

Attenuated Access to Emotions in Obsessive-Compulsive Disorder

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The Seeking Proxies for Internal States (SPIS) model of obsessive-compulsive disorder (OCD) posits that OCD is associated with attenuated access to internal states. Here we explored the implications of this model in the realm of emotions. Participants with OCD, anxiety disorders, and nonclinical control participants completed the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT), assessing two domains of emotional intelligence: Experiential emotional intelligence (EI), reflecting the ability to perceive and feel emotions accurately, and Strategic EI, reflecting the ability to understand and manage emotions correctly. As only Experiential EI requires accurate perception of one's emotions for adequate performance, we predicted an interaction between group and EI area. Specifically, we predicted that compared to both anxiety disorders and healthy control participants, OCD participants would show a larger deficit in Experiential area of the MSCEIT relative to the Strategic area. Results were fully in line with this prediction. Moreover, supporting the specificity of the hypothesized deficit to OCD, participants

with anxiety disorders did not differ from nonclinical control participants in their performance, and findings were not attributable to anxiety or depression levels. These results replicate and extend previous findings obtained with analogue samples and suggest that OCD is associated with attenuated access to emotional states, which may be partially compensated for by reliance on semantic knowledge of emotion.

Keywords: obsessive-compulsive disorder; internal states; emotions; emotional intelligence

WOULD YOU KNOW whether a bitter feeling constricting your chest is anger or disappointment? Would you know whether the excitement you feel when expecting your partner is love or rather anxiety? These are important questions with both personal and interpersonal consequences. For example, if you are angry at your child for failing an exam, you might discuss it with him/her to change his/her behavior; but if you are disappointed with his/her performance, you might want to reconsider your own expectations. Love suggests that you should cherish the relations with your partner, whereas anxiety might suggest that you should question them. For some people, the answers to those questions come easily and naturally, whereas other people seem to struggle. The present study examined the hypothesis that individuals with obsessive-compulsive disorder (OCD) belong to the latter category.

According to the Seeking Proxies for Internal States (SPIS) model of OCD (Dar et al., 2019;

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Lazarov et al., 2015; Lazarov et al., 2012a; Lazarov et al., 2010; Lazarov et al., 2020; Lazarov et al., 2014; Liberman & Dar, 2018), people with OCD are characterized by attenuated access to their own internal states. In the model, internal states are defined as subjective states to which one has privileged access, such as one's motivations, feelings, preferences, and physiological states. The SPIS model further stipulates that the attenuated experience of internal states drives people with OCD to seek and use substitutes, or "proxies," for their internal states, which they perceive as more easily discernible or less ambiguous compared with the states for which they substitute. For example, a person with OCD may find it difficult to know whether she loves her partner (the internal state), thereby counting the number of times she has texted him during the day (the proxy).

As the opening examples demonstrate, emotions are particularly important internal states. They guide our decisions, help us understand our own and others' behaviors and experiences, and inform our goals. From the SPIS perspective, OCD symptoms in the realm of emotions are viewed as emanating from difficulties in accessing internal emotional states. To use the previous example, lacking a clear access to one's own feelings toward one's partner might breed tormenting doubts regarding these feelings, as well as regarding additional aspects of the relationship (e.g., Do I feel loved? Am I doing enough to make this relationship work?). This may then lead to compulsive behaviors in a futile attempt to resolve these doubts, such as counting the number of times one has texted their partner as an indication of one's love. In therapy, the SPIS framework can be fruitfully used to discuss with patients the difficulties they experience in trusting their own feelings, understanding and conceptualizing the ensuing doubts and uncertainties not merely as excessive and irrational, but also, at least in part, as emanating from deficient access to one's own emotional signals.

Previous research in the realm of emotions has shown that OCD is associated with impaired ability to recognize emotions in facial expressions of others (for review see Daros et al., 2014) and with alexithymia (for a review see Robinson & Freeston, 2014). While alexithymia comprises difficulty in identifying and describing one's own feelings, echoing the SPIS concept of attenuated access to emotional states, it is a much broader concept encompassing also difficulty in distinguishing one's feelings from bodily sensations, diminished affect-related fantasy and imagery, and difficulty

using representational or symbolic modes of mental functioning (Aleman, 2005; Nemiah et al., 1976; Robinson & Freeston, 2014). To more directly test the SPIS tenet of attenuated access to one's own internal states in the domain of emotions, Dar et al. (2016) used the Mayer-Salovey-Caruso-Emotional-Intelligence-Test (MSCEIT; Mayer & Salovey, 1997; Mayer et al., 2002, 2004), a widely used ability-based measure of emotional intelligence (EI) with a strong conceptual basis and good psychometric properties (Brackett & Mayer, 2003; Mayer et al., 2004; Mayer et al., 2003). The MSCEIT yields performance scores in two different EI areas: The Experiential area reflects the ability to perceive and feel emotions, and comprises items that require responders to access *their own feelings* (e.g., in response to an abstract painting). The Strategic area, in contrast, reflects the ability to understand and manage emotions, comprising items that require responders to access *their knowledge about emotions* (e.g., what a person is likely to feel in a certain situation). Based on the SPIS model, Dar et al. (2016) predicted that OCD symptoms would be related to more impaired performance on Experiential EI relative to Strategic EI, because only Experiential EI items require responders to accurately gauge their own emotions. Results of two studies corroborated this prediction. First, participants with high levels of OCD symptoms, compared with participants with low levels of OCD symptoms, scored significantly worse on Experiential EI, but not on Strategic EI (Study 1, Dar et al., 2016). Second, in a large sample of non-selected participants, OCD symptoms correlated negatively with Experiential but not with Strategic EI scores, a correlation that remained significant after controlling for depression and anxiety scores (Study 2, Dar et al., 2016). Finally, comparing the top and bottom quartiles of this sample based on levels of OCD symptoms, replicated the results of Study 1.

While providing preliminary evidence for the SPIS model in the domain of emotional states, the aforementioned research by Dar and colleagues (Dar et al., 2016) has two critical limitations, both of which we aimed to rectify in the present study. First, results were based on nonclinical, highly functioning participants, considerably limiting what can be learned about clinical OCD. Second, as participants with high and low levels of OC symptoms also differed on anxiety levels, we could not ascertain the extent to which the obtained results were specific to OCD as opposed to anxiety, which is highly correlated with OCD (American Psychiatric Association, 2013; Van

Ameringen et al., 2014). Here, we addressed these limitations by replicating Dar et al.'s (2016) original study in participants with clinical OCD, participants with anxiety disorders (AD), and non-clinical control (NC) participants (see Lazarov et al., 2014, for a similar design). We predicted an interaction between group and EI area. Specifically, we predicted that compared to both anxiety disorders and healthy control participants, OCD participants would show a larger deficit in Experiential area of the MSCEIT relative to the Strategic area.

Method

PARTICIPANTS

Participants were 20 patients with OCD, 24 patients with AD, and 26 NC participants with no psychiatric history. Groups were matched in terms of age, gender, and years of education (see Table 1). Of the 20 AD participants, 14 met criteria for social anxiety disorder (SAD), 10 for panic disorder (PD), seven for generalized anxiety disorder (GAD), four for agoraphobia, and one for a specific phobia.

OCD and AD participants were recruited from a community mental health center. Primary and comorbid diagnoses were based on a formal intake interview conducted by a psychiatrist or clinical psychologist using the *Diagnostic and Statistical Manual of Mental Disorders* (DSM; American Psychiatric Association, 2013) as part of the center's regular admission process. For the OCD group, we invited individuals with a primary diagnosis of OCD coupled with an Obsessive-Compulsive Inventory-Revised (OCI-R; Foa et al., 2002) score >27, denoting severe OCD (Abramovitch et al., 2020). For the AD group, we invited individuals with a primary diagnosis of SAD, GAD, specific phobia, agoraphobia, or PD, without comorbid OCD. Exclusion criteria for both groups were present or past psychiatric

diagnosis other than anxiety disorders, including psychotic episodes, comorbid posttraumatic stress disorder, Tic disorder or Tourette's syndrome, neurologic conditions (e.g., epilepsy, brain injury), substantial present usage of drugs or alcohol, or use of neuroleptic medication. NC participants were assessed using the Mini-International Neuropsychiatric Interview (MINI; Sheehan et al., 1998; see Measures below). We excluded participants with any current or past psychiatric diagnosis.

Of the 20 participants with OCD, five also met criteria for a past or present depressive episode, four met criteria for PD, three met criteria for GAD, three met criteria for SAD, three met criteria for body dysmorphic disorder, and two met criteria for agoraphobia. Of the 20 participants with anxiety disorders, six also met criteria for past or present depressive episode.

The study was approved by the local Institutional Review Board. All participants signed informed consent and received 100 NIS (~30 U. S. dollars) as compensation for their time.

MEASURES

Primary and Comorbid Diagnoses

Primary and comorbid diagnoses were assessed in individual clinical interviews using the MINI (Sheehan et al., 1998), a structured diagnostic interview for DSM-IV and ICD-10 psychiatric disorders, which takes approximately 20 min to administer, and found to be a valid time-efficient alternative to other structured clinical interviews (Lecrubier et al., 1997; Sheehan et al., 1997).

Obsessive-Compulsive Symptoms

Obsessive-compulsive symptoms were measured using the OCI-R (Foa et al., 2002), which lists 18 characteristic symptoms of OCD, with each rated on a 0 (*Not at all*) to 4 (*Extremely*) scale regarding its prevalence during the last month. The OCI-R demonstrates good validity, test-

Table 1
Demographic and Psychopathological Characteristics of the Three Experimental Groups

Measure	OCD group (n=20)		AD group (n=24)		NC group (n=26)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Age	29.45 ^a	9.05	32.38 ^a	9.37	35.61 ^a	12.38
Years of education	13.17 ^a	1.78	14.45 ^a	2.24	14.04 ^a	2.31
Gender ratio	12:8 ^a	-	10:14 ^a	-	18:8 ^a	-
OCI-R	39.00 ^a	10.62	12.29 ^b	8.72	10.50 ^b	5.71
DASS-21 depression	8.90 ^a	6.16	6.91 ^a	6.47	1.65 ^b	1.99
DASS-21 anxiety	7.70 ^a	5.78	6.00 ^a	5.20	1.11 ^b	1.18

Note. Different superscripts signify differences between groups at $p < .001$. Same superscripts signify non-significant differences between groups. OCD, obsessive compulsive disorder; AD, anxiety disorders; NC, non-clinical control; OCI-R, Obsessive-Compulsive Inventory-Revised; DASS, Depression Anxiety and Stress Scales-21.

retest reliability, and internal consistency in both clinical (Abramovitch et al., 2020; Abramowitz & Deacon, 2006; Foa et al., 2002) and nonclinical samples (Hajcak et al., 2004). Cronbach's alpha in our sample was .93.

Depression and Anxiety Symptoms

Depression and anxiety symptoms were measured using the depression and anxiety subscales of the Depression, Anxiety and Stress Scales-21 (DASS-21; Lovibond & Lovibond, 1995) self-report questionnaire. Items are scored on a 0-to-3 scale, on which participants indicate how much each item/statement applied to them over the past week. The DASS-21 has high reliability, validity, and internal consistency in both clinical and nonclinical groups (Antony et al., 1998; Henry & Crawford, 2005; Lovibond, 1998; Lovibond & Lovibond, 1995). Cronbach's alphas of the depression and anxiety subscales in our sample were .93 and .87, respectively.

EMOTIONAL INTELLIGENCE ASSESSMENT

Emotional intelligence was measured using the Hebrew version of the MSCEIT V2.0 (Mayer et al., 2002, 2004) approved by the test publishers (Multi-Health Systems; North Tonawanda, NY, USA). The MSCEIT contains 141 items in total, divided among eight different tasks tapping into different EI-related skills and abilities (tasks *A* through *H*), with each task using different item types and different response scales. These eight tasks measure four branches of EI (branches 1 through 4): (Branch 1) Perceiving emotions in (*task A*) faces and (*task E*) landscapes; (Branch 2) Using emotions in (*task B*) synesthesia and in (*task F*) facilitating thought; (Branch 3) Understanding emotional (*task C*) changes across time and (*task G*) emotional blends; (Branch 4) Managing emotions in (*task D*) oneself and (*task H*) relationships (Mayer & Salovey, 1997; Mayer et al., 2004). Specifically, Branch 1 assesses the ability to perceive and recognize emotions properly in yourself and others; Branch 2 measures the ability to create, use, and integrate emotions to facilitate thought in various cognitive tasks (e.g., reasoning, decision making, problem solving, creativity); Branch 3 reflects the ability to analyze emotions correctly, to understand their causes, development and progression over time and their probable outcomes; Branch 4 gauges one's ability to manage emotions adaptively in creating effective strategies that use one's emotions to achieve his/her personal goals, rather than being influenced by emotions in unpredictable ways. These four branches comprise the two above-described areas of EI: Experiential EI (branches 1 and 2 combined) and Strategic EI

(branches 3 and 4 combined). In total, the MSCEIT yields seven scores, one for each of the four branches and two area scores, and a total EI score, with scores expressed as percentiles in the distribution of normative scores, based on more than 5,000 responders, with lower percentile scores reflecting worse performance relative to the norm (Jacobs et al., 2008; Mayer et al., 2002). Cronbach's alpha was reported to be .93 for MSCEIT's as a whole, and $\sim .90$ for both the Experiential and Strategic EI areas (Mayer et al., 2003). The test-retest reliability of the full scale over a three-week interval was found to be .86 (Brackett & Mayer, 2003).

PROCEDURE

Participants were tested individually in a small and quiet room. On arrival, they received a short explanation of the procedure and then signed informed consent. Next, they completed the MSCEIT followed by the additional described-above measures.

DATA ANALYSIS

Prior results with the same paradigm comparing participants with high and low OC symptoms yielded effects of $\eta_p^2=0.14$ to 0.19 (Dar et al., 2016, Studies 1 and 2, respectively) for the interaction of group-by-EI area. We calculated the required sample size for detecting the here predicted interaction between group and MCSEIT area scores using G*Power 3.1.9.4 (Faul et al., 2007) based on the smaller effect size (0.14), and specifying a 2-tailed $\alpha=.05$ and a power of .80. This calculation resulted in a required sample size of 66 participants.

To examine group differences on EI scores, we performed a mixed-model ANOVA with group (OCD, AD, NC) as a between-subjects factor and EI area (Experiential, Strategic) as a within-subject factor. Follow-up analyses included separate one-way ANOVAs for the Experiential and Strategic EI areas, with follow-up contrasts to further explicate group differences. All statistical tests were two-sided, using an α of .05. Effect sizes for significant findings are reported using η_p^2 and 90% effect size confidence interval (CI). Significance levels for multiple comparisons were adjusted using the Bonferroni correction. All statistical analyses were conducted with SPSS (IBM; version 25).

Results

DATA AVAILABILITY

The data that support the findings of this study are openly available in Open Science Foundation

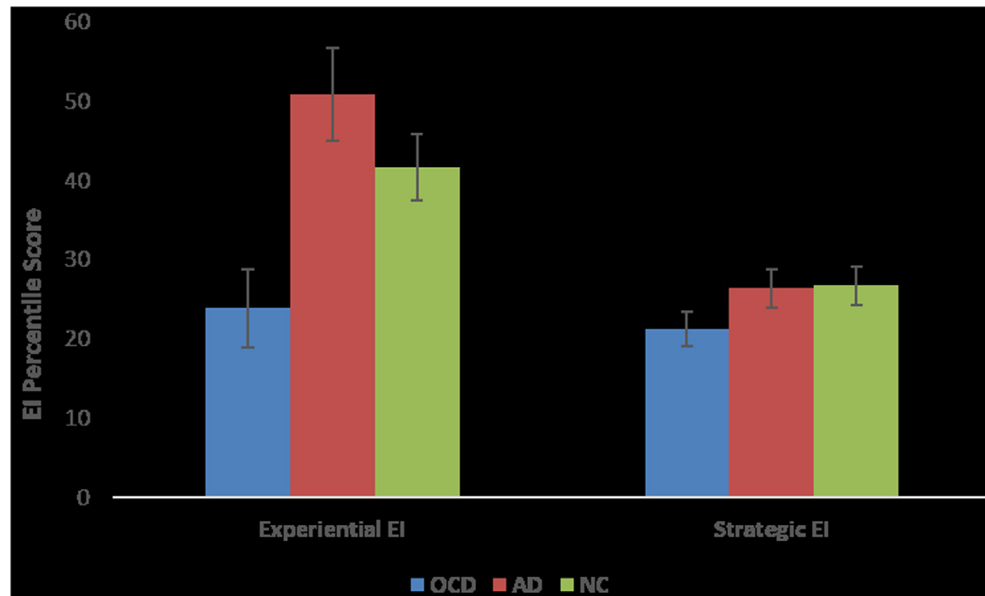


FIGURE 1 Mean EI Percentile Scores by EI Area (Experiential, Strategic) and Group. Note: AD = Anxiety Disorders, NC = Nonclinical control). Higher values indicate higher mean score. Error bars denote standard error of the mean.

(OSF) at https://osf.io/8x4sv/?view_only=0303a0b8ab624a6faf56b38a2a2c53c2.

DEMOGRAPHIC AND CLINICAL CHARACTERISTICS

Demographic and clinical characteristics of the two groups are described in Table 1. Groups did not differ on age, $F(2, 69) = 1.96, p = .15$, education years, $F(2, 69) = 2.01, p = .14$, or gender distribution, $\chi^2(2) = 3.96, p = .14$.

Not surprisingly, the three groups differed significantly on OCI-R scores, $F(2, 69) = 77.92, p < .001$, and on depression and anxiety scores, $F(2, 69) = 12.46, p < .001$, and $F(2, 69) = 14.93, p < .001$, respectively. Follow-up analyses showed that OCD participants had significantly higher OCI-R scores in comparison to both AD, $t(42) = 9.16, p < .001$, and NC participants, $t(44) = 11.68, p < .001$, which did not differ between them, $t(48) = 0.87, p = .39$. Both OCD and AD participants had significantly higher depression scores in comparison to NC participants, $t(44) = 5.64, p < .001$, and $t(48) = 3.95, p < .001$, respectively, which was also evident for anxiety scores, $t(44) = 5.68, p < .001$, and $t(48) = 4.67, p < .001$, respectively. Importantly, OCD and AD participants did not differ on depression, $t(42) = 1.03, p = .31$, or anxiety scores, $t(42) = 1.03, p = .31$.

EMOTIONAL INTELLIGENCE

Percentile scores by group are presented in Figure 1. A main effect of EI area, $F(1, 67) = 24.97,$

$p < .001, \eta_p^2 = .27, CI = .13-.40$, indicated that participants scored higher on the Experiential EI ($M = 39.77, SD = 26.20$) compared with the Strategic EI ($M = 25.06, SD = 11.71$). However, this main effect was qualified by a significant group-by-area interaction effect, $F(2, 67) = 4.73, p = .01, \eta_p^2 = .12, CI = .02-.23$. Separate one-way ANOVAs on total scores on the Experiential and Strategic EI areas revealed a significant difference between the groups on the Experiential area, $F(2, 69) = 6.89, p = .002, \eta_p^2 = .17, CI = .04-.28$, but not on the Strategic area, $F(2, 69) = 1.53, p = .22$. Follow-up contrasts on the Experiential EI scores revealed that, as predicted, participants with OCD had lower scores ($M = 23.94, SD = 22.20$) compared to the AD group ($M = 50.90, SD = 28.49$), $F(1, 43) = 11.88, p = .001, \eta_p^2 = .22, CI = .06-.37$, and the NC group ($M = 41.68, SD = 21.21$), $F(1, 45) = 7.60, p = .008, \eta_p^2 = .14, CI = .02-.30$, with no differences between the AD and the NC groups, $F(1, 49) = 1.70, p = .20$.¹

¹ Collapsing across the AD and NC groups showed an average of 46.11 on the Experiential EI and 26.60 on the Strategic EI (and 25.06 when collapsing across all three groups). While the Experiential EI score is in line with the expected normative score for this age group (49.00), the score for the Strategic EI is below what would be expected (49.00). Still, the fact that main finding of the present study was related to scores on the Experiential EI maintains our confidence in the reported findings.

Discussion

Based on the SPIS model, the present study aimed to test the hypothesis that individuals with OCD would have attenuated access to their emotional states. As predicted, a significant group-by-EI area emerged, whereby the OCD participants performed significantly worse than both anxiety disorders participants and nonclinical participants on the Experiential, but not on the Strategic MSCEIT area. Importantly, anxious and nonclinical participants did not differ in their Experiential EI performance, indicating that the deficit in this area is specific to OCD. As Experiential EI depends on accurate perception of one's emotions, the inferior performance of OCD participants in this area is consistent with their postulated deficiency in perceiving their own affective, internal states.

The study replicates our previous findings comparing people with high and low levels of OCD symptoms (Dar et al., 2016) and demonstrates their relevance to clinical OCD. In fact, current findings are even stronger. For example, the mean Experiential EI score of OCD participants in the present study was 23.94, as compared to 41.68 and 37.02 for participants with high levels of OCD symptoms (Dar et al., 2016; Study 1 and 2, respectively). This amplification of the results when extending experimental procedures from analogue to clinical samples echoes previous findings from our lab with other experimental paradigms (compare, for example, Lazarov et al., 2012b; Lazarov et al., 2014). Just as important, the present study indicates that the attenuated access to emotions is specific to OCD and not attributable to anxiety or depression, two disorders that tend to co-occur with OCD (Brown et al., 2001; Overbeek et al., 2002). The mean Experiential EI score of OCD participants was significantly lower than that of AD participants, despite the fact of having the same proportion of participants meeting criteria for past or present depressive episode (25%) and not differing on DASS-21 depression and anxiety subscales scores (see Table 1). Still, prior research has also shown social anxiety levels to be specifically and negatively correlated only with Experiential EI, but not Strategic EI, suggesting Experiential EI to be reflective of more basic-level *socially relevant* emotional processing (Jacobs et al., 2008), which has been implicated in OCD (Jansen et al., 2020). Yet, the fact that no differences on Experiential EI scores were found between AD and NC participants, who differed considerably on SAD prevalence (58% of AD participants met criteria for SAD as their primary anxiety-related diagnosis),

strengthens the relevance of present findings to OCD rather than to socially related emotional processing. We should like to note at this juncture that such clear differentiation in task performance between OCD and anxiety disorders participants is rarely observed in the experimental literature (Lazarov et al., 2014). Theoretically, we consider the observed difference between OCD and AD participants on Experiential EI in the present study in relation to the SPIS model's tenet of attenuated access to internal states (i.e., subjective states to which one has privileged access). We believe that this hypothesized deficit, which renders internal states vague and less clearly experienced for obsessive-compulsive individuals, does not characterize anxious non-OCD individuals. Indeed, prior research of the SPIS model has shown that the performance of anxious participants is comparable to that of healthy individuals when engaging in tasks that necessitate access to internal states (Lazarov et al., 2014) and that controlling for anxiety scores does not change the pattern of results of obsessive-compulsive individuals in these tasks (e.g., Dar et al., 2016; Lazarov et al., 2020).

Our results are also in line with previous research examining the domain of emotions in OCD more broadly, while addressing some of their shortcomings. First, our findings are consistent with studies showing that OCD is associated with alexithymia (for review see Robinson & Freeston, 2014). However, those studies relied mostly on the self-report Toronto Alexithymia Scale (TAS-20; Bagby, Parker, et al., 1994; Bagby, Taylor, et al., 1994). As a self-report measure, the TAS-20 may reflect responders' *evaluation* of their ability to accurately perceive and express their emotions, rather than their *actual ability* to do so (Brackett et al., 2006; Cogle et al., 2007; Dar et al., 2000). Moreover, lacking an ability often makes it impossible for people to know, let alone report, of its absence (Dunning et al., 2003). Conversely, the present study relied on the MSCEIT, which conceptualizes and measures EI as an ability, rather than as a self-reported belief. In addition, in contrast to the present findings, studies comparing alexithymia scores in OCD participants to those of other clinical groups, including anxiety patients, did not find any difference between these groups (Robinson & Freeston, 2014). Second, our results are also in line with studies demonstrating deficient ability of OCD participants to correctly recognize emotional facial expressions (for review see Daros et al., 2014). However, those studies did not assess participants' ability to accurately assess their *own* emotional states, but rather the emotions expressed by

others. Furthermore, most of these studies did not include measures of anxiety, so their results cannot be specifically attributed to OCD.

While items in the Experiential area of the MSCEIT require responders to access their current feelings, items in the Strategic area tap responders' semantic knowledge about emotions (e.g., asking how a person would likely feel in a certain situation). In contrast to their deficient Experiential EI, the present study, as well as previous studies using the MSCEIT (Dar et al., 2016), found OCD participants to have Strategic EI comparable to that of non-OCD participants. This finding fits nicely with the SPIS model's assertion that people with OCD tend to seek and use proxies for their internal states (Lazarov et al., 2014). Specifically, it suggests that semantic knowledge about emotions can be used to compensate for an attenuated emotional experience. This idea is consistent with the process of accessing emotions, as hypothesized by Robinson and Clore (2002), which suggests that when people attempt to access their emotions, they generally start with their current experience, but when this fails, they proceed to other available sources of information. One of these sources, according to Robinson and Clore, is people's semantic knowledge about emotions. In the terminology of the SPIS model, then, semantic knowledge about emotions can serve as a proxy for direct emotional experience when access to this experience is attenuated (Dar et al., 2016). Still, while semantic knowledge may have served as a proxy for attenuated emotional experience, the present study did not include a more explicit test of proxy usage. Future research could more directly explore this possibility.

Our results should be considered in light of some limitations. First, while our total sample size ($N = 70$) exceeded the required sample size based on our a-priori power calculation for detecting the hypothesized group-by-EI area interaction ($N = 66$), it was still relatively small, especially the OCD group ($N = 20$). Unfortunately, the outbreak of the COVID-19 epidemic brought a halt to the recruitment of OCD and AD patients, rendering our study slightly underpowered, which may have precluded the detection of group difference also on the Strategic EI. Yet, present results are in line with previous studies showing no group differences on this EI area (Dar et al., 2016), strengthening our confidence in current findings. Second, due to our relatively small sample of OCD patients, we could not explore whether different OCD subtypes or dimensions (e.g., cleaning, checking) are also differently related to performance on the Experiential and Strategic EI areas. As OCD is a highly

heterogeneous disorder, future research could explore this important possibility. Third, previous research in our lab has shown participants with high levels of OC symptoms to be less confident in their performance on tasks necessitating access to one's internal states (Lazarov et al., 2012a) and to find them more difficult, compared with control participants (Lazarov et al., 2020). In the present study we did not assess participants' confidence in their performance or their difficulty with the MSCEIT, which could have supplemented the objective performance data. Future research should rectify this omission. Fourth, while participants in the OCD and AD groups underwent a formal intake interview based on the DSM (American Psychiatric Association, 2013) as part of their admission to the community mental health center, NC participants were assessed using the MINI (Sheehan et al., 1998), which omits a few psychiatric disorders such as specific phobia or personality disorders. However, as the NC group significantly differed from the OCD and AD groups on all psychopathological characteristics (Table 1) we do not consider this to be a major limitation. Finally, future studies can attempt to validate our findings using alternative methodologies. For example, Itkes and colleagues (Itkes et al., 2017) have recently demonstrated that the process of accessing one's own emotional responses to affective stimuli ("affective valence") can be differentiated from the process of evaluating the valence of the same stimuli ("semantic valence"). They showed that verbal and physiological responses of participants who were asked to report their feelings about emotional stimuli habituated more rapidly with repeated exposure, than responses of participants who were asked to evaluate the valence of the stimuli (Itkes et al., 2017). Based on the SPIS model and on our previous (Dar et al., 2016) and present findings, we would predict that compared to that observed in healthy participants, this effect would be smaller in participants with OCD, who must rely on their semantic knowledge of emotions even when asked to report their own emotional responses.

Notwithstanding the above-stated limitations, we believe that the SPIS model may have some potential clinical implications. Specifically, from a clinical stance, the SPIS model suggests that some of the symptoms displayed by OCD patients may be attempts to manage their difficulties in accessing their own emotional states. Therefore, therapy could benefit from using SPIS terminology to offer patients a novel way to conceptualize and interpret their symptoms, which is both more functional and more emphatic compared with the interpreta-

tions patients typically come up with. First, therapists can use the model's framework and concepts to discuss with their patients the difficulties they experience in trusting their own emotions. Doubts and uncertainties about the patients' own feelings and emotions can be understood in therapy as emanating from deficient access to one's own internal signals, and not only as excessive and irrational. Second, as the SPIS model postulates that no action/proxy will ever successfully eliminate obsessive doubt, an emphasis on excepting and acknowledging doubt and uncertainty as an integral part of human existence can also benefit from using SPIS terminology. Indeed, targeting doubt in achieving beneficial treatment outcome has been suggested in previous approaches to OCD (Aardema & O'Connor, 2012; Tolin et al., 2003). Third, the present findings may also encourage using mentalization-based techniques aimed at achieving greater awareness of internal experiences, including emotions, in treating patients with OCD (Fonagy, 2002; Fonagy et al., 1991). Future studies could examine these suggestions to better elucidate the potential therapeutic benefits of using the SPIS model's conceptualizations in treating OCD.

To conclude, the present study indicates that OCD is specifically associated with attenuated access to emotional states. This finding is consistent with, and further substantiates, the SPIS model of OCD, according to which OCD is characterized by an impaired access to one's internal states.

Conflict of Interest Statement

The authors declare that there are no conflicts of interest.

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