. LME models can be written as follows:

\[ y_{ij} = \beta_0 + \beta_1 t_{ij} + v_{0i} + v_{1i} t_{ij} + \epsilon_{ij} . \]

where the vector \( y_{ij} \) represents the responses of subject \( i \) to the time \( j \), \( \beta_0 \) is the overall population intercept, \( \beta_1 \) is the overall population slope, \( v_{0i} \) is the intercept deviation for subject \( i \), \( v_{1i} \) is the slope deviation for subject \( i \), and \( \epsilon_{ij} \) is an independent error term normally distributed with mean 0 and variance \( \sigma^2 \). The population distribution of intercept and slope deviations is assumed to be bivariate normal \( N(0; \Sigma_v) \), with the random-effects variance-covariance matrix given by:

\[ \Sigma_v = \begin{bmatrix} \sigma^2_{v0} & \sigma_{v01} \\ \sigma_{v01} & \sigma^2_{v1} \end{bmatrix} \]

This model represents the measurements of \( y \) as a function of time, both at the individual and population levels. The population intercept \( \beta_0 \) and slope \( \beta_1 \) parameters represent the population trend, while the individual parameters \( v_{0i} \) and \( v_{1i} \) express how the subjects’ intercept and slope deviate from the population trend.

2. We acknowledge that, to date, there’s no evidence in literature of this problem with the OCI-R checking subscale. However, we cannot completely dismiss this possibility as well, since we do not know data that firmly rule out such hypothesis.
REFERENCES


Table 1

Bivariate Correlations for NJREs and OC symptoms at Times 0, 1, and 2

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td>A2**</td>
<td>.28**</td>
<td>.19**</td>
<td>.33**</td>
<td>.70**</td>
<td>.36**</td>
<td>.10</td>
<td>.34**</td>
<td>.34**</td>
<td>.34**</td>
<td>.34**</td>
<td>.34**</td>
<td>-.10</td>
<td>.19**</td>
<td>.29**</td>
<td>.48**</td>
</tr>
<tr>
<td>2.</td>
<td>-.61**</td>
<td>.61**</td>
<td>.63**</td>
<td>.58**</td>
<td>.72**</td>
<td>.32**</td>
<td>.55**</td>
<td>.47**</td>
<td>.48**</td>
<td>.49**</td>
<td>.68**</td>
<td>.12</td>
<td>.40**</td>
<td>.52**</td>
<td>.38**</td>
<td>.38**</td>
<td>.38**</td>
</tr>
<tr>
<td>3.</td>
<td>-.33**</td>
<td>.46**</td>
<td>.20**</td>
<td>.33**</td>
<td>.56**</td>
<td>.51**</td>
<td>.49**</td>
<td>.23**</td>
<td>.04</td>
<td>.25**</td>
<td>.36**</td>
<td>.30**</td>
<td>.15**</td>
<td>.40**</td>
<td>.40**</td>
<td>.40**</td>
<td>.40**</td>
</tr>
<tr>
<td>4.</td>
<td>-.34**</td>
<td>.27**</td>
<td>.1**</td>
<td>.34**</td>
<td>.25**</td>
<td>.37**</td>
<td>.1**</td>
<td>.14**</td>
<td>.37**</td>
<td>.47**</td>
<td>.17**</td>
<td>.34**</td>
<td>.34**</td>
<td>.11**</td>
<td>.35**</td>
<td>.35**</td>
<td>.35**</td>
</tr>
<tr>
<td>5.</td>
<td>-.33**</td>
<td>.55**</td>
<td>.55**</td>
<td>.12</td>
<td>.33**</td>
<td>.61**</td>
<td>.35**</td>
<td>.55**</td>
<td>.68**</td>
<td>.08</td>
<td>.33**</td>
<td>.98**</td>
<td>.27**</td>
<td>.33**</td>
<td>.60**</td>
<td>.60**</td>
<td>.60**</td>
</tr>
<tr>
<td>6.</td>
<td>-.43**</td>
<td>.49**</td>
<td>.09</td>
<td>.24**</td>
<td>.29**</td>
<td>.65**</td>
<td>.21**</td>
<td>.24**</td>
<td>-.10</td>
<td>.0</td>
<td>.35**</td>
<td>.60**</td>
<td>.27**</td>
<td>.35**</td>
<td>.60**</td>
<td>.60**</td>
<td>.60**</td>
</tr>
<tr>
<td>7.</td>
<td>-.71**</td>
<td>.23**</td>
<td>.30**</td>
<td>.55**</td>
<td>.41**</td>
<td>.75**</td>
<td>.53**</td>
<td>.0</td>
<td>.18**</td>
<td>.47**</td>
<td>.51**</td>
<td></td>
<td>.51**</td>
<td>.51**</td>
<td>.51**</td>
<td>.51**</td>
<td>.51**</td>
</tr>
<tr>
<td>8.</td>
<td>-.40**</td>
<td>.53**</td>
<td>.34**</td>
<td>.37**</td>
<td>.67**</td>
<td>.70**</td>
<td>.10</td>
<td>.35**</td>
<td>.55**</td>
<td>.58**</td>
<td></td>
<td></td>
<td>.58**</td>
<td>.58**</td>
<td>.58**</td>
<td>.58**</td>
<td>.58**</td>
</tr>
<tr>
<td>9.</td>
<td>-.22**</td>
<td>.27**</td>
<td>-.10</td>
<td>.22**</td>
<td>.27**</td>
<td>.61**</td>
<td>.10</td>
<td>.13</td>
<td>.07</td>
<td></td>
<td></td>
<td></td>
<td>.07</td>
<td>.07</td>
<td>.07</td>
<td>.07</td>
<td>.07</td>
</tr>
<tr>
<td>10.</td>
<td>-.21**</td>
<td>.20**</td>
<td>.40**</td>
<td>.47**</td>
<td>.05</td>
<td>.34**</td>
<td>.33**</td>
<td>.22**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.22**</td>
<td>.22**</td>
<td>.22**</td>
<td>.22**</td>
<td>.22**</td>
</tr>
<tr>
<td>11.</td>
<td>-.45**</td>
<td>.55**</td>
<td>.60**</td>
<td>.13</td>
<td>.20**</td>
<td>.67**</td>
<td>.38**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.38**</td>
<td>.38**</td>
<td>.38**</td>
<td>.38**</td>
<td>.38**</td>
</tr>
<tr>
<td>12.</td>
<td>-.32**</td>
<td>.26**</td>
<td>-.10</td>
<td>.10</td>
<td>.35**</td>
<td>.45**</td>
<td>.48**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.48**</td>
<td>.48**</td>
<td>.48**</td>
<td>.48**</td>
<td>.48**</td>
</tr>
<tr>
<td>13.</td>
<td>-.66**</td>
<td>.05</td>
<td>.45**</td>
<td>.45**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.45**</td>
<td>.45**</td>
<td>.45**</td>
<td>.45**</td>
<td>.45**</td>
</tr>
<tr>
<td>14.</td>
<td>-.24**</td>
<td>.61**</td>
<td>.68**</td>
<td>.42**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.42**</td>
<td>.42**</td>
<td>.42**</td>
<td>.42**</td>
<td>.42**</td>
</tr>
<tr>
<td>15.</td>
<td>-.02</td>
<td>.08</td>
<td>.03</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.03</td>
<td>.03</td>
<td>.03</td>
<td>.03</td>
<td>.03</td>
</tr>
<tr>
<td>16.</td>
<td>-.35**</td>
<td>.06</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.06</td>
<td>.06</td>
<td>.06</td>
<td>.06</td>
<td>.06</td>
</tr>
<tr>
<td>17.</td>
<td>-.27**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.27**</td>
<td>.27**</td>
<td>.27**</td>
<td>.27**</td>
<td>.27**</td>
</tr>
<tr>
<td>18.</td>
<td>-.27**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.27**</td>
<td>.27**</td>
<td>.27**</td>
<td>.27**</td>
<td>.27**</td>
</tr>
</tbody>
</table>

Notes: T0–T1 _ 6 months, T1–T2 _ 6 months. NJRE-Q-R= Not Just Right Experiences-Questionnaire-Revised; OCIR-T= Obsessive-Compulsive Inventory-Revised Total; OCIR-W= Obsessive-Compulsive Inventory-Revised Washing; OCIR-C= Obsessive-Compulsive Inventory-Revised Checking; OCIR-OR= Obsessive-Compulsive Inventory-Revised Ordering; OCIR-OB= Obsessive-Compulsive Inventory-Revised Obsessing.

*p < .05; **p < .01
Table 2

Means, standard deviations (in parenthesis) and range for NJREs, looming maladaptive style, anxiety, depressive and OC symptoms at Times 0, 1, and 2

<table>
<thead>
<tr>
<th></th>
<th>T0</th>
<th>Range</th>
<th>T1</th>
<th>Range</th>
<th>T2</th>
<th>Range</th>
<th>F test</th>
<th>η²</th>
<th>Pairwise comparison</th>
</tr>
</thead>
<tbody>
<tr>
<td>NJRE-Q-R</td>
<td>21 (9.2)</td>
<td>6-46</td>
<td>19.9 (7.5)</td>
<td>3-38</td>
<td>17.3 (0)</td>
<td>7-42</td>
<td>46.9**</td>
<td>.33</td>
<td>T0=T1&gt;T2</td>
</tr>
<tr>
<td>LMSQ</td>
<td>60.3 (12.8)</td>
<td>28-90</td>
<td>61 (11.7)</td>
<td>29-87</td>
<td>58 (12.5)</td>
<td>18-86</td>
<td>8.0**</td>
<td>.08</td>
<td>T0=T1&gt;T2</td>
</tr>
<tr>
<td>BAI</td>
<td>11.1 (8.8)</td>
<td>0-43</td>
<td>10.1 (7.1)</td>
<td>0-32</td>
<td>9 (6.0)</td>
<td>0-31</td>
<td>8.4**</td>
<td>.08</td>
<td>T0=T1&gt;T2</td>
</tr>
<tr>
<td>BDI-II</td>
<td>8.7 (7.4)</td>
<td>0-34</td>
<td>7.1 (5.3)</td>
<td>0-30</td>
<td>6.1 (5)</td>
<td>0-35</td>
<td>27.6**</td>
<td>.23</td>
<td>T0&gt;T1&gt;T2</td>
</tr>
<tr>
<td>OCIR-T</td>
<td>12.1 (8.5)</td>
<td>0-37</td>
<td>8.9 (5.5)</td>
<td>0-26</td>
<td>7.2 (5.4)</td>
<td>0-32</td>
<td>56.9**</td>
<td>.38</td>
<td>T0&gt;T1&gt;T2</td>
</tr>
<tr>
<td>OCIR-W</td>
<td>1.1 (1.6)</td>
<td>0-8</td>
<td>0.9 (1.0)</td>
<td>0-7</td>
<td>0.6 (0.8)</td>
<td>0-5</td>
<td>13.0**</td>
<td>.12</td>
<td>T0=T1&gt;T2</td>
</tr>
<tr>
<td>OCIR-C</td>
<td>2 (1.9)</td>
<td>0-10</td>
<td>1.5 (1.5)</td>
<td>0-6</td>
<td>1.0 (1.1)</td>
<td>0-5</td>
<td>52.9**</td>
<td>.36</td>
<td>T0&gt;T1&gt;T2</td>
</tr>
<tr>
<td>OCIR-OR</td>
<td>2.4 (2.4)</td>
<td>0-10</td>
<td>2.1 (1.9)</td>
<td>0-10</td>
<td>2.4 (2.4)</td>
<td>0-10</td>
<td>5.3*</td>
<td>.03</td>
<td>NS</td>
</tr>
<tr>
<td>OCIR-OBS</td>
<td>2.6 (2.9)</td>
<td>0-12</td>
<td>1.0 (1.4)</td>
<td>0-7</td>
<td>.09 (1.4)</td>
<td>0-6</td>
<td>51.1**</td>
<td>.36</td>
<td>T0&gt;T1=T2</td>
</tr>
</tbody>
</table>

Notes: T0–T1 _ 6 months, T1–T2 _ 6 months. NJRE-Q-R= Not Just Right Experiences-Questionnaire-Revised; LMSQ= Looming Maladaptive Style Questionnaire; BAI= Beck Anxiety Inventory; BDI-II = Beck Depression Inventory-II; OCIR-T= Obsessive-Compulsive Inventory-Revised Total; OCIR-W= Obsessive-Compulsive Inventory-Revised Washing; OCIR-C= Obsessive-Compulsive Inventory-Revised Checking; OCIR-OR= Obsessive-Compulsive Inventory-Revised Ordering; OCIR-OB= Obsessive-Compulsive Inventory-Revised Obsessing.

*p < 05; **p < 01; NS = not significant
### Table 3. Fixed-effect coefficients in a mixed-effects model fitted to the OCI-R Total and subscales score of 187 subjects.

#### OCI-R Total score

<table>
<thead>
<tr>
<th></th>
<th>Estimate</th>
<th>HPD lower</th>
<th>HPD upper</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>0.8880</td>
<td>-2.5096</td>
<td>1.6897</td>
<td>0.4542</td>
</tr>
<tr>
<td>Time</td>
<td>-0.1843</td>
<td>-0.2424</td>
<td>-0.1002</td>
<td>0.0000</td>
</tr>
<tr>
<td>NJRE-Q-R</td>
<td>0.2518</td>
<td>0.2188</td>
<td>0.3332</td>
<td>0.0000</td>
</tr>
<tr>
<td>BDI-II</td>
<td>0.1168</td>
<td>0.0115</td>
<td>0.1863</td>
<td>0.0126</td>
</tr>
<tr>
<td>BAI</td>
<td>0.2222</td>
<td>0.1776</td>
<td>0.3213</td>
<td>0.0000</td>
</tr>
<tr>
<td>LMSQ</td>
<td>0.0221</td>
<td>-0.0037</td>
<td>0.0650</td>
<td>0.2535</td>
</tr>
</tbody>
</table>

#### OCI-R Washing

<table>
<thead>
<tr>
<th></th>
<th>Estimate</th>
<th>HPD lower</th>
<th>HPD upper</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-0.4909</td>
<td>-0.6683</td>
<td>0.1383</td>
<td>0.0316</td>
</tr>
<tr>
<td>Time</td>
<td>-0.0169</td>
<td>-0.0312</td>
<td>-0.0029</td>
<td>0.0059</td>
</tr>
<tr>
<td>NJRE-Q-R</td>
<td>0.0139</td>
<td>0.0048</td>
<td>0.0179</td>
<td>0.0210</td>
</tr>
<tr>
<td>BDI-II</td>
<td>-0.0123</td>
<td>-0.0463</td>
<td>-0.0119</td>
<td>0.1868</td>
</tr>
<tr>
<td>BAI</td>
<td>0.0228</td>
<td>0.0237</td>
<td>0.0523</td>
<td>0.0017</td>
</tr>
<tr>
<td>LMSQ</td>
<td>0.0157</td>
<td>0.0072</td>
<td>0.0207</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

#### OCI-R Checking

<table>
<thead>
<tr>
<th></th>
<th>Estimate</th>
<th>HPD lower</th>
<th>HPD upper</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>0.1526</td>
<td>-0.6778</td>
<td>0.4962</td>
<td>0.6253</td>
</tr>
<tr>
<td>Time</td>
<td>-0.0572</td>
<td>-0.0715</td>
<td>-0.0353</td>
<td>0.0000</td>
</tr>
<tr>
<td>NJRE-Q-R</td>
<td>0.0043</td>
<td>0.0024</td>
<td>0.0333</td>
<td>0.5661</td>
</tr>
<tr>
<td>BDI-II</td>
<td>0.0081</td>
<td>-0.0524</td>
<td>-0.0055</td>
<td>0.4779</td>
</tr>
<tr>
<td>BAI</td>
<td>0.0587</td>
<td>0.0571</td>
<td>0.0961</td>
<td>0.0000</td>
</tr>
<tr>
<td>LMSQ</td>
<td>0.0153</td>
<td>0.0067</td>
<td>0.0256</td>
<td>0.0021</td>
</tr>
</tbody>
</table>

#### OCI-R Ordering

<table>
<thead>
<tr>
<th></th>
<th>Estimate</th>
<th>HPD lower</th>
<th>HPD upper</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>1.4382</td>
<td>-1.0821</td>
<td>0.6760</td>
<td>0.0003</td>
</tr>
<tr>
<td>Time</td>
<td>0.0133</td>
<td>0.0111</td>
<td>0.0626</td>
<td>0.0941</td>
</tr>
<tr>
<td>NJRE-Q-R</td>
<td>0.0226</td>
<td>0.0394</td>
<td>0.0850</td>
<td>0.0179</td>
</tr>
<tr>
<td>BDI-II</td>
<td>0.0283</td>
<td>0.0195</td>
<td>0.0876</td>
<td>0.0498</td>
</tr>
<tr>
<td>BAI</td>
<td>0.0013</td>
<td>0.0038</td>
<td>0.0602</td>
<td>0.9055</td>
</tr>
<tr>
<td>LMSQ</td>
<td>0.0014</td>
<td>-0.0094</td>
<td>0.0190</td>
<td>0.8173</td>
</tr>
</tbody>
</table>

#### OCI-R Obsessing

<table>
<thead>
<tr>
<th></th>
<th>Estimate</th>
<th>HPD lower</th>
<th>HPD upper</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>0.9319</td>
<td>-0.1744</td>
<td>1.0394</td>
<td>0.0069</td>
</tr>
<tr>
<td>Time</td>
<td>-0.0576</td>
<td>-0.0770</td>
<td>-0.0318</td>
<td>0.0000</td>
</tr>
<tr>
<td>NJRE-Q-R</td>
<td>0.0397</td>
<td>0.0212</td>
<td>0.0552</td>
<td>0.0000</td>
</tr>
<tr>
<td>BDI-II</td>
<td>0.1209</td>
<td>0.0902</td>
<td>0.1397</td>
<td>0.0000</td>
</tr>
<tr>
<td>BAI</td>
<td>0.0293</td>
<td>0.0122</td>
<td>0.0554</td>
<td>0.0101</td>
</tr>
<tr>
<td>LMSQ</td>
<td>-0.0197</td>
<td>-0.0220</td>
<td>-0.0018</td>
<td>0.0006</td>
</tr>
</tbody>
</table>

Notes:  Estimate= estimated coefficient; HPD lower/higher=95% Highest Posterior Density (HPD) intervals based on 10,000 Markov chain Monte Carlo samples; p= two-tailed MCMC probability. NJRE-Q-R= Not Just Right Experiences-Questionnaire-Revised; BAI= Beck Anxiety Inventory; BDI-II = Beck Depression Inventory-II; LMSQ= Looming Maladaptive Style Questionnaire.
Figure 1 caption

Partial effects of NJREs, looming maladaptive style (LMSQ), anxiety (BAI), and depressive symptoms (BDI-II) for OCI Total.

Notes: the graphs are adjusted for the median value for the other numerical predictors in the model. The dashed lines represent 95% highest posterior density credible intervals.