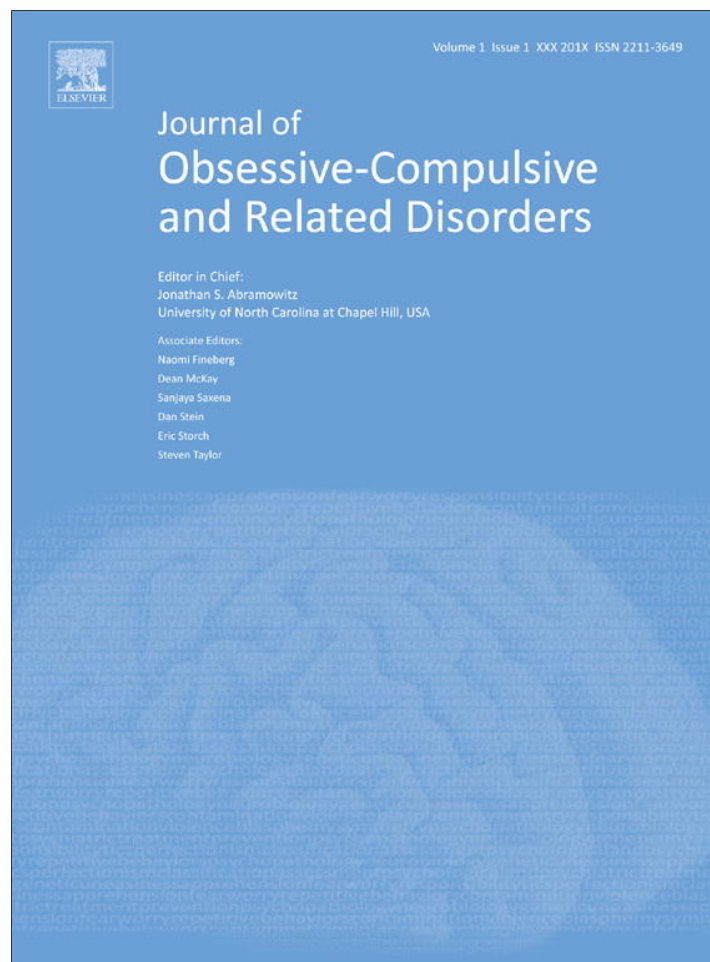


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## Tainted love: Exploring relationship-centered obsessive compulsive symptoms in two non-clinical cohorts

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### ABSTRACT

Obsessive-compulsive disorder (OCD) is a disabling anxiety disorder with a wide range of clinical presentations. Previous research has examined a variety of obsessional themes within OCD including contamination fears, sexual or aggressive obsessions and scrupulosity. Absent from current literature of OCD, however, is an investigation of obsessive-compulsive (OC) symptoms centering on intimate relationships. The present investigation reports on the development and evaluation of the Relationship Obsessive Compulsive Inventory (ROCI), a 12-item measure assessing the severity of OC symptoms centering on three relationship dimensions: the individual's feelings towards his or her partner, the partner's feelings towards the individual, and the "rightness" of the relationship experience. Factor analysis supports a 3-factor structure of the ROCI above two alternative measurement models (Study 1). The ROCI was found to be internally consistent and showed the expected associations with OCD related symptoms and cognitions, mood and relationship variables (Study 2). Moreover, the ROCI significantly predicted depression and relationship related distress, over-and-above common OCD symptoms, and other mental health and relationship insecurity measures. Relationship-centered OC symptoms may be an important theme for further OCD research.

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### 1. Introduction

Obsessive compulsive disorder (OCD) is an incapacitating anxiety disorder with a lifetime prevalence of 1–2.5% (Kessler, Berglund, Demler, Jin, & Walters, 2005). OCD is characterized by the occurrence of unwanted and disturbing intrusive thoughts, images or impulses (obsessions), and by compulsive rituals that aim to reduce distress or to prevent feared events (i.e., intrusions) from occurring (American Psychiatric Association [APA], 2000; Rachman, 1997).

The specific manifestation of OCD symptoms varies widely from patient to patient, making it a highly heterogeneous and complex disorder (Abramowitz, McKay, & Taylor, 2008; McKay et al., 2004). Treatment of OCD is further complicated by the fact that similar motivations may underlie different symptoms and indistinguishable symptoms may be driven by different underlying motivations (Abramowitz, 2006). Systematic exploration of the variety of clinical presentations has assisted in promoting further refinement in the treatment of OCD, and has reduced misdiagnosis of obsessive and compulsive symptoms (Clark & Beck, 2010).

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One theme of OCD that has yet to be systematically explored is relationship-centered obsessive compulsive phenomena. The lack of research on this topic stands in sharp contrast to the increased appreciation within psychology of the fundamental importance of interpersonal relationships, particularly romantic relationships, for individuals' well-being (e.g., Hendrick & Hendrick, 1992; Ryan & Deci, 2001). Research over the past few decades has consistently shown that enduring emotional bonds with others affect psychosocial functioning and growth across the life span and act as a general resilience factor against life's adversities (Lopez, 2009; Mikulincer & Florian, 1998). Conversely, unfulfilled needs for interpersonal closeness and intimacy have been shown to lead to negative psychological and physiological outcomes (Baumeister & Leary, 1995).

OCD patients may be particularly vulnerable to developing impaired interpersonal relationships. They often report disturbances in relationship functioning, display increased marital distress, and are less likely to get married (Emmelkamp, de Haan, & Hoogduin, 1990; Rasmussen & Eisen, 1992; Riggs, Hiss, & Foa, 1992). OC symptoms were also found to be negatively correlated with intimacy and self-disclosure (Abbey, Clopton, & Humphreys, 2007). Moreover, OCD symptoms can indirectly impair relationship quality by eliciting partner anger about the continuous pressure to participate in OCD rituals (Koran, 2000).

In the current study we propose that obsessive-compulsive symptoms may affect relationships more directly when the main

focus of the symptoms is the relationship itself. In such cases, obsessive-compulsive symptoms, such as pathological doubts, checking and reassurance-seeking behaviors may focus on relational experiences and partners' feelings towards one another. An example of such a case is Sarah,<sup>1</sup> a 28-year-old married woman who arrived at our clinic and described the following problem: "I don't know what to do. I am afraid my husband will leave me. Every time he comes home, I start questioning him about where he's been, whom he's talked with, for how long, and many other silly details. By knowing all this information, I try to assess how much he loves me. This has been going on for years. I am sure he loves me but the thought that he might not, drives me crazy. I know that I am pushing him away with all my interrogations, I can see it in his face, but I just cannot stop. I ask him if he loves me and he replies that he does, but I am not sure if it is true or if he is just afraid of me."

For Jack, a 40-year-old man in a 4-year romantic relationship, difficulties with his own feelings towards his partner and doubts about whether his current relationship is the "right" and "final" one are the main issues of concern: "I can't handle it anymore. I am sure about my feelings towards my partner, but sometimes it feels right and sometimes it doesn't. Every time I see another couple or when I meet her [his partner] outside of home I start having these thoughts. I ask my friends how they were sure about their romantic choices. I check whether I feel love or not. Is this the same feeling as in the movies? I try to imagine how life would be by her side in the next 20 years. I imagine how it might be with someone else. I fear I will be stuck with these doubts forever and won't be able to take it anymore".

In both Sarah's and Jack's cases, their obsessional preoccupations regarding romantic relationships lead to extreme dissatisfaction for them and their partners. Their compulsive checking behaviors are experienced as uncontrollable on their part, and consume over a couple of hours a day. Beyond having to cope with disabling OCD (e.g., repeated checking) the specific content of their obsessions poses an additional and significant challenge to maintaining a functioning and satisfying relationship. Such examples of the distress and social consequences of obsessive-compulsive symptoms centering on intimate relationships highlight the need for a systematic empirical examination of this phenomenon as well as a better understanding of its clinical manifestations and mechanisms of action.

## 2. Relationship-centered obsessive compulsive phenomena

Doubts and fears regarding romantic relationships are common, especially during the initial stages of a relationship or during relational conflict. Experiencing some ambivalence–inconsistent or contradictory feelings and attitudes towards a romantic partner (Brickman, 1987)—is perceived to be a natural feature of intimate relationships that reflects changes in interdependence and interpersonal accommodation (Thompson & Holmes, 1996). Moreover, personality factors such as attachment insecurity have been shown to exacerbate relationship doubts and concerns (Mikulincer & Shaver, 2007). We propose, however, that relationship-centered obsessive-compulsive phenomena are different from normative relationship doubts and concerns, inasmuch as their key distinctive features include ego-dystonicity, intrusiveness, high intensity, and functional impairment.

Indeed, clinical experience suggests that in comparison with common relationship worries, relationship-centered intrusions

are experienced as less wanted and more unacceptable. The intrusions often contradict the relationship experience (e.g., "I know I love her, but it does not feel right/perfect"; "I know he loves me, but I have to check") and are therefore less self-congruent than common relationship worries. Similar to forms of OCD, relationship-centered intrusions are frequently experienced as interruptions in one's flow of thoughts and actions, triggered by particular situations. Like other obsessions, they tend to be perceived by the individual as exaggerated or irrational reactions to a specific triggering event, and to result in extreme anxiety and repetitive neutralizing behaviors (e.g., checking and reassurance seeking), which impair the affected individual's daily life and relationship quality.

## 3. Relationship-centered OC phenomena and cognitive-behavioral models of OCD

According to cognitive behavioral theories of OCD, most of us experience a range of intrusive phenomena that are similar in form and content to clinical obsessions (Rachman & de Silva, 1978). Individuals with OCD, however, misinterpret such intrusions because of dysfunctional beliefs (e.g., inflated responsibility, perfectionism, threat overestimation; *Obsessive Compulsive Cognitions Working Group [OCCWG], 1997*), resulting in significant distress and anxiety. Moreover, individuals with OCD tend to rely on ineffective strategies for managing intrusive thoughts and reducing anxiety (e.g., thought suppression, compulsive behaviors), which paradoxically exacerbate the frequency and impact of intrusions, and result in obsessions (Clark & Beck, 2010; Salkovskis, 1985).

Relationship-centered OC phenomena may involve similar cognitive processes. Specifically, cognitive biases found to be associated with OCD may influence the perception of relationship concerns, and consequently, the relationship experience. For instance, perfectionist tendencies and striving for "just right" experiences (OCCWG, 1997; Summerfeldt, 2004) may lead to extreme preoccupation with the "rightness" of the relationship (e.g., "Is this relationship the right one? Is s/he THE ONE?"). Similarly, uncertainty about one's own feelings and emotions (the tendency to question and monitor one's own emotional experiences) and intolerance for such uncertainty (Lazarov, Dar, Oded, & Liberman, 2010; OCCWG, 2005) may lead to doubts and concerns regarding one's feelings towards the partner (e.g., "Do I really love my partner?"). Finally, overestimation of threat and intolerance for uncertainty (OCCWG, 2005) may bias individuals' interpretations of others' feelings towards them (e.g., "Does my partner really love me?").

Cognitive biases may lead to misinterpretation and enhancement of commonly experienced relationship-related intrusions, especially among individuals who are vulnerable or insecure in this self-domain (Doron & Kyrios, 2005; Doron, Kyrios, & Moulding, 2007). This, in turn, may lead to intense relational distress and anxiety. As a result, a person with relationship-centered obsessions may take extreme measures to reduce distress, such as repeated reassurance seeking from the partner or from others (e.g., "Do you think he loves me?"), frequent checking behaviors (e.g., "Do I feel in love?"), or avoiding situations that evoke doubts (e.g., with parents or friends). This course of events is similar to the one identified in the OCD literature, in which obsessions are followed by momentary anxiety-reducing compulsive rituals, which in the long run maintain and escalate the vicious cycle of OCD.

## 4. The current studies

To gain a better understanding of relationship-centered OC phenomena, we conducted two studies. In Study 1, we constructed

<sup>1</sup> All names in the manuscript were replaced in order to maintain confidentiality.

the Relationship Obsessive Compulsive Inventory (ROCI), a brief self-report measure aimed at assessing the severity of relationship-centered OC phenomena. The items were based on extensive clinical experience with OCD patients. The hypothesized factor structure of the ROCI was examined through factor analysis. In Study 2, we re-examined the factor structure of the ROCI on a different sample. We then examined associations between this measure and other OCD and relationship-related measures. Finally, we examined the incremental predictive validity of the ROCI.

## 5. Study 1

The goal of Study 1 was to examine the factor structure of the Relationship Obsessive Compulsive Inventory (ROCI), a scale specifically designed to assess relationship-centered OC phenomena. Items were generated in an effort to represent obsessions (e.g., preoccupation and doubts) and neutralizing behaviors (e.g., checking and reassurance seeking) related to three relational dimensions that were recurrent in our clinical experience with OCD clients presenting relationship-centered OC concerns. These dimensions included the three main features of a relational experience: feelings towards one's partner (e.g., "I continuously reassess whether I really love my partner"), one's perception of partner's feelings (e.g., "I continuously doubt my partner's love for me"), and one's appraisal of the "rightness" of a relationship (e.g., "I check and recheck whether my relationship feels right").

In accordance with common practice in studies of OCD, the sample used in the present study consisted of non-clinical participants. Similarly to individuals who are clinically diagnosed with OCD, non-clinical participants tend to engage in compulsive behaviors to alleviate distress (e.g., Muris, Merckelbach, & Clavan, 1997). Furthermore, taxometric studies of OCD (e.g., Haslam, Williams, Kyrios, McKay, & Taylor, 2005) have found that OCD symptoms and OC-related beliefs are best conceptualized as continuous dimensional rather than categorical.

### 5.1. Method

#### 5.1.1. Generation of items

The first two authors (GD and DD), who have extensive clinical experience treating individuals with OCD, generated a pool of 30 items based on interviews with OCD patients, and then assessed the face validity of these items to fit the three hypothesized relational dimensions. These items inquired about various obsessive thoughts and compulsive behaviors related to intimate relationships. Each of the three relational dimensions (i.e., "rightness" of relationship, love for partner, being loved by partner) was represented by 10 items assessing obsessive doubts, preoccupation, checking, and reassurance seeking behaviors. Participants were asked to rate the extent to which such thoughts and behaviors described their experiences in intimate relationships on a 5-point scale ranging from 0 (*not at all*) to 4 (*very much*). In addition, three reversed items were included in order to safeguard against problematic response patterns (e.g., identical ratings for all items).

#### 5.1.2. Participants

In total, 333 Israeli participants from the general population that were in an intimate relationship at the time of the study were recruited via *Midgam.com*, the largest Israeli online survey platform. Four participants were excluded because of inconsistent demographic information or unrealistic response times, leaving 329 participants (235 women ranging in age from 15 to 68 years, *Mdn*=30, and 94 men ranging in age from 15 to 75, *Mdn*=35.5). Participants were informed of their rights and completed an online informed consent form in accordance with university IRB standards.

#### 5.1.3. Procedure

The study was administered online using the web-based survey platform [www.midgam.com](http://www.midgam.com). Responses were saved anonymously on the server and downloaded for analysis. All participants completed the 30 ROCI items.

### 5.2. Results and discussion

#### 5.2.1. Item reduction

Our aim was to create a measure that is reliable, but still short enough for clinical application. Hence, we set out to reduce the number of items in each subscale. Two main criteria were used for item reduction: good content validity and adequate scale reliability. Specifically, the goal was for each of the three subscales ("rightness" of relationship, love for partner and being loved by partner) to include an equal number of obsession items (i.e., doubts and preoccupation) and compulsion items (i.e., checking and reassurance seeking). Within each subscale, pairs of items that had similar wording and were highly correlated ( $r > .45$ ; Abramowitz, Huppert, Cohen, Tolin, & Cahill, 2002; Rapee, Craske, Brown, & Barlow, 1996) were considered redundant, and the item with the lower corrected item-total correlation was removed. This process eliminated a total of 12 items.

Corrected item-total correlations were recalculated for the remaining 18 items within their respective subscales. Subsequent item reduction proceeded under empirical and substantive considerations. Namely, each subscale was reduced to four items (two compulsion items and two obsession items) by removing items with lower corrected item-total correlations, while making sure that the overall scale included an equal number of doubting, preoccupation, checking and reassurance seeking items.

The final scale included 12 items across three subscales, each representing one of the relationship dimensions described above (see Appendix A). The subscales displayed high internal consistency (see Table 1). Correlations between averaged subscale scores were very high (see Table 1), suggesting the existence of a higher order construct of relationship-centered OCD. As expected, the scale as a whole was also highly reliable, Cronbach's  $\alpha = .93$ .

#### 5.2.2. Descriptive statistics

Means and standard deviations of the three ROCI subscales are presented in Table 1. Of note is that 6.7% of the participants rated 3 or above (on a 0–4 scale) on more than 33% of the 12 ROCI items, indicating that relatively severe relationship-centered OC symptoms exist even within nonclinical populations.

#### 5.2.3. Confirmatory factor analysis

In order to examine the hypothesized factor structure of the ROCI, we specified an oblique measurement model, in which the three ROCI subscales were represented by three latent factors

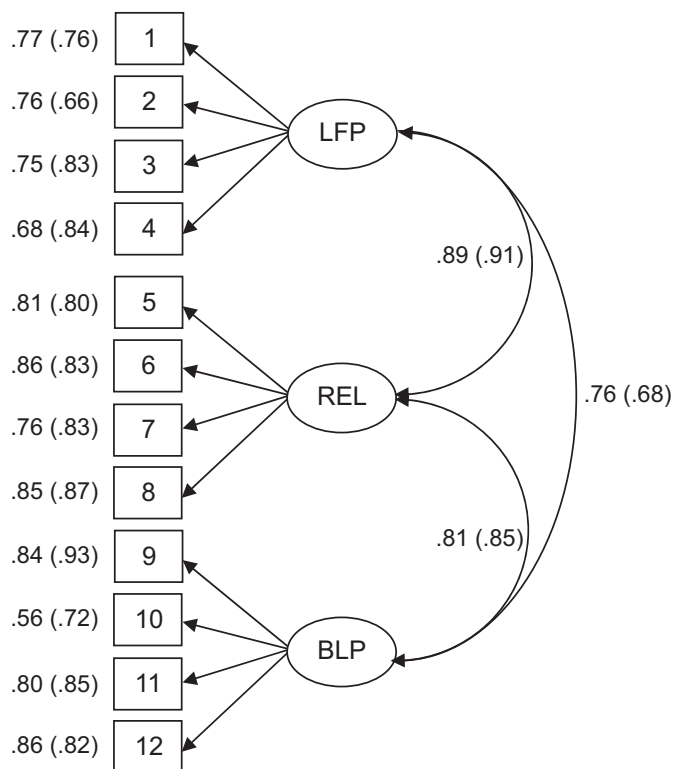
**Table 1**

Inter-factor correlations, Cronbach's  $\alpha$ 's, means and standard deviations for the three ROCI subscales ( $N = 329$ ).

	LFP	REL	BLP
LFP	.84		
REL	.79***	.89	
BLP	.62***	.71***	.87
<i>M</i>	.64	.74	.60
<i>SD</i>	.78	.92	.88

Note: LFP=love for the partner, REL=relationship rightness, BLP=being loved by the partner. Correlations are between the means of the items of each factor (averaged factor scores). Values on the diagonal are Cronbach's  $\alpha$ 's.

\*\*\*  $p < .001$ .



**Fig. 1.** Confirmatory factor analysis model of the Relationship Obsessive Compulsive Inventory (ROCI). Standardized maximum likelihood estimates for Studies 1 and 2 (in parentheses). Error variances and covariances are omitted. Estimated factor loadings are presented to the left of indicators (items). Item numbers conform to Appendix A. All estimates are significant ( $p < .001$ ). LFP=love for the partner, REL=relationship rightness, BLP=being loved by the partner.

**Table 2**  
Fit indices for ROCI confirmatory factor Analyses in Study 1 ( $N=329$ ) and Study 2 ( $N=179$ ).

	df	$\chi^2$	CFI	SRMR	RMSEA	RMSEA .90 CI	
						Low	High
<i>Study 1</i>							
Three factors	39	139.98***	.962	.036	.089	.073	.105
Two factors	41	176.02***	.950	.042	.100	.085	.116
Two factors vs. three factors	2	36.04***					
One factor	42	299.99***	.904	.058	.137	.123	.152
One factor vs. three factors	3	160.01***					
<i>Study 2</i>							
Three factors	39	100.73***	.963	.040	.094	.072	.117

Note: All models had an identical error structure. The two-factor model combined the relationship rightness and love for the partner factors into one factor with 8 indicators. CFI=Comparative Fit Index, SRMR=Standardized Root Mean Square Residual, RMSEA=Root Mean Square Error of Approximation.

\*\*\*  $p < .001$ .

with four indicators each, which were allowed to covary (see Fig. 1). Errors associated with items assessing the same OC phenomenon (e.g., reassurance seeking) were not assumed to be independent and were allowed to covary. This model was examined via AMOS version 19.0.

The goodness-of-fit indices reported here (see Table 2) are the ones commonly recommended by SEM theorists and reported in the literature (Hu & Bentler, 1999; Kline, 2011; Quintana & Maxwell, 1999). The comparative fit index (CFI) and the standardized root mean-square residual (SRMR) fell within the range

commonly regarded as indicating acceptable fit ( $CFI > .95$ ,  $SRMR < .08$ ; Hu & Bentler, 1999). The root mean square error of approximation (RMSEA), which penalizes for model complexity, fell outside the range commonly regarded as indicating poor fit ( $RMSEA > .10$ ; Browne & Cudeck, 1993) though falling short of reaching the criterion indicating good fit ( $RMSEA < .06$ ; Hu & Bentler, 1999). This measurement model was examined again without 55 participants who responded *not at all* to all items. No appreciable differences were found.

In order to exclude the possibility that a symptom-based factor structure would fit the data better, we examined an additional model in which obsession items loaded onto an obsession latent factor and compulsion items loaded onto a compulsion latent factor. Errors associated with items relating to the same relational-dimension (e.g., love for the partner) were allowed to covary. Both the Akaike Information Criterion (AIC) and the Bayesian Information Criterion (BIC) indicated that our original model was better ( $AIC=217.98$ ,  $BIC=366.03$ ) than the alternative ( $AIC=246.55$ ,  $BIC=409.78$ ).

In addition, because inter-factor correlations were high (see Fig. 1), the fit of two additional alternative measurement models were compared with the original model. Firstly, a one-factor model was specified and examined (all 12 items loaded onto a single factor). This model fitted the data significantly less well than the 3-factor model, as indicated by a significant Chi-square difference test and less favorable fit indices (see Table 2). Secondly, a two-factor model was specified and examined. It can be argued that OC phenomena relating to individuals' feelings toward their partners go hand in hand with more general relationship concerns. Specifically, it may be that individuals' preoccupations with the "rightness" of their relationship are brought about by doubts about their feelings towards their partners. Indeed, the estimated correlation between these two factors was especially high ( $r=.89$ ) in our sample. Therefore, the two-factor model combined the relationship rightness and love for the partner factors into one factor with 8 indicators. However, the two-factor model fitted the data significantly less well than the three-factor model (see Table 2). Therefore, the three-factor model emerged as a superior solution.

Although the results seem to support a three-factor structure, it should be noted that a second-order measurement model with one higher-order factor and three lower-order factors would have fitted the data equally well. The second-order part of such a model would be just-identified, making it equivalent to the oblique three-factor measurement model that was tested. Therefore, the ROCI can also be considered as a single scale, with three subordinate subscales. This conceptualization may be more theoretically sound than a correlated-factors conceptualization, as it views relationship-centered OCD as a single construct that reflects OC phenomena in three relationship dimensions, rather than viewing these three dimensions as three related constructs.

## 6. Study 2

In Study 2 we had three main goals: Firstly, we attempted to further validate the factor structure of the ROCI using a second confirmatory factor analysis with another independent sample. Secondly, we tried to establish construct validity for the ROCI. This was done by examining how the ROCI relates to more common OCD symptoms (e.g., checking and obsessions) and OCD related cognitions (e.g., inflated responsibility, perfectionism and importance of thought). We also evaluated the links between the ROCI and measures of disability (e.g., depression, anxiety and stress), general self-esteem and relationship measures

(i.e., relationship ambivalence, relationship satisfaction, attachment insecurities). Third, we examined the incremental contribution of the ROCI to the prediction of depression and relationship-related distress beyond the contribution of more common OCD symptoms, relationship factors (i.e., relationship ambivalence, attachment insecurities), mood and self-esteem. In addition, we examined the incremental contribution of the ROCI to the prediction of OCD symptoms beyond the contribution of mental health and relationship factors.

## 6.1. Method

### 6.1.1. Participants

In total, 203 Israeli participants from the general population were recruited via *Midgam.com*. Twenty-four participants were excluded because of inconsistent demographic information or unrealistic response times, leaving 179 participants (91 women ranging in age from 18 to 65 years,  $Mdn=37$ , and 88 men ranging in age from 18 to 65,  $Mdn=37.5$ ). Out of these participants, 152 were in a relationship at the time of the study, and 37 were not. Participants were informed of their rights and completed an online informed consent form in accordance with university IRB standards.

### 6.1.2. Materials and procedure

The study was administered online using the web-based survey platform *www.midgam.com*. Responses were saved anonymously on the server and downloaded by the first author for analysis. All participants completed the 12 ROCI items, the Obsessive-Compulsive Inventory (OCI-R; Foa et al., 2002), the short form of the Obsessive Beliefs Questionnaire (OBQ; Moulding et al., 2011), the Depression Anxiety Stress Scales (DASS; Lovibond & Lovibond, 1995), the Single-Item Self-Esteem Scale (SISE; Robins, Hendin, & Trzesniewski, 2001), the Relationship Assessment Scale (RAS; Hendrick, Dicke, & Hendrick, 1998), the short form of the Experiences in Close Relationships scale (ECR; Wei, Russell, Mallinckrodt, & Vogel, 2007) and the ambivalence subscale from the Personal Relationship Questionnaire (Braiker & Kelley, 1979).

The Obsessive-Compulsive Inventory (OCI-R; Foa et al., 2002) is an 18-item self-report questionnaire. In this measure participants were asked to rate the degree to which they were bothered or distressed by OCD symptoms in the past month on a 5-point scale from 0 (*not at all*) to 4 (*extremely*). The OCI-R assesses OCD symptoms across six factors: (1) washing, (2) checking/doubting, (3) obsessing, (4) mental neutralizing, (5) ordering, and (6) hoarding. Previous data suggested that the OCI-R possesses good internal consistency for the total score ( $\alpha$ 's ranged from .81 to .93 across samples) although internal consistency was less strong for certain subscales in nonclinical participants (.34 for mental neutralizing and .65 for checking; Foa et al., 2002). Test-retest reliability has been found to be adequate (.57–.91 across samples; Foa et al., 2002). In our study, the measure was used as a whole. The internal consistency for the total measure was .90.

The short form of the Obsessive Beliefs Questionnaire (Moulding et al., 2011) is an abbreviated version of the 44-item Obsessive Beliefs Questionnaire-Revised (OCCWG, 2005), a self-report measure of pan-situational cognitions associated with OCD, which was developed collaboratively by many of the prominent cognitive researchers of OCD. The 20-item OBQ loads on four domains represented in four subscales: (1) Responsibility, consisting of 5 items concerning the responsibility for bad things happening (e.g., "Even if harm is very unlikely, I should try to prevent it at any cost"). (2) Threat Estimation, consisting of 5 items about preventing harm from happening to oneself or

others (e.g., "If I do not take extra precautions, I am more likely than others to have or cause a serious disaster"). (3) Perfectionism/uncertainty, consisting of 5 items reflecting high standards, rigidity, concern over mistakes and feelings of uncertainty (e.g., "In order to be a worthwhile person, I must be perfect at everything I do"). (4) Importance/control of thoughts, consisting of 5 items concerning the consequences of having intrusive distressing thoughts and the need to rid oneself of intrusive thoughts (e.g., "For me, having bad urges is as bad as actually carrying them out"). All items are rated on a 7-point scale ranging from 1 (*disagree very much*) to 7 (*agree very much*). All subscales of the 44-item OBQ have been shown to relate strongly to OCD-symptom measures, as well as to measures of anxiety, depression and worry (OCCWG, 2005; Tolin, Worhunsky, & Maltby, 2006). The internal consistencies of the subscales in our sample (Cronbach's  $\alpha$ 's) ranged from .76 to .86. The internal consistency of the scale as a whole was .92.

The DASS (Lovibond & Lovibond, 1995) is a self-report questionnaire listing negative emotional symptoms and is divided into three subscales measuring depression, anxiety and stress. In this study we used the short version of the DASS (Antony, Bieling, Cox, Enns, & Swinson, 1998; Clara, Cox, & Enns, 2001), which contains 21 items, 7 items for each scale. The Depression scale assesses dysphoria, hopelessness, devaluation of life, self-deprecation, lack of interest/involvement, anhedonia and inertia (e.g., "I couldn't seem to experience any positive feeling at all"). The Anxiety scale assesses autonomic arousal, skeletal muscle effects, situational anxiety, and subjective experience of anxious affect (e.g., "I was worried about situations where I might panic and make a fool of myself"). The Stress scale is sensitive to levels of chronic non-specific arousal. It assesses difficulty relaxing, nervous arousal, and being easily upset/agitated, irritable/over-reactive and impatient (e.g., "I found it hard to wind down"). Higher scores on each of the DASS scales represent decreased mental health. Participants rated the extent to which they experienced each symptom over the past week on a 4-point scale ranging from 0 (*did not apply to me at all*) to 3 (*applied to me very much, or most of the time*). The DASS scales have been shown to have high internal consistency and to yield meaningful discriminations in a variety of settings (Lovibond & Lovibond, 1995). The internal consistencies of the scales (Cronbach's  $\alpha$ 's) in the current sample ranged from .84 to .90.

The Single-Item Self-Esteem Scale (SISE; Robins et al., 2001) required the participants to rate the extent to which the sentence "I have a high self esteem" was self-descriptive on a 9-point scale, ranging from 1 (*not very true for me*) to 9 (*very true for me*). The SISE has been found to have high test-retest reliability, criterion validity coefficients above .80 (median=.93 after correcting for unreliability) with the Rosenberg Self-Esteem Scale (RSE), and a similar pattern of construct validity coefficients as the RSE with above 35 different constructs (Robins et al., 2001). Using longitudinal data, Robins et al. (2001) estimated the reliability of the SISE to be .75.

The Relationship Assessment Scale (RAS; Hendrick et al., 1998) consists of 7 items assessing relationship satisfaction (e.g., "To what extent are you satisfied with your relationship?" "To what extent is this relationship good compared to most?"). Items are rated on a 5-point scale ranging from 1 (*not much*) to 5 (*very much*). The internal consistency of the scale in our sample was .92.

The short form of the Experiences in Close Relationships scale (Wei et al., 2007) is an abbreviated version of the 36-item Experiences in Close Relationships inventory (ECR; Brennan, Clark, & Shaver, 1998). The scale assesses attachment anxiety and avoidance. It includes 12 items, 6 assessing attachment anxiety (e.g., "my desire to be very close sometimes scares people away") and 6 assessing attachment avoidance (e.g., "I want to get

close to my partner, but I keep pulling away”). Participants were asked about the extent to which each item was self-descriptive of their thoughts, feelings and behaviors in romantic relationships, and rated their level of agreement with each of them on a 7-point scale ranging from 1 (*disagree strongly*) to 7 (*agree strongly*). In our sample, internal consistencies were .72 for the 6 items assessing anxious attachment, and .58 for the 6 items assessing avoidant attachment.

Relationship ambivalence was assessed via the ambivalence subscale of the Personal Relationship Questionnaire (Braiker & Kelley, 1979), which includes 5 items that measure confusion and uncertainty about the value of the relationship as well as the perceived sacrifice involved with remaining in the relationship (e.g., “How ambivalent or unsure are you about continuing your relationship with your partner?”). Responses were given on a 9-point scale ranging from 1 (*not at all*) to 9 (*very much*). The internal consistency of the scale in the current sample was .85.

6.1.3. Preparation for analysis

Total scores were created for the OCI-R, the OBQ subscales and total scale, the three DASS scales (depression, anxiety and stress) the Relationship Assessment Scale, the attachment anxiety and avoidance scales and the ambivalence subscale by averaging out the relevant items.

6.2. Results and discussion

6.2.1. Descriptive statistics

Similar to Study 1, 8.9% of participants rated 3 or above (on a 0–4 scale) on more than 33% of the ROCI items. Only 37.5% of these participants were also part of the 10% who did the same for the OCI-R. These statistics indicate that severe relationship-centered OC symptoms are as frequent in nonclinical populations as severe OCD symptoms, but both can occur separately from one another.

6.2.2. Confirmatory factor analysis

In order to further validate the factor structure of the ROCI, we examined via AMOS version 19.0 the same oblique three-factor measurement model as in Study 1 (see Fig. 1). Goodness-of-fit indices, summarized in Table 2, were very similar to the indices obtained in Study 1 for the same model. Namely, CFI and SRMR values were favorable by common standards (Hu & Bentler, 1999), whereas the RMSEA value was less favorable.

6.2.3. Tests of validity

First, the correlations between the ROCI and demographic variables were examined. The ROCI total score was not significantly correlated with gender, relationship length and years of education, although a small negative correlation was found with age,  $r(177) = -.17, p < .05$ .

In order to examine whether the ROCI (its total score and subscales) captures a theoretical construct distinct from general OCD and relationship-related anxiety, the correlations between the ROCI scores and established measures of OCD, mental health and relationship-related insecurities and concerns were examined. As expected, significant positive correlations were found with established measures of OCD, depression, anxiety, stress, low self-esteem, attachment anxiety, attachment avoidance and relationship ambivalence (see Tables 3–5). However, the moderate size of these correlations (ranging between .21 and .56) indicated that the ROCI captured a relatively distinct theoretical construct. With regard to OCD symptoms, this is congruent with the frequency statistics reported earlier, and supports our claim that high relationship-centered symptom level (as assessed by the

**Table 3**  
Correlations of the ROCI with the OCI-R subscales (N=177).

	ROCI			
	Total	LFP	REL	BLP
OCI-R checking	.39***	.40***	.36***	.30***
OCI-R obsessions	.47***	.37***	.47***	.43***
OCI-R contamination	.35***	.37***	.29***	.29***
OCI-R ordering	.30***	.30***	.31***	.21***
OCI-R neutralizing	.28***	.27***	.26***	.23***
OCI-R hoarding	.30***	.23***	.30***	.29***
OCI-R total	.45***	.35***	.43***	.43***

Note: LFP=love for the partner, REL=relationship rightness, BLP=being loved by the partner.

\*\*\*  $p < .001$ .

**Table 4**  
Correlations of the ROCI with the OBQ subscales (N=179).

	ROCI			
	Total	LFP	REL	BLP
OBQ threat overestimation	.34***	.29***	.33***	.30***
OBQ perfectionism	.30***	.24**	.26***	.30***
OBQ importance of thoughts	.31***	.30***	.27***	.27***
OBQ responsibility	.21**	.16*	.16*	.25***
OBQ total	.34***	.29***	.30***	.34***

Note: LFP=love for the partner, REL=relationship rightness, BLP=being loved by the partner.

\*  $p < .05$ .

\*\*  $p < .01$ .

\*\*\*  $p < .001$ .

**Table 5**  
Correlations of the ROCI with mental health and relationship measures.

	ROCI			
	Total	LFP	REL	BLP
DASS Depression (N=177)	.52***	.41***	.56***	.45***
DASS Anxiety (N=177)	.41***	.34***	.40***	.39***
DASS Stress (N=177)	.50***	.37***	.49***	.48***
Rel. Ambivalence (N=178)	.56***	.57***	.59***	.38***
ECR Anxiety (N=179)	.36***	.31***	.35***	.32***
ECR Avoidance (N=179)	.30***	.27***	.29***	.24**
Rel. Satisfaction (N=152)	-.55***	-.46***	-.61***	-.39***
Self-Esteem (N=179)	-.35***	-.30***	-.35***	-.29***

Note: LFP=love for the partner, REL=relationship rightness, BLP=being loved by the partner.

\*\*  $p < .01$ .

\*\*\*  $p < .001$ .

ROCI) does not necessarily co-occur with high general symptom level (as assessed by the OCI-R).

The incremental predictive value of the ROCI total score in predicting general distress (i.e., depression), relationship-related distress and OCD symptoms was assessed in three hierarchical regressions. The ROCI significantly predicted depression, relationship (dis)satisfaction and OCD symptoms over and above other mental health and relationship insecurity measures (see Tables 6–8). The unique ROCI effects were relatively small in our nonclinical sample, but will likely be larger in clinical ones. These findings indicated that the ROCI has unique predictive value, which is not subsumed by existing scales.

**Table 6**  
Regression coefficients for DASS depression regressed on OCI-R, ECR, Ambivalence Scale, Single-Item Self-Esteem and ROCI (N=187).

	$\beta$	$t$	$\Delta R^2$
<i>Step 1</i>			.40
OCI-R	.18	2.54*	
Rel. Ambivalence	.29	4.63***	
Self-Esteem	-.07	-1.08	
ECR Anxiety	.23	3.30**	
ECR Avoidance	.18	2.72**	
<i>Step 2</i>			.02
ROCI total	.20	2.57*	

\*  $p < .05$ .

\*\*  $p < .01$ .

\*\*\*  $p < .001$ .

**Table 7**  
Regression coefficients for relationship satisfaction (RAS) regressed on OCI-R, DASS, ECR, Ambivalence Scale, Single-Item Self-Esteem and ROCI (N=149).

	$\beta$	$t$	$\Delta R^2$
<i>Step 1</i>			.49
OCI-R	.04	.49	
DASS Depression	-.21	-1.92	
DASS Anxiety	.03	.31	
DASS Stress	.07	.64	
Rel. Ambivalence	-.62	-9.33***	
Self-Esteem	.05	.73	
ECR Anxiety	-.01	-.10	
ECR Avoidance	-.01	-.13	
<i>Step 2</i>			.03
ROCI total	-.21	-2.68**	

\*\*  $p < .01$ .

\*\*\*  $p < .001$ .

**Table 8**  
Regression coefficients for OCD symptoms (OCI-R) regressed on DASS, ECR, Ambivalence Scale and ROCI (N=175).

	$\beta$	$t$	$\Delta R^2$
<i>Step 1</i>			.43
DASS Depression	-.25	-2.33*	
DASS Anxiety	.22	2.41*	
DASS Stress	.45	4.43***	
Rel. Ambivalence	.11	1.75	
ECR Anxiety	.18	2.70**	
ECR Avoidance	.16	2.45*	
<i>Step 2</i>			.01
ROCI total	.16	2.06*	

\*  $p < .05$ .

\*\*  $p < .01$ .

\*\*\*  $p < .001$ .

## 7. Discussion

The aim of this paper was to explore the structure and correlates of relationship-centered obsessive compulsive phenomena. For this purpose we constructed the Relationship Obsessive Compulsive Inventory (ROCI). The final 12-item scale assesses the severity of OC symptoms centered on three related aspects of intimate relationships: one's feelings towards his or her partner, the partner's feelings towards the individual, and the "rightness" of the relationship.

Our results support a three-factor structure of the ROCI relative to two alternative measurement models. The ROCI was found to be internally consistent and showed expected significant but moderate associations with OCD symptoms and related cognitions, mood, and relationship variables. Moreover, the ROCI significantly predicted relationship satisfaction and depression over-and-above common OCD symptoms and other mental health and relationship insecurity measures. These findings indicate that the ROCI has good construct validity and that it captures a relatively distinct theoretical construct that has unique predictive value.

The exploration of OC phenomena centered on intimate relationships is consistent with current trends in OCD research, attempting to identify mechanisms that are common to all OCD presentations as well as specific mechanisms that are particular for each manifestation (Abramowitz et al., 2002; McKay et al., 2004). As expected, our results indicated that relationship-centered OC symptoms are moderately related to global OC symptoms, with somewhat stronger correlations with obsessions and checking symptoms. Indeed, the central tenet of relationship-centered OC phenomena is obsessional preoccupation and doubt regarding the relationship experience.

Our results show small to moderate links between the ROCI and OC-related cognitive beliefs, such as overestimation of threat, intolerance of uncertainty, and importance of thought control. This is consistent with cognitive theories of OCD, wherein intrusive anxiety-provoking thoughts (e.g., "I do not feel right with my partner at the moment") may trigger maladaptive appraisals (e.g., "I shouldn't have such doubts regarding my partner", "I should always feel in love with my partner") that are followed by neutralizing behaviors (e.g., reassurance seeking and checking) aimed at reducing the anxiety, but paradoxically increasing it. However, the magnitude of the correlations between the ROCI and OC-related cognitive beliefs suggest that other cognitive biases may also contribute to the development and maintenance of relationship-centered OC phenomena.

Consistent with Rachman's (1997) conceptualization of OCD and based on clinical experience, we propose that these biases may include, for example, catastrophic beliefs regarding future consequences of relationship-related decisions. In the case of love for partner and relationship rightness dimensions, these beliefs may refer to the disastrous consequences of leaving an existing relationship (e.g., "If I leave this relationship, I will always regret it") and the catastrophic consequences of remaining in a less than perfect relationship (e.g., "If I maintain a relationship I am not sure about, I will be miserable forever"). Beliefs about the devastating consequences of being alone (e.g., "Anything is better than being alone") may be linked with the loved-by-partner dimension. Future research may benefit from examining the link between such catastrophic beliefs and relationship-centered OC dimensions.

Previous research has linked OCD with relationship dysfunction mainly through indirect processes, such as negative partner feelings (e.g., frustration and anger), which reduce relationship satisfaction and increase relationship distress (Koran, 2000). However, we have found that the ROCI predicted relationship dissatisfaction over and above other relationship factors (i.e., relationship ambivalence, attachment insecurities) and OC symptoms. Moreover, the ROCI predicted general distress (i.e., depression) over and above other relationship and OCD measures. Relationship-centered OC symptoms may be particularly disabling as they involve maladaptive, chronic doubts regarding the relationship itself. Specifically, repeated doubting about one's feelings towards a partner or the "rightness" of a relationship may directly destabilize the relationship bond (e.g., "I can't trust her/him to stay with me"), escalating already



existing fears and doubts, and resulting in increased relationship distress.

In addition, the specific theme (i.e., relationship content) of the symptoms may compound both individual and couple distress by affecting relationship structure. For instance, continuous preoccupation with a partner's love may increase clinging and dependent behaviors resulting in the development of a hierarchical relationship structure. For one partner, this may increase fear of abandonment, which may be generalized to broad negative self-evaluations, guilt, and shame. For the other partner, such a relationship structure may reinforce feelings of anger and frustration as well as withdrawal and rejecting behaviors.

The repeated compulsive nature of relationship-related OC symptoms can also lead to the development of "social allergies," whereby hypersensitive annoyance or disgust is developed towards repeated partner behaviors (Cunningham, Shamblen, Barbee, & Ault, 2005). According to this view, an annoying partner behavior activates memories of similar prior incidents (i.e., mood congruent memory; Blaney, 1986) together with the negative affect that was associated with them. In this way, each new incident produces more intense negative affect than the original incident, thereby progressively increasing couple distress. Thus, relationship-centered OC symptoms may promote relationship distress by challenging mutual trust, increasing abandonment fears, and inducing social allergies. To culminate this, they challenge one of the main resources for individuals' resilience and wellbeing: satisfactory intimate relationships.

Recent research has implicated relationship-related representations, particularly attachment insecurities, in the maintenance and development of OCD (Doron & Kyrios, 2005; Doron et al., in press). Specifically, attachment insecurities seem to exacerbate sensitivity to intrusive thoughts by disrupting functional coping with experiences that challenge highly important self-domains (Doron, Moulding, Kyrios, Nedeljkovic, & Mikulincer, 2009). Therefore, addressing attachment insecurities, such as fear of abandonment and difficulties in trusting others, may be particularly relevant when dealing with relationship-centered OC phenomena (Doron & Moulding, 2009).

Although consistent with the proposed model, some limitations of the current studies should be addressed. First, we used two nonclinical community cohorts. Although nonclinical participants experience OC-related beliefs and symptoms, they may differ from clinical patients in the type and severity of OCD symptoms, as well as in symptom-related impairment. Future research would benefit from studying the links between relationship-centered OC phenomena and more common OCD presentations, mood variables and relationship variables among clinical participants. It is also seen that considering the high co-morbidity of OCD with other types of psychopathology, particularly depression, future research should examine the impact of co-morbidity on relationship-centered OC symptoms. Second, the ROCI does not include avoidant items. The ROCI items were generated based on our clinical experience, which suggested that avoidant behaviors in relationship-centered OC phenomena are very idiosyncratic. As such, they were not included in the ROCI. Future studies may consider examination of avoidant behaviors associated with relationship-centered OC phenomena. Finally, it is important to note that our design was cross-sectional and correlational, and therefore one cannot derive any causal inference from the findings.

Despite these potential limitations and pending replication of the results with a clinical cohort, the studies' findings have important theoretical and clinical implications. To our knowledge this is the first study exploring OC symptoms centered on intimate relationships. The construction of a short measure assessing relationship-centered OC symptoms enables more

systematic research of this unexplored phenomenon. Finally, our preliminary investigation of relationship-related obsessions, checking and reassurance seeking behaviors has the potential to increase clinical awareness of patients with such clinical presentations thereby reducing misdiagnosis of this disabling phenomenon. Indeed, the ROCI may provide clinicians with a quick overview of relationship-centered OC symptoms. When dealing with relationship-centered OC symptoms one may consider adapting cognitive and behavioral interventions that include the assessment and challenging of relationship insecurities (e.g., fear of abandonment, distrust) and maladaptive relationship dynamics. Couples therapy may be particularly effective when dealing with such issues. In sum, findings from our studies may prove to be an initial step for further refinement of OCD theory and treatment.

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### Declaration of interest

All authors declare that they have no conflicts of interest.

### Appendix A. The relationship Obsessive Compulsive Scale (ROCI)

The final scale included 12 items across three subscales, each representing one of the relationship dimensions (Table A1).

Table A1

#### Love for the partner

- (1) I feel that I must remind myself over and over again why I love my partner
- (2) I feel a need to repeatedly check how much I love my partner
- (3) The thought that I do not really love my partner haunts me
- (4) I continuously doubt my love for my partner

#### Relationship "rightness"

- (5) I constantly doubt my relationship
- (6) I am extremely disturbed by thoughts that something is "not right" in my relationship
- (7) I check and recheck whether my relationship feels right
- (8) I frequently seek reassurance that my relationship is "right"

#### Being loved by the partner

- (9) I am constantly bothered by the thought that my partner does not really want to be with me
- (10) I keep asking my partner whether she/he really loves me
- (11) I am constantly looking for evidence that my partner really loves me
- (12) I find it difficult to dismiss doubts regarding my partner's love for me

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