



Obsessive-compulsive tendencies predict seeking proxies for understanding

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ABSTRACT

Background and objectives: The Seeking Proxies for Internal States (SPIS) model of obsessive-compulsive disorder (OCD) postulates that obsessive-compulsive (OC) individuals have reduced access to their internal states and must therefore seek and rely on external proxies for these states. The present study extended this hypothesis to the feeling of understanding, which had not been examined previously in relation to OCD.

Methods: We presented 148 participants with a computerized task requiring them to read and understand a text on medieval architecture. Participants were randomly assigned to an ongoing feedback condition (comprehension quiz and answers provided after each text segment) or no-feedback condition (quiz and answers provided only at the end). Throughout, participants were offered proxies in the form of “learning aids,” which were unrelated to text comprehension. Participants were divided to high vs. low OC tendencies based on a median split on a measure of OCD symptoms.

Results: As predicted, lacking feedback on understanding was associated with higher use of proxies and high OC participants used more proxies than low OC participants in the no-feedback condition. Actual understanding, as assessed by comprehension scores, was unrelated to OC tendencies.

Limitations: Among other limitations discussed in the article, our results were obtained on a non-selected sample of students varying on OC tendencies. It would be important to replicate these findings with diagnosed OCD participants as compared to both non-clinical and anxiety disorders control participants.

Conclusions: These findings extend the SPIS model to the domain of understanding and may have important clinical implications.

1. Introduction

When you read a long, difficult text, how do you know that you've understood it correctly? For most people, this would be a strange question, and they might answer something like “I just know.” Presumably, this answer reflects some internal sense that most people have when they read a text. Whereas most people seem to be able to access their *feeling of understanding* easily, this is sometimes difficult for people with obsessive-compulsive disorder (OCD). Obsessive-compulsive (OC) individuals often report being unable to generate a sense that they understand what they read. Here is how a person with OCD describes, on her website, her experience of reading a text: “With each sentence the tightness in my chest grew stronger, alongside the growing panic that **I hadn't understood it properly or read it correctly**” (Lucy, 2013). On her website “Bringing along OCD”, another person with OCD (Barbour, 2012) describes in their blog what they term “Reading OCD” in these words:

You read a paragraph. Then you reread it. Then you move to the second paragraph, but you realize that you may not have read the first paragraph well enough. So you go back and read paragraph one again. Then you read and reread paragraph two several times. You finally make it to the end of the page, and in turning the page, you think, “I've read page one adequately.” But you can't be sure. Did you understand everything you read? Will you remember it?

Another person who presents him/herself as suffering from the same problem reports that her/his career in law was “sidelined” because of the anxiety associated with reading legal materials. Another mentioned that this problem has ruined not only his enjoyment of reading, but also of watching movies (<https://myocdvoice.wordpress.com/2018/02/21/how-i-overcame-my-reading-ocd/>). The fears associated with not understanding the text include the distressing thought that one is “cheating” because they don't really understand, or that other would see them as frauds (<https://blogs.psychcentral.com/ocd-reflections/2016/03/ocd-and-reading/>). The most common symptoms mentioned

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in these blogs are re-reading and gradually, because of the distress associated with reading, partial or complete avoidance of reading. Contributors to these blogs describe various strategies designed to cope with the fears that they would not understand what they are reading, including reading very slowly, repeating the words in one's mind, underlining nearly every word, and reading sentences to a certain rhythm.

Interestingly, while these difficulties appear to characterize at least some people with OCD, we could not find any empirical research on this issue. The only publication we could find that addresses the feeling of understanding in OCD is a treatment-oriented book (Grayson, 2014). According to its author, "The core of the problem is having the feeling that you don't understand what you read. As a result, you reread a sentence or a word over and over before going on to the next sentence. Unfortunately, this contributes to destroying the flow of what you are reading, so the feeling of understanding becomes even more unattainable. Generally, the more important the material, the greater the anxiety. Schoolwork becomes torture." (p. 169).

The present experiment aimed to examine the feeling of understanding in relation to OC tendencies in the context of the Seeking Proxies for Internal States model of OCD (SPIS; Lazarov, Dar, Oded, & Liberman, 2010; Liberman & Dar, 2009). According to the SPIS model, a core feature of OCD is impaired access to internal states, including cognitive functions, emotions and preferences, as well as bodily states and sensations. The attenuation in access to internal states, according to this model, lead OC individuals to seek and use more easily discernible indices or "proxies" for their internal states. For example, an OC individual might find it difficult to access his/her feeling of hunger and cravings for specific foods, and instead resort to various objective considerations to decide what and when to eat (for example, by checking how long it's been since the last meal and applying rules about the optimal ratio of proteins to carbohydrates). In relation to the feeling of understanding, the focus of the present study, an OCD sufferer may use the proxy of being able to recite the material by heart, despite the fact that this proxy may be only marginally correlated with understanding.

A substantial body of empirical evidence supports the SPIS model. Initial corroboration for the model came from studies using biofeedback as a proxy for the internal states of relaxation and muscle tension. These studies found that reliance on both genuine and false feedback was related to OC tendencies and was more evident in participants with high OC tendencies than in participants with low OC tendencies (Lazarov et al., 2010; Lazarov, Dar, Liberman, & Oded, 2012a, 2012b), and even more so in participants with clinical OCD as compared to both non-clinical and anxiety disorder participants (Lazarov, Liberman, Hermesh, & Dar, 2014). A more recent series of studies by Dar, Lazarov, and Liberman (2016) found that OC tendencies are related to attenuated access to emotions. Specifically, OC tendencies were related to lower scores on the Experiential area of the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT; Mayer, Salovey, & Caruso, 2002; Palmer, Gignac, Manocha, & Stough, 2005), which relies on access to experienced emotions, but not on the Strategic area, which relies on semantic knowledge about emotions.

Moving from the laboratory into the realm of daily experiences, Liberman and Dar (in press) recently developed an inventory for assessing reliance on external proxies for diverse internal states such as hunger, enjoyment, interpersonal liking, and preferences. The Seeking Proxies for Internal States Inventory (SPISI) probes the individual's reliance on a variety of proxies for those states, such as other people's opinions (e.g., "I turn to others to know if I acted right"), their own behavior (e.g., "Sometimes I have to infer my feelings from my own actions"), objective indices (e.g., "To know how hungry I am, I consider what and when I've eaten today"), and a-priori fixed rules (e.g., "I choose what to wear based on pre-determined criteria"). In two large internet samples, scores on the SPISI correlated positively with OC tendencies even after controlling for concurrent anxiety and depression. In another study, SPISI scores were significantly higher in diagnosed

OCD participants than in non-clinical control participants (unpublished data).

According to Liberman and Dar (2009), people are likely to seek and rely on proxies for their internal states when they lack objective and reliable feedback on their performance. This is because when such feedback is available, there is less need to rely on internal states to assess one's level of performance. In the present study, we examined the effects of OC tendencies and receiving (vs. not receiving) ongoing feedback on using proxies for the feeling of understanding. We predicted that not receiving ongoing feedback about one's understanding would increase the tendency to use proxies for understanding in all participants. In addition, we predicted that in the absence of ongoing feedback, higher OC tendencies would be related to using more proxies for understanding.

We examined these predictions with a novel task that required participants to read and understand a text that was presented in segments on a computer screen and was followed by questions designed to test participants' understanding of the text. Half of the participants received ongoing feedback on their level of understanding of the text whereas the other half did not. While reading the text, a set of proxies was available for the participants in the form of "learning aids." These "learning aids" were designed and tested to be unhelpful for understanding the text. Beyond making for a stronger test of our hypotheses, this was important in order to prevent a ceiling effect whereby most or all participants would use these proxies, especially in the no-feedback condition. Moreover, we wanted to ensure that the proxies do not provide valid feedback about understanding, which could diminish the difference between the feedback and the no-feedback conditions. We predicted that the use of the proxies ("learning aids") would be higher in the no-feedback as compared to the ongoing feedback condition, and, in the no-feedback condition, would be higher in high-OC participants compared to low-OC participants

2. Method

2.1. Participants

Participants were Hebrew native speaking students from Tel Aviv University, who participated in the study in exchange for course credit or monetary compensation (approximately \$10 in Israeli New Shekels). Participants were recruited in two stages. In the first stage, we recruited 80 participants and then conducted an interim analysis of the results. The analysis indicated the results were in the predicted direction, but the sample size was too small for reaching statistical significance. We therefore ran the study on 68 additional participants for a total of 148 participants and adjusted the statistical significance level for sequential statistical tests (Armitage, McPherson, & Rowe, 1969; see Results section).

2.2. Materials

OCI-R (the Obsessive Compulsive Inventory – Revised). OC tendencies were measured with the Obsessive-Compulsive Inventory-Revised (OCI-R; Foa et al., 2002). The OCI-R lists 18 characteristic symptoms of OCD followed by a 5-point scale ranging from 0 (*not at all*) to 4 (*extremely*), on which participants indicate the symptom's prevalence during the last month. The OCI-R has been shown to have good validity, test-retest reliability and internal consistency in both clinical (Foa et al., 2002) and non-clinical samples (Hajack, Huppert, Simons, & Foa, 2004).

2.3. Text and questions

The text participants had to read and understand was a complicated, abstract and fairly long text (in Hebrew) about medieval architecture that was downloaded from an internet source (Berliner 2011). The text was revised and split into six segments. For each segment we

constructed two to four multiple-choice comprehension questions.

2.4. Proxies

We created four types of “learning aids” which could be used as proxies for understanding the text. These aids were available to participants while reading the text by pressing the corresponding virtual button on the screen. The four types of proxies were:

- (1) *Sentence Location* - The participant was presented with a sentence taken from the text and was offered the chance to see in which quartile of the screen the sentence was located when presented within the original text (e.g., upper left).
- (2) *Statistics*- The participant was provided with the number of appearances of certain words, digits or linguistic structures in a certain segment of the text. (e.g., the number of verbs in segment #6).
- (3) *Highlighting words*- The participant is presented with a blurred version of the text he had just read, in which some words, digits or linguistic structures were readable and highlighted in a different color.
- (4) *Progress Index*- The participant was given the option to view his or her progress in the reading task in terms of number of words, percentage of text, and number of segments that he or she read until that point.

For each of the six text segments there were three instances of each proxy, for a total of 72 proxies (six text segments X four proxies X three instances of each proxy). The proxies were chosen based on a pilot study, in which the relevance of various proxies for understanding the text was rated by ten independent judges. The judges read a segment of the text and were given an initial pool of nine “learning aids.” They were asked to rate how helpful each of these was for understanding the text, using a scale of 1–10. The four “learning aids” with the lowest scores (range of 1.7–4.3) were chosen as proxies for the study. Subsequently, we conducted another pilot study to examine whether exposure to these proxies was related to understanding. Forty participants were asked to read the entire text and answer the questions that followed. Half of the participants were provided with all of the proxies while reading the text, whereas the other half was not. Comprehension scores did not differ between the two groups, $t(38) = -0.25$; $p = .80$, confirming that the proxies were unhelpful for understanding.

2.5. Computer software

The experiment was conducted using a Windows application that was designed specifically for the current task. It randomly assigned each participant to the ongoing feedback or the no-feedback group (see below) and presented the instructions, the text (during which the proxies were available via virtual buttons on a sidebar) and finally the OCI-R. The application was written in Python 2.5 using the WXPython extension for the graphical user interface.

2.6. Procedure

Participants were tested individually or in small groups in a quiet room and were told that the study was designed to test text comprehension. Each session lasted 45–80 min (depending on proxy usage and reading speed). At the beginning of each session, participants entered basic demographic information and pressed a button to continue to the instructions. All participants were told that they would have to read a text about medieval architecture and should understand the text sufficiently to answer comprehension questions. They were told that while reading the text, they could use learning aids that may or may not improve their understanding of the text. The four “learning aids” were explained to them and they were told that they could use them by pressing the corresponding virtual bars to the right-hand side of the

screen. After reading the instructions, participants were presented with a short paragraph and viewed an example of each “learning aid” in relation to that paragraph. During the subsequent experimental phase, participants read the text, divided into six segments, and used the learning aids at will by pressing the virtual bars. Participants in the ongoing feedback condition received the questions relevant to each text segment immediately after they finished reading it. After answering each question, they were provided with the correct answer. Participants in the no-feedback condition answered all the questions only after having completed reading the entire text rather than after each segment (i.e., they received no ongoing feedback on their level of understanding during the task). Finally, participants completed a computerized version of the OCI-R, were thanked, received course credit or money, and were debriefed.

3. Results

Alpha level in all statistical analyses was set to 0.003 to compensate for inflation of type I error due to the two-stage analysis, following the guidelines suggested by Armitage et al. (1969). Participants were divided to high vs. low OC tendencies based on a median split of the OCI-R scores. The low OC groups ($N = 73$) had a mean OCI-R score of 10.63 ($SD = 4.91$, range = 0–18) whereas the high OC groups ($N = 75$) had a mean OCI-R score of 32.36 ($SD = 9.81$, range = 19–57).

We first examined the effects of the two independent variables on comprehension scores. Not surprisingly, participants receiving ongoing feedback had higher comprehension scores ($M = 11.85$, $SD = 2.57$) than participants in the no-feedback condition ($M = 9.92$, $SD = 2.57$), $F(1, 144) = 21.33$, $p < .001$. The effects of OC tendencies on comprehension was not statistically significant $F(1,144) = 2.49$, $p = .136$, nor was its interaction with feedback condition $F(1,144) = 0.53$, $p = .467$. Importantly, and consistent with our pilot tests, the number of “learning aids” used was uncorrelated with comprehension scores in both the ongoing feedback condition ($r(148) = 0.049$, $p = .69$) and the no-feedback condition ($r(148) = -0.067$, $p = .57$).

We tested our main hypotheses using two planned contrasts on the number of proxies used, as recommended by Marascuilo and Serlin (1988). As explicated above, we predicted a main effect of feedback and a simple effect of OC tendencies in the no-feedback condition. Confirming these predictions, the main effect of feedback was significant, with participants in the no-feedback condition using more proxies ($M = 11.77$, $SD = 16.64$) than those in the ongoing feedback condition ($M = 4.53$, $SD = 6.42$), $F(1, 144) = 13.24$, $p < .001$, $\eta^2 = 0.084$. A simple effect analysis showed that as predicted, in the no-feedback condition, high OC participants used more proxies ($M = 16.43$, $SD = 20.25$) than did low OC participants ($M = 7.11$, $SD = 10.32$), $F(1, 144) = 10.83$, $p = .001$, partial $\eta^2 = 0.070$ (see Fig. 1). In the feedback condition there was no significant difference between the high OC participants ($M = 6.24$, $SD = 8.07$) and the low OC participants ($M = 2.72$, $SD = 3.77$), $F(1, 144) = 1.54$, $p = .217$, partial $\eta^2 = 0.011$.¹

¹ Following comments from the Editor and one of the reviewers, we conducted two more analyses of the data. First, we conducted a linear regression analysis predicting the use of proxies from OCI-R scores and feedback condition (binary variable, dummy coded). There was a significant effect for OCI-R scores, $Beta = 0.194$, $t(144) = 2.536$, $p = .012$, which indicates that participants with higher OC tendencies used more proxies than those with low OC tendencies. There was also a main effect for feedback condition, $Beta = -7.487$, $t(144) = -3.673$, $p < .001$, which indicates that participants in the no-feedback condition used more proxies than those in the ongoing feedback condition. The Multiple R-squared for this model was 0.116, $F(2, 145) = 9.544$, $p < .001$. Adding the interaction term (OCI-R x feedback condition) did not add significantly to the model, R-squared change = 0.0072, $F(1,144) = 1.130$, $p = .289$. Second, we repeated the planned contrasts analysis using the established OCI-R clinical cutoff score of ≥ 21 (Foa et al., 2002) instead of the

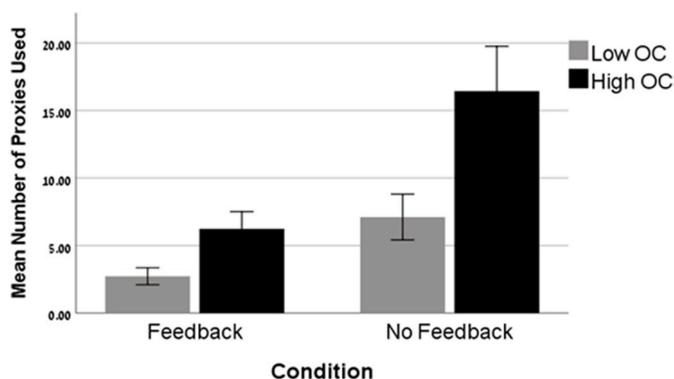


Fig. 1. Mean number of proxies used by condition and OC tendencies (Low OC = below the median on the OCI-R; High OC = above the median on the OCI-R). Error bars represent standard errors.

4. Discussion

This study examined the effects of OC tendencies and of having versus lacking ongoing feedback about understanding on the use of proxies for understanding. Based on the SPIS model, we predicted that lack of feedback would increase the use of proxies, and that in the absence of feedback, high OC participants would use more proxies than low OC participants. The results were fully in line with these predictions.

Importantly, high OC participants showed intact understanding of the text; across feedback conditions, their scores on a comprehension test were equivalent to those of the low OC participants. This finding implies that it was *the feeling of understanding* rather than actual understanding that was impaired in high-OC participants. More broadly, it suggests that among OC individuals, the feeling of understanding might be dissociated from actual understanding. In terms of the SPIS model, the present findings document a situation in which the intensity of the internal state itself, the “signal” (in our case, understanding) does not vary with OC tendencies, but accuracy of access to that state (in our case, evaluating one’s own feeling of understanding) does. In other paradigms that tested the SPIS model, the question of whether OC tendencies are associated with a weaker signal or rather with a less accurate reading of the signal remains open. For example, the studies on emotional intelligence do not allow one to conclude whether high OC participants do not feel an emotion as intensely as others, or rather experience it with the same intensity but cannot accurately access what they feel. The dissociation documented in the present study accords with previous findings (Dar, Rish, Hermesh, Fux, & Taub, 2000) that participants with OCD, compared to non-OCD participants, underestimated their scores on a general knowledge test while actually performing equally well.

The effect of OC tendencies on the use of proxies for understanding extends earlier findings on the relationships between OC tendencies and reliance on proxies for internal states (e.g., Dar & Liberman, submitted; Lazarov et al., 2010; 2012a, 2012b; 2014). Together, this body of evidence is consistent with the main tenet of the SPIS model, that OCD is related to attenuated access to internal states and that many OCD symptoms can be viewed as attempts to compensate for this

(footnote continued)

median split. The results were very similar to the ones obtained with the median split analysis. In the no-feedback condition, as predicted, above-cutoff participants used more proxies ($M = 16.77$, $SD = 12.18$) than did below-cutoff participants ($M = 7.28$, $SD = 12.18$), $F(1, 144) = 13.10$, $p < .001$, partial $\eta^2 = 0.083$. In the ongoing feedback condition there was no significant difference between the above-cutoff participants ($M = 5.97$, $SD = 12.21$) and the below-cutoff participants ($M = 3.43$, $SD = 12.18$), $F(1, 144) = 2.02$, $p = .158$, partial $\eta^2 = 0.014$.

attenuation. The present study is particularly important in this regard, as the feeling of understanding appears to be relevant to OCD. As documented above, difficulties in reading (and other mediums that require language comprehension) are discussed in OCD forums and clinical literature, but as far as we know, this is the first study to demonstrate a relation between OCD and a difficulty to generate a feeling of understanding. As the text we presented was about medieval architecture, our findings indicate that such difficulties are not limited to texts that involve OCD-related contents such as cleanliness, morality, or safety.

The current findings constitute an important extension of the SPIS model also in light of the relevance of feeling of understanding to everyday life. We commonly encounter complex texts that do not afford ongoing (or any) feedback on how well we understand them, including legal documents, manuals for appliances, literary fiction, and scientific articles such as this one. Not being able to generate a feeling of understanding for such texts may cause considerable distress, leading individuals who experience these difficulties to avoid reading complex texts as much as possible (e.g., Lucy, 2013; Rondanelli, 2016). Such avoidance may have detrimental effects not only on daily functioning, but even on study and career choices. It would be important in future studies to survey the prevalence of “reading OCD” and the extent to which individuals experiencing these difficulties tend to avoid domains such as humanities and social sciences, in which such texts are more common.

We believe that our findings may have implications to cognitive-behavior therapy for OCD, particularly in regard to so-called “reading OCD.” In our study, high OC participants appeared to have a diminished feeling of understanding (as reflected in enhanced seeking proxies), while at the same time demonstrating intact actual understanding. The distinction between understanding and having a feeling of understanding may be helpful to individuals suffering from “reading OCD” and related symptoms. Specifically, suggesting to such clients that their inability to generate a feeling of understanding does not mean that they have not understood what they read may alleviate their anxiety and help counter avoidance. It may also reduce their need to seek and rely on proxies for understanding (such as learning things by heart), a costly and oftentimes useless process. Moreover, elucidating the difficulty to generate a feeling of understanding might be a good entry point for discussing with clients the more general problems associated with their difficulty of accessing internal states and relying on proxies in their stead.

Our study has several limitations and leaves many open questions that can be addressed in future studies. First, we did not provide participants in our study a specific incentive to understand the text fully, and more importantly, there were no negative consequences for misunderstanding. It may well be that high OC participants were more motivated to understand the text correctly and avoid errors, which could partially account for their increased reliance on proxies. The same logic suggests that incorporating scenarios that increase the importance of understanding the text correctly would have increased the differences between high and low OC participants. Second, while we interpret our results in terms of the SPIS model, they are also compatible with an explanation in terms of obsessive doubt; specifically, it may be that doubt about understanding the text, rather than difficulty accessing their feeling of understanding, motivated the high OC participants to use more proxies when objective feedback on understanding was lacking. We should note that this alternative explanation is less tenable in relation to findings of deficient performance in participants with high OC tendencies, as well as with clinical OCD, on tasks that rely on access to internal states (e.g., Dar et al., 2016; Lazarov et al., 2014, 2012b). Third, we found that in the absence of objective feedback, all participants, and particularly those high in OC tendencies, seek information that has low diagnostic utility in relation to (i.e., is a poor proxy for) their understanding of the text. We do not know, however, what participants were aiming to achieve by using these proxies, and

what effect this had for them – for example, we do not know whether using proxies made participants more certain that they understood the text, or reduced their anxiety about not understanding, or increased their sense of control. These are important questions for further study, because the use of proxies of low diagnostic value is common not only at the individual but also at the societal and institutional level (for example, assessing academic excellence by counting the number of conferences a candidate has attended; see discussion in Liberman & Dar, 2018). Fourth, the segmentation of the text in our study may have been more pronounced for participants in the ongoing feedback condition, who had to answer comprehension questions following each segment. It would be important in future studies to examine the effect of different types of feedback, including feedback that would not be time-consuming (e.g., telling participants in the ongoing feedback condition that their brain activation suggests that they understand the text well). Finally, it would be important to replicate our findings with diagnosed OCD participants as compared to both non-clinical and anxiety disorders control participants, as we have done in relation to other internal states (Lazarov et al., 2014). This step is essential for generalizing our findings to clinical OCD as well as for determining their specificity to OCD.

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References

- Armitage, P., McPherson, C. K., & Rowe, B. C. (1969). Repeated significance tests on accumulating data. *Journal of the Royal Statistical Society: Series A*, *132*, 235–244.
- Barbour, T. F. (2012, July 23). *Bringing along OCD. Read, reread, again and again*. Reading OCD [blog post]. Retrieved from <http://bringingalongocd.blogspot.com/2012/07/read-reread-again-and-again-reading-ocd.html/>.
- Berliner, H. (2011, September 2). *History of architecture. Medieval architecture*. Retrieved from <http://historyofarchitecture.blogspot.com/>.
- Dar, R., Lazarov, A., & Liberman, N. (2016). How can I know what I am feeling? Obsessive-compulsive tendencies and induced doubt are related to reduced access to emotional states. *Journal of Behavior Therapy and Experimental Psychiatry*, *52*, 128–137.
- Dar, R., Rish, S., Hermesh, H., Fux, M., & Taub, M. (2000). Realism of confidence in obsessive compulsive checkers. *Journal of Abnormal Psychology*, *109*, 673–678.
- Foa, E. B., Huppert, J. D., Leiberg, S., Langner, R., Kichic, R., Hajcak, G., et al. (2002). The Obsessive-Compulsive Inventory: Development and validation of a short version. *Psychological Assessment*, *14*, 485–495.
- Grayson, J. (2014). Freedom from obsessive compulsive disorder: A personalized recovery program for living with uncertainty. *Berkely*.
- Hajcak, G., Huppert, J. D., Simons, R. F., & Foa, E. B. (2004). Psychometric properties of the OCI-R in a college sample. *Behaviour Research and Therapy*, *42*, 115–123.
- Lazarov, A., Dar, R., Liberman, N., & Oded, Y. (2012a). Obsessive-compulsive tendencies and undermined confidence are related to reliance on proxies for internal states in a false feedback paradigm. *Journal of Behavior Therapy and Experimental Psychiatry*, *43*, 556–564.
- Lazarov, A., Dar, R., Liberman, N., & Oded, Y. (2012b). Obsessive-compulsive tendencies may be associated with attenuated access to internal states: Evidence from a bio-feedback-aided muscle tensing task. *Journal of Behavior Therapy and Experimental Psychiatry*, *12*, 1041–1049.
- Lazarov, A., Dar, R., Oded, Y., & Liberman, N. (2010). Are obsessive-compulsive tendencies related to reliance on external proxies for internal states? Evidence from biofeedback-aided relaxation studies. *Behaviour Research and Therapy*, *48*, 516–523.
- Lazarov, A., Liberman, N., Hermesh, H., & Dar, R. (2014). Seeking proxies for internal states in obsessive-compulsive disorder. *Journal of Abnormal Psychology*, *123*, 695–704.
- Liberman, N., & Dar, R. (2018). Obsessive-compulsive tendencies are related to seeking proxies for internal states in everyday life. *Journal of Behavior Therapy and Experimental Psychiatry*, *61*, 164–171.
- Liberman, N., & Dar, R. (2009). Normal and pathological consequences of encountering difficulties in monitoring progress toward goals. In G. Moskowitz, & H. Grant (Eds.). *The psychology of goals*. (pp. 277–303). New York: Guilford Press.
- Lucy (2013, November 10). *Tolstoy Therapy. Reading OCD. A confession of why I am not reading [blog post]*. Retrieved from <https://www.tolstoytherapy.com/2013/11/reading-ocd-confession-of-why-im-not.html/>.
- Marascuilo, L. A., & Serlin, R. C. (1988). *Statistical methods for the social and behavioral sciences*. New York, NY, US: W H Freeman/Times Books/Henry Holt & Co.
- Mayer, J. D., Salovey, P., & Caruso, D. R. (2002). *Mayer-salovey-caruso emotional intelligence test (MSCEIT) user's manual*. Toronto: Multi-Health Systems.
- Palmer, B. R., Gignac, G., Manocha, R., & Stough, C. (2005). A psychometric evaluation of the mayer-salovey-caruso emotional intelligence test version 2.0. *Intelligence*, *33*, 285–305.
- Rondanelli, M. (2016, July 15). *When OCD took away my ability to read*. Retrieved from <https://themighty.com/2016/07/ocd-making-it-hard-to-read/>.