INFERENTIAL CONFUSION MODERATES THE EFFECTS OF DISSOCIATIVE EXPERIENCES ON OCD SYMPTOMS SEVERITY IN A CLINICAL SAMPLE WITH OBSESSIVE-COMPULSIVE DISORDER

Andrea Pozza, Sabrina Torniai, Davide Dèttore

Abstract

Objective: Recent research showed that greater OCD severity may be associated to stronger dissociation experiences. Higher dissociation was found to predict treatment resistance after cognitive behavioural therapy for OCD. Inferential Confusion (IC), a reasoning error where the person with OCD persists in his/her obsessional belief despite sense information to the contrary, might moderate the relation between dissociation and OCD severity. Using a clinical sample of patients with OCD, the current study investigated whether the relation between more severe dissociation and OCD severity might be moderated by IC. A second aim was to test whether IC might moderate the relation between more severe dissociation and OCD symptoms subtypes.

Method: Sixty patients with primary OCD (mean age= 37.17, SD= 9.98, 53.30% females) completed the Inferential Confusion Questionnaire-Extended Version (ICQ-EV), Dissociative Experiences Scale-II (DES-II), Yale-Brown Obsessive Compulsive Scale (Y-BOCS), Padua Inventory (PI), Beck Anxiety Inventory (BAI). Moderation effects of IC on the relation between dissociation and OCD severity and subtypes were tested through General Linear Models.

Results: When Y-BOCS scores were considered as dependent variable, only an interaction effect emerged between ICQ-EV and DES-II Depersonalization/Derealization scores (B= 0.12, p<.05): patients with higher scores on ICQ-EV and higher scores on DES-II Depersonalization/Derealization scale had higher scores on Y-BOCS. When PI scores were considered as dependent variables, a main effect of DES-II Amnesia on PI Insufficient control of mental activities scores was found (F= 9.31, p<.01). In addition, an interaction effect between DES Amnesia and ICQ-EV scores was found (F= 7.46, p<.01) on PI Insufficient control of mental activities: patients with higher DES Amnesia scores and higher ICQ-EV scores had higher scores on PI Insufficient control of mental activities.

Conclusions: The relation between depersonalization/derealization and OCD severity might be moderated by IC. Patients with such types of dissociative experiences, who typically are resistant to cognitive behavioural therapy, might benefit from inference-based approaches. Dissociative amnesia could be a dimension implicated in Insufficient control of mental activities, and its effects might be moderated by IC. Future research should assess inference-based treatments for resistant OCD with dissociative amnesia symptoms and Insufficient control of mental activities.

Key words: obsessive-compulsive disorder, inferential confusion, dissociation, amnesia, depersonalization/derealization

Declaration of interest: the authors have no conflict of interest to declare

Andrea Pozza[a], Sabrina Torniai[b], Davide Dèttore[c]

a Department of Experimental and Clinical Medicine, University of Florence, Italy
b "Studi Cognitivi" Postgraduate Program on Cognitive Psychotherapy, Florence, Italy
c Department of Health Sciences. University of Florence, Italy

Corresponding author
Andrea Pozza
Department of Experimental and Clinical Medicine, University of Florence, Italy
Phone: +39 055 2755067. Fax: +39 055 2751093
E-mail: andrea.pozza@unifi.it

Introduction

Dissociative experiences consist of a disruption or discontinuity in the normal integration of consciousness, memory, identity, emotion, perception, and behaviour (American Psychiatric Association 2013). The classification of dissociative phenomena is based on the most widely used measure of dissociative symptoms, the Dissociative Experiences Scale (DES; Carlson and Putnam 1993), which assesses three different domains: Dissociative Amnesia (AM; it includes experiences such as getting somewhere without remembering how you arrived), (b) Depersonalization/Derealization (DEP/DER; for example, looking in the mirror and not recognizing oneself, or experiencing the world as if seen through fog), (c) Absorption/imaginative involvement (AB; for example, it can involve immersion in an external stimulus, such as a movie or a book, or an internal one, such as a thought, which results in disconnection from other stimuli in the environment).

Transient dissociative experiences, particularly DEP/DER feelings, are relatively common among clinical and non-clinical populations (Hunter et al. 2004). Despite lifetime prevalence of the full diagnosis of Dissociative Disorder is estimated at 1-2% in the general population (American Psychiatric Association 2013), approximately one half of adults have experienced at least one lifetime transient dissociative experience (Soffer-Dudek 2014). In addition to Dissociative Disorder, dissociative experiences

Submitted July 2016, Accepted November 2016

© 2016 Giovanni Fioriti Editore s.r.l.

are quite common also among other psychological conditions, including Post-traumatic Stress Disorder, Schizophrenia, Borderline Personality Disorder, and Eating Disorders (for a review, see Soffer-Dudek 2014).

Recently, some research investigated the role of dissociative experiences in OCD symptoms, but data did not appear consistent. Goff and colleagues (1992) reported that patients with higher DES scores had more severe OCD symptoms, as measured by the Maudsley Obsessional Compulsive Inventory (MOCI; Hodgson and Rachman 1977); however, DES scores did not significantly correlate with scores on the Yale-Brown Obsessive-Compulsive Scale (YBOCS; Goodman et al. 1989), a measure of OCD severity. Pozza and colleagues (2016) compared a group of patients with OCD, a group with Anxiety Disorders and a non-clinical matched control group on the DES scores. Results showed that patients with OCD had significantly more severe dissociative Amnesia symptoms than patients with Anxiety Disorders and controls and had more severe Depersonalization/Derealization than controls but not than patients with Anxiety Disorders. With regard to OCD severity, although some studies indicated that severity of OCD symptoms predicted more severe dissociative symptoms among patients with OCD (Belli et al. 2012), other have not documented such an effect (Lochner et al. 2004).

Certain subtypes of OCD symptoms could be more strongly related to dissociative experiences than others (Besiroglu et al. 2006). In a study using 50 patients with OCD, Rufer and colleagues (2006) found that checking symptoms were the subtype most strongly associated to dissociative phenomena, whereas washing symptoms were not related to any kind of dissociation experience. This finding was consistent with other studies using both clinical and non-clinical samples (Grabe et al. 1999, Watson et al. 2004), which showed an association also with symmetry/ordering symptoms. Other studies indicated a significant relation between dissociation symptoms and OCD symptoms of unacceptable thoughts (Watson et al. 2004).

Some researchers hypothesized that these conflicting results could be linked to the fact that specific dissociative experiences were more strongly related to OCD symptoms (Soffer-Dudek 2014). AB and AM have been hypothesized to play a significant role in strengthening or engendering OCD symptoms. Reduced confidence in reality monitoring and memory might mediate the role of AB and AM in OCD symptoms (Hermans et al. 2008, Merckelbach and Wessel 2000). In a study with undergraduates (Aardema and Wu 2011), AB was the strongest predictor of OCD symptoms. On the other hand, the role of DEP/DER in OCD appeared more equivocal. DEP/DER experiences might be outcomes of OCD symptoms: in a non-clinical sample compulsive-like staring brought about DEP/DER (van den Hout et al. 2009). Consistent with these hypotheses, Aardema and Wu (2011) found a negative relation between DEP/DER and OCD after controlling for AB, supporting a more specific role for AB and AM in OCD than DEP/DER.

Inferential Confusion (IC) is a reasoning error where the person with OCD confuses an imagined possibility with an actual probability based in the senses, and then acts "as if" the imagined possibility is real (O'Connor and Robillard 1995). A crucial element of IC is inverse inference, the reverse of normal inference, where a person starts out with the validity of a hypothesis despite evidence to the contrary (O'Connor and Robillard 1995). Accumulating evidence showed the specificity of the IC construct in OCD indicating that IC was associated to OCD symptoms controlling for obsessive beliefs (Aardema et al. 2006).

Rationale and objectives

In conclusion, research produced equivocal data on the relation between OCD and dissociation. IC reasoning errors could moderate the relation between different dissociation experiences and OCD symptoms; yet, no study investigated this aspect. A recent work suggested that dissociation and IC were the strongest predictors of OCD symptoms in a clinical sample but this study did not differentiate between dissociation experiences (Paradisis et al. 2015).

The current study investigated whether the relation between more severe dissociative experiences and OCD severity might be moderated by higher levels of IC in a clinical sample of patients with OCD. A second aim was to test whether IC might moderate the relation between more severe dissociative experiences and OCD symptom subtypes. Based on previous data (Rufer et al. 2006), AB was hypothesized to predict more severe checking symptoms and impaired control over mental activities by interacting with higher IC. Finally, IC was investigated as a moderator of the relation between more severe dissociation experiences and stronger anxiety severity.

Method

Participants

Sixty treatment-seeking patients with OCD, who were consecutive referrals to public mental health centres, were included. Patients were included if they received a primary diagnosis of OCD. Primary diagnoses were defined according to the following criteria: (a) the principal psychiatric problem in terms of severity and impairment, (b) the patient's primary source of distress, and (c) as the disorder for which the patient was seeking treatment. Exclusion criteria were: diagnosis of Schizophrenia, Mental Retardation, neurological conditions, lifetime diagnosis of alcohol/substance/medication dependence. Patients completed individually the measures after having received a description of the aims of the study and having given written informed consent to participate.

Mean age was 31.17 years (SD= 9.98). Thirty-two participants (53.30% of the sample) were females. Seventeen (28.30%) had comorbid Recurrent Depression, 4 (6.70) a comorbid Eating Disorder, 1 Bipolar Disorder (1.70). Six participants (10%) had a concurrent Borderline Personality Disorder. A full description of demographic and clinical characteristics is presented in **tables 1** and **2**, respectively.

Measures

Inferential Confusion Questionnaire-Extended Version (ICQ-EV)

The Inferential Confusion Questionnaire–Expanded Version (ICQ-EV; Aardema al. 2010), a 30-item revision of the ICQ (Aardema et al. 2005) on a 6-point Likert scale ("strongly disagree" = 1, "strongly agree" = 6) was used as a measure of IC tendencies. It showed excellent internal consistency (Cronbach's alpha= 0.96) and strong correlations with OCD symptoms

Table 1. *Demographic characteristics of the sample (n= 60)*

	M (SD)	*n (%)*
Females		32 (53.30)
Age	31.17 (9.98)	
Marital status		
Single		31 (51.70)
Married		20 (33.30)
Divorced		9 (15.00)
Occupational status		
Student		11 (18.30)
Employed		26 (43.30)
Unemployed		22 (36.60)
Retired		1 (1.70)
Education		
Middle school		10 (16.70)
High school		34 (56.70)
Degree		16 (26.70)

Table 2. *Clinical characteristics of the sample (n= 60)*

	M (SD)	*n (%)*
Axis I comorbidity		22 (37.70)
Recurrent Depression		17 (28.30)
Eating Disorders		4 (6.70)
Bipolar Disorders		1 (1.70)
Personality comorbidity		
Borderline		6 (10.00)
PI Impaired control over mental activities		15 (25.00)
PI Washing		18 (30.00)
PI Checking		6 (10.00)
PI Worry of losing control over motor behaviour		9 (15.00)
Y-BOCS	27.68 (6.84)	
DES-II Total	24.25 (20.06)	
DES-II AM	7.30 (8.62)	
DES-II DEP/DER	5.06 (5.54)	
DES-II AB	14.6 (7.94)	

Note

DES-II DEP/DER= Dissociative Experiences Scale-II Depersonalization/Derealization, DES-II AM= Dissociative Experiences Scale-II Amnesia, DES-II AB= Dissociative Experiences Scale-II Absorption, PI= Padua Inventory, Y-BOCS= Yale-Brown Obsessive Compulsive Scale.

beyond the effects of negative affect and obsessive beliefs (Aardema et al. 2006). High scores represent an overreliance on imagination, a distrust of the senses, and a tendency to confuse imagination with reality.

Dissociative Experiences Scale-II (DES-II)

The Dissociative Experiences Scale-II (DES-II; Carlson and Putnam 1993), a 28-item questionnaire on a 11-point scale, was used as a measure of dissociative experiences. Scores are calculated by dividing the total by 28, leaving a potential range from 0 to 100. Three subscales are calculated: Absorption and Imaginative involvement (AB), Amnesia (AM) and Depersonalization/Derealization (DEP/DER). It showed very good or excellent internal consistency (range of Cronbach's alpha= 0.85-0.93) (Carlson and Putnam 1993), strong correlations with other dissociation measures and higher scores among individuals with Dissociative Disorders. Higher scores on the three subscales indicate a higher degree of dissociative experiences.

Yale Brown Obsessive Compulsive Scale (Y-BOCS)

The Yale-Brown Obsessive-Compulsive Scale (Y-BOCS; Goodman et al. 1989), a 10-item semi-structured clinician-administered interview, was used to evaluate OCD general severity. Symptoms from the past week are rated on a 5-point Likert scale ranging from 0 to 4, with higher scores corresponding to greater symptom severity. Items regarding obsessions and compulsions are summed to derive the total score. Internal consistency has shown to be moderate to excellent (Goodman et al. 1989). Scores on the Y-BOCS can range from 0 to 40. Higher scores indicate greater OCD symptom severity. The measure showed very good inter-rater reliability, convergent validity and sensitivity to change are high (Taylor et al. 1998).

Padua Inventory (PI)

The Padua Inventory (PI; Sanavio 1988), a 60-item self-report inventory, was used as a measure of OCD symptom subtypes. The measure is based on a 5-point response Likert scale ("Never" = 0, "Always" = 4). It includes four subscales: Impaired control over mental activities, Washing, Checking, and Worry of losing control over motor behaviour. The measure showed satisfactory internal consistency and one-month reliability (Sanavio 1988).

Beck Anxiety Inventory (BAI)

The Beck Anxiety Inventory (BAI; Beck and Steer 1990), a 21-item questionnaire, was used to assess anxious symptoms. Items are rated from 0 to 3 scores, which can range from 0 to 63 with higher scores indicating greater anxiety severity. The measure showed very good internal consistency (Beck and Steer 1990).

Statistical analysis

Missing data were not found for none of the items of the measures. The moderation effect of IC on the relation between dissociation dimensions and OCD severity was tested through a Multivariate General Linear Model, where main effects of DES-II scales and ICQ-EV scores and an interaction effect between DES-II and ICQ-EV scores were entered as independent variables, whereas Y-BOCS scores were entered as dependent variable. The moderation effect of IC on the relation between dissociation dimensions and OCD

symptoms subtypes was tested through a Multivariate General Linear Model where main effects of DES-II scales and ICQ-EV scores and an interaction effect between DES-II and ICQ-EV scores were entered as independent variables, whereas PI scales scores were entered as dependent variables. Effect sizes were calculated as Eta Squared (η^2) according to guidelines provided by Olejnik and Algina (2003).

Results

Effects of IC and dissociative experiences on general OCD severity

An interaction effect of IC and DES-II DEP/DER scores on Y-BOCS scores was found: patients with higher scores on the ICQ-EV and higher scores on the DES-II DEP/DER had higher scores on the Y-BOCS (*B*= 0.01, t= 2.06, η^2= 0.07, p<.05). This result suggested that patients with more severe IC and depersonalization/derealization reported more severe general OCD symptoms.

No main and interaction effects of ICQ-EV and DES-II scores were found on scores on the item 11 of the Y-BOCS, indicating no relations between OCD insight, dissociative experiences and IC.

Coefficients of main and interaction effects of DES-II and ICQ-EV on Y-BOCS score are presented in **tables 3** and **4**, respectively.

Effects of IC and dissociative experiences on OCD subtypes and anxiety severity

A main effect of DES-II AM scores on the PI Impaired control over mental activities scale scores was found: patients with higher scores on the DES-II AM had higher scores on the PI Impaired control over mental activities (*B*= 3.01, t= 3.05, η^2= 0.15, p<.01). An interaction effect of DES-II and ICQ-EV scores was found on the PI Impaired control over mental activities: patients with higher scores on the DES-II and higher scores on the ICQ-EV had more severe Impaired control of mental activities (*B*= 0.02, t= 2.73, η^2= 0.13, p<.01). No main and interaction effect of ICQ-EV and DES-II scores were found on the other scales of the PI. Coefficients of main and interaction effects of DES-II and ICQ-EV on PI scales are presented in **table 5**.

With regard to the effects of IC and dissociation on anxiety severity, a main effect of DES-II DEP/DER scores on the BAI scores was found (*B*= 1.71, t= 2.08, η^2= 0.07, p<.05), indicating that patients with more severe DEP/DER experiences had more severe anxiety

Table 3. *Coefficients of main and interaction effects of DES-II and ICQ-EV on Y-BOCS*

	B	t	Sig.	Partial squared Eta
ICQ-EV * DES-II AM	-.01	-1.27	.21	.03
ICQ-EV * DES-II DEP/DER	.01	2.06*	.04	.07
ICQ-EV * DES-II AB	-.01	-1.12	.27	.02
ICQ-EV	.02	.36	.72	.02
DES-II AM	1.17	1.98	.05	.07
DES-II DEP/DER	-1.40	-2.00	.05	.07
DES-II AB	.32	.71	.48	.01

Note

DES-II DEP/DER= Dissociative Experiences Scale-II Depersonalization/Derealization, DES-II AM= Dissociative Experiences Scale-II Amnesia, DES-II AB= Dissociative Experiences Scale-II Absorption, ICQ-EV= Inferential Confusion Questionnaire-Extended Version, PI= Padua Inventory, Y-BOCS= Yale-Brown Obsessive Compulsive Scale.

Table 4. *Coefficients of main and interaction effects of DES-II and ICQ-EV on Y-BOCS item 11*

	B	t	Sig.	Partial Squared Eta
DES-II AM	.29	1.19	.24	.06
DES-II DEP/DER	-.17	-1.30	.20	.07
DES-II AB	.10	1.32	.20	.07
ICQ-EV	.01	1.65	.11	.11
DES-II AB * ICQ-EV	-.01	-1.35	.17	.08
DES-II DEP/DER * ICQ-EV	.01	1.08	.29	.05
DES-II AM * ICQ-EV	-.02	-1.08	.32	.04

Note

DES-II DEP/DER= Dissociative Experiences Scale-II Depersonalization/Derealization, DES-II AM= Dissociative Experiences Scale-II Amnesia, DES-II AB= Dissociative Experiences Scale-II Absorption, ICQ-EV= Inferential Confusion Questionnaire-Extended Version, PI= Padua Inventory, Y-BOCS= Yale-Brown Obsessive Compulsive Scale.

symptoms. An interaction effect of ICQ-EV and DES-II AM scores was also found (B= 0.01, t= 2.26, η^2= 0.09, p<.05): patients with more severe IC and more severe amnesia experiences had stronger anxiety symptoms.

Table 5. *Coefficients of main and interaction effects of DES-II and ICQ-EV on PI scales*

	B	*t*	Sig.	Partial squared Eta
ICQ-EV * DES-II AM	-.01	-1.27	.21	.03
ICQ-EV * DES-II DEP/DER	.01	2.06*	.04	.07
ICQ-EV * DES-II AB	-.01	-1.12	.27	.02
ICQ-EV	.02	.36	.72	.02
DES-II AM	1.17	1.98	.05	.07
DES-II DEP/DER	-1.40	-2.00	.05	.07
DES-II AB	.32	.71	.48	.01

Note

DES-II DEP/DER= Dissociative Experiences Scale-II Depersonalization/Derealization, DES-II AM= Dissociative Experiences Scale-II Amnesia, DES-II AB= Dissociative Experiences Scale-II Absorption, ICQ-EV= Inferential Confusion Questionnaire-Extended Version, PI= Padua Inventory.

Discussion

Poor attention has been dedicated to the role of dissociative experiences in OCD. Although recent research found a significant relation between OCD and dissociative experiences (Belli et al. 2012), other studies reported inconclusive evidence (Lochner et al. 2004). Investigating clinical variables that could moderate this relation may have some implications for practice, encouraging identification of novel treatments to be integrated in evidence-based cognitive behavioural therapy (CBT) for OCD cases presenting with comorbid dissociative experiences. Indeed, higher levels of dissociation, specifically dissociative symptoms of AB, predicted treatment resistance during CBT (Rufer et al. 2005).

IC reasoning errors, resulting in a tendency to confuse imagination with reality, could moderate the relationship between different dissociation experiences and OCD symptoms. The current study investigated whether the relation between dissociative experiences and OCD severity might be moderated by more severe IC in a sample of patients with OCD. Subsequently, IC was tested as a potential moderator of the relation between dissociative experiences and different OCD subtypes.

Findings showed that IC moderated the relation between DEP/DER and general OCD severity. This result could be explained by the fact that, when it is associated to narrowed attention and blurring of reality-fantasy boundaries typical of DEP/DER, IC might lead to more severe OCD symptoms (Giesbrecht et al. 2008). Patients with more severe DEP/DER and IC tendencies might have selective attention on intrusive thoughts and focus less and less attention on real external events, thereby reinforcing importance to control obsessions and need for performing compulsions.

Dissociative experiences of AM resulted to be phenomena specific to the impaired control over mental activities OCD subtype. A potential explanation could be that dissociator patients with AM experiences for external events and stronger IC tendencies could experience stronger fear of losing control of their thoughts and confuse unwanted thoughts with real actions or events. They would use worry/ruminating about trigger situations as safety behaviours to manage amnesia for events through a vicious cycle thus maintaining OCD symptoms. It is also plausible that self-reported AM in OCD represents distrust in memory and action as some previous data suggested that patients with OCD tend to have weaker confidence in their memory, perception and action (Coles et al. 2006). Thus, high dissociators - individuals who can rapidly switch attention, allocate it in full to a single stimulus, and at times direct it inward toward images in favor of percepts - would have reduced confidence in their actions, thereby engendering excessive checking behaviours.

AM and DEP/DER experiences were directly associated to anxiety severity. It could be hypothesized that patients with AM experiences for external events - and consequently having weaker confidence in their memory - would experience more intense anxiety, then would do more compulsions. Another finding was that IC tendencies moderated the relation between AM and anxiety severity, suggesting that patients with more severe IC levels and more severe AM experiences reported more impairing anxiety feelings. It could be hypothesized that patients with perceived AM experiences and tendency to confuse imagination with reality have more compelling doubts, thus tend to experience stronger anxiety feelings.

Another finding was that neither main or interaction effects were found for dissociation and IC on a poorer insight, suggesting that these two variables could not be associated with insight of OCD symptoms. It should be noted that the study did not use a systematic measure of insight, such as the Brown Assessment of Beliefs Scale (BABS; Eisen et al. 1998), and this limitation could explain this data. Further studies should use other measures of insight to explore this aspect.

Overall, clinical implications of these results could be the introduction of inference-based approaches (IBA; Julien et al. 2016) for treating OCD associated to AM and DEP/DER experiences. IBA could be a first step of therapy to reduce anxiety and DEP/DER symptoms, thereby facilitating subsequent implementation of exposure with response prevention in a sequential modality of therapy. Comorbid depersonalization/derealization experiences could result in higher affect and inhibit reality testing, emotional regulation, thus habituation during exposure therapy. Therefore, IBA

could target these obstacles to treatment success.

Different from hypotheses and previous data (Grabe et al. 1999), AB did not appear associated to OCD severity and checking. A potential explanation is that checking symptoms were under-represented in the sample (only 10% of the patients had greater scores on the PI checking scale), and this limitation could have produced a narrowed range on the scores of this scale of the PI. However, consistent with previous data (Besiroglu et al. 2006), any of dissociation experiences was not associated with washing symptoms. In contrast with inference-based models (Aardema et al. 2006; O'Connor and Robillard 1995), IC tendencies did not appear to be directly correlated with OCD since, when controlling for dissociation experiences, IC did not remain a significant predictor of OCD symptoms.

Some limitations should be highlighted. First, a cross-sectional design was used, which did not allow drawing conclusions about the causal role of IC and dissociative experiences in OCD. It could be argued that dissociative experiences are consequences of having more severe OCD symptoms, rather than engendering OCD symptoms. Consistently, in an experimental study using a non-clinical sample compulsive-like staring behaviours brought about DEP/DER experiences (van den Hout et al. 2009). Second, whereas a measure of perceived amnesia was used as an indirect indicator, the current study did not use performance-based measures of dissociation. Thus, future research should assess dissociative experiences through clinician-administered tools, such as observations of ongoing dissociative experiences or interviews made by the clinician. Finally, patients having the subtype of worries about losing control over motor behaviour were under-represented, being only a 15% of the sample. Further studies should include also patients with this subtype of OCD symptoms to more deeply explore the relation with IC and dissociation. Finally, current findings could shed some light for future trials on the treatment of OCD, highlighting the introduction of DEP/DER measures as outcomes of psychotherapy effects in randomized clinical trials on OCD. In addition, it could be useful to investigate whether psychotherapeutic treatments for OCD which reduce IC reasoning errors (e.g., Julien et al. 2016), could have an effect also on dissociative experiences driving clinical change for those patients who are dissociators, and are typically believed as treatment-resistant.

In conclusion, this study extended previous knowledge on the role of dissociative experiences in OCD general and subtypes severity, highlighting IC tendencies as potential moderators of this relation.

References

American Psychiatric Association (2013). Diagnostic and Statistical Manual of Mental Disorders (DSM5), 5th ed. Washington, DC: American Psychiatric Association.

Aardema F, O'Connor KP, Emmelkamp PM (2006). Inferential Confusion and Obsessive Beliefs in Obsessive-Compulsive Disorder. *Cognitive Behaviour Therapy* 35, 138-147.

Aardema F, O'Connor KP, Emmelkamp PM, Marchand A, Todorov C (2005). Inferential confusion in obsessive–compulsive disorder: the inferential confusion questionnaire. *Behaviour Research and Therapy* 43, 293-308.

Aardema F, Wu KD, Careau Y, O'Connor K, Julien D, Dennie S (2010). The expanded version of the Inferential Confusion Questionnaire: further development and validation in clinical and non-clinical samples. *Journal of Psychopathology and Behavioral Assessment* 32, 448-462.

Aardema F, Wu KD (2011). Imaginative, dissociative, and schizotypal processes in obsessive-compulsive symptoms. *Journal of Clinical Psychology* 67, 74-81.

Beck AT, Steer RA (1990). *Beck Anxiety Inventory Manual*. The Psychological Corporation Harcourt Brace Company, San Antonio, TX.

Belli H, Ural C, Vardar MK, Yesılyurt S, Oncu F (2012). Dissociative symptoms and dissociative disorder comorbidity in patients with obsessive-compulsive disorder. *Comprehensive Psychiatry* 53, 975-980.

Besiroglu L, Agargun MY, Ozbebit O, Aydin A (2006). A discrimination based on autogenous versus reactive obsessions in obsessive-compulsive disorder and related clinical manifestations. *CNS Spectrums* 11, 179-186.

Coles ME, Radomsky AS, Horng B (2006). Exploring the boundaries of memory distrust from repeated checking: Increasing external validity and examining thresholds. *Behaviour Research and Therapy* 44, 995-1006.

Carlson EB, Putnam FW (1993). An update on the dissociative experiences scale. *Dissociation: progress in the dissociative disorders* 6, 16-27.

Eisen JL, Phillips KA, Baer L, Beer DA, Atala KD, Rasmussen SA (1998). The brown assessment of beliefs scale: reliability and validity. *American Journal of Psychiatry* 155, 102-108.

Goff DC, Olin JA, Jenike MA, Baer L, Buttolph ML (1992). Dissociative symptoms in patients with obsessive-compulsive disorder. *Journal of Nervous and Mental Disease* 180, 332-337.

Giesbrecht T, Lynn SJ, Lilienfeld SO, Merckelbach H (2008). Cognitive processes in dissociation: an analysis of core theoretical assumptions. *Psychological Bulletin* 134, 617.

Goodman WK, Price LH, Rasmussen SA, Mazure C, Fleischmann RL, Hill CL, Heninger GR, Charney DS (1989). The Yale-Brown obsessive–compulsive scale, I: development, use and reliability. *Archives of General Psychiatry* 40, 1006–1011.

Grabe HJ, Goldschmidt F, Lehmkuhl L, Gänsicke M, Spitzer C, Freyberger HJ (1999). Dissociative symptoms in obsessive-compulsive dimensions. *Psychopathology* 32, 319-324.

Hermans D, Engelen U, Grouwels L, Joos E, Lemmens J, Pieters G (2008). Cognitive confidence in obsessive-compulsive disorder: Distrusting perception, attention, and memory. *Behaviour Research and Therapy* 46, 98-113.

Hodgson RJ, Rachman S (1977). Obsessional compulsive complaints. *Behaviour Research and Therapy* 15, 389-395.

Hunter ECM, Sierra M, David AS (2004). The epidemiology of depersonalization and derealization: A systematic review. *Social Psychiatry and Psychiatric Epidemiology* 39, 9-18.

Julien D, O'Connor K, Aardema F (2016). The inference-based approach to obsessive-compulsive disorder: A comprehensive review of its etiological model, treatment efficacy, and model of change. *Journal of Affective Disorders* 202, 187-196.

Lochner C, Seedat S, Hemmings SM, Kinnear CJ, Corfield VA, Niehaus DJ, Moolman-Smook JC, Stein DJ (2004). Dissociative experiences in obsessive-compulsive disorder and trichotillomania: Clinical and genetic findings. *Comprehensive Psychiatry* 45, 384-391.

Merckelbach H, Wessel I (2000). Memory for actions and dissociation in obsessive-compulsive disorder. *Journal of Nervous and Mental Disease* 188, 846-848.

O'Connor K, Robillard S (1995). Inference processes in obsessive-compulsive disorder: Some clinical observations. *Behaviour Research and Therapy* 33, 887-896.

Olejnik S, Algina J (2003). Generalized eta and omega squared statistics: measures of effect size for some common research designs. *Psychological Methods* 8, 434.

Paradisis SM, Aardema F, Wu KD (2015). Schizotypal, dissociative, and imaginative processes in a clinical OCD

sample. *Journal of Clinical Psychology* 71, 606-624.
Pozza A, Giaquinta N, Dèttore D (2016). Exploring the role of dissociation dimensions in obsessive compulsive disorder. *European Psychiatry* 33, S496.
Rufer M, Fricke S, Held D, Cremer J, Hand I (2006). Dissociation and symptom dimensions of obsessive–compulsive disorder. *European Archives of Psychiatry and Clinical Neuroscience* 256, 146-150.
Rufer M, Held D, Cremer J, Fricke S, Moritz S, Peter H, Hand I (2005). Dissociation as a predictor of cognitive behavior therapy outcome in patients with obsessive-compulsive disorder. *Psychotherapy and Psychosomatics* 75, 40-46.
Sanavio E (1988). Obsessions and compulsions: the Padua Inventory. *Behaviour Research and Therapy* 26, 169-177.
Soffer-Dudek N (2014). Dissociation and dissociative mechanisms in panic disorder, obsessive–compulsive disorder, and depression: A review and heuristic framework. *Psychology of Consciousness: Theory, Research, and Practice* 1, 243.
Taylor S (1998). *Assessment of obsessive-compulsive disorder*. In RP Swinson, MM Antony, S Rachman, MA Richter (eds) Obsessive–compulsive disorder: theory, research, and treatment (pp. 229-256). Guildford Press, New York.
Watson D, Wu KD, Cutshall C (2004). Symptom subtypes of obsessive-compulsive disorder and their relation to dissociation. *Journal of Anxiety Disorders* 18, 435-458.
van den Hout MA, Engelhard IM, Smeets M, Dek EC, Turksma K, Saric R (2009). Uncertainty about perception and dissociation after compulsive-like staring: Time course of effects. *Behaviour Research and Therapy* 47, 535-539.