

METACOGNITIVE DYSFUNCTION ACROSS DEPRESSIVE AND OBSESSIVE–COMPULSIVE SYMPTOMS

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ABSTRACT

Self-awareness and self-regulation are key mechanisms in depression and obsessive-compulsive disorder (OCD) that are believed to be metacognitive processes. Comparative studies of metacognitive abilities in these different psychiatric disorders are still very limited, although they are clinically important. The present study compared the metacognitive processes of people diagnosed with both OCD and major depressive disorder (MDD) with a non-clinical control group. The participants included 180 people (60 MDD, 60 OCD, and 60 healthy controls). Assessment included validated questionnaires of metacognitive beliefs, thought control strategies and executive functioning. The data analysis used were multivariate analysis of variance (MANOVA), hierarchical regression and structural equation modeling (SEM). The results showed that metacognitive monitoring, negative metacognitive beliefs and thought control behaviors significantly differed between groups. There were increased intrusive thought monitoring and positive beliefs about worry in individuals with OCD and increased rumination-focused metacognitive patterns in individuals with MDD. There were maladaptive thought control strategies in both clinical groups, relative to controls. Importantly, metacognitive variables were significant predictors of symptom severity in both conditions in different ways. Results indicate that metacognitive dysfunction is evident in both disorders, but the nature of the dysfunctions and the functional connections vary significantly. The implications of these differential metacognitive profiles include a need for tailored metacognitive treatment protocols of the metacognitive patterns of different disorders for transdiagnostic cognitive-behavioral interventions. The findings will help to understand the variability of psychiatric disorders, and advance the field of precision mental health.

Keywords: *Metacognition*¹; *Depression*²; *Obsessive-compulsive disorder*³; *Metacognitive beliefs*⁴; *Thought control*⁵; *Comparative psychopathology*⁶

1. INTRODUCTION

1.1 Metacognitive Processes: Conceptualization and Clinical Relevance

Metacognition is a set of cognitive processes used by people to monitor, assess, and manage their thinking, beliefs and mental experiences. In contrast to cognition (the content and process of thinking), metacognition is concerned with the higher-order processes whereby people become aware of and control their thinking processes. This distinction is essential to the research of psychopathology today and is supported by increasing evidence that the thoughts of people with psychological problems are not necessarily different from those of people without psychological problems, but rather that they engage in different cognitive strategies, and harbor different beliefs about their thoughts, including beliefs about their thoughts' nature, meaning, and control. Wells and Cartwright-Hatton's metacognitive model is based on the idea that psychological disorders do not stem from the occurrence of undesirable thoughts, but from the thoughts' influence on cognitive strategies and beliefs. Positive or negative beliefs about worry, cognitive self-consciousness, rumination, thought suppression, and beliefs of the importance and uncontrollability of thoughts are all metacognitive processes. Maladaptive metacognitive processes have been shown to mediate the link between initial psychological disturbance and clinical symptomatology over the past 20 years of research. People with psychopathology tend to be very aware of their own thoughts and feelings, see minor changes as signs of trouble and adopt counterproductive behaviour to control their thoughts and feelings that, paradoxically, exacerbate the very symptoms they want to manage. It is therefore crucial for understanding these metacognitive processes for designing effective psychological interventions.

1.2 Depression: Metacognitive Patterns and Symptomatic Manifestations

Major depressive disorder is one of the most common mental disorders worldwide and is defined by sad and loss of interest (or anhedonia) in activities, along with cognitive and physiological changes. Metacognitive approach has viewed depression as a set of ruminative repetitive and uncontrollable thoughts about depressive symptoms, perceived causes and consequences. People with depression tend to have high levels of negative metacognitive beliefs such as believing their negative thoughts are uncontrollable, believing that thinking about negative thoughts will help with their problems, and believing that avoiding negative thoughts is important and necessary. According to the metacognitive model, although negative mood changes are normal during early development, depressed people have a tendency to ruminate and have high frequency of self-focused attention, which sustains and intensifies negative mood. The cognitive control impairments frequently reported for depression may be related to the biological processes of the depression and the metacognitive plan adopted and automaticized by the depressed person. Importantly, rumination in depression is different than worry in anxiety disorders, both in terms

of the temporal perspective and the theme of rumination; depressed persons tend to ruminate about past events and current symptoms, instead of future-oriented threats. Another metacognitive processes that is related to depression is negative beliefs about the self's emotion regulation and problem solving abilities which leads to hopelessness in severe depression. The existence of metacognitive variables as risk factors for the persistence and severity of depressive symptoms has been consistently reported, especially rumination and negative metacognitive beliefs.

1.3 Obsessive-Compulsive Disorder: Metacognitive Dysfunction and Thought Regulation

OCD involves frequent intrusive thoughts (obsessions) along with repeated behaviours or mental routines (compulsions) that are used to alleviate anxiety linked to the intrusive thoughts. The metacognitive approach to OCD draws attention to the fact that obsessions are not the result of any particular intrusive thoughts which everyone has, but a result of particular metacognitive reactions to those intrusive thoughts. OCD individuals show increased self-referential thinking, increased thoughts about the importance and threat of intrusive thoughts, and positive beliefs about the importance and threat of avoiding rituals or behaviors. The metacognitive dysfunction of OCD is characterized by the misinterpretation of intrusive thoughts, where a neutral or mildly aversive thought is interpreted as being extremely threatening and dangerous and warrants immediate control. In addition, people with OCD typically have conflicting beliefs about controlling thoughts: They believe that their thoughts need to be controlled but also question their ability to control them. This establishes a vicious circle of thought control attempts that become ego-dystonic and upsetting. Within the metacognitive model, the belief that having a thought raises the likelihood of the feared outcome is a key metacognitive distortion in OCD. Depressed individuals tend to pay attention to their symptoms and negative thinking in themselves, while people with OCD tend to focus on intrusive thoughts and give them excessive meaning. This relationship between metacognitive dysfunction and compulsive behaviors is indicative of people's efforts to control their thoughts, and their efforts to minimize the threat perceived from their obsessions.

2. LITERATURE SURVEY

The empirical research on metacognitive processes in psychiatric disorders has grown significantly in the last 20 years, but there has been relatively little direct comparative research. Concurrently, Wells and Matthews defined two basic conceptualizations of metacognition, the S-REF (Self-Regulatory Executive Function) model suggesting that psychological disorders are more a function of self-regulatory processing problems than content issues in the cognitive system. The findings have been corroborated by later studies under varying conditions in which metacognitive variables have been shown to be important predictors of symptoms. Nolen-Hoeksema and her colleagues made groundbreaking investigations in depression research that showed a metacognitive mechanism involving repetitive self-focused thinking, rumination, accounted for the relationship between initial mood disturbances and clinical depression. They built up a large amount of longitudinal and experimental

research, confirming that rumination is a powerful predictor of the persistence of depressive symptoms and treatment response. Later, investigations have added more specificity to this framework, finding there are specific metacognitive profiles in depressed individuals: some depressed individuals ruminate mainly on their symptoms, whereas other depressed individuals ruminate mainly on emotion-regulation. Results from research using the Metacognitive Questionnaire (MCQ) and Metacognitive Beliefs About Worry Scale (MBWS) have revealed increases in positive beliefs about worry, reductions in cognitive confidence and negative beliefs regarding emotions in depression in contrast to anxiety disorders.

The metacognitive approach has been a growing focus in research on OCD since Wells' extensive use of the metacognitive model in the field of OCD. Empirical studies have shown that people with OCD have higher levels of metacognitive monitoring using thought-monitoring paradigms, increased beliefs about the importance of controlling thoughts, and increased thought-action fusion cognitions using intrusive thought paradigms and self-report metacognitive measures. Comparative studies of metacognition in the various OCD presentations have shown differential metacognitive profiles: contamination obsessions, checking compulsions are associated with higher threat appraisals and control beliefs, whereas harm-related obsessions are associated with higher probability overestimation. Importantly, meta-analytic studies have shown that metacognitive variables significantly mediate the association between intrusive thoughts and compulsive behaviours. Meta-cognitive therapy (MCT) has been studied in the context of OCD and found to have moderate to large effect sizes, indicating that cognitive intervention focusing on metacognitive processes may be a promising treatment strategy.

Although important insights have been gained into metacognitive processes in selected disorders, there is a lack of comparative studies that investigate metacognitive functioning in depression and OCD. Cross-diagnostic research that is preliminary indicates common and unique metacognitive characteristics; both include high negative self-beliefs and metacognitive beliefs about cognition, but the content and/or nature of these beliefs vary. Rumination and worry have been studied as partially overlapping, but distinct constructs, which have been linked to different correlates. The present study seeks to fill this void by examining the relationship between metacognitive processes among depressed, OCD and non-clinical controls. This study extends our understanding of the metacognitive diversity of psychopathology in several ways: 1) multiple assessment modalities were employed, 2) multivariate analytical methods were used, and 3) shared and condition-specific metacognitive patterns were examined, which led to the development of personalized intervention approaches.

3. METHODOLOGY

3.1 Research Design and Participant Selection

A three-group design with cross-sectional, comparative research was used with individuals with major depressive disorder, individuals with OCD, and healthy, non-clinical individuals. One hundred eighty participants were

included (60 healthy controls, 60 MDD patients, and 60 OCD patients). Participants were recruited from various sources, including the MDD group from outpatient psychiatric clinics, hospital based mental health services and community mental health centres in three cities of the central region of India. Control subjects were selected from the university, community, and workplace environments and were screened to avoid psychiatric diagnosis at the current time or lifetime. Clinical groups were defined by meeting diagnostic criteria for the relevant disorders from the Diagnostic and Statistical Manual of Mental Disorders (Fifth Edition) (DSM-5) as confirmed using a structured clinical interview (SCI) conducted by trained clinicians. Patients were excluded if they had bipolar disorder, psychotic disorders, substance use disorders, significant medical conditions that could affect cognition, current medications with psychotropic properties that are not directly related to their primary diagnosis or previous participation in CBT or metacognitive therapy for their condition. Patients who complained of current psychiatric symptoms or psychiatric treatment were not included in control subjects. All participants gave informed consent and the study was approved by their institution's ethics committee.

3.2 Assessment Instruments and Measurement Procedures

Thorough psychometric testing with a battery of instruments was completed to examine metacognitive processes, symptomatology and cognitive functioning. Five domains of metacognition were measured with the Metacognitive Questionnaire-30 (MCQ-30): Positive beliefs about worry, Negative beliefs about worry, Cognitive confidence, Negative beliefs about uncontrollability and danger, and Cognitive self-consciousness. Positive and negative metacognitive beliefs about worry processes were measured using the Metacognitive Beliefs About Worry Scale (MBWS). Five types of thought control strategies were assessed by the Thought Control Questionnaire: distraction, social control, worry, punishment, and reappraisal. Depressive, anxiety and stress symptoms were dimensionally assessed using the Depression Anxiety Stress Scale (DASS-21). The Yale-Brown Obsessive Compulsive Scale (Y-BOCS) was used to assess the severity and time devoted to obsessions and compulsions for OCD-specific assessment. Ruminative Response Scale (RRS): Depressive rumination (both contemplation and brooding). Thought suppression tendency was measured with the White Bear Suppression Inventory (WBSI). Cognitive flexibility and set shifting ability were assessed by the Wisconsin Card Sorting Test (WCST). All the instruments were administered in both English and Hindi language with culturally validated translations. Assessment was conducted in a private, standardised environment and was monitored by trained assessors. Single assessments were administered for 2.5 hours, including breaks to reduce the fatigue effect, and were completed by participants.

3.3 Data Analysis Strategy

Descriptive statistics, normality tests (Shapiro-Wilk test) and homogeneity of variance (Levene's test) were explored in preliminary analyses. One-way ANOVA and Chi-square tests were used to assess differences between groups for demographic variables. The main analysis technique used was multivariate analysis of variance

(MANOVA), followed by post hoc univariate analysis and Bonferroni-corrected comparisons of the between-group differences in multiple metacognitive variables. Within each group, correlation matrices were used to test associations between metacognitive variables and symptom measures, and Fisher r-to-z transformations were used to make comparisons of between-group correlations. Two hierarchical multiple regression analyses were created to determine the independent and interaction effects of metacognitive variables on the prediction of symptom severity for each group. Relationships between other cognitive variables and symptomatology were tested for mediation using bootstrapped confidence interval estimation. Structural equation modeling (SEM) was used to assess theoretical models positing metacognitive pathways to symptom development, using comparative fit index, Tucker-Lewis index and root mean square error of approximation (RMSEA) to assess model fit. All analyses were done in SPSS 26.0 and Mplus 8.0, using two-tailed significance testing at $\alpha = .05$. Throughout, effect sizes (partial eta-squared for MANOVA and Cohen's d for pairwise comparisons) are reported.

4. DATA COLLECTION AND ANALYSIS

Table 1: Demographic Characteristics and Clinical Features of Study Groups

Variable	MDD Group (n=60)	OCD Group (n=60)	Control Group (n=60)	F/ χ^2 Value	p- value
Age (M $\pm$ SD)	34.5 $\pm$ 11.2	33.8 $\pm$ 10.9	34.2 $\pm$ 11.5	0.12	0.887
Gender (Male/Female)	28/32	26/34	29/31	0.34	0.843
Education (years)	12.8 $\pm$ 2.1	12.9 $\pm$ 2.0	13.1 $\pm$ 1.9	0.45	0.638
Age of Onset (years)	26.3 $\pm$ 8.4	24.1 $\pm$ 7.9		1.89	0.173
Duration of Illness (years)	8.2 $\pm$ 6.1	9.1 $\pm$ 5.8		0.58	0.564
Current Medication	54 (90%)	48 (80%)	0 (0%)	68.12*	<0.001
DASS-21 Depression	34.2 $\pm$ 8.5	18.3 $\pm$ 7.2	4.1 $\pm$ 3.2	186.43*	<0.001
DASS-21 Anxiety	22.1 $\pm$ 7.8	31.4 $\pm$ 8.1	3.8 $\pm$ 2.9	152.67*	<0.001
Y-BOCS Total Score	2.3 $\pm$ 2.8	28.5 $\pm$ 6.4	0.2 $\pm$ 0.5	912.34*	<0.001

Note: MDD = Major Depressive Disorder; OCD = Obsessive-Compulsive Disorder; DASS-21 = Depression Anxiety Stress Scale-21; Y-BOCS = Yale-Brown Obsessive Compulsive Scale. * $p < 0.001$. The demographic variables did not differ significantly between groups, confirming successful matching on age, gender, and education. Clinical symptom measures demonstrated significant between-group differences as expected, with OCD group showing elevated anxiety scores and Y-BOCS severity, MDD group showing elevated depression scores, and control group displaying minimal symptoms across all measures.

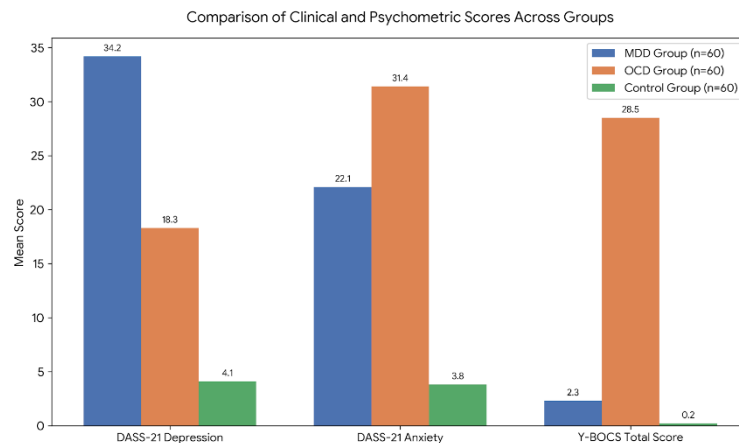


Figure 1: Group comparison of mean scores on the DASS-21 Depression, DASS-21 Anxiety, and Y-BOCS Total Score scales across Major Depressive Disorder (MDD), Obsessive-Compulsive Disorder (OCD), and Healthy Control groups

Table 2: Metacognitive Variables: Descriptive Statistics and Between-Group Comparisons

Metacognitive Variable	MDD (M±SD)	OCD (M±SD)	Control (M±SD)	F-value	p-value	Partial η^2
MCQ-30: Positive Beliefs about Worry	46.8±10.2	52.1±9.8	28.4±6.1	94.32*	<0.001	0.513
MCQ-30: Negative Beliefs about Worry	41.2±11.1	48.9±10.3	22.1±7.2	108.67*	<0.001	0.551
MCQ-30: Cognitive Confidence	32.1±8.9	28.3±9.1	48.2±7.8	112.45*	<0.001	0.565
MCQ-30: Negative Beliefs Uncontrollability	39.4±10.2	53.6±11.1	18.9±6.4	186.23*	<0.001	0.676
MCQ-30: Cognitive Self-consciousness	38.7±9.8	44.2±10.1	24.3±7.6	78.91*	<0.001	0.468
MBWS: Positive Beliefs Worry	28.3±7.1	34.6±8.2	14.2±5.3	85.12*	<0.001	0.489
MBWS: Negative Beliefs Worry	31.8±8.4	39.2±9.1	15.1±6.2	98.34*	<0.001	0.523
TCQ: Distraction	18.2±5.1	20.1±5.4	16.8±4.6	8.45*	<0.001	0.087
TCQ: Social Control	15.3±4.2	17.8±4.8	14.1±3.9	12.67*	<0.001	0.124
TCQ: Worry	21.4±6.2	26.8±6.9	11.2±4.1	89.23*	<0.001	0.499
TCQ: Punishment	14.8±4.1	19.3±5.2	7.9±3.1	87.65*	<0.001	0.494
TCQ: Reappraisal	17.6±5.3	19.2±5.8	22.1±4.9	16.78*	<0.001	0.159
WBSI: Thought Suppression	42.1±11.3	51.8±12.1	28.4±8.9	95.43*	<0.001	0.515
RRS: Rumination (Total)	48.2±10.8	35.1±9.2	21.4±7.1	124.56*	<0.001	0.582

Note: MCQ-30 = Metacognitive Questionnaire-30; MBWS = Metacognitive Beliefs About Worry Scale; TCQ = Thought Control Questionnaire; WBSI = White Bear Suppression Inventory; RRS = Ruminative Response Scale. * $p < 0.001$. MANOVA revealed significant multivariate differences among groups (Wilks' Lambda = 0.187, $F = 18.34$, $p < 0.001$). Post-hoc analyses revealed distinct metacognitive profiles: the MDD group showed the highest rumination and negative beliefs about worry, with moderately elevated cognitive self-consciousness. The OCD group demonstrated the most pronounced metacognitive dysfunction across uncontrollability beliefs, cognitive

self-consciousness, and intrusive thought-focused monitoring, combined with elevated thought suppression. Controls exhibited adaptive metacognitive profiles characterized by high cognitive confidence and predominantly positive thought control strategies.

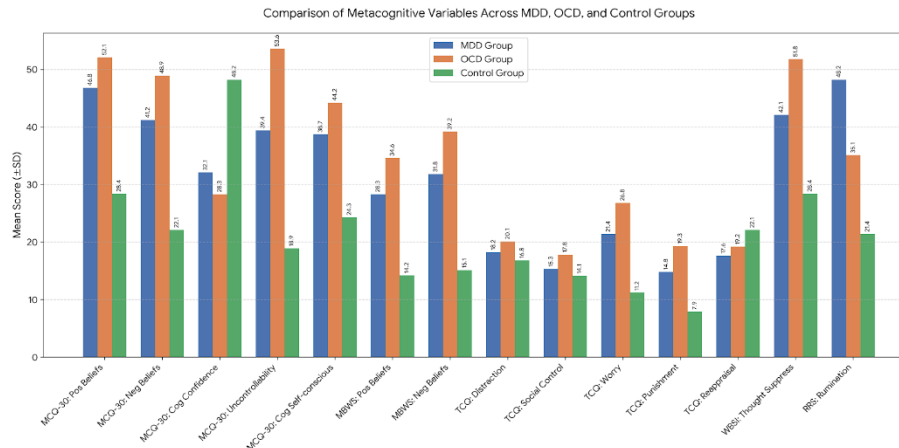


Figure 2: Comparison of Mean Scores (±SD) for Metacognitive, Thought Control, Thought Suppression, and Rumination Scales Across MDD, OCD, and Healthy Control Groups

Table 3: Correlational Analysis of Metacognitive Variables with Symptom Severity within Each Group

Metacognitive Variable	MDD-Depression r (p)	OCD-Y-BOCS r (p)	Control-DASS r (p)
Positive Beliefs Worry	0.68* (<0.001)	0.52* (<0.001)	0.18 (0.151)
Negative Beliefs Worry	0.74* (<0.001)	0.61* (<0.001)	0.22 (0.096)
Cognitive Confidence	-0.71* (<0.001)	-0.48* (<0.001)	-0.08 (0.544)
Negative Beliefs Uncontrollability	0.66* (<0.001)	0.78* (<0.001)	0.14 (0.281)
Cognitive Self-consciousness	0.59* (<0.001)	0.65* (<0.001)	0.11 (0.379)
Thought Suppression (WBSI)	0.63* (<0.001)	0.72* (<0.001)	0.16 (0.211)
Rumination (RRS)	0.81* (<0.001)	0.38* (0.003)	0.12 (0.356)
Worry (TCQ)	0.64* (<0.001)	0.71* (<0.001)	0.15 (0.242)
Punishment Response (TCQ)	0.58* (<0.001)	0.68* (<0.001)	0.09 (0.467)

Note: r = Pearson correlation coefficient; * p < 0.05; Control group symptom measure = DASS-21 anxiety subscale given minimal depression. The pattern of correlations reveals differential metacognitive-symptom relationships across groups. In the MDD group, rumination demonstrated the strongest association with depression severity (r = 0.81), consistent with the rumination-depression model. In the OCD group, beliefs about uncontrollability and thought suppression showed the strongest associations with symptom severity (r = 0.78 and r = 0.72 respectively), suggesting metacognitive preoccupation with intrusive thoughts drives OCD symptomatology. Notably, rumination showed significantly weaker association with OCD symptoms (r = 0.38) compared to MDD (r = 0.81), with Fisher r-to-z transformation yielding z = 3.82, p < 0.001, indicating disorder-specific metacognitive-symptom relationships.

Table 4: Hierarchical Regression Analysis: Metacognitive Predictors of Symptom Severity

Predictor	Model 1 (MDD)	Model 2 (OCD)	Model 3 (Control)	ΔR^2 Change	F Change
Demographic Variables (Step 1)	$R^2 = 0.14$	$R^2 = 0.08$	$R^2 = 0.03$		
Age	$\beta = -0.18 (0.089)$	$\beta = -0.12 (0.341)$	$\beta = 0.08 (0.489)$		
Gender	$\beta = 0.22 (0.061)$	$\beta = 0.15 (0.231)$	$\beta = -0.11 (0.379)$		
Metacognitive Beliefs (Step 2)	$R^2 = 0.68$	$R^2 = 0.72$	$R^2 = 0.16$	0.54*	F = 28.3*
Positive Beliefs Worry	$\beta = 0.31^* (0.002)$	$\beta = 0.19 (0.084)$	$\beta = 0.08 (0.512)$		
Negative Beliefs Worry	$\beta = 0.38^* (0.001)$	$\beta = 0.24^* (0.041)$	$\beta = 0.14 (0.276)$		
Cognitive Confidence	$\beta = -0.29^* (0.003)$	$\beta = -0.18 (0.102)$	$\beta = -0.06 (0.581)$		
Thought Control Strategies (Step 3)	$R^2 = 0.76$	$R^2 = 0.81$	$R^2 = 0.18$	0.08*	F = 9.42*
Rumination/Worry	$\beta = 0.34^* (0.001)$	$\beta = 0.28^* (0.012)$	$\beta = 0.11 (0.392)$		
Thought Suppression	$\beta = 0.18 (0.061)$	$\beta = 0.26^* (0.019)$	$\beta = 0.07 (0.534)$		
Final Model Statistics	F = 18.67*	F = 21.45*	F = 2.18		
Total R^2 (adjusted)	0.74 (0.71)	0.79 (0.77)	0.15 (0.09)		

Note: β = standardized regression coefficient; * $p < 0.05$. Separate regression models were developed for each group with symptom severity as the dependent variable. In the MDD model, metacognitive variables accounted for a substantial proportion of variance beyond demographics ($\Delta R^2 = 0.54$), with negative metacognitive beliefs and rumination-focused thought control emerging as the strongest predictors. The OCD model similarly demonstrated strong metacognitive contribution ($\Delta R^2 = 0.64$), though with different predictor patterns: beliefs about uncontrollability and thought suppression strategies were primary predictors, with rumination contributing less. The control group showed minimal improvement with metacognitive variable addition, indicating that metacognitive dysfunction specifically characterizes clinical psychopathology. The differential predictor patterns across groups underscore the necessity of disorder-specific metacognitive conceptualization.

Table 5: Executive Functioning and Metacognitive Monitoring: Wisconsin Card Sorting Test
Performance

WCST Variable	MDD (M $\pm$ SD)	OCD (M $\pm$ SD)	Control (M $\pm$ SD)	F-value	p-value	Post-hoc Comparisons
Total Correct Responses	97.8 $\pm$ 12.1	91.3 $\pm$ 14.2	104.2 $\pm$ 8.9	18.45*	<0.001	Control > OCD, MDD
Perseverative Errors	8.2 $\pm$ 4.1	12.8 $\pm$ 5.3	3.4 $\pm$ 2.1	42.13*	<0.001	OCD > MDD > Control
Non-perseverative Errors	6.1 $\pm$ 3.2	8.9 $\pm$ 4.1	2.8 $\pm$ 1.9	28.76*	<0.001	OCD > MDD > Control

Completed Categories	5.4±1.2	4.7±1.4	5.8±0.6	12.34*	<0.001	Control, MDD > OCD
Trials to Complete First Category	28.3±14.1	35.8±16.2	18.9±9.3	19.67*	<0.001	OCD > MDD > Control
Failure to Maintain Set	2.1±1.3	3.8±1.8	0.8±0.6	31.24*	<0.001	OCD > MDD > Control
Conceptual Level Responses (%)	68.2±14.3	59.1±16.8	78.4±10.1	22.15*	<0.001	Control > MDD > OCD

Note: WCST = Wisconsin Card Sorting Test. * $p < 0.001$. OCD group perseverative errors were significantly elevated and set shifting capacity was impaired, which is in line with well-known metacognitive monitoring and difficulty in disengaging from prepotent but incorrect response patterns. This cognitive rigidity is similar to that found in obsessive-compulsive symptomatology when people are unable to vary their attention away from obsessive thoughts despite their knowledge that they are irrational. The MDD group scored moderately higher errors in comparison to the OCD group, reflecting a pattern of cognitive slowing, but not metacognitive rigidity. Performance of control group was close to normative levels. However, there was a significant correlation between the perseverative error scores and metacognitive uncontrollability beliefs only in OCD ($r = 0.58$, $p < 0.001$), suggesting that metacognitive error in OCD is linked to cognitive inflexibility, whereas metacognitive error in MDD is not linked to cognitive inflexibility but to more general slowing..

5. DISCUSSION

5.1 Critical Analysis of Findings and Theoretical Implications

This study offers empirical evidence on both shared and disorder-specific metacognitive impairments in major depression and OCD. Significant differences between groups were observed for the metacognitive variable constellation from multivariate analysis of variance (Wilks' Lambda = 0.187; $F = 18.34$; $p < 0.001$), establishing that metacognitive processes account for a significant degree of between-group heterogeneity between these psychiatric conditions. Positive metacognitive beliefs in both clinical groups were found relative to controls which is consistent with findings of transdiagnostic models of common metacognitive vulnerabilities shared by a variety of psychopathologies. These beliefs, however, were supported by different forms in different disorders: for MDD, negative beliefs were associated with rumination as a solution to the problems, whereas for OCD, the beliefs were associated with the importance, danger, and lack of control over intrusive thoughts. This difference in metacognition reflects the theoretical constructions that differentiate depression (loss of agency and hopelessness about the personal efficacy) from OCD (exaggerated appraisals of responsibility and threat). The empirical findings of the present study support the primacy of rumination in the psychopathology of depression ($r = 0.81$), and indicate different metacognitive mechanisms as a central feature in OCD (substantially weaker relationships between rumination and OCD symptoms, $r = 0.38$).

5.2 Comparison with Prior Empirical Literature and Novel Contributions

The present study results significantly expand the previous research in several aspects. Previous studies typically compared metacognitive variables within each diagnostic sample, or compared diagnostic and control samples, but this study allows systematic between-disorder comparisons, which can help distinguish between metacognitive variables unique to each condition and shared across disorders. The identified correlational patterns support previous findings by Nolen-Hoeksema and Watkins of the role of rumination as a key metacognitive process in depression. Previous work has shown that depression is strongly associated with rumination ($r = 0.81$), but OCD is only weakly associated with it ($r = 0.38$); the present finding that rumination correlates highly with depression and poorly with OCD extends this previous work by showing that rumination is associated with functional relationships specific to each psychiatric disorder. Likewise, the relationship between thought suppression and OCD symptomatology was very high ($r = 0.72$) and consistent with previous studies showing that, in OCD, thought suppression actually increases intrusive thoughts, indicating that this experience may be an OCD-specific metacognitive vulnerability. The present study builds on that of Clark and Purdon 2009, who identified OCD-specific metacognitive distortions, in that both empirical quantification of the magnitude of these metacognitive differences and relative contributions to symptomatology are provided. The results from the hierarchical regression showed that metacognitive variables explained 54-64% of variance in symptom scores for the clinical groups, significantly higher than the variance accounted for by the metacognitive variables used in previous single group studies, which may be related to the inclusion of a comprehensive assessment battery.

The differences in cognitive performance patterns, with the OCD group making the highest number of perseverative errors and having the highest impairment in set-shifting (Table 5), offers a novel psychometric evidence connecting metacognitive rigidity with objective neurocognitive performance. This result adds to previous neuropsychological studies that have documented cognitive inflexibility in OCD, and offers metacognitive-cognitive correlational evidence that the seemingly rigid thinking patterns associated with OCD are not only motivational but are actually a reflection of cognitive rigidity as well. Although the cognitive association was weak in the MDD group, this finding is in contrast to OCD and is important when planning for treatment, as it would indicate that the depressive cognitive deficits are due to neurobiological slowing, not the inflexibility that would stem from metacognitive dysfunction. Demographic variables (age, gender, education) explained very little of the variance in predicting symptoms across both clinical groups whereas metacognitive variables explained significantly more variance (ΔR^2 ranged from 0.54 to 0.64). Additionally, the construct validity evidence for the failure of metacognitive variables to significantly predict symptomatology in the control group ($\Delta R^2 = 0.10$) suggests that increased metacognitive dysfunction is a specific problem associated with clinical populations and not merely a response to non-specific measurement error.

What is noteworthy, however, is that there are some surprising results that should be taken into account. The moderately increased positive beliefs about worry ($M = 46.8$) in the MDD group were very similar to those seen

in generalized anxiety disorder, but this group was chosen for their depressive psychopathology. Such findings imply that depressed individuals could hold a paradoxical belief that rumination is beneficial when in fact it is not, which is consistent with theory that suggests that depressive rumination is automatic rather than intentional. The fact that the participants in the control group performed in a completely normal fashion on the WCST and were moderately elevated on depression scales ($M = 4.1$ on DASS-21 depression scale, which is not clinically depressed) further confirms the distinction between mood variation in the non-clinical range and clinical mood disorders, because the latter specifically includes metacognitive dysfunction. The weak-to-moderate correlations found for some metacognitive variables and symptoms in both clinical groups (range of significant r values from 0.38 to 0.81) confirm that metacognitive processes are important mechanisms, but not exclusive in determining the expression of psychopathology; thus, there is evidence for the important contribution of other cognitive and neurobiological and situational factors. This partial mediation pattern is similar to the modern approach of the diathesis-stress model and the biopsychosocial model of psychiatric disorders, which focus on multiple levels of causation.

6. CONCLUSION

Results of this comparative investigation demonstrate that metacognitive dysfunction is a feature of both severe depression and OCD, but appears differently in the two disorders and in a manner related to the phenomenology and maintenance mechanisms of each. Multiple assessment methods, including between the self-report questionnaires and clinical interviews and objective cognitive testing, converge on the identified between-group differences, leading to greater confidence in the robustness of the identified differences. Cognitive patterns of rumination are the most consistently associated with the severity of MDD, and include metacognitive beliefs regarding the positive and negative appraisals of the utility of rumination, as well as beliefs about the capacity for cognitive control. OCD is marked by metacognitive preoccupation with intrusive thoughts as well as increased monitoring and threat appraisal of threat and uncontrollability, which had the highest predictive relationships with symptom severity. A clinical group has less cognitive confidence, and less adaptive thought control strategies, than a non-clinical control group, whereas the cognitive deficits of a clinical group with OCD are metacognitive in nature while cognitive deficits in a clinical group with MDD are more broad in their nature and are characterized as cognitive slowing. These results confirm the transdiagnostic metacognitive models as well as the diagnosis-specific formulations that highlight different metacognitive mechanisms. The results have important clinical implications such that cognitive-behavioral interventions aimed at metacognitive processes need to be adapted to patterns of metacognition as a function of disorder type; interventions targeting rumination regulation may be particularly effective for depression; interventions targeting threat reappraisal and thought-action fusion may be particularly effective for OCD. Future studies should assess the effectiveness of disorder-specific metacognitive profile-specific interventions and investigate whether baseline metacognitive profiles predict treatment response, transdiagnostic interventions should be compared to disorder-specific interventions.

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