DOI: 10.14744/DAJPNS.2026.00335
Dusunen Adam J Psychiatr Neurol Sci
2026;39:184-196

RESEARCH ARTICLE

A comparison of metacognitive beliefs and social cognition in autogenous and reactive subtypes of adolescent obsessive-compulsive disorder

Omca Guney, Seher Atis Cevik, Demet Sertel, Hale Aybars

Basaksehir Cam and Sakura City Hospital, Department of Child and Adolescent Psychiatry, Istanbul, Turkiye

ABSTRACT

Objective: Obsessive-compulsive disorder (OCD) is clinically heterogeneous, and the autogenous–reactive distinction may help characterize this heterogeneity. This study compared adolescents with reactive OCD, autogenous OCD, and healthy controls in terms of clinical characteristics, metacognitive beliefs, and social cognition, and examined associations between metacognitive beliefs and social cognition within OCD subtypes.

Method: This cross-sectional case-control study included 102 adolescents: 33 with reactive OCD, 31 with autogenous OCD, and 38 healthy controls. Diagnoses were confirmed using the Schedule for Affective Disorders and Schizophrenia for School-Age Children–Present and Lifetime Version (K-SADS-PL). OCD severity, metacognitive beliefs, and social cognition were assessed using the Children's Yale-Brown Obsessive-Compulsive Scale (CY-BOCS), the Metacognitions Questionnaire for Children and Adolescents, the Reading the Mind in the Eyes Test, and the Faux Pas Test. Group comparisons and correlation analyses were performed.

Results: The reactive and autogenous OCD groups differed primarily in symptom content, with cleaning and checking symptoms more common in the reactive group and religious and sexual obsessions more common in the autogenous group. The OCD subtypes did not differ in overall OCD severity or global functioning. After correction for multiple comparisons, metacognitive belief domains differed across groups; however, post hoc analyses revealed no significant differences between the two OCD subtypes. No significant group differences were observed in social cognition measures. Correlation analyses suggested selective associations between metacognitive beliefs and social understanding, particularly in the autogenous group.

Conclusion: In adolescent OCD, the autogenous–reactive distinction appears to reflect differences in symptom content rather than distinct metacognitive or social cognitive profiles. Larger longitudinal studies are needed to clarify subtype-related cognitive heterogeneity.

Keywords: Obsessive-compulsive disorder, adolescent, metacognition, social cognition, theory of mind

INTRODUCTION

Obsessive-compulsive disorder (OCD) is a heterogeneous disorder with respect to symptom content and clinical presentation (1). One of the most widely used approaches to characterizing this heterogeneity is the classification of obsessions into autogenous and reactive subtypes (2). According to

How to cite this article: Guney O, Atis Cevik S, Sertel D, Aybars H. A comparison of metacognitive beliefs and social cognition in autogenous and reactive subtypes of adolescent obsessive-compulsive disorder. Dusunen Adam J Psychiatr Neurol Sci 2026;39:184-196.

Correspondence: Omca Guney, Basaksehir Cam and Sakura City Hospital, Department of Child and Adolescent Psychiatry, Istanbul, Turkiye
E-mail: omcaguney@gmail.com

Received: May 05, 2026; **Revised:** July 30, 2026; **Accepted:** August 05, 2026

the model proposed by Lee and Kwon, autogenous obsessions consist of ego-dystonic thoughts that typically arise without an identifiable external trigger and often involve aggressive, sexual, or moral/religious themes. In contrast, reactive obsessions are centered on fears elicited by external stimuli, such as contamination, making mistakes, causing harm, or disruptions of symmetry, and are frequently accompanied by observable compulsions such as washing, checking, or ordering (2). Previous studies have shown that these two obsession types differ not only in content but also in their triggering patterns, subjective experiences, and coping strategies (3, 4).

Metacognition refers to higher-order cognitive processes through which individuals monitor, evaluate, and regulate their own thinking (5, 6). In OCD, it is widely accepted that not only the content of obsessive thoughts but also the interpretation of these thoughts as dangerous, meaningful, or requiring control plays a central role in maintaining the disorder. Dysfunctional metacognitive beliefs are more pronounced in individuals with OCD than in healthy controls and are associated with symptom severity (7, 8). Studies in pediatric populations have similarly demonstrated associations between maladaptive metacognitive beliefs and OCD (5, 9, 10). However, it remains unclear whether these associations differ between the autogenous and reactive subtypes in children and adolescents.

Social cognition encompasses the cognitive processes that enable individuals to understand their own and others' emotions, intentions, and mental states within social contexts. In OCD, impairments have been reported particularly in theory of mind, cognitive empathy, and certain aspects of emotion recognition (11, 12). Although metacognition and social cognition are conceptually related, they represent distinct constructs: metacognition concerns the monitoring and evaluation of one's own mental processes, whereas social cognition involves understanding the mental states of others and navigating interpersonal interactions (13). Associations between these domains have been documented across psychiatric disorders (13). However, studies directly examining the relationship between metacognition and social cognition in individuals with OCD remain limited. Existing evidence suggests that dysfunctional metacognitive beliefs in OCD may contribute to psychosocial impairment and may partially overlap with social cognitive processes, although the nature of this relationship remains unclear (14, 15). Consequently, metacognition and social cognition may be viewed as distinct yet potentially interacting higher-order cognitive domains. In OCD, maladaptive beliefs about intrusive thoughts, responsibility, threat, and cognitive control may influence not only how individuals interpret their own mental experiences but also how they perceive and interpret socially relevant situations. Nevertheless, studies investigating metacognitive beliefs and social cognition simultaneously within the autogenous and reactive OCD subtypes are scarce, particularly in adolescent populations. Examining these relationships during adolescence may provide further insight into the cognitive mechanisms underlying OCD.

Accordingly, examining autogenous and reactive obsession patterns alongside metacognitive beliefs and social cognition may improve our understanding of the cognitive heterogeneity of adolescent OCD. However, studies integrating these domains within a single framework remain limited, especially in adolescent samples. In the present study, adolescents with autogenous OCD, reactive OCD, and healthy controls were compared with respect to metacognitive beliefs and social cognition. In addition, correlations between metacognitive belief domains and measures of social cognition were examined separately within the autogenous and reactive OCD groups to determine whether these constructs were independent or selectively associated within each subtype. Based on previous findings suggesting that autogenous obsessions are more internally generated, ego-dystonic, and more closely linked to the appraisal of intrusive thoughts, we hypothesized that subtype-related differences would be more evident in metacognitive beliefs. Analyses of social cognition and its associations with metacognitive beliefs were conducted to explore whether subtype-related heterogeneity also extends to the interpretation of emotions, intentions, and socially relevant interpersonal situations. Through this integrated approach, the study aimed to clarify the relationships among OCD subtypes, metacognitive beliefs, and social cognition in adolescents with OCD.

METHODS

Study Design and Sample

This cross-sectional, comparative case-control study was designed to compare the autogenous and reactive subtypes of adolescent OCD in terms of metacognitive beliefs and social cognition. The study

was conducted at the Child and Adolescent Psychiatry Outpatient Clinic of Basaksehir Cam and Sakura City Hospital, Istanbul, Turkiye. The sample comprised 102 adolescents: 33 with reactive OCD, 31 with autogenous OCD, and 38 healthy controls.

All participants, including adolescents with OCD and healthy controls, were evaluated using the Schedule for Affective Disorders and Schizophrenia for School-Age Children–Present and Lifetime Version (K-SADS-PL) (16). The OCD group included adolescents who were evaluated by a child and adolescent psychiatrist and whose diagnosis of OCD was confirmed using the K-SADS-PL. The healthy control group consisted of volunteers with sociodemographic characteristics comparable to those of the OCD group. Healthy controls were also screened using the K-SADS-PL, and those who met the criteria for any psychiatric disorder were excluded.

Adolescents with sufficient cognitive capacity to complete the assessment instruments were eligible for inclusion. Participants with a psychotic disorder, bipolar disorder, neurological disease, or any other clinical condition that could interfere with the assessment process were excluded.

The distinction between the autogenous and reactive OCD subtypes was based on the predominant obsession pattern, in accordance with Lee and Kwon's classification model, which considers the mode of emergence and content of obsessions. Subtype assignment was made by the evaluating clinicians during the clinical assessment. Participants with predominantly aggressive, sexual, religious, magical, or somatic obsessions were classified as having autogenous OCD, whereas those with predominantly cleaning, checking, repetitive, counting, or symmetry/ordering symptoms were classified as having reactive OCD.

In participants with multiple symptom dimensions, subtype classification was based on the obsessive-compulsive symptom pattern that was most prominent in the clinical presentation, caused the greatest subjective distress, and had the greatest effect on daily functioning. Accordingly, adolescents with both autogenous and reactive symptom features were assigned to the subtype that best represented their predominant clinical presentation. A mixed symptom profile, defined as the presence of at least one autogenous and one reactive symptom dimension, was observed in 40 participants with OCD (62.5%). In these cases, subtype assignment was made based on the predominant symptom pattern identified during the clinical assessment.

Data Collection Instruments

A sociodemographic and clinical data form developed by the researchers was completed for all participants. The form recorded age, sex, educational level, clinical diagnosis, illness duration, psychiatric comorbidities, medication use, and other relevant clinical characteristics.

Children's Yale-Brown Obsessive Compulsive Scale (CY-BOCS)

OCD symptom severity was assessed using the Children's Yale-Brown Obsessive Compulsive Scale. The CY-BOCS is a clinician-administered, semistructured interview used to assess the type and severity of obsessive-compulsive symptoms in children and adolescents (17). The assessment is based on information obtained from both the child and the parent, together with the clinician's judgment. Current obsessions and compulsions are first identified, after which symptom severity is rated according to the time occupied by symptoms, functional interference, symptom-related distress, resistance, and degree of control. The scale yields separate obsession and compulsion severity scores and a total severity score calculated as the sum of the two subscale scores. Total scores range from 0 to 40, with higher scores indicating greater OCD severity. The interrater reliability and clinical utility of the Turkish version have been demonstrated by Yücelen et al. (18).

Metacognitions Questionnaire for Children and Adolescents

Metacognitive beliefs were assessed using the Metacognitions Questionnaire for Children and Adolescents. The questionnaire was developed by Bacow et al. to assess metacognitive beliefs and appraisals related to thought processes in children and adolescents (19). It was adapted from the adolescent measure developed by Cartwright-Hatton et al. and modified for use in child and adolescent populations. The questionnaire consists of 24 items across four subdomains: cognitive monitoring, positive meta-worry, negative meta-worry, and superstitious, punishment, and responsibility beliefs. Each item is rated on a 4-point Likert scale ranging from 1 ("strongly disagree") to 4 ("strongly agree"). Total scores range from 24 to 96, with higher scores indicating greater maladaptive metacognitive activity. The total score was used to assess metacognitive beliefs. The Turkish standardization, validity, and reliability study was conducted by Irak (20).

Reading the Mind in the Eyes Test (RMET)

Social cognition was assessed using the Reading the Mind in the Eyes Test (RMET). The RMET is a performance-based measure of social cognition that evaluates the ability to infer another person's mental or emotional state from photographs showing only the eye region of the face. It assesses theory of mind and emotion recognition abilities. For each item, participants select the mental-state descriptor that best corresponds to the eye-region image presented. Correct responses are awarded one point, and higher total scores indicate better theory of mind and social cognition performance (21). The RMET total score was used in the analyses. The Turkish reliability study was conducted by Yıldırım et al. (22) and the psychometric properties of the Turkish child and adult forms were examined by Girli (23).

Faux Pas Test

An additional dimension of social cognition was assessed using the Faux Pas Test. This performance-based measure evaluates the ability to detect socially inappropriate, hurtful, or tactless remarks and to understand the underlying intentions, emotions, and false beliefs. Participants listen to or read brief social stories and then answer questions about whether a faux pas occurred, who made it, why it was inappropriate, and what the characters thought or felt (24). The detection, identification, understanding, and false-belief subdomains, as well as the total Faux Pas score, were evaluated. Higher scores indicate better social cognition and theory of mind performance. The Turkish adaptation and psychometric properties of the child version of the Faux Pas Recognition Test were examined by Şahin et al. in a sample of children and adolescents aged 9–17 years (25).

Children's Global Assessment Scale (CGAS)

Overall functioning was assessed using the Children's Global Assessment Scale. The CGAS is a clinician-rated, unidimensional scale developed to evaluate overall functioning in children and adolescents. It provides a global assessment of psychological, social, and academic functioning. Scores range from 1 to 100, with higher scores indicating better overall functioning and lower scores indicating greater functional impairment (26). The CGAS score was used to assess participants' overall functioning.

Procedure

Clinical and sociodemographic data were obtained through clinical interviews and medical records. All assessment instruments were administered under standardized conditions. In the OCD group, obsession content was reviewed in detail, and each participant was assigned to the autogenous or reactive subtype according to the predominant symptom pattern. Healthy controls were screened to confirm the absence of any current or lifetime psychiatric disorder.

Ethical Approval

The study was approved by the Clinical Research Ethics Committee of Basaksehir Cam and Sakura City Hospital on April 8, 2025 (approval no. KAEK-11/26.03.2025.116). The study was conducted in accordance with the principles of the Declaration of Helsinki. Written informed consent and assent were obtained from all participants and their parents.

Statistical Analysis

Statistical analyses were performed using jamovi version 2.6 (27), with a two-tailed significance level of $p<0.05$. The distributions of continuous variables were assessed using the Shapiro–Wilk test. Continuous variables are presented as the mean ± standard deviation or median [25^{th}–75^{th} percentile], according to their distribution, whereas categorical variables are summarized as frequencies and percentages.

Sociodemographic characteristics and parental psychiatric history were compared among the reactive OCD, autogenous OCD, and healthy control groups. Welch's analysis of variance (ANOVA) was used for normally distributed continuous variables when parametric assumptions were met, whereas the Kruskal–Wallis test was used for nonnormally distributed variables. Categorical variables were analyzed using the chi-square test or Fisher's exact test, as appropriate. These baseline comparisons were used to characterize the study groups and were interpreted descriptively.

Clinical characteristics and treatment-related variables were evaluated only among participants with OCD because these variables were not applicable to healthy controls. The reactive and autogenous OCD groups were compared in terms of the duration of psychiatric symptoms, time from symptom onset to diagnosis, duration of medication use, psychotropic medication use, and history of cognitive behavioral therapy. Continuous clinical variables were analyzed using the Mann–Whitney U test because they did not meet the assumption of normality. Categorical treatment-related variables were analyzed using the chi-square test or Fisher's exact test, as appropriate.

Table 1: Comparison of clinical, metacognitive, and social cognition measures among adolescents with reactive obsessive-compulsive disorder (OCD), autogenous OCD, and healthy controls

Variables	Reactive OCD (n=33)	Autogenous OCD (n=31)	HC (n=38)	p	FDR-adjusted p	Effect size
CGAS	55.0 [50.0–62.0]	52.0 [49.0–60.0]	75.5 [72.0–80.8]	**<0.001**[a]	**0.007**[a]	ε^2=0.695
Total CY-BOCS	21.3±6.24	19.4±7.02	–	0.33	0.429	d=0.29
Metacognitions Questionnaire for Children and Adolescents						
Metacognitive beliefs (total score)	62.0 [57.0–70.0]	67.0 [59.5–75.0]	61.0 [57.0–64.0]	**0.008**[b]	**0.029**[b]	ε^2=0.095
Positive meta-worry	11.0 [8.0–12.0]	12.0 [8.0–16.0]	11.0 [10.0–13.0]	0.411	0.445	ε^2=0.018
Negative meta-worry	18.0 [16.0–21.0]	20.0 [17.0–22.5]	15.0 [12.0–18.0]	**<0.001**[c]	**0.007**[c]	ε^2=0.141
Superstitious/responsibility-punishment beliefs	17.0 [12.0–21.0]	18.0 [16.0–21.0]	15.0 [11.3–17.8]	**0.009**[b]	**0.029**[b]	ε^2=0.092
Cognitive monitoring	18.0 [15.0–21.0]	18.0 [16.0–21.0]	17.0 [15.0–18.8]	0.076	0.197	ε^2=0.051
Theory of Mind (ToM)						
RMET	20.0 [19.0–21.0]	20.0 [18.0–22.0]	21.0 [19.0–22.0]	0.372	0.440	ε^2=0.020
Faux Pas total	37.0 [33.0–38.0]	36.0 [33.0–38.0]	37.0 [36.0–39.0]	0.106	0.197	ε^2=0.045
Faux Pas Detection	10.0 [9.0–10.0]	9.0 [8.5–10.0]	10.0 [9.0–10.0]	0.152	0.230	ε^2=0.038
Faux Pas Identification	10.0 [9.0–10.0]	9.0 [7.5–10.0]	10.0 [9.0–10.0]	0.102	0.197	ε^2=0.046
Faux Pas Understanding	10.0 [10.0–10.0]	10.0 [10.0–10.0]	10.0 [10.0–10.0]	0.973	0.973	ε^2=0.001
False-belief attribution	8.0 [6.0–9.0]	8.0 [7.0–9.0]	9.0 [7.8–10.0]	0.159	0.230	ε^2=0.037

Values are presented as median [25th–75th percentile], except for Total CY-BOCS, which is presented as mean ± standard deviation. OCD: Obsessive-compulsive disorder; HC: Healthy controls; CGAS: Children's Global Assessment Scale; CY-BOCS: Children's Yale-Brown Obsessive Compulsive Scale; RMET: Reading the Mind in the Eyes Test; ToM: Theory of mind. Three-group comparisons were performed using the Kruskal–Wallis test. Total CY-BOCS scores were compared only between the reactive and autogenous OCD groups. False discovery rate (FDR)-adjusted p values were calculated using the Benjamini–Hochberg procedure for all comparisons reported in this table. Effect sizes are reported as epsilon-squared (ε^2) for Kruskal–Wallis tests and Cohen's d for the CY-BOCS comparison. Post hoc comparisons were performed using the Dwass–Steel–Critchlow–Fligner test. Superscript letters indicate significant pairwise group differences. [a]HC > Reactive OCD ≈ Autogenous OCD; [b]Autogenous OCD > HC; Reactive OCD ≈ Autogenous OCD and Reactive OCD ≈ HC; [c]Reactive OCD ≈ Autogenous OCD > HC.

Global functioning, metacognitive beliefs, and social cognition measures were compared among the reactive OCD, autogenous OCD, and healthy control groups using the Kruskal–Wallis test. When an omnibus test was significant, post hoc pairwise comparisons were performed using the Dwass–Steel–Critchlow–Fligner test. The total CY-BOCS score was compared only between the reactive OCD and autogenous OCD groups because this measure was not applicable to healthy controls.

To control the risk of Type I error due to multiple testing, the Benjamini–Hochberg false discovery rate (FDR) procedure was applied to the comparisons reported in Table 1. Both unadjusted and FDR-adjusted p values are reported.

Associations between metacognitive beliefs and social cognition measures were examined separately in the reactive and autogenous OCD groups using Spearman's rank correlation analysis. Separate correlation matrices were constructed for each OCD subgroup.

Effect sizes were reported as eta-squared (η^2) for Welch's ANOVA, epsilon-squared (ε^2) for Kruskal–Wallis tests, Cramér's V for three-group categorical comparisons, rank-biserial correlation ($r_{r\beta}$) for Mann–Whitney U tests, Cohen's d for two-group parametric comparisons, and phi (φ) for two-group categorical comparisons.

A formal a priori power analysis was not conducted because the sample was determined by the number of eligible participants available during the study period. A sensitivity power analysis was therefore performed using G*Power to estimate the minimum detectable effect size for the available sample. For three-group comparisons with a total sample size of 102, α=0.05, and 80% power, the minimum detectable effect size was f=0.31, corresponding to $\eta^2 \approx 0.089$. For pairwise comparisons between the reactive and autogenous OCD groups, with sample sizes of n=33 and n=31, respectively, the minimum detectable effect size was approximately Cohen's d=0.71. These estimates indicate that the study was adequately powered to detect medium-to-large effects, whereas smaller effects may have remained undetected.

Table 2: Sociodemographic, parental psychiatric history, and clinical treatment characteristics of the study groups

Variables	Reactive OCD (n=33)	Autogenous OCD (n=31)	HC (n=38)	p	Effect size
Age, years	15.4±2.28	15.2±1.90	15.0±2.55	0.812	η^2=0.005
Male sex, n (%)	18 (54.5)	15 (48.4)	19 (50.0)	0.880	V=0.051
School grade	9.64±2.06	9.39±1.94	8.92±2.44	0.411	η^2=0.020
Grade repetition, n (%)	5 (15.2)	4 (12.9)	0 (0.0)	0.051	V=0.242
Maternal psychiatric diagnosis, n (%)	7 (21.2)	7 (22.6)	2 (5.3)	0.082	V=0.226
Maternal psychiatric treatment, n (%)	6 (18.2)	6 (19.4)	2 (5.3)	0.159	V=0.194
Paternal psychiatric diagnosis, n (%)	7 (21.2)	7 (22.6)	0 (0.0)	**0.008**	V=0.308
Paternal psychiatric treatment, n (%)	7 (21.2)	4 (12.9)	0 (0.0)	**0.014**	V=0.288
Clinical characteristics and treatment variables					
Duration of psychiatric complaints, months	41.42±17.53	34.26±21.16	—	0.165	$r_{r\beta}$=0.203
Time from symptom onset to diagnosis, months	21.13±18.85	19.30±17.92	—	0.707	$r_{r\beta}$=0.057
Duration of medication use, months	13.25±14.19	9.17±14.67	—	0.146	$r_{r\beta}$=0.215
Antipsychotic use, n (%)	15/32 (46.9)	8/30 (26.7)	—	0.103	φ=0.209
SSRI use, n (%)	28/32 (87.5)	22/30 (73.3)	—	0.163	φ=0.179
Other antidepressant use, n (%)	2/32 (6.3)	1/30 (3.3)	—	0.600	φ=0.068
Mood stabilizer use, n (%)	3/32 (9.4)	1/30 (3.3)	—	0.341	φ=0.123
Benzodiazepine use, n (%)	3/32 (9.4)	0/30 (0.0)	—	0.088	φ=0.218
Stimulant medication use, n (%)	2/32 (6.3)	1/30 (3.3)	—	0.593	φ=0.068
CBT, n (%)	11/33 (33.3)	7/30 (23.3)	—	0.388	φ=0.111

Values are presented as mean ± standard deviation or n (%). OCD: Obsessive-compulsive disorder; HC: Healthy controls; SSRI: Selective serotonin reuptake inhibitor; CBT: Cognitive behavioral therapy. Sociodemographic variables were compared among the reactive OCD, autogenous OCD, and healthy control groups. Clinical characteristics and treatment-related variables were compared only between the reactive OCD and autogenous OCD groups, as these variables were not applicable to healthy controls. Continuous sociodemographic variables were analyzed using Welch's ANOVA, whereas categorical sociodemographic variables were analyzed using the chi-square test or Fisher's exact test, as appropriate. Continuous clinical variables were analyzed using the Mann–Whitney U test, and categorical treatment-related variables were analyzed using the chi-square test or Fisher's exact test, as appropriate. Effect sizes are reported as eta-squared (η^2) for Welch's ANOVA, Cramér's V for three-group categorical comparisons, rank-biserial correlation ($r_{r\beta}$) for Mann–Whitney U tests, and phi (φ) for two-group categorical comparisons.

RESULTS

A total of 102 adolescents were included in the study: 33 with reactive OCD, 31 with autogenous OCD, and 38 healthy controls. The groups were comparable in age, sex distribution, and school grade. Grade repetition showed a borderline group difference among the groups but did not reach statistical significance. Maternal psychiatric diagnosis and treatment history did not differ significantly among the groups. Paternal psychiatric diagnosis and treatment history differed among the groups and were more common in the OCD groups than in healthy controls. These baseline comparisons were interpreted descriptively. The sociodemographic characteristics and parental psychiatric histories of the study groups are presented in Table 2.

Clinical and treatment-related variables were evaluated only among participants with OCD. The reactive and autogenous OCD groups did not differ significantly in the duration of psychiatric symptoms, time from symptom onset to diagnosis, duration of medication use, antipsychotic use, selective serotonin reuptake inhibitor (SSRI) use, use of other antidepressants, mood stabilizer use, benzodiazepine use, stimulant use, or history of cognitive behavioral therapy. The clinical and treatment-related characteristics of the OCD subgroups are presented in Table 2.

Psychiatric comorbidities were also compared between the reactive and autogenous OCD groups. The most common comorbidities in the OCD sample were specific phobia, generalized anxiety disorder, major depressive disorder, and attention-deficit/hyperactivity disorder (ADHD). Specific phobia was more common in the reactive OCD group, whereas generalized anxiety disorder was numerically more common in the autogenous OCD group, although this difference did not reach statistical significance. ADHD and other psychiatric comorbidities did not differ significantly between the two OCD subgroups. These findings are presented in Table 3.

Table 3: Psychiatric comorbidities in adolescents with reactive and autogenous obsessive-compulsive disorder (OCD)

Psychiatric comorbidity	Reactive OCD (n=33) n (%)	Autogenous OCD (n=31) n (%)	p	Effect size
Specific phobia	16 (48.5)	7 (22.6)	0.039	φ=0.270
Generalized anxiety disorder	8 (24.2)	14 (45.2)	0.114	φ=0.220
Major depressive disorder	12 (36.4)	7 (22.6)	0.280	φ=0.151
ADHD	10 (30.3)	8 (25.8)	0.784	φ=0.050
Social anxiety disorder	8 (24.2)	5 (16.1)	0.539	φ=0.101
Tic disorder	7 (21.2)	6 (19.4)	1.000	φ=0.023
Separation anxiety disorder	4 (12.1)	7 (22.6)	0.331	φ=0.139
Dissociative symptoms/disorder	8 (24.2)	2 (6.5)	0.083	φ=0.245
History of nonsuicidal self-injury (NSSI)	3 (9.1)	5 (16.1)	0.468	φ=0.106
Suicidality	5 (15.2)	2 (6.5)	0.428	φ=0.139
Eating disorder	4 (12.1)	2 (6.5)	0.673	φ=0.097
Oppositional defiant disorder	4 (12.1)	1 (3.2)	0.356	φ=0.166
Panic disorder	2 (6.1)	2 (6.5)	1.000	φ=0.008
Specific learning disorder	1 (3.0)	1 (3.2)	1.000	φ=0.006
History of hypomania/mania	0 (0.0)	1 (3.2)	0.484	φ=0.130

The distribution of obsession and compulsion symptom dimensions differed between the OCD subtypes. In the reactive OCD group, cleaning was the most frequently endorsed symptom dimension, followed by checking and counting. In the autogenous OCD group, religious symptoms were the most common, followed by checking, cleaning, and sexual symptoms. Aggressive and sexual symptoms were more prominent in the autogenous group, whereas cleaning symptoms were more characteristic of the reactive group. Hoarding and somatic symptoms were relatively uncommon in both OCD subgroups. The distribution of obsession and compulsion symptom dimensions in the reactive and autogenous OCD groups is shown in Figure 1.

Comparisons of clinical, metacognitive, and social cognition measures among the reactive OCD, autogenous OCD, and healthy control groups are summarized in Table 1. After Benjamini–Hochberg FDR correction, the overall pattern of findings remained unchanged. Significant group differences remained for CGAS scores, total metacognitive beliefs, negative meta-worry beliefs, and superstitious and responsibility/punishment beliefs. No social cognition measure differed significantly among the groups after FDR correction.

CGAS scores differed significantly among the groups, $\chi^2(2)=70.15$, $p<0.001$, FDR-adjusted $p=0.007$, $\varepsilon^2=0.695$. Post hoc comparisons indicated that healthy controls had significantly higher CGAS scores than both OCD groups, whereas the reactive and autogenous OCD groups did not differ significantly from each other.

Total metacognitive belief scores also differed significantly among the groups, $\chi^2(2)=9.56$, $p=0.008$, FDR-adjusted $p=0.029$, $\varepsilon^2=0.095$. Post hoc comparisons showed that the autogenous OCD group had higher total metacognitive belief scores than healthy controls, whereas the reactive OCD group did not differ significantly from either the autogenous OCD group or healthy controls. Negative meta-worry beliefs differed significantly among the groups, $\chi^2(2)=14.27$, $p<0.001$, FDR-adjusted $p=0.007$, $\varepsilon^2=0.141$. Both OCD groups had higher negative meta-worry belief scores than healthy controls, with no significant difference between the reactive and autogenous OCD groups. Superstitious and responsibility/punishment beliefs also differed significantly among the groups, $\chi^2(2)=9.32$, $p=0.009$, FDR-adjusted $p=0.029$, $\varepsilon^2=0.092$. Post hoc comparisons indicated that the autogenous OCD group scored higher than healthy controls, whereas the reactive OCD group did not differ significantly from either group.

No significant group differences were found in positive meta-worry beliefs, cognitive monitoring, RMET scores, Faux Pas Detection, Faux Pas Identification, Faux Pas Understanding, False Belief Attribution, or total Faux Pas scores. Total CY-BOCS scores did not differ significantly between the reactive and autogenous OCD groups.

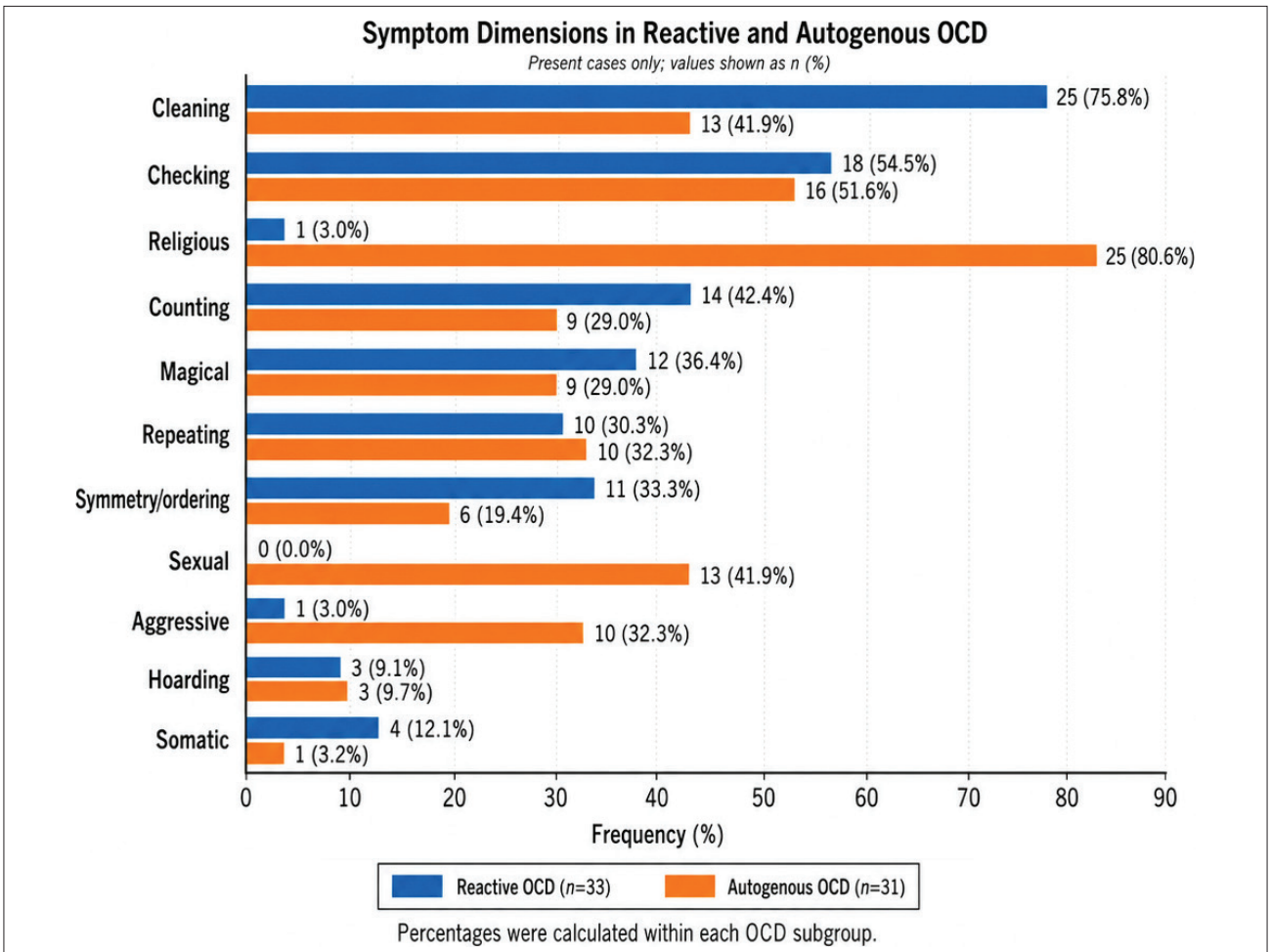

Figure 1. Distribution of obsession/compulsion symptom dimensions in the reactive and autogenous OCD groups. Bars represent the percentage of participants endorsing each symptom dimension within each OCD subgroup. Cleaning and checking symptoms were more frequent in the reactive OCD group, whereas religious and sexual symptoms were more frequent in the autogenous OCD group. Percentages were calculated within groups (reactive OCD, n=33; autogenous OCD, n=31).

In the reactive OCD group, total metacognitive belief scores were not significantly associated with RMET or Faux Pas measures. Significant correlations were observed primarily among the metacognitive subdomains and among the Faux Pas subcomponents. Negative meta-worry beliefs were positively correlated with superstitious and responsibility/punishment beliefs and with cognitive monitoring. Total metacognitive belief scores were positively correlated with negative meta-worry beliefs, superstitious and responsibility/punishment beliefs, and cognitive monitoring. Among the Faux Pas subcomponents, total Faux Pas scores were positively correlated with Faux Pas Detection, Faux Pas Identification, and False Belief Attribution. Faux Pas Detection and Faux Pas Identification scores were identical across participants in the reactive OCD group, resulting in a correlation coefficient of r=1.000 between these two subdomains. The data and scoring for these variables were rechecked, and the coefficient was retained because it reflected complete overlap between the two subdomain scores in this subgroup. The correlation matrix for the reactive OCD group is presented in Table 4.

In the autogenous OCD group, total metacognitive belief scores were positively correlated with Faux Pas Understanding. Negative meta-worry beliefs and superstitious and responsibility/punishment beliefs were also positively associated with Faux Pas Understanding. Significant correlations were additionally observed among the metacognitive subdomains and among the Faux Pas subcomponents. Total Faux Pas scores were positively correlated with Faux Pas Detection, Faux Pas Identification, and False Belief Attribution. Overall, associations between metacognitive domains and social cognition

Table 4: Correlation matrix for the reactive obsessive-compulsive disorder (OCD) group

No.	Variables	1	2	3	4	5	6	7	8	9	10	11
1	Positive meta-worry	—										
2	Negative meta-worry	-0.110	—									
3	Superstitious/responsibility-punishment beliefs	-0.068	**0.589*****	—								
4	Cognitive monitoring	0.142	**0.582*****	**0.386***	—							
5	Metacognitive beliefs (total)	0.227	**0.765*****	**0.777*****	**0.773*****	—						
6	RMET	0.223	-0.224	-0.107	-0.194	-0.058	—					
7	Faux pas detection	-0.061	0.124	0.084	-0.031	0.060	0.124	—				
8	Faux pas identification	-0.061	0.124	0.084	-0.031	0.060	0.124	**1.000*****	—			
9	Faux pas understanding	-0.045	-0.114	0.058	0.084	0.029	0.186	0.228	0.228	—		
10	False-belief attribution	0.279	-0.088	-0.028	-0.139	-0.012	0.142	-0.082	-0.082	-0.034	—	
11	Faux pas total	0.144	0.069	0.039	0.047	0.106	0.211	**0.655*****	**0.655*****	0.236	**0.598*****	—

Values are presented as Spearman's rank correlation coefficients. OCD: Obsessive-compulsive disorder; RMET: Reading the Mind in the Eyes Test. Faux Pas Detection and Faux Pas Identification scores were identical in the reactive OCD group, resulting in a correlation coefficient of r=1.000. The data and scoring were verified, and no data entry or scoring errors were identified. This value was therefore retained because it reflected complete overlap between the two subdomain scores in this subgroup. *p<0.05, **p<0.01, ***p<0.001.

Table 5: Correlation matrix for the autogenous obsessive-compulsive disorder (OCD) group

No.	Variables	1	2	3	4	5	6	7	8	9	10	11
1	Positive meta-worry	—										
2	Negative meta-worry	-0.102	—									
3	Superstitious/responsibility-punishment beliefs	-0.095	**0.772*****	—								
4	Cognitive monitoring	0.070	0.336	0.299	—							
5	Metacognitive beliefs (total)	**0.360***	**0.746*****	**0.755*****	**0.646*****	—						
6	RMET	-0.079	0.261	0.302	0.303	0.306	—					
7	Faux Pas Detection	0.200	0.019	0.021	0.009	0.114	0.017	—				
8	Faux Pas Identification	0.105	-0.011	-0.023	-0.050	0.034	0.105	**0.877*****	—			
9	Faux Pas Understanding	0.140	**0.367***	**0.407***	0.224	**0.464****	0.232	0.203	0.327	—		
10	False-belief attribution	0.025	-0.254	0.053	-0.058	-0.107	0.076	-0.022	0.056	-0.049	—	
11	Faux Pas total	0.160	-0.144	0.077	-0.039	0.025	0.099	**0.691*****	**0.747*****	0.279	**0.621*****	—

Values are presented as Spearman's rank correlation coefficients. OCD: Obsessive-compulsive disorder; RMET: Reading the Mind in the Eyes Test. *p<0.05, **p<0.01, ***p<0.001.

measures were limited and were most evident for Faux Pas Understanding in the autogenous OCD group. The correlation matrix for the autogenous OCD group is presented in Table 5.

DISCUSSION

This study examined metacognitive beliefs and social cognition in adolescents with reactive and autogenous OCD compared with healthy controls. Overall, the findings suggest that the autogenous–reactive distinction was reflected primarily in symptom content and metacognitive beliefs, whereas group-level differences in social cognition were less apparent.

Before interpreting the subtype-related findings, the clinical characteristics of the study groups should be considered. The groups were broadly comparable in age, sex distribution, and school grade, suggesting that the principal findings were unlikely to be attributable to major sociodemographic differences. The higher frequency of paternal psychiatric diagnoses and treatment histories in the OCD groups may reflect broader familial vulnerability to OCD and related psychopathology. This interpretation is consistent with previous studies emphasizing the contribution of familial and developmental factors to early-onset pediatric OCD (28, 29). However, this pattern was observed in both OCD subgroups and should therefore not be interpreted as specific to either the reactive or autogenous subtype.

Treatment-related variables were also generally similar between the two OCD subgroups. The absence of significant differences in medication use or history of cognitive behavioral therapy suggests that the observed subtype-related findings were unlikely to be explained primarily by treatment exposure. Psychiatric comorbidities likewise did not show a clear subtype-specific pattern. Anxiety disorders and major depressive disorder were observed in both OCD subgroups, consistent with previous pediatric OCD literature indicating that anxiety and depressive disorders commonly co-occur with OCD in children and adolescents (30, 31). However, the overall comorbidity profile did not indicate a clear separation between the reactive and autogenous subtypes. Taken together, these background findings suggest that the two OCD groups were clinically comparable in many respects while also displaying the familial burden and comorbidity patterns commonly observed in pediatric OCD.

The reactive and autogenous OCD groups did not differ significantly in total metacognitive belief scores or in most metacognitive subdomains. This finding suggests that maladaptive metacognitive beliefs may represent a broader cognitive feature of OCD rather than a clearly subtype-specific marker. Nevertheless, comparisons with healthy controls indicated that metacognitive beliefs were not entirely independent of subtype-related symptom patterns. The autogenous OCD group had higher total metacognitive belief scores and higher superstitious and responsibility/punishment belief scores than healthy controls, whereas both OCD groups had higher negative meta-worry belief scores than healthy controls.

Adult studies of the autogenous–reactive distinction have yielded inconsistent findings. Some studies have reported higher scores on the 30-item Metacognitions Questionnaire (MCQ-30), including both total and subscale scores, in individuals with autogenous obsessions than in those with reactive obsessions, suggesting that secondary beliefs about thoughts may be more pronounced in autogenous presentations (32). In contrast, other studies have found comparable levels of metacognitive pathology across OCD subtypes (33). Thus, the adult literature does not provide a definitive conclusion as to whether metacognitive beliefs constitute a consistent and specific marker of the autogenous–reactive distinction. Direct evidence comparing autogenous and reactive OCD in pediatric samples remains limited. Recent pediatric OCD research has identified distinct metacognitive profiles, with more maladaptive metacognitive beliefs associated with older age, greater OCD severity, aggressive, sexual, and religious obsessions, and internalizing symptoms (10). Similarly, studies of children and adolescents with OCD have suggested that metacognitive beliefs may be more closely related to particular symptom dimensions, especially obsessing and doubting/checking symptoms (34). These findings indirectly support an association between metacognitive beliefs and symptom content resembling the autogenous cluster, but they do not establish metacognition as a categorical subtype marker. Taken together, the present findings suggest that metacognitive heterogeneity in adolescent OCD cannot be reduced to the autogenous–reactive dichotomy. Rather, metacognitive beliefs may represent a shared cognitive vulnerability that varies according to symptom content, clinical severity, developmental characteristics, and broader internalizing psychopathology.

With respect to social cognition, no significant group differences were found in RMET or Faux Pas performance after correction for multiple comparisons. This finding suggests that social cognition may not represent a broad or homogeneous distinguishing feature of the autogenous and reactive OCD subtypes in adolescence. It is consistent with previous literature showing that social cognitive difficulties are not uniformly observed across OCD samples or assessment tasks (11, 12). Reviews and meta-analyses of adult OCD have reported impairments particularly in theory of mind and cognitive empathy, while also emphasizing that the magnitude of these impairments varies according to the task and social cognitive domain assessed (11). Similarly, task-based studies have suggested that basic social cognitive abilities may remain relatively preserved in OCD, whereas more complex mentalizing processes may be more vulnerable (35).

Although group-level differences in social cognition were not evident, the correlation findings suggested a more selective relationship between metacognitive beliefs and specific aspects of social understanding. In the reactive group, significant associations were largely confined within the same domain, suggesting relative separation between metacognitive beliefs and social cognition. In contrast, in the autogenous group, more maladaptive metacognitive beliefs were associated with better performance in interpreting the meaning, intention, and interpersonal consequences of socially inappropriate situations. Rather than indicating global social cognitive impairment, this pattern may reflect a selective association between beliefs about intrusive thoughts and the processing of complex social meaning in adolescents with autogenous OCD. An exploratory pilot study examining social cognition and metacognition concurrently similarly suggested that basic social cognitive abilities may be relatively preserved in OCD, whereas metacognitive disturbances may be more prominent (15). Taken together, the present findings suggest that metacognition and social cognition in adolescent OCD are neither entirely independent nor components of a single unified dimension of impairment. Instead, their relationship may emerge through selective associations between specific metacognitive belief domains and particular aspects of social understanding.

Several limitations should be considered when interpreting these findings. First, the cross-sectional design precludes causal inferences regarding the relationships among OCD subtype, metacognitive beliefs, and social cognition. Second, the study was conducted at a single tertiary child and adolescent psychiatry outpatient clinic, and the autogenous and reactive OCD subgroups were relatively small. Although the sensitivity power analysis indicated that the available sample was sufficient to detect medium-to-large effects, smaller effects, particularly in pairwise comparisons between the OCD groups, may have remained undetected. The generalizability of the findings may therefore be limited, and nonsignificant results should be interpreted cautiously. Third, although subtype classification was based on Lee and Kwon's theoretical model, assignment to the autogenous or reactive OCD group relied on clinical judgment regarding the predominant symptom profile. In participants with multiple symptom dimensions, classification was based on the symptom pattern that was most prominent, caused the greatest subjective distress, and had the greatest effect on daily functioning. However, interrater reliability for subtype assignment was not formally calculated, which may have introduced some degree of subjectivity into the classification process. In addition, the presence of mixed symptom profiles in a substantial proportion of the OCD sample suggests that differences in symptom content between groups should be interpreted in relation to the classification criteria rather than as wholly independent findings. Fourth, psychotropic medication use and psychiatric comorbidities may have influenced the results. Although treatment-related variables did not differ significantly between the reactive and autogenous OCD groups, antipsychotic use was numerically more common in the reactive group and may have affected RMET and Faux Pas performance. ADHD did not differ significantly between the OCD subgroups, but some anxiety-related comorbidities, particularly specific phobia and generalized anxiety disorder, were unevenly distributed. Because of the small subgroup sizes and low cell counts for several comorbidities, these variables were not included as covariates in the main analyses. Residual confounding related to medication status and psychiatric comorbidity therefore cannot be excluded. Fifth, IQ was not included as a covariate in the main analyses, although cognitive ability may influence performance on tasks such as the RMET and Faux Pas Test. Another limitation concerns the high overlap between Faux Pas Detection and Faux Pas Identification in the reactive OCD subgroup. Although the data and scoring were rechecked, the two subdomain scores were

identical in this subgroup, limiting their independent interpretation. Finally, multiple comparisons were conducted across clinical, metacognitive, and social cognition variables. Statistically significant findings, particularly those limited to a single social cognition subcomponent, should therefore be interpreted cautiously and require replication in larger samples.

CONCLUSION

The findings suggest that the autogenous–reactive distinction in adolescent OCD is reflected primarily in symptom content rather than in clearly differentiated metacognitive or social cognitive profiles. Although some metacognitive belief domains differed between the OCD groups and healthy controls, the reactive and autogenous OCD groups did not differ significantly from each other in metacognitive beliefs. Similarly, no significant group differences were observed in RMET or Faux Pas performance after correction for multiple comparisons. Correlation analyses revealed only selective associations between metacognitive beliefs and specific aspects of social understanding, particularly in the autogenous group. Overall, the autogenous–reactive distinction may be useful for characterizing symptom presentation but not for defining distinct metacognitive or social cognitive subtypes in adolescent OCD. Larger longitudinal studies are needed to clarify these relationships.

Ethical Approval: This study was approved by The Clinical Research Ethics Committee of Basaksehir Cam and Sakura City Hospital, (08.04.2025 KAEK-11/26.03.2025.116).

Informed Consent: Written informed consent and assent were obtained from all participants and their parents.

Conflict of Interest: The authors declare that there is no conflict of interest.

Financial Disclosure: The authors declared that this study has received no financial support.

Use of AI for Writing Assistance: The authors declared that artificial intelligence was not used in the study.

Contribution Categories		Author Initials
Category 1	Concept/Design	O.G.
	Data acquisition	S.A.C., H.A., D.S.
	Data analysis/Interpretation	O.G.
Category 2	Drafting manuscript	O.G.
	Critical revision of manuscript	O.G.
Category 3	Final approval and accountability	O.G., S.A.C., D.S., H.A.
Other	Technical or material support	S.A.C., D.S., H.A.
	Supervision	O.G.

Peer-review: Externally peer-reviewed.

REFERENCES

1. Cervin M, Miguel EC, Güler AS, Ferrão YA, Erdoğdu AB, Lazaro L, et al. Towards a definitive symptom structure of obsessive-compulsive disorder: a factor and network analysis of 87 distinct symptoms in 1366 individuals. Psychol Med 2022; 52:3267-3279. [CrossRef]
2. Lee HJ, Kwon SM. Two different types of obsession: autogenous obsessions and reactive obsessions. Behav Res Ther 2003; 41:11-29. [CrossRef]
3. Lee HJ, Kwon SM, Kwon JS, Telch MJ. Testing the autogenous-reactive model of obsessions. Depress Anxiety 2005; 21:118-129. [CrossRef]
4. Moulding R, Kyrios M, Doron G, Nedeljkovic M. Autogenous and reactive obsessions: further evidence for a two-factor model of obsessions. J Anxiety Disord 2007; 21:677-690. [CrossRef]
5. Isaksen CS, Hybel KA, Wolters L, Højgaard DRMA, Farrell L, Thomsen PH. Metacognition in children and adolescents with obsessive-compulsive disorder treated with cognitive behavioral therapy. Behav Ther 2025; 56:95-109. [CrossRef]
6. Tümkaya S, Karadağ F, Yenigün EH, Özdel O, Kashyap H. Metacognitive beliefs and their relation with symptoms in obsessive-compulsive disorder. Noro Psikiyatr Ars 2018; 55:358-363. [CrossRef]
7. Barahmand U, Tavakolian E, Alaei S. Association of metacognitive beliefs, obsessive beliefs and symptom severity with quality of life in obsessive-compulsive patients. Arch Psychiatr Nurs 2014; 28:345-351. [CrossRef]
8. Kim ST, Park CI, Kim HW, Jeon S, Kang JI, Kim SJ. Dysfunctional metacognitive beliefs in patients with obsessive-compulsive disorder and pattern of their changes following a 3-month treatment. Front Psychiatry 2021; 12:628985. [CrossRef]
9. Rizvi M, Smilansky H, Porth R, Myers N, Geller D, Small BJ, et al. The moderating effect of age on the associations of cognitive and metacognitive beliefs with pediatric OCD symptoms. Cogn Behav Ther 2021; 50:104-120. [CrossRef]
10. Isaksen CS, Thomsen PH, Farrell LJ, Højgaard DRMA, Wolters L, Nissen J, et al. Metacognitive profiles in children and adolescents with obsessive-compulsive disorder. Journal of Obsessive-Compulsive and Related Disorders 2024; 41:100874. [CrossRef]
11. Bora E. Social cognition and empathy in adults with obsessive compulsive disorder: A meta-analysis. Psychiatry Res 2022; 316:114752. [CrossRef]
12. Jansen M, Overgaauw S, De Bruijn ERA. Social cognition and obsessive-compulsive disorder: a review of subdomains of social functioning. Front Psychiatry 2020; 11:118. [CrossRef]
13. Motut A, Isaac C, Castillo MC, Januel D. Link between metacognition and social cognition in schizophrenia: a systematic review and meta-analysis. Front Psychiatry 2023; 14:1285993. [CrossRef]
14. O'Kearney R, Nicholson C. Can a theory of mind disruption help explain OCD related metacognitive disturbances? Behaviour Change 2008; 25:55-70. [CrossRef]

15. Mavrogiorgou P, Bethge M, Luksnat S, Nalato F, Juckel G, Brüne M. Social cognition and metacognition in obsessive-compulsive disorder: an explorative pilot study. Eur Arch Psychiatry Clin Neurosci 2016; 266:209-216. [CrossRef]

16. Kaufman J, Birmaher B, Brent D, Rao U, Flynn C, Moreci P, et al. Schedule for Affective Disorders and Schizophrenia for School-Age Children-Present and Lifetime Version (K-SADS-PL): initial reliability and validity data. J Am Acad Child Adolesc Psychiatry 1997; 36:980-988. [CrossRef]

17. Scahill L, Riddle MA, McSwiggin-Hardin M, Ort SI, King RA, Goodman WK, et al. Children's Yale-Brown Obsessive Compulsive Scale: reliability and validity. J Am Acad Child Adolesc Psychiatry 1997; 36:844-852. [CrossRef]

18. Yucelen AG, Rodopman-Arman A, Topcuoglu V, Yazgan MY, Fisek G. Interrater reliability and clinical efficacy of Children's Yale-Brown Obsessive-Compulsive Scale in an outpatient setting. Compr Psychiatry 2006; 47:48-53. [CrossRef]

19. Bacow TL, Pincus DB, Ehrenreich JT, Brody LR. The metacognitions questionnaire for children: development and validation in a clinical sample of children and adolescents with anxiety disorders. J Anxiety Disord 2009; 23:727-736. [CrossRef]

20. Irak M. Standardization of Turkish form of metacognition questionnaire for children and adolescents: the relationships with anxiety and obsessive-compulsive symptoms. Turk Psikiyatri Derg 2012; 23:46-52. [CrossRef]

21. Baron-Cohen S, Wheelwright S, Hill J, Raste Y, Plumb I. The "Reading the Mind in the Eyes" Test revised version: a study with normal adults, and adults with Asperger syndrome or high-functioning autism. J Child Psychol Psychiatry 2001; 42:241-251. [CrossRef]

22. Yildirim EA, Kaşar M, Güdük M, Ateş E, Küçükparlak İ, Özalmete EO. Gözlerden zihin okuma testi'nin Türkçe güvenirlik çalışması. Turk Psikiyatri Dergisi 2011; 22:177-186. [Article in Turkish]

23. Girli A. Psychometric properties of the Turkish child and adult form of "Reading the Mind in the Eyes Test." Psychology 2014; 05:1321-1337. [CrossRef]

24. Baron-Cohen S, O'Riordan M, Stone V, Jones R, Plaisted K. Recognition of faux pas by normally developing children and children with Asperger syndrome or high-functioning autism. J Autism Dev Disord 1999; 29:407-418. [CrossRef]

25. Şahin B, Önal B, Hoşoğlu E. Adaptation of Faux Pas Recognition Test Child Form to Turkish and investigation of psychometric properties. Anatolian Journal of Psychiatry 2020; 21(Supplement 2), 54-62. [CrossRef]

26. Shaffer D, Gould MS, Brasic J, Ambrosini P, Fisher P, Bird H, et al. A children's global assessment scale (CGAS). Arch Gen Psychiatry 1983; 40:1228-1231. [CrossRef]

27. The jamovi project. jamovi [computer software]. Version 2.6. Sydney (AU): The jamovi project; 2024. Available at: https://www.jamovi.org. Accessed: August 06, 2026.

28. Pauls DL, Abramovitch A, Rauch SL, Geller DA. Obsessive-compulsive disorder: an integrative genetic and neurobiological perspective. Nat Rev Neurosci. 2014; 15:410-424. [CrossRef]

29. Nestadt G, Grados M, Samuels JF. Genetics of obsessive-compulsive disorder. Psychiatr Clin North Am 2010; 33:141-158. [CrossRef]

30. Boileau B. A review of obsessive-compulsive disorder in children and adolescents. Dialogues Clin Neurosci 2011; 13:401-411. [CrossRef]

31. Geller DA. Obsessive-compulsive and spectrum disorders in children and adolescents. Psychiatr Clin North Am 2006; 29:353-370. [CrossRef]

32. Keleş Altun İ, Uysal E, Özkorumak Karagüzel E. Differences between autogenous and reactive obsessions in terms of metacognitions and automatic thoughts. Neuropsychiatr Dis Treat 2017; 13:2977-2985. [CrossRef]

33. Dogan K, Solak OS, Ozdel K, Turkcapar MH. Comparison of metacognitions between obsessive compulsive disorder's subtypes and normal healthy controls. Journal of Cognitive Behavioral Psychotherapies and Research 2013; 2:34-40.

34. Cervin M, McNeel MM, Wilhelm S, McGuire JF, Murphy TK, Small BJ, et al. Cognitive beliefs across the symptom dimensions of pediatric obsessive-compulsive disorder: type of symptom matters. Behav Ther 2022; 53:240-254. [CrossRef]

35. Sayin A, Oral N, Utku C, Baysak E, Candansayar S. Theory of mind in obsessive-compulsive disorder: Comparison with healthy controls. Eur Psychiatry 2010; 25:116-122. [CrossRef]