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RESEARCH ARTICLE

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How willing are you? Willingness as a predictor of change during treatment of adults with obsessive–compulsive disorder

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Objective: Exposure and response prevention (ERP) is an effective treatment for individuals with obsessive–compulsive disorder (OCD), yet a substantial number of individuals with OCD do not fully respond to this intervention. Based on emerging experimental and clinical research on acceptance, this study sought to explore whether willingness to experience unpleasant thoughts, emotions, and bodily sensations during ERP was associated with improved treatment response.

Methods: Two hundred eighty-eight adults with OCD receiving residential ERP provided self-rated willingness and other exposure-related variables during each daily coached ERP session. Obsessive–compulsive and depressive symptom severity was assessed every week. Multilevel modeling was used to study the impact of willingness on treatment outcome during the first 6 weeks of residential care.

Results: Data indicated that individuals with higher willingness during ERP reported faster symptom reduction during residential treatment, even when controlling for length of stay, psychopharmacological intervention, depression, adherence, and rituals performed during ERP. These results appear to have both statistical and clinical significance.

Conclusions: Willingness to fully experience unpleasant and unwanted thoughts, emotions, and bodily sensations during exposures appears to be a marker of successful exposure therapy in adults with OCD. Future research should examine how willingness may enhance extinction learning during ERP.

KEYWORDS
acceptance, anxiety, cognitive–behavioral therapy, exposure and response prevention, extinction learning

1 | INTRODUCTION

Exposure and response prevention (ERP), considered the gold-standard psychotherapeutic treatment for OCD (Olatunji et al., 2013), is an effective intervention for approximately 50–85% of adults with OCD (Abramowitz, 1997; Fisher & Wells, 2005). However, as indicated by these outcomes, ERP is not effective for everyone. A recent review by Ong, Clyde, Bluett, Levin, and Twohig (2016) estimated that 24% of patients do not reach a 35% reduction in symptoms after treatment completion, which is posited to be a reliable indicator of treatment response (Foa et al., 2005; McLean et al., 2001; Simpson, Huppert, Petkova, Foa, & Liebowitz, 2006). Given the high rates of both treatment dropout and nonresponse, understanding factors related to optimal implementation of ERP is essential. One possible reason for not completing or not responding to ERP is the aversive nature of exposures, which requires a patient to engage in challenging tasks without utilizing maladaptive coping strategies such as emotional suppression (Hannesdottir & Ollendick, 2007; Mitchell, Riccardi, Keough, Timpano, & Schmidt, 2013).

Acceptance and Commitment Therapy (ACT; Hayes, Strosahl, & Wilson, 1999), a third-wave behavioral therapy, has recently gained attention in the literature for its focus on reducing the perceived

aversiveness of certain experiences. One core component of ACT is acceptance, which is described as an individual's willingness to embrace, rather than simply tolerate, negative internal experiences during a difficult experience (Hayes, 2004). Research suggests that this willingness is associated with increased engagement in unpleasant tasks. In studies that utilize pain tasks to create discomfort, participants in the acceptance condition were taught to notice their pain-related thoughts or feelings and be willing to experience them without letting them influence their actions. These participants tolerated pain for longer periods and reported a greater willingness to experience pain than those in the control condition (Gutiérrez, Luciano, Rodríguez, & Fink, 2004; Hayes, Bissett, Korn, & Zettle, 1999). Similar results were found in two additional studies in which participants were exposed to carbon dioxide, which can be used to induce symptoms of anxiety (Eifert & Heffner, 2003; Levitt, Brown, Orsillo, & Barlow, 2004). Further, there is some evidence that willingness may be a factor associated with positive ACT outcomes, such that increases in willingness were associated with reduced distress and improved functioning in individuals with chronic pain and occupation strain (Bond & Bunce, 2000; McCracken, Vowles, & Eccleston, 2005).

Given that research suggests willingness is a marker of acceptance and is associated with improved engagement in distressing tasks, it may also be an important factor to consider during ERP. Research has shown that following through with assigned exposures (i.e., treatment adherence) is associated with improved outcomes (Wheaton et al., 2016), but this fails to capture the internal stance of the patient. A patient can complete an assigned exposure while simultaneously trying to distract from internal experiences, engaging in overt or covert rituals, suppressing emotional or cognitive experiences, or simply trying to "just get through" the exposure. Previous experimental and clinical findings demonstrate that patients adopting these approaches have reduced extinction learning, thereby interfering with treatment outcome (for review, see Parrish, Radomsky, & Dugas, 2008). In contrast, cultivating willingness encourages the individual to embrace unwanted obsessions or anxiety during an exposure without trying to inhibit or change these inner experiences (Twohig et al., 2015). As ACT shows promise as a viable treatment for reducing OCD symptoms (see Twohig, Morrison, & Bluet, 2014 for review), willingness may be a core factor associated with symptom change in ERP for OCD.

The current study aimed to explore whether increased willingness to engage in ERP was associated with improved treatment response for adults with OCD. The research was conducted in an intensive/residential treatment (IRT) for OCD in which patients engaged in daily sessions of coached ERP. This IRT setting was ideal for the study aim considering our ability to recruit a large sample, the high symptom severity typically observed, and the frequency of coached exposure sessions that occur in a controlled environment (e.g., family factors are minimized). During each coached exposure session, coaches asked patients to rate how willing they felt before and during the exposure, as well as how willing they would be to repeat the exposure in the future. Willingness was assessed in this manner due to clinical experience indicating that willingness is a state-like construct that can fluctuate throughout an exposure and it is unknown if the importance of willingness varies based on when it is assessed.

TABLE 1 Sample demographics

Demographic variable	Demographic type	Percentage of *N*
1. Gender	Male	56
	Female	44
2. Ethnicity/race[a]	Caucasian	87
	Asian	4
	Multiracial	2
	African American	1
	Latino/Latina	1
	American Indian	<1
	Caribbean Islander	<1
3. Education	Some College	40
	Bachelor's degree	22
	Postgraduate education	20
	High school	13
	Some high school	5
4. Employment	Unemployed	67
	Medical leave	14
	Part-time	11
	Full-time	8
5. Relationship status	Single	70
	Married	18
	Partner	7
	Separated/divorced	5

This table represents the demographic information for the entire sample ($N = 288$).

[a]Four percent of the sample choose not to identify with a race/ethnicity.

2 | METHODS

2.1 | Participants

Two hundred eighty-eight participants met the inclusionary criteria for this study. The mean age of the sample was 31 years old ($SD = 13$). The remaining demographic information for this sample is presented in Table 1. In terms of diagnoses at admission, 94% had a primary diagnosis of OCD and the most common comorbid diagnoses were major depressive disorder (63%), social anxiety disorder (22%), and generalized anxiety disorder (13%). Average age of onset for OCD was 16.31 ($SD = 18.08$) and 40% had a history of being hospitalized due to OCD. At the time of admission, 83% of the sample was prescribed a psychiatric medication for their OCD symptoms. Average length of stay was 50 days ($SD = 24$).

2.2 | Procedures

Participants in the study were seeking treatment at an IRT program for OCD. The treatment program utilizes an integrative treatment approach, based on the principles of ERP. As part of standard clinical care, each participant was administered a computerized assessment battery at admission and discharge, along with weekly progress monitoring assessments. The Structured Clinical Interview for DSM-IV-TR (SCID-IV) was administered as part of a clinical assessment by trained staff within the first 2 weeks of admission. The standard treatment regimen included approximately 4 hr of ERP per day, with approximately 25–50% of sessions being led by trained clinical residence counselors or practicum students and the remainder being self-directed by the

patient. Patient self-report and coached-report data were collected for each coached ERP.

This study was approved by the Institutional Review Board and all patients 18 years or older were invited to participate in the research. Out of the individuals who consented to have their data used for research (N = 323/465), participants were included in this study if they attended at least 1 week of treatment and met diagnostic criteria for OCD based on clinical interview described below (N = 288/323). Analyses indicated that those who consented averaged 4 years younger than those who did not consent, $F(2, 462) = 5.54$, $p < .01$. No other significant differences between these groups were observed, including obsessive–compulsive severity at admission.

2.3 | Measures

2.3.1 | NetSCID

The Structured Clinical Interview for DSM-IV-TR Axis I Disorders (SCID-IV; First, Spitzer, Gibbon, & Williams, 2002) is a structured clinical interview that assess for the presence of Axis I disorders based on the DSM-IV-TR diagnostic criteria. The NetSCID (Brodey et al., 2016) is a validated, web-based version of the SCID-IV and was used in this study.

2.3.2 | Yale–brown obsessive compulsive scale

The 10-item Yale–Brown Obsessive Compulsive Scale (Y-BOCS) (Goodman, Price, Rasmussen, Mazure, Delgado, et al., 1989; Goodman, Price, Rasmussen, Mazure, Fleischmann, et al., 1989) is the gold-standard measure for assessing obsessive–compulsive symptom severity. The self-report version of the Y-BOCS was used in this study (Steketee, Frost, & Bogart, 1996) and has displayed good psychometric properties (Federici et al., 2010).

2.3.3 | Hamilton depression scale

The Hamilton Depression Scale (Bech et al., 1981) is a six-item self-report measure assessing for severity of depressive symptoms over the last 3 days. This scale has demonstrated acceptable psychometric properties (Bech, 2008).

2.3.4 | ERP feedback form

The ERP Feedback Form was created by the authors to assess for self-reported willingness at three time points: before ERP, termed *before-exposure willingness* (i.e., "No matter what your expectancies may be, how willing are you to do whatever it takes to engage in this ERP, and welcome unpleasant thoughts, emotions, and bodily sensations without trying to make them go away?"), immediately after ERP, termed *during-exposure willingness* (i.e., "How willing were you to welcome unpleasant and unwanted thoughts, emotions, and bodily sensations without trying to make them go away during this ERP?"), and in regards to future exposures, termed *future-exposure willingness* (i.e., "How willing would you be to fully engage in the ERP if you had to do it again?"). It is important to clarify that although "during-exposure willingness" is actually participants' reflections on how willing they had been during the session, the authors felt that creating terms that refer to the time period being assessed would be more intuitive and less confusing when interpreting data. Willingness was rated on a scale of 0 (*not at all willing*) to 100 (*extremely willing*).

In addition, this form assessed for participants' self-reported pre-exposure, peak during exposure, and postexposure SUDS (Wolpe & Lazarus, 1966) on a scale of 0 to 100, with higher scores indicating a higher degree of distress experienced by the participant. Habituation in the current study refers to within-session decreases from a participant's peak reported SUDS to their postexposure SUDS, which occurred at the last moment of the ERP session, while still in contact with the stimulus. The coach's rating of the percentage of ERP time (0–100%) in which the participant was observed engaging in rituals was also measured, with higher percentages indicating more time spent engaging in rituals. Similarly, coaches rated adherence to the exposure plan after the exposure using a scale of 0 (*patient chose not to participate in the exposure*) to 100 (*patient completed the plan as written, without modification, and worked the entire time*).

2.4 | Analyses

Due to the constraints of a naturalistic residential setting, length of treatment was not standardized and was dependent upon multiple factors (e.g., insurance, response to treatment). To best test study hypotheses and not have estimates skewed by significant dropout, only data collected during the first 6 weeks of residential care were analyzed. Six weeks was selected as a cut-off because more than 50% of the sample had left residential care by week 7 (42% of the sample left residential care by week 6). Additionally, longitudinal analyses described below controlled for discharge date.

For each willingness variable, weekly means were calculated for analyses only if a participant had at least three coached ERPs for a given week. Using calculated mean scores, we ran Pearson correlations to examine the relationship between willingness and exposure-related variables. Multilevel modeling (MLM; see Singer & Willett, 2003) was then conducted to assess how willingness enhances or reduces the rate of change in obsessive–compulsive symptoms during residential exposure therapy, after controlling for length of treatment, number of selective serotonin reuptake inhibitors (SSRIs) or serotonin norepinephrine reuptake inhibitors (SNRIs), depressive symptoms, number of rituals during treatment, and adherence to the exposure plan. Habituation was not entered as a covariate due to the lack of data suggesting that (within-session) habituation impacts outcome (Craske et al., 2008; Rupp, Doebler, Ehring, & Vossbeck-Elsebusch, 2016). Advanced statistical modeling such as MLM is suggested to have more power to capture effects than traditional analyses of repeated measures (Kahn & Schneider, 2013; Snijders & Bosker, 1999). Inclusionary criteria for each MLM model was a significant reduction in the *−2 Log Likelihood* (−2LL) when compared to the previous model. For clarity, the results presented below represent estimates from the final, best fitting model. A *psuedo-R2* was calculated for the *Fixed* and *Random Effects* of each model to display the total variance explained by each predictor (Kreft & deLeeuw, 1998).

TABLE 2 Descriptives of exposure-related variables

Variable	*M* (*SD*)	Range
1. Before-exposure willingness	92.54 (10.70)	30.00–100.00
2. During-exposure willingness	84.49 (14.82)	21.67–100.00
3. Future-exposure willingness	93.45 (10.72)	28.33–100.00
4. Exposure adherence	92.42 (7.04)	60.83–100.00
5. Rituals during exposure	17.84 (19.35)	0.00–97.45
6. Peak SUDS	76.07 (16.22)	14.58–100.00
7. Habituation	16.81 (10.95)	0.00–62.00

Note: Means represent average scores across treatment (i.e., calculated by averaging across all time points). SUDS, subjective units of distress.

TABLE 3 Correlations among willingness and exposure process related variables

Variable	1	2	3	4	5	6	7
1. Before-exposure willingness	–						
2. During-exposure willingness	.67[d]	–					
3. Future-exposure willingness	.67[d]	.46[d]	–				
4. Exposure adherence	.46[d]	.44[d]	.38[d]	–			
5. Rituals during exposure	–.24[d]	–.36[d]	–.12[a]	–.20[c]	–		
6. Peak SUDS	–.08	–.12[a]	.07	–.01	.14[b]	–	
7. Habituation	.14[b]	.18[c]	.14[b]	.05	–.06	–.16[c]	–

Note: SUDS, subjective units of distress.
[a]$p < .08$.
[b]$p < .05$.
[c]$p < .01$.
[d]$p < .001$.

3 | RESULTS

3.1 | Descriptive statistics

Average Y-BOCS scores at baseline were 25.42 (*SD* = 5.98), indicating that the average patient had clinically severe obsessive–compulsive symptoms at admission. During 6 weeks of IRT, obsessive–compulsive symptoms reduced an average of 8.16 (*SD* = 6.88) points on the Y-BOCS, resulting in an average reduction of 31% in symptoms (*SD* = 27%). Descriptive statistics for exposure-related variables are displayed in Table 2. Post hoc MLM analysis found that future-exposure willingness did not significantly increase or decrease over treatment. Before-exposure willingness ($b = 0.38$, $t = 2.05$, $p < .05$) and during-exposure willingness ($b = 1.17$, $t = 4.27$, $p < .001$) had a significant positive linear trajectory. However, the sizes of these increases were very modest (e.g., just over one point in average during-exposure willingness per week).

3.2 | Associations among willingness and exposure process variables

Correlations among the willingness variables and exposure-related variables are displayed in Table 3. In general, the willingness variables were significantly and positively correlated with each other. More so, higher willingness was significantly associated with more adherence, less ritualizing, and more habituation during ERP.

3.3 | Willingness and treatment response

For our MLM analysis, nested covariate models were entered to control for time, length of treatment, psychopharmacological treatment, depressive symptoms, number of rituals during exposure, and adherence to exposure plan. Compared to the null model, the two covariate models that estimated linear and quadratic time resulted in a significant -2LL reduction (χ^2 (2, $N = 286$) = 613.63, $p < .001$) and explained 42% of the between-subject variance and 0% of the within-subject variance in obsessive–compulsive severity. Results indicated that during each week of treatment obsessive–compulsive severity significantly decreased by over one point on the Y-BOCS ($b = -1.21$, $t = -20.02$, $p < .001$), with some individuals displaying a faster rate of response early in treatment and a slower rate of response at the end of treatment ($b = 0.23$, $t = 8.22$, $p < .001$).

The additional covariate models described above also met inclusionary criteria (χ^2 (5, $N = 281$) = 1085.513, $p < .001$). These five covariates explained an additional 51% of between-subject variance and 4% of within-subject variance in obsessive–compulsive severity during treatment. Results indicated that longer length of treatment ($b = 0.64$, $t = 3.15$, $p < .01$) and increased depressive symptoms ($b = 2.61$, $t = 9.84$, $p < .001$) were associated with higher average obsessive–compulsive symptoms across treatment. Higher number of SSRIs/SNRIs ($b = 0.80$, $t = 1.73$, $p = .08$) and number of rituals during exposure trials ($b = 0.58$, $t = 1.65$, $p = .10$) were very weakly associated with higher average obsessive–compulsive symptoms across treatment. Adherence showed no significant association.

The final model containing the independent variables of interest met inclusionary criteria (χ^2 (6, $N = 275$) = 50.88, $p < .001$) and explained an additional 10% of the between-subject variance and 8% of the within-subject variance in obsessive–compulsive severity during treatment. The six independent variables of interest are displayed in Table 4. In general, higher average before-exposure willingness, during-exposure willingness, and future-exposure willingness were all significantly associated with faster symptom reduction during treatment.

To graphically depict the clinically relevant impact of the three willingness-related variables on overall treatment response, the three continuous willingness variables (that were each individually significant predictors of outcome) were summed to create a total willingness score. The sample was then split into three groups based on their total willingness score: those 0.5 *SD*s or more below the mean, those within 0.5 *SD*s of the mean, and those 0.5 *SD*s or more above the mean. In Figure 1, obsessive–compulsive symptom trajectories across treatment for these three groups are displayed. Symptom trajectories depicted echo the MLM findings; those with higher average willingness during treatment displayed a steeper reduction in obsessive–compulsive symptoms.

TABLE 4 Willingness-related independent variables from multilevel modeling analysis

	β	*SE*	*T*	*p*-value
Before-exposure willingness	−1.00	0.47	−2.16	.03
Before-exposure willingness × linear time	−0.69	0.16	−4.35	.00
During-exposure willingness	−1.87	0.40	−4.62	.00
During-exposure willingness × linear time	−0.68	0.13	−5.21	.00
Future-exposure willingness	−0.67	0.37	−1.65	.10
Future-exposure willingness × linear time	−0.42	0.13	−3.12	.00

Note: *β*, fixed-effect estimate; SE, standard error of estimate. Variables without "× Linear Time" indicate how much the independent variable relates to average obsessive–compulsive severity across treatment. Variables with "× Linear Time" indicate how much the independent variable moderates the slope of obsessive–compulsive symptoms over treatment. In essence, this table depicts how the three willingness variables of interest relate to average obsessive–compulsive severity during treatment and treatment response, after controlling for covariates included in Model A and B.

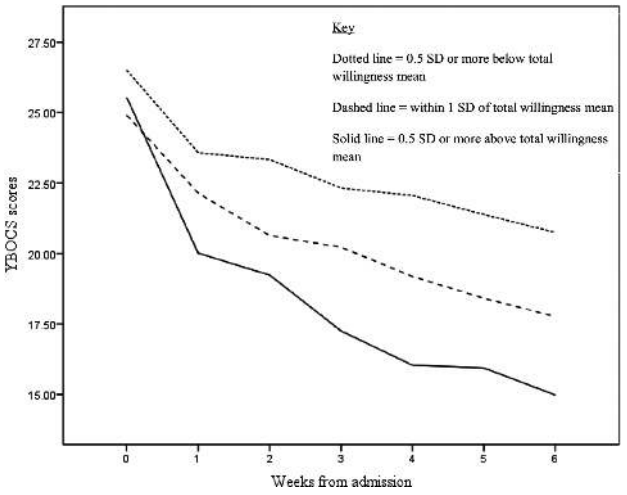

FIGURE 1 This figure displays average obsessive–compulsive symptom severity, as measured by the Y-BOCS, at each week of residential treatment. To graphically depict the clinically significant impact of the three willingness-related variables on overall treatment response, the three continuous willingness variables (that were each individually significant predictors of outcome) were summed to create a total willingness score. The sample was then split into three groups based on their total willingness score: those 0.5 *SD*s or more below the mean (dotted line), those within 0.5 *SD*s of the mean (dashed line), and those 0.5 *SD*s or more above the mean (solid line). Outcome trajectories were then graphed for each group.

4 | DISCUSSION

Willingness to experience unpleasant and unwanted thoughts, emotions, and bodily sensations during an exposure appears to enhance exposure therapy outcomes. Data showed that higher willingness immediately before beginning an exposure, willingness during an exposure, and willingness to engage in a future exposure were each associated with faster symptom reduction during 6 weeks of residential-level exposure therapy for adults with severe OCD. Considering the recent movement away from traditional markers of the exposure process (e.g., initial fear activation, within-session habituation; Craske et al., 2008), willingness may provide a clinical marker of exposure response that can be feasibly captured by clinicians in a naturalistic clinical setting. Why may taking an internal stance of willingness be an important aspect of the exposure process? Below, we outline how research on extinction learning and relational frame theory may explain why willingness may improve response to exposure therapy.

In this study, higher willingness was significantly associated with improved adherence and less ritualization during exposures. Research has shown that engaging in an exposure and refraining from overt or covert compulsions enhances extinction learning by reducing the perception that the lack of presentation of the unconditioned stimulus is the result of the compulsive behavior (e.g., Blakey & Abramowitz, 2016; Hermans, Craske, Mineka, & Lovibond, 2006). However, ritualizing and adherence were controlled for in our MLM analyses and willingness remained a significant moderator of outcome. This suggests that a more willing patient may be more adherent and engage in less rituals, which is important for extinction learning, but the impact of willingness on outcomes appears to go beyond these two clinical factors (i.e., the impact of willingness on outcome is only partially mediated by adherence and rituals during ERP).

A review of the literature identifies a few additional reasons why willingness may enhance extinction learning. First, willingness may reduce avoidance during exposures. There is substantial research supporting the detrimental effect that cognitive, behavioral, and emotional avoidance strategies have on treatment outcome. Paradoxically, these strategies, which are intended to reduce distress, *prolong* emotional distress, whereas acceptance strategies may reduce suffering (see Ruiz, 2010 for a review). Therefore, willingness to experience negative internal experiences should decrease these ineffective avoidance strategies during exposure. As with the engagement of rituals during exposures, avoidance strategies increase the likelihood that the patient will perceive that the lack of presentation of the unconditioned stimulus is due to the avoidant behavior and as such, expectancy violations, which are an important target in exposure therapy, are less likely to occur during treatment (e.g., Hofmann, 2008; Rescorla & Wagner, 1972).

In our study, those who were more willing experienced more within-session habituation. The current literature on the necessity of within-session habituation for optimal treatment response is inconsistent (e.g., Craske et al., 2008; Rupp et al., 2016). One reason for the inconsistent findings may be the fact that that ineffective strategies more likely to occur in those with less willingness, such as suppression, avoidance, or covert rituals, can result in a short-term reduction in anxiety that mimics habituation. Willingness, rather than within-session habituation, may be a more effective marker of within-session treatment response for clinicians to consider.

Second, increased willingness may allow for enhanced extinction learning that is more resistant to spontaneous recovery and generalizes to a wider range of stimuli not directly involved in the exposures. Accordingly, there is evidence in the behavioral literature supporting the inhibitory learning theory (see Craske et al., 2008 for a review), which posits that exposures involving a higher number of novel

stimuli and combinations of stimuli cause a deepened extinction learning that is more likely to be accessed during future situations. This is because extinction learning is contextual to the internal and external factors present during the exposure (Bouton, 2004). Perhaps patients with higher willingness are more amenable to facing a higher number of novel stimuli and environments during exposure therapy. In support of this hypothesis, research by Levitt et al. (2004) found that individuals with panic disorder who were taught emotional and cognitive acceptance before carbon dioxide exposure were significantly more likely to be open to engaging in a second challenge as compared to no-instruction controls or those taught emotional and cognitive suppression.

From a Relational Frame Theory perspective (Hayes, Barnes-Holmes, & Roche, 2001), patients with higher willingness may allow for the incorporation of stimuli that have greater aversive functions. If a patient is presented with the option of doing an exposure with stimuli A, B, or C (where C > B > A in terms of aversive functions), the patient with higher willingness may reach stimulus C sooner in treatment, possibly never actually directly exposing himself/herself to stimuli A or B. In this scenario, if extinction learning occurs with stimulus C (i.e., changing the stimulus function of C from "threat" to "safe"), then the new stimulus functions of C (i.e., "safe") will transfer to stimuli A and B without direct exposure to those stimuli. In this manner, a patient with increased willingness may experience expedited outcomes due to incorporation of stimuli with higher transformation of adverse functions. In treatment, this could be represented by the patient with contamination fears who engages in an exposure in which he/she eats on a bathroom floor early in treatment despite the high level of anxiety caused by the exposure. From a Relational Frame Theory perspective, the patient would then view exposures related to touching easier stimuli, such as bathroom doorknobs and faucets, as "safe" without direct exposure to those stimuli.

Third, willingness may enhance extinction learning by addressing some of the attentional biases that are observed in anxiety disorders and linked to their maintenance (Cisler & Koster, 2010). In order for effective extinction learning to occur, attention must focus both on the conditioned stimuli and the lack of occurrence of the aversive unconditioned stimuli (Craske et al., 2008). For example, those who show attentional bias away from threat stimuli respond worse to exposure-based treatments (Legerstee et al., 2010; Price, Tone, & Anderson, 2011; Waters & Kershaw, 2015). There is evidence that willingness may be associated with mindfulness and improved attentional capacities (Arch & Craske, 2010; Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006; Bullis, Bøe, Asnaani, & Hofmann, 2014; Treanor, 2011). Perhaps those who are more willing to experience their obsessions and negative emotions during exposure may have more attentional resources to allocate toward task goals because less effort is spent suppressing thoughts or emotional experiences. Indeed, extinction learning is enhanced when distraction is minimal and cognitive loads are manageable (e.g., Kamphuis & Telch, 2000). Extinction learning is also likely to improve when attentional resources can be employed to reduce overt visual avoidance of threat cues (e.g., Förster, Friedman, Özelsel, & Denzler, 2006; Mulckhuyse, Crombez, & Van der Stigchel, 2013), which can cause better discrimination between threat and nonthreat cues in one's environment (e.g., Duits et al., 2015) and allow for extinction learning to be less contextualized (e.g., Barry, Vervliet, & Hermans, 2015).

These novel clinical findings align with recent literature suggesting that ACT is an effective treatment for OCD (Twohig et al., 2010) and point to willingness to experience obsessions and anxiety as a potential mechanism of change during exposure therapy. Specifically, individuals with OCD engaging in exposure therapy may benefit from being coached to accept rather than control negative internal experiences. Clinical techniques that enhance willingness to take this stance warrant attention. Willingness may be increased by putting challenges in the context of one's personal values (Branstetter-Rost, Cushing, & Douleh, 2009; Luciano et al., 2010), and this aligns with our clinical experience. For OCD, this often involves reminding patients why experiencing uncomfortable internal experiences during the specific exposure at hand will lead to a life more worth living.

We acknowledge several study limitations. First, this study utilized a residential sample of adults with severe OCD who were highly impaired (e.g., low employment). Although it is unknown whether the role of willingness plays a greater role in a residential setting compared to outpatient settings, we conceptualize willingness as an aspect of exposure process that should play an important role in any setting implementing exposure techniques. Individual average willingness scores in our sample ranged from 84 to 93 during exposure, which could reflect the residential sample where highly willing residents agreed to admit to a level of care requiring several hours of exposure a day. That being said, there are no data in the literature to support this belief and other explanations are plausible (e.g., willingness may have been lower if measured outside of a coached exposure session). Second, we used self-report measures to assess symptom severity and willingness, which may be more prone to respondent bias. However, our study used advanced statistical modeling in a large sample size to minimize type 1 error. Third, our willingness variable lacked psychometric testing. To improve measurement accuracy, we modeled our willingness questions after those used in experimental research and ensured our willingness questions aligned with how willingness is described in ACT (see Ruiz, 2010 for a review).

5 | CONCLUSIONS

Willingness to fully experience unpleasant and unwanted thoughts, emotions, and bodily sensations during exposures appears to be a marker of successful exposure therapy in adults with OCD. These findings highlight several possible directions for future research. First, experimental studies should seek to replicate our findings that were captured in a naturalistic clinical setting. Previous experimental work of this nature has been conducted (Eifert & Heffner, 2003; Gutiérrez et al., 2004; Hayes et al., 1999; Levitt et al., 2004), but rarely with individuals with OCD (Najmi, Riemann, & Wegner, 2009). Until further replication via experimental and naturalistic observational research with diverse clinical samples is conducted, definite conclusions about the clinical significance of willingness cannot be drawn. Second, research should explore whether willingness improves treatment response due to direct effects on extinction learning or if

willingness impacts outcomes through more indirect pathways (i.e., impacting factors that, in turn, improve extinction learning). Our discussion suggests that future research of this nature should consider experiential avoidance, decontextualized extinction learning, and attentional bias as ways in which enhanced willingness may improve extinction learning. Finally, future clinical research should seek to study how to best assess willingness during ERP and work to understand the types of patients who display higher willingness during exposures, considering clinical characteristics such as diagnostic comorbidities, functional impairment, level of care, distress tolerance skills, and treatment expectancy.

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CONFLICT OF INTEREST

Dr. Reid, Ms. Garner, Dr. Van Kirk, Ms. Gironda, Dr. Krompinger, Ms. Mathes, Dr. Monaghan, Mr. Tifft, Ms. Andre, Dr. Cattie, Dr. Jesse Crosby, and Dr. Elias have nothing to disclose. Dr. Brennan reports grants from Transcept Pharmaceuticals, grants from Eli Lilly, and personal fees from Rugen Therapeutics.

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