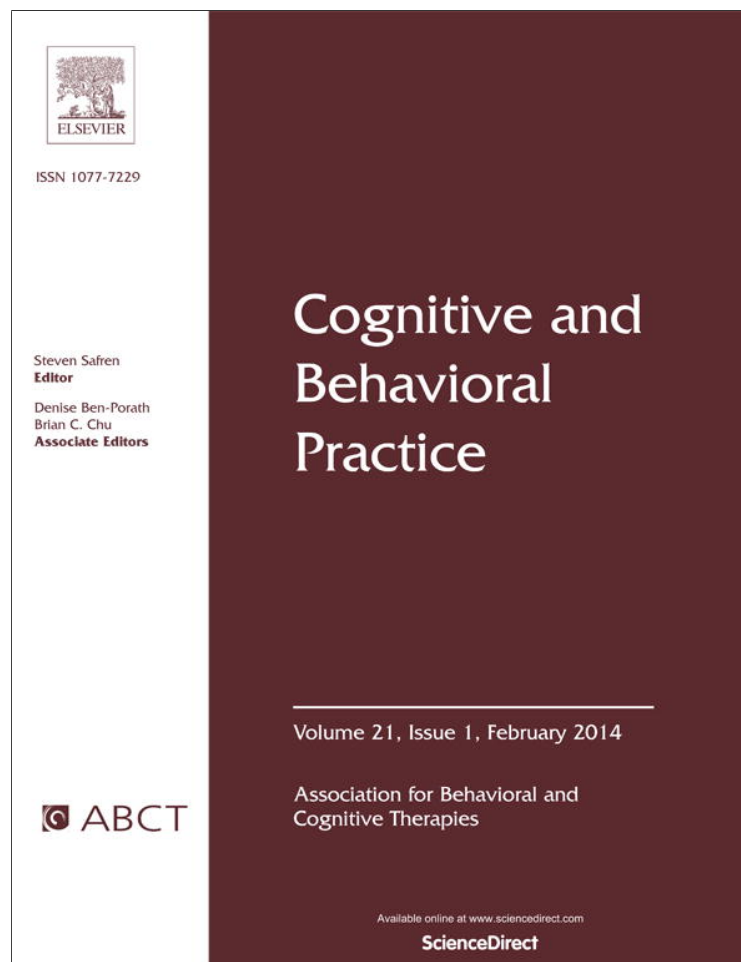


Provided for non-commercial research and education use.
Not for reproduction, distribution or commercial use.



This article appeared in a journal published by Elsevier. The attached copy is furnished to the author for internal non-commercial research and education use, including for instruction at the authors institution and sharing with colleagues.

Other uses, including reproduction and distribution, or selling or licensing copies, or posting to personal, institutional or third party websites are prohibited.

In most cases authors are permitted to post their version of the article (e.g. in Word or Tex form) to their personal website or institutional repository. Authors requiring further information regarding Elsevier's archiving and manuscript policies are encouraged to visit:

<http://www.elsevier.com/authorsrights>



Strategies for Improving Long-Term Outcomes in Cognitive Behavioral Therapy for Obsessive-Compulsive Disorder: Insights From Learning Theory

Jonathan S. Abramowitz, *University of North Carolina at Chapel Hill*
Joanna J. Arch, *University of Colorado Boulder*

Cognitive-behavioral therapy (CBT) for obsessive-compulsive disorder (OCD) is often highly effective, yet some patients experience relapses following a seemingly successful course of treatment. In this article we describe the components of CBT for OCD and then present a patient who relapses after making significant gains during a course of CBT. Likely explanations for the patient's relapse, and methods for optimizing long-term treatment outcomes, are explored from the standpoint of research on learning and memory. These strategies mainly apply to the implementation of situational (in vivo) and imaginal exposure therapy, but also include suggestions for optimizing the psychoeducational and cognitive therapy components.

THE beneficial effects of exposure-based cognitive-behavioral therapy (CBT) for obsessive-compulsive disorder (OCD) are among the most consistent findings in research and clinical settings. Still, as anyone who has implemented this treatment knows, not all individuals respond equally well; and even those who show impressive short-term gains are at risk of setbacks as treatment progresses or at some point following a full course of CBT. This article addresses the well-known phenomenon of relapse in exposure-based CBT for OCD, with the aim of offering empirically derived suggestions for optimizing long-term outcomes.

CBT for OCD is based on a conceptualization of the problem that begins with the well-established finding that negative intrusive thoughts (i.e., distressing thoughts, images, impulses, and doubts that intrude into consciousness; e.g., unwanted horrific images) are normal occurrences that most people—with and without OCD—experience from time to time (e.g., [Rachman & de Silva, 1978](#)). Often triggered by external stimuli (e.g., the sight of a police officer's gun), such thoughts usually reflect the individual's personal concerns. Yet these normal and universal intrusions are thought to escalate into highly fear-provoking and time-consuming clinical obsessions when they are misappraised as personally significant ([Rachman, 1997, 1998](#); e.g., "Thinking about something bad means I am a bad person"), needing to be controlled (e.g., [Clark, 2004](#)), or as

posing a threat for which the individual is responsible ([Salkovskis, 1985](#); "I can and must prevent this"). That is, the intrusive thoughts are not considered the problem; rather, it is how the person interprets, responds to, and tries to control the intrusions that is thought to lead to obsessional fear and distress. The tendency to respond to thoughts in this way might be acquired through learning, even if there is a predisposing biological or genetic vulnerability ([Taylor & Jang, 2011](#); [Taylor, Jang, & Asmundson, 2010](#)).

Compulsive rituals (overt and mental), avoidance, and other safety-seeking or neutralizing behaviors (e.g., counting) present in OCD are conceptualized as efforts to control or remove intrusions and to prevent feared consequences. After performing rituals, individuals with OCD generally report a reduction (albeit temporary) in their obsessional distress ([Rachman & Hodgson, 1980](#)), which negatively reinforces these behaviors. Thus, they evolve into time-consuming patterns that can impair functioning. Rituals, avoidance, safety seeking, and neutralizing also prevent the natural abatement of obsessional fear that would eventually occur with time even without the anxiety-reducing behavior. Moreover, rituals and avoidance lead to an increase in the frequency of obsessions by serving as reminders of their occurrence. For example, compulsively checking the stove can trigger intrusions about house fires. Finally, avoidance and rituals preserve the dysfunctional interpretations of intrusive thoughts. Specifically, following performance of a ritual, when feared consequences do not occur, the person attributes this to the ritual rather than to the low probability of the feared consequence. Thus, while environmental and biological factors enhance the vulnerability to acquire obsessional fear, rituals and avoidance behavior, along with cognitive biases, maintain this fear (see [Abramowitz, 2006](#)).

Keywords: OCD; relapse; exposure; CBT; learning theory

1077-7229/13/20–31\$1.00/0

© 2013 Association for Behavioral and Cognitive Therapies.
Published by Elsevier Ltd. All rights reserved.

In CBT, it is these maintenance processes that are targeted. In the following section we provide a brief description of the components in CBT for OCD.

CBT for OCD

Derived from the conceptualization outlined above, exposure-based CBT for OCD focuses on reducing (a) pathological fear associated with obsessional intrusions and triggering stimuli, and (b) the reliance on avoidance and rituals for controlling the obsessional fear. This approach typically includes psychoeducation, self-monitoring, cognitive restructuring, in vivo and imaginal exposure, and response prevention (e.g., Abramowitz, 2006). Treatment begins with information-gathering and psychoeducation about the nature and symptoms of OCD. Using both didactic and Socratic methods, the therapist socializes the patient to the cognitive-behavioral framework and develops a working model of the patient's OCD symptoms. Self-monitoring of rituals is introduced as a way to enhance objective self-awareness. Patients are instructed to record their rituals as they occur, as well as the thought or activity that provoked the ritual and their level of distress before performing the ritual.

Cognitive therapy techniques are used to target misappraisals of intrusive thoughts and distorted beliefs pertaining to inflated estimates of threat and responsibility, the need for certainty and perfection, and the importance of and need to control unwanted thoughts. Mistaken cognitions are identified and subjected to logical disputation through the evaluation of various sources of evidence. Therapists use Socratic dialogue and behavioral experiments to help clients make discoveries that support alternative beliefs and appraisals that are more evidence-based rather than fear-based (i.e., based on the client's own assumptions).

The exposure component of CBT promotes the cognitive goal of providing data to challenge mistaken beliefs and appraisals. It also promotes the behavioral goal of extinguishing conditioned fear responses to obsessional thoughts, doubts, and images (imaginal exposure) and to external situations and stimuli that trigger obsessions (in vivo exposure). Exposure therapy for anxiety has developed over time, originating with the pairing of imaginal exposure with relaxation (i.e., counterconditioning) as developed by Wolpe (1959). Later, emotional processing theory emphasized habituation of fear within and between exposure trials as indicators of corrective learning (Foa & Kozak, 1986). More recently, Craske et al. (2008) have emphasized optimizing inhibitory learning with an approach that is not necessarily dependent on fear reduction during or across exposure sessions; we discuss this approach in a later section.

Efficacy of CBT for OCD

Only half a century ago, OCD was considered unresponsive to psychological interventions, which at that time

typically centered on psychoanalytic and supportive approaches. However, with the introduction of exposure and response prevention (ERP) in the 1960s (Meyer, 1966), the prognosis substantially improved. Numerous controlled and uncontrolled studies conducted in various centers around the world have established ERP (and CBT more broadly) as a highly effective short- and long-term treatment for OCD (e.g., Abramowitz, 1996; Foa et al., 2005). In a meta-analysis of the seven existing randomized controlled studies, Olatunji, Davis, Powers, and Smits (2013) found that ERP outperformed control conditions such as relaxation, anxiety management training, and pill placebo on measures of OCD, yielding a large mean effect size of 0.92. Despite these beneficial effects, not all patients undergo significant symptom reduction; and perhaps as many as 25% to 50% discontinue treatment prematurely or experience relapses in the longer term (e.g., Franklin & Foa, 1998).

To illustrate the application of CBT to OCD, we next present a case study ("Lisa") based on a patient treated by a supervisee of one of the authors. In subsequent sections, we examine what went wrong with Lisa's treatment. Based on lessons learned from Lisa's case and on relevant developments in basic learning and memory research, we present revised aims and methods of CBT for OCD.

Case Study: Lisa

Lisa, a 27-year-old Caucasian woman who was married with a 6-month old son, received a diagnosis of OCD in our anxiety clinic following administration of the Yale-Brown Obsessive Compulsive Symptom Checklist and Severity Scale (Goodman et al., 1989a, 1989b; Lisa's score of 26 fell in the moderate to severe range). She described obsessional thoughts about being possessed by the devil and compulsive reassurance-seeking and mental rituals in response to these obsessions. Lisa was extremely fearful of anything that reminded her of death, possession, hell, and the devil, including the names of famous serial killers and words such as "murder" and "possession." Although not particularly religious (she was raised as a Catholic), Lisa also engaged in compulsive praying in response to her obsessional thoughts. Her problems with OCD had begun several years earlier when she learned that someone in her high school graduating class had murdered his wife. At that point, Lisa began avoiding her former school and anyone associated with it. Following the recent birth of her son, Lisa's obsessions and rituals became much more frequent and caused greater distress, leading her to seek treatment at our training clinic. Lisa's Beck Depression Inventory (Beck, Ward, & Mendelson, 1961) score was 15, yet she did not meet criteria for any mood disorders (or any other comorbid conditions).

Lisa was primarily afraid that exposure to the fear-provoking stimuli described above—including simply

thinking about these topics—would lead her to become possessed by the devil. If possessed, she feared she would lose her judgment and self-control and end up murdering her husband (Dan) and 6-month-old son (Ethan). As a result, Lisa avoided death-related and devil-related stimuli where possible, and frequently sought reassurance from her husband and parents that she was not possessed. That is, Lisa tried to manage her obsessional thoughts by attempting to suppress them, praying that awful things would not happen, and by asking others to provide reassurance. Avoidance behavior also developed as a way of trying to control obsessional thoughts and anxiety. For example, if thoughts of possession came to mind while she was shopping for food, she avoided eating any of the items purchased during that outing. Even with all of her attempts to resist the intrusive thoughts, Lisa remained generally apprehensive about the possibility that she would become possessed.

Lisa had previously received only medication treatment for OCD (fluvoxamine) and was interested in trying exposure therapy as she had read about it on our clinic's website. Accordingly, treatment was started after Lisa's therapist provided an introduction and overview to this approach and discussed what would be expected of Lisa. Sessions 1 and 2, which followed an empirically supported therapy protocol (Abramowitz, 2006), involved the therapist conducting a functional assessment of (i.e., collecting detailed information about) the external situations and stimuli that cued Lisa's obsessional anxiety, the intrusive obsessional thoughts themselves, Lisa's feared consequences of confronting the fear cues (e.g., thinking about serial killers will lead me to become one), all avoidance and ritualistic behaviors performed to neutralize anxiety, and Lisa's beliefs about the effects of these behaviors. The therapist also used didactic and Socratic methods to help Lisa conceptualize this information within the cognitive-behavioral model of OCD. Within this model, Lisa's obsessions about violence and possession were considered normal, harmless (albeit unwelcome) intrusive thoughts which had become associated with fear because of the way Lisa misinterpreted them as highly significant and meaningful. Rituals, reassurance-seeking, and avoidance were viewed as responses to obsessional fear and doubts, that while sometimes successful at immediately reducing this distress, did not work in the long run and in fact maintained the cycle of obsessional fear.

Lisa was somewhat comforted to understand her OCD symptoms from this perspective, and this helped counteract her fear that her recurrent thoughts about violence were a sign that her soul was already possessed by the devil. Nevertheless, she continued to worry that thinking about committing harm might lead her to engage in violent behavior. Lisa was given a handout containing a summary of the educational material, which she read over multiple

times. Finally, Lisa's therapist provided a rationale for using ERP, explaining that prolonged and repeated exposure to feared situations results in a natural decrease in the fear response over time (i.e., habituation), even if no ritual is performed.

After the development of (and agreement on) an exposure hierarchy and response prevention plan during Session 3, graduated exposure was begun in Session 4. For in vivo exposure, Lisa practiced deliberately confronting fear-provoking stimuli (e.g., words such as "devil," watching documentaries about serial killers). Imaginal exposures included repeated confrontation with obsessional thoughts of violence and possession using recordings of descriptions of these thoughts, which Lisa dictated into a handheld voice recorder. Each exposure practice successfully provoked Lisa's anxiety. With the use of informal discussions with her therapist about risk, she was able to repeat these exercises a sufficient number of times so that her anxiety decreased to very mild levels. Lisa was also generally successful with resisting urges to recite prayers, perform other mental rituals, and ask for reassurance. She was very compliant in practicing exposures in the session with her therapist and at home between sessions.

Lisa's therapist used cognitive restructuring informally throughout treatment to help Lisa engage in exposures. If Lisa was apprehensive about a particular situational exposure practice, the therapist would help Lisa examine the evidence for and against her perception of the situation or stimulus as dangerous. In the case of imaginal exposure, cognitive techniques were used to challenge misappraisals of obsessional thoughts as significant (e.g., that such thoughts indicated she was possessed) by exploring the evidence for and against this hypothesis, and considering other information about the normalcy and universality of distressing intrusive thoughts (e.g., research showing that distressing intrusions are a universal experience). Lisa understood that her catastrophic appraisals of intrusive thoughts were not based on factual evidence and she was able to generate alternative hypotheses regarding the harmlessness of her obsessions. She reviewed her notes from these cognitive therapy discussions to help her each time she conducted imaginal and in vivo exposures.

Lisa's progress was consistent, yet more gradual than her therapist would have preferred. After completing each assigned exposure, Lisa felt pleased with herself, but also relieved. On occasion, she expressed the fear that too much imaginal exposure might make her too at ease (i.e., not anxious enough) with her violent obsessions, causing her to act on these thoughts. At other times, she worried about whether she was "going too far," and that her obsessional thoughts and doubts would "never completely go away." The therapist, however, successfully encouraged Lisa to continue the particular exposure practices the number of times needed until she was able to confront the situations

and stimuli and stay exposed until anxiety had decreased to a minimal level. She shared her success enthusiastically: "I'm not afraid of cemeteries anymore. I didn't even get anxious during the exposure this week!" With this gradual and systematic approach, Lisa was able to confront all of the items on her hierarchy. She coached herself through the more challenging in vivo exposures by reassuring herself: "I'll be okay because I know my fear will go away by the end." Similarly, when she encountered high levels of anxiety during imaginal exposure, she would remind herself of what she had learned at the beginning of therapy: "I know these are just normal thoughts," and "It's not me, it's my OCD." Lisa's therapist would also help Lisa to realize the senselessness of her obsessional fears by pointing out that despite all of the exposures Lisa had completed, she had never lost control or herself or murdered anyone. Thus, she probably wasn't becoming possessed. Finally, Lisa's husband was very supportive, and continuously encouraged the approach that "the more you practice, the easier it gets, and the more you realize that you're not possessed or going to kill anyone."

Lisa's progress through her exposure hierarchy continued in a stepwise fashion and without obvious generalization from prior situations to new or unfamiliar situations. That is, she began every new situation with elevated anxiety, although with continued practice her anxiety would subside. A little more than 3 months into treatment (after 14 sessions), Lisa felt ready to confront the highest item on her hierarchy: watching the movie *The Exorcist*. As it turned out, this movie was being shown later that week at a university located in her home town (where Lisa also worked), and she and Dan decided to watch it on campus as an exposure exercise. Lisa prepared herself by reassuring herself that her anxiety would decrease just as it had in previous exposures. She prayed that she would not become overly anxious, and reviewed her educational materials and cognitive therapy notes. However, during a particularly frightening scene in which a character in the movie is possessed by the devil and acts very bizarre, Lisa became overwhelmed with obsessional thoughts about being possessed, losing control, and murdering her family. She tried reassuring herself that these were *just thoughts*, and that her anxiety would decrease, but this didn't work; and things only got worse when she became worried about "having a breakdown" and "making a scene" in front of everyone attending the movie. Feeling like a failure, she left the auditorium and returned home with Dan.

For the next few days, Lisa experienced a *lapse*—an increase in her OCD symptoms relative to how she had been functioning. She was once again extremely anxious about being possessed. Unfortunately, she also stopped her exposures and returned to performing mental rituals, excessive praying, and reassurance-seeking. She also returned

to avoiding reminders of death and demonic possession. The day before her next appointment, Lisa called her therapist to explain that the obsessional thoughts and rituals had come back and that she felt there was little that could be done to make them go away for good; she informed the therapist of her decision to discontinue treatment for the time being. Although Lisa's therapist urged Lisa to return to therapy, or at least practice ERP at home to avoid a relapse, Lisa felt that she needed a break and refused. A follow-up phone call from the therapist 2 weeks later confirmed that Lisa's lapse had become a *relapse*—a more significant and lasting deterioration in functioning approaching baseline pretreatment levels.

Factors Accounting for Relapse

There are various ways to conceptualize the events leading to Lisa's lapse and relapse. Because ERP was the main approach used in her treatment, we viewed her case primarily through the lens of learning theory and research. The conceptual basis for ERP within Lisa's treatment was emotional processing theory (e.g., Foa & Kozak, 1986), which emphasizes the importance of provoking initial anxiety during exposure and remaining in the exposure situation until this anxiety subsides naturally. If Lisa's self-reported anxiety level (or "subjective units of distress" [SUDS]) reduced from the beginning to the end of a given exposure session (i.e., within-session habituation), and if exposure to the same stimulus evoked less anxiety from one trial to the next (i.e., between-session habituation), it was assumed that Lisa had improved—i.e., that she had learned that her fear-provoking situations, stimuli, and obsessional thoughts were not dangerous. Prior to attempting exposure to viewing *The Exorcist*, Lisa reached the point of experiencing little to no anxiety during in vivo and imaginal exposures. She was not performing many rituals and her treatment goals seemed to have been achieved.

To understand Lisa's relapse, it is useful to consider the assumptions of emotional processing theory through the lens of basic research on learning and memory. One such assumption is that performance during exposure (i.e., within-session habituation) is a reliable indicator of learning. Yet in reviewing the research evidence, Craske et al. (2008) found that although within-session habituation frequently occurs during exposure, it is not a strong predictor of treatment outcome. This finding is consistent with Bjork and Bjork's (1992, 2006) New Theory of Disuse, which proposes that performance during training fails to serve as a consistent index of learning. Translating this to exposure therapy, there is discord between "fear expression during learning" and actual "fear learning" (Craske et al.; p. 11). Similarly, research shows that a decline in anxiety across similar exposures (i.e., between-

session habituation) might predict, but is not necessary for, long-term improvement (Craske et al.). That is, successful response to exposure therapy can occur in the absence of between-session habituation. Thus, the central tenet of emotional processing theory—that habituation is an indicator of long-term corrective learning—is not well supported by research evidence.

Accordingly, reliance on fear habituation during and between exposure practices as the key indicator of improvement within ERP likely helped set the stage for Lisa's relapse. The fact that Lisa experienced little to no anxiety during (and between) exposures up until watching the movie (including exposure to reading and watching documentaries about possession with the therapist or in the comfort of her own home) did not predict how she performed when exposed in a public place to the scene depicting demonic possession in *The Exorcist*. To the contrary, when she experienced a strong surge of obsessional anxiety while watching the movie, she suffered an abrupt relapse in obsessional fear, avoidance, and rituals. The strong emphasis on habituation during exposure led Lisa to view obsessional fear as a problem she had learned to control with exposure. Hence, she interpreted her surge of uncontrollable obsessional thoughts and anxiety during the movie scene as overwhelming and a sign of failure.

From the perspective of learning theory, Lisa's experience at the movie functioned to reinstate (see Bouton, 1993) her fear of intrusive thoughts. Reinstatement in this instance refers to Lisa being reexposed to the unconditioned stimulus (distressing intrusive thoughts) after going through exposure (or extinction), which reawakened her fear of the intrusions and caused her to become much more fearful of these thoughts and related environmental cues. If treatment had fostered more extensive generalization of exposure and instilled greater fear tolerance, then the effects of the reinstatement episode could have been attenuated or avoided.

The emphasis on using exposure to disconfirm obsessional fears (e.g., of becoming possessed) was also likely reinforced by the sense of assurance that Lisa felt when she completed each practice without seeming to become possessed or lose control of herself. Indeed, the stated goal of ERP was to minimize anxiety by disconfirming her fears, and she often experienced relief at the end of exposures, explaining that she "knew" that her obsessions were senseless. Such relief, in turn, likely reinforced Lisa's belief that she couldn't tolerate obsessional doubts and uncertainty without trying to achieve reassurance. As a result, her intolerance of uncertainty about being possessed remained unchanged. Similarly, the slow pace of treatment might have contributed to the treatment's failure by implicitly communicating a need to establish safety, comfort, and certainty.

In addition, Lisa had practiced imaginal exposures only in her therapist's office and in her own home. She had not varied the environment in which she systematically confronted her obsessional thoughts and doubts; nor had she ever combined imaginal exposures with in-vivo exposures (in vivo exposures were occasionally conducted outside the home). If Lisa had conducted imaginal exposures in a broader range of environments and while confronting feared external cues (e.g., imagining being possessed while reading news articles about serial killers), her learning might have generalized more extensively. Instead, her tolerance for experiencing distressing obsessional thoughts did not generalize to many real-life situations. Lisa's relapse occurred in part because she was not encouraged to confront the feared obsessional thoughts and uncertainty to the maximal extent that she could.

Cognitive restructuring and psychoeducation erred in similar ways. Cognitive techniques, for example, targeted Lisa's overestimates of the likelihood that she was (or would become) possessed and begin acting in bad or evil ways. More fruitful targets, however, might have been her exaggerated beliefs about the intolerability of obsessional intrusions, anxiety, and uncertainty; as well as the belief that she was bad or evil, or highly susceptible to bad or evil behavior. Furthermore, Lisa frequently used cognitive restructuring for immediate relief of fear and uncertainty (i.e., as reassurance), rather than as a method for normalizing and better tolerating these experiences. The way she used psychoeducation to reassure herself that her obsessional thoughts were not omens also reinforced immediate distress reduction, as opposed to strengthening beliefs that intrusive thoughts and uncertainty are normal and tolerable. Moreover, in reviewing psychoeducational and cognitive therapy materials when carrying out exposures, these materials became safety cues that interfered with her learning that she could tolerate obsessional fear and uncertainty. Thus, the emphasis on immediate fear reduction likely played a role in the treatment's failure to (a) generalize to the most highly provoking stimuli, and (b) impart that obsessional intrusions, anxiety, and uncertainty are tolerable and normal experiences that don't need to be "gotten rid of" in order for Lisa to feel that treatment had been successful.

When cognitive therapy and psychoeducation are used as anxiety reduction (or control) strategies, the exposure-based treatment of OCD fails to result in broad generalization and also falls short of successfully teaching the patient beliefs about intrusive thoughts that would likely be more resilient to full reinstatement (as noted previously). That is, beliefs that could allow Lisa to experience fear reinstatement (i.e., strong feelings of anxiety during *The Exorcist*) but not send her spiraling down into full-blown relapse and a sense of failure. Rather, she would be able to

frame such an experience as a normal and nearly inevitable (i.e., expected) occurrence.

Rethinking the Pathways to Long-Term Success

One explanation for the failure of Lisa's treatment to produce long-term, broadly generalized learning is the reliance on emotional processing theory to guide ERP. Emphasizing the importance of habituation of fear during exposure interfered with inhibitory learning and failed to teach Lisa how to tolerate obsessional thoughts, anxiety, and uncertainty. As reviewed by [Craske and colleagues \(2008, 2012\)](#), basic research suggests that inhibitory learning lies at the core of fear extinction—the reduction in conditioned fear that occurs during exposure therapy—at least for acquired fears that cannot be reversed immediately following acquisition (e.g., [Bouton, 1993](#)), as is the case in OCD and other anxiety disorders. In inhibitory learning, the original threat-based association between the conditioned and unconditioned stimulus remains intact while alternative, nonthreat associations between the conditioned and unconditioned stimulus are formed. The goal of an inhibitory learning approach to the treatment of OCD (and other anxiety disorders) is to maximize the likelihood that nonthreat associations (e.g., obsessional thoughts and uncertainty = normal and acceptable) inhibit access and retrieval of threat associations (e.g., obsessional thoughts and uncertainty = significant and intolerable). The degree to which threat-based versus nonthreat associations are expressed following treatment depends on the strength of inhibitory learning across time and context, rather than, as purported by emotional processing theory, fear expression during exposure ([Craske et al., 2008](#)). Therefore, the most important test of learning occurs at post treatment and follow-up assessments when the strength of inhibitory learning determines which among competing associations is expressed. The discrepancy in Lisa's fear levels prior to watching *The Exorcist* versus while watching the movie can be explained by insufficient strength of inhibitory learning.

Research also points to the role of experiential avoidance—the tendency to resist uncomfortable internal experiences such as distressing intrusive thoughts, feelings of doubt and uncertainty, and negative emotions such as anxiety—in the maintenance of OCD and other anxiety disorders (e.g., [Abramowitz, Lackey, & Wheaton, 2009](#); [Berman, Wheaton, McGrath, & Abramowitz, 2010](#)). Consistent findings suggest, for example, that trying to suppress unwanted thoughts is generally futile and paradoxically leads to the thought's reoccurrence (e.g., [Abramowitz, Tolin, & Street, 2001](#)). Accordingly, rather than trying to reduce or eliminate experiences such as obsessional thoughts, uncertainty, and anxiety, it might be more productive to focus the treatment of OCD on enhancing the patient's ability to accept and tolerate these

unpleasant experiences—especially since they are universal and harmless.

The goal of enhancing tolerance of unpleasant experiences also complements the aim of enhancing inhibitory learning. That is, to the degree that patients learn to tolerate obsessional anxiety and uncertainty, inhibitory associations (e.g., “I can live with everyday uncertainty”) can be maximally acquired. Moreover, maximizing toleration of obsessional thoughts, uncertainty, and anxiety reduces the risk that patients will return to using avoidance behavior and rituals to reduce discomfort should inhibitory learning “fail” to be retrieved in a given situation.¹ In Lisa's case, learning to tolerate sudden intense thoughts that she was possessed may have allowed her to better tolerate her experience during *The Exorcist*, thereby reducing the likelihood that she would return to OCD symptoms to keep her fears at bay. Further, individuals with OCD and other anxiety disorders are at risk for additional psychological disorders throughout the lifespan (even as the originally treated disorder remains in remission; e.g., [Brown, Antony, & Barlow, 1995](#); [Brown & Barlow, 1995](#)). Thus, increasing tolerance might decrease the risk for acquiring new fear learning (and new disorders) in the future (or at least minimize their severity).

In summary, theory and basic research on learning suggest that rather than relying on habituation as an indicator of success in the treatment of OCD, one is better off using (a) observations of performance at posttreatment or follow-up and (b) tolerance of obsessional intrusions, uncertainty, and anxiety as signs that nonthreat associations have been consolidated. This shift from habituation to tolerance and long-term performance as indices of learning necessitates a reframing of the aims and methods of CBT for OCD. In the remainder of this article, we discuss the practical implications of this reframing, with the aim of maximizing the effectiveness and minimizing failure when implementing this treatment. Realizing this aim involves two primary steps: (a) generating new nonthreat associations and (b) enhancing the retrieval of these new associations (see [Craske et al., 2008](#)).

Reframing ERP for OCD

Generating Nonthreat Associations

Generating nonthreat associations towards conditioned stimuli is the first step in inhibitory learning and, thus, the first step towards extinction of obsessional fear. In Lisa's treatment, the therapist sought to engender nonthreat

¹ Inhibitory (i.e., safety) associations are more context-dependent than initially acquired ones (i.e., fear associations) and thus may “fail” to compete successfully with the old association during one or multiple occasions in the patient's future. Lisa's case illustrates how even one occasion of this can be devastating, which highlights the importance of enhancing tolerance.

associations to conditioned fear cues—external situations and stimuli, as well as intrusive thoughts—using psychoeducation, cognitive therapy, and ERP aimed at immediate and short-term fear reduction. Yet producing strong and long-lasting inhibitory learning that minimizes the risk of relapse requires additional procedures. Existing research points to specific approaches that help patients to acquire strong nonthreat associations, including (a) mismatching expectancies, (b) weaning safety cues and safety behaviors, (c) integrating multiple excitors, and (d) linguistic processing (Craske et al., 2008, 2012). Although most of these techniques are already incorporated into current CBT programs for OCD (e.g., Abramowitz, 2006; Foa, Yadin, & Lichner, 2012; Kozak & Foa, 1997), we discuss how clinicians can get the most out of them within the context of basic research on learning and memory.

Mismatching Expectancies

One method for generating nonthreat associations is mismatching expectancies—in other words, violating the expectation that the conditioned stimulus predicts the unconditioned stimulus. To illustrate, consider the straightforward case of a phobia of dogs. When exposure to the CS (e.g., a dog) does not result in a feared outcome (e.g., being attacked), an alternative, nonthreatening meaning for the CS develops (e.g., dogs are safe). In many instances, however, obsessional fears in OCD focus on long-term or otherwise “unknowable” outcomes (e.g., “I might be possessed by the devil” or “I might murder my family 5 years from now”). Accordingly, we can conceptualize the obsessional thoughts and uncertainty as unconditioned stimuli (US) and the external situations and cues (e.g., cemeteries, articles about serial killers), as conditioned stimuli (CS). Although it is routine to practice exposure to conditioned stimuli, there is also value in conducting exposures directly to the US (i.e., to feeling uncertain about whether feared consequences will occur, or already have occurred). The aim of exposure to the US would be to diminish the significance and intolerance of uncertainty, thereby initiating habituation to the US.

Consequently, it might be fruitful to reframe the goal of ERP as violating expectancies. So, rather than keeping track of subjective units of discomfort (SUDS) during exposure, as is typical, the therapist could track the patient’s shifting expectancies of negative outcome, with the goal of continuing the exposure until the maximum expectancy is violated. For example, when Lisa drove past her high school, she would perform a prayer ritual which made her feel less uncertain about being possessed by the devil. Using expectancy tracking, the therapist could assess how long Lisa believes she could tolerate the feelings of uncertainty, and what activities she believes she could and could not accomplish while feeling this way. Lisa’s expectations are likely to shift during the exposure:

At first, she may believe that she can tolerate feeling possessed (without engaging in a prayer ritual) for only 30 seconds, but as she surpasses 30 seconds, she may shift her expectancy to believing she can tolerate feeling possessed for 10 minutes. Exposure would then be arranged to violate these expectations, until her maximum expectancy (10 minutes) has been surpassed. For instance, exposures that provoke uncertainty would be used to induce obsessional doubt, and Lisa would practice remaining uncertain (without ritualizing) and engaging in daily activities until she exceeded her maximum predictions. The goal would be to repeatedly violate Lisa’s expectations regarding tolerating obsessional distress and uncertainty in different contexts, in and out of the session.

Eliminating Safety Behaviors and Safety Cues

Most CBT programs for OCD include response prevention to eliminate compulsive rituals (e.g., Abramowitz, 2006; Kozak & Foa, 1997). From an inhibitory learning perspective, response prevention serves to enhance the generation of nonthreat associations. Yet it is not only compulsive rituals that must be curtailed; rather, any action (including mental actions) taken to suppress or “deal with” obsessional thoughts, reduce anxiety, gain reassurance, or prevent feared consequences can be conceptualized as a safety behavior (Abramowitz, 2006) and should be targeted in response prevention. Because popular descriptions of OCD typically highlight classic compulsions such as washing and checking, patients (and therapists) sometimes overlook subtle or brief safety behaviors that are functionally equivalent to compulsive rituals, such as visually inspecting peoples’ facial expressions for their reactions, opening doors with a sleeve, mentally reviewing one’s behaviors or conversations, and performing crude risk analyses.²

An extensive animal literature (see Hermans, Craske, Mineka, & Lovibond, 2006) and a more methodologically limited human literature (Powers, Smits, & Telch, 2004; Sloan & Telch, 2002) shows that the use or presence of safety signals interferes with fear extinction. Although there is debate regarding the precise mechanisms of interference, one possibility is that performance of safety behaviors encourages patients to attribute the lack of aversive outcomes to the safety behavior, rather than develop new, non-threat associations between the conditioned and unconditioned stimulus. Dismantling studies have demonstrated that instructing patients to refrain from safety behaviors (i.e., response prevention) improves outcomes

²This is one reason we prefer the term “response prevention” to “ritual prevention,” as is sometimes used. The former, more than the latter, clearly conveys the importance of resisting all anxiety-reducing responses, some of which are not compulsive rituals in the prototypical sense.

with exposure-based treatment for OCD (e.g., Foa, Steketee, & Milby, 1980).³

The presence of the therapist might also serve as a safety cue by implicitly or explicitly providing reassurance and preventing tolerance of uncertainty. This highlights the importance of having patients practice exposures on their own, in the absence of the therapist, in addition to practicing in session. Thus, encouraging Lisa to read books about serial killers and visit her high school between treatment sessions are methods of eliminating safety signals during ERP. This also underscores the importance of refraining from explicitly providing reassurance to patients during exposures. For patients who persistently ask questions about the risks of exposure tasks (e.g., “would you let your child do this?”), refraining from providing reassuring answers and instead explaining the importance of remaining uncertain, is another method of eliminating safety behaviors. In couples where one partner has OCD, the other partner is often drawn into providing reassurance (e.g., answering questions, providing assurances of safety for the OCD partner). We have developed a couple-based CBT program for OCD in which we work with both partners to address this safety behavior as a team (Abramowitz et al., 2013). Partners also learn about the importance of learning to tolerate anxiety, rather than trying to relieve it immediately. Although similar methods were used in Lisa’s treatment, their effectiveness likely was weakened by the emphasis on immediate and short-term fear reduction in the rest of therapy.

Combining Excitatory Conditioners

Rescorla and Wagner (1972) suggested that when an expected negative outcome fails to occur despite the presence of *multiple* predictors of the negative outcome, inhibitory learning is greater than when the predicted negative outcome fails to occur in the presence of just a *single* predictor (Rescorla & Wagner, 1972). Based on this principal, Rescorla (2006) coined the term “deepened extinction” to refer to the finding that relative to a single stimulus, combining multiple conditioned stimuli during extinction trials enhances extinction learning. In nonprimates, deepened extinction resulted in lower spontaneous recovery (i.e., the return of fear over time), less reinstatement (the return of fear following presentation of the unconditioned stimuli alone), and slower reacquisition of the conditioned fear response (following CS-US pairing)

³ A recent study suggested that the judicious use of safety behaviors may not be harmful to exposure therapy outcomes in OCD (Rachman, Shafraan, Radomsky, & Zysk, 2011), yet the finding was limited to short-term outcomes in a nonclinical undergraduate sample. Thus, our recommendation to eliminate safety behaviors and cues as much as possible still holds at present.

than the noncombined approach. Translating this work to a clinical context, Craske et al. (2008, 2012) suggested that inhibitory learning could be strengthened by conducting exposures to feared stimuli individually, and then combining them. For example, Lisa could be exposed separately to situational triggers of her obsessional anxiety (e.g., movie about a serial killer) and to thoughts and uncertainty about being possessed and becoming a murderer (imaginal exposure); and then these exposures could be combined (e.g., by having Lisa imagine possibly being possessed by the devil and plotting to kill her family while watching a movie about serial killers).

Linguistic Processing

Cognitive neuroscience has shown that “putting feelings into words disrupts the feelings being verbalized” (Lieberman, 2011, p. 188)—a process driven by the right ventrolateral prefrontal cortex and known as *disruption theory* (Lieberman, 2007, 2011). The most commonly studied method for disruption is affect labeling—assigning labels to emotion (“sad,” “scared”) or emotional stimuli such as faces. A recent study (Kircanski, Lieberman, & Craske, 2012) demonstrated that in the middle of each exposure trial for spider phobia, having patients create and speak sentences that described the spider and their emotional response to it (“I feel anxious the disgusting tarantula will jump on me”) resulted in lower skin conductance (a measure of sympathetic nervous system activity) and less behavioral avoidance at 1-week follow up, relative to cognitive reappraisal, distraction, or exposure alone. Similar findings were found in an earlier study that examined affect labeling during exposure to threatening images (albeit by labeling images with negative words irrelevant to the image; Tabibnia, Lieberman, & Craske, 2008). Although nascent, these findings suggest the potential utility of having OCD patients label feelings shortly after initiating an exposure. In Lisa’s case, she might park her car in front of her high school, sit for 10 seconds, and then label her feelings about doing the exposure (“I feel terrified that being near the high school will cause me to become possessed”), and then continue with the exposure until her maximum expectancy for harm had been violated.

Enhancing the Retrievability of Nonthreat Associations

As Lisa’s case clearly shows, simply acquiring and strengthening nonthreat associations with obsessional stimuli does not ensure that these associations will be retrieved during exposure to obsessional stimuli in a novel context. Once nonthreat associations are generated and strengthened, these connections must be readily retrievable. Contextual and temporal factors influence the degree to which patients will be able to recall the new nonthreat associations when obsessional thoughts and external cues are encountered. It is as if the learning and memory system

is organized with a default assumption that the first learned association is correct, and everything else is conditional on the current context, place, or time. Thus, enhancing the retrieval of new nonthreat associations is an important task for maximizing long-term success with CBT. Techniques that we discuss for doing so include maximizing variability during exposure, scheduling expanding spaced sessions and follow-up sessions, and aiding in context retrieval.

Maximizing Variability During ERP

According to Bjork and Bjork's (1992, 2006) New Theory of Disuse, learning in varied contexts makes short-term learning more difficult but increases long-term retention. To be specific, the more diversified the conditions in which learning takes place, the greater the number of retrieval cues that will be generated, thereby increasing the likelihood of accessing a retrieval cue in the future. Craske and colleagues (Lang & Craske, 2000; Rowe & Craske, 1998) provided initial evidence that conducting exposures according to a variable or random schedule results in less fear at posttest than conducting exposures according to a constant or stepped schedule, at least for individuals with specific phobias.

This approach is readily translated to the treatment of OCD. For example, in Lisa's case, rather than conduct in vivo exposures in a stepped method according to a graded fear hierarchy, Lisa and her therapist could generate a fear hierarchy but conduct exposures according to a random schedule. They could begin with an exposure from the middle of the fear hierarchy (e.g., pictures of Lisa's classmate who murdered his wife), then conduct one from the upper end (e.g., reading about a serial killer), and then one from the lower end (e.g., the number 666), and so forth, in order to vary the amount of fear generated from one exposure to the next. Moreover, instead of repeating exposures again and again until anxiety levels decline to almost zero, the stopping point of exercises could be varied. In this way, Lisa would grow to better tolerate different levels of anxiety and the uncertainty that accompanies stopping exposures before anxiety fully declines. Imaginal exposures could also be varied. In some, Lisa could imagine not knowing for sure whether she is possessed or will commit murder (i.e., exposure to uncertainty); whereas in others, she could imagine that her soul is possessed and confront images of herself losing control and violently killing her husband and child.

In contrast to needing to believe, as Lisa did, that "I'll be okay because I know my fear will go away by the end," conducting randomly ordered and varied exposures would foster a belief that "I'll be okay because I can tolerate anxiety and uncertainty." Although carrying out ERP in this way might cause patients some uneasiness—and this is important to consider—the rationale for doing so could be explained beforehand as an effort to maximize long-term

learning by varying the fear levels, context, and content of exposure.

Another way to maximize variability during ERP is to encourage the patient to make the most out of unplanned encounters with obsessional cues; that is, to be opportunistic and consider such encounters as occasions to practice exposure, rather than just enduring them with great distress or avoiding them altogether. Along with the increase in temporal and situational variability, the patient's decision to conduct an exposure "on the fly" also creates new contexts in which exposure is practiced and broader retrieval cues, thereby increasing the likelihood of accessing newly learned associations in the future. Lisa, as directed by her therapist, reliably completed exposures assigned for each day between her treatment sessions. Yet she proceeded to use avoidance strategies if she encountered obsessional stimuli by chance, outside of her assigned exposures. For example, when not conducting deliberate exposure to her high school, Lisa would go out of her way to avoid driving past this location. Her chances of relapse would have been reduced had she regarded ERP as a new "lifestyle," rather than as something to practice only when directed by the therapist. We have found that distinguishing between two types of exposure—"programmed" and "lifestyle" exposure—helps patients be opportunistic in this way (Abramowitz, 2006). While the former refers to exposure that is systematically planned and prescribed by the therapist, the latter involves making choices to take advantage of any opportunities to confront obsessional cues and resist rituals (i.e., without having to be instructed).

Scheduling Expanding Spaced and Follow-up Sessions

Research on expanding retrieval practice (e.g., Bjork, 1988; Landauer & Bjork, 1978) indicates that temporally spacing learning trials at increasingly larger intervals results in better long-term retention than does massed or regularly spaced learning trials, at least for nonemotional material. Bjork proposed that spaced learning intervals allow for opportunities to forget and relearn associations, which strengthens long-term memory retention and ease of retrieval. Perhaps because of inconsistent methodology across studies, research findings on spaced versus massed exposure therapy are inconclusive (see Craske et al., 2008). Yet, the evidence for expanding retrieval practice across numerous learning and memory studies translates into scheduling ERP sessions at increasingly larger intervals. After several twice-weekly ERP sessions, the therapist could schedule sessions once per week, then every 2 weeks, then once per month, then once every 2 months, and so on, in order to consolidate long-term learning.

Aiding in Context Retrieval

Because the original fear associations are not erased during extinction (i.e., during exposure practice), reencounters with the CS (e.g., obsessional thoughts and cues)

in a context that is different from the extinction context (e.g., watching a frightening movie in a public theatre) can lead to a reinstatement of the original fear (e.g., fear of being possessed and becoming a murderer) (Mineka, Mystkowski, Hladek, & Rodriguez, 1999; Mystkowski, Craske, & Echiverri, 2002). Thus, an additional method for enhancing the accessibility and retrieval of newly learned nonthreat associations is to offset context renewal effects by practicing exposures in as many different contexts as possible. Vansteenwegen et al. (2007), for example, had spider-phobic individuals watch videos of a spider located in different rooms versus a single room of a house. Later, when a spider was viewed in a new location, the group that had watched the spider in different locations evidenced lower skin conductance than did those who underwent single location exposure. Translating this to the treatment of OCD, practice with ERP could be conducted in as many different contexts as possible (e.g., therapist's office, home, workplace, school, public locations, etc.). We recommend an emphasis on conducting exposures outside the therapist's office, especially under real-world circumstances where the patient is likely to encounter obsessional cues (e.g., Bouton et al., 2006).

It turns out that mental rehearsal of the original extinction context can also help patients link the original extinction context and novel contexts (Bouton et al., 2006). For example, when Mystkowski, Craske, Echiverri, and Labus (2006) treated spider phobics and then re-exposed them to spiders in a novel context, those who had been instructed to mentally rehearse the treatment context (including what they had learned during treatment) showed less return of fear than did those instructed to recall a neutral scenario. Accordingly, Lisa might have been able to avoid her relapse if (rather than reviewing the cognitive and psychoeducational information) she had spent more time systematically reviewing in her mind what she had learned in previous ERP trials.

Psychoeducation and Treatment Planning

In concert with shifts in ERP emphasis, basic research on learning and memory also has implications for the psychoeducational and treatment planning stages of CBT for OCD. Therapists can begin to lay the appropriate foundations for ERP during these preliminary stages of treatment by explaining how using ERP to learn fear tolerance, as opposed to emphasizing fear reduction, will best promote long-term learning and minimize relapse. For example, rather than casting ERP for Lisa as techniques to reduce fear of particular situations and stimuli, it could be presented as an approach to help her practice confronting anxiety, intrusive thoughts, and uncertainty so that she can learn how not to be afraid of these experiences. Moreover, instead of labeling the occurrence of obsessional intrusions, anxiety, and uncertainty as signs

that treatment is not working, these would be normalized and labeled as opportunities to learn greater distress tolerance and as occasions to enhance long-term learning by practicing the retrieval of nonthreat associations (similar to how someone wishing to lose weight might take advantage of a broken elevator to use the stairs and get more exercise). A "bring it on" attitude would be adopted to generate opportunities to learn and practice how to cope with obsessional anxiety and doubt without the need for avoidance and rituals, further enhancing learning and extinction. Therapists should be alert, however, to the fact that patients might have other ideas about how to use ERP (likely more in line with fear reduction and habituation), and it is thus important to continually assess for discrepancies in treatment goals. Strategies from the motivational interviewing literature to help elicit "change talk" (e.g., "Looking forward technique"; Miller & Rollnick, 2013) can be useful when therapist and patient goals are misaligned.

Cognitive Restructuring and Rational Discussions About Risk

Cognitive interventions—whether used formally or informally for OCD—are another set of techniques that can be optimized with proper consideration of the role of inhibitory learning. Therapists working with OCD occasionally fall into the trap of trying to convince the patient that obsessional thoughts are illogical, unlikely to come true, or otherwise senseless (e.g., "You're such a gentle person; you're not going to act on unwanted violent thoughts"). Some therapists use formal cognitive restructuring to try to demonstrate to the patient that an obsessional fear is unlikely to occur (e.g., "Where's the evidence that you're a murderer?"). Yet although the obsessional fear itself intuitively seems like a sound target for rational debate (i.e., because of its irrationality), this approach overemphasizes short-term anxiety reduction (and reassurance) and will have only a transient beneficial effect at best. The suggestions we have discussed for enhancing ERP also provide a guide for enhancing cognitive restructuring. Consistent with the work of Clark (2004) and Wilhelm and Steketee (2006), rather than focusing on the likelihood of feared outcomes, cognitive restructuring for OCD should address the likelihood of tolerating anxiety, uncertainty, and distressing intrusive thoughts.

Lisa's treatment, for example, might have benefitted from verbal cognitive techniques to help Lisa challenge her need for absolute certainty about future events, such as whether her soul would be possessed. Indeed, it is futile to try to gain absolute certainty regarding such supernatural ideas (as well as most worldly things). Thus, Lisa could have been helped to make lists of the pros and cons of continuing her attempts to gain certainty versus learning to accept normal everyday uncertainty about such enigmatic

things. This might lead to questioning the utility of avoidance and rituals. Through logical discussion with the therapist, Lisa might also come to realize that she already accepts uncertainty in most other areas of her life (e.g., driving in a car to the treatment session!), and so has evidence that she can function sufficiently even in a state of uncertainty. The use of cognitive techniques in this way could set the stage for the sorts of ERP assignments described previously to diminish the significance of obsessional thoughts and uncertainty (i.e., mismatching expectancies).

Conclusion

In this article we have presented the case of Lisa, who received CBT for OCD. Although she appeared to be faring well during most of her time in treatment, she experienced a relapse after 14 sessions and discontinued therapy. We used basic research on learning and memory consolidation to elucidate factors that can make patients such as Lisa vulnerable to relapse and treatment failure even within this generally effective intervention. This perspective also leads to suggestions for improving the implementation of exposure, response prevention, education, and cognitive restructuring for OCD. Although these suggestions are translated from empirical findings, many of them still require evaluation in treatment outcome studies and with OCD patients. Such studies are currently ongoing, and we anticipate continuing to improve the treatment of OCD as informed by future findings.

References

- Abramowitz, J. S. (1996). Variants of exposure and response prevention in the treatment of obsessive-compulsive disorder: A meta-analysis. *Behavior Therapy, 27*, 583–600.
- Abramowitz, J. S. (2006). *Understanding and treating obsessive-compulsive disorder: A cognitive-behavioral approach*. Mahwah NJ: Lawrence Erlbaum.
- Abramowitz, J. S., Baucom, D. H., Wheaton, M. G., Boeding, S., Fabricant, L. E., Paprocki, C., & Fischer, M. S. (2013). Enhancing exposure and response prevention for OCD: A couple-based approach. *Behavior Modification, 37*, 189–210.
- Abramowitz, J. S., Lackey, G., & Wheaton, M. G. (2009). Obsessive-compulsive symptoms: The contribution of obsessive beliefs and experiential avoidance. *Journal of Anxiety Disorders, 23*, 160–166.
- Abramowitz, J. S., Tolin, D. F., & Street, G. P. (2001). Paradoxical effects of thought suppression: A meta-analysis of controlled studies. *Clinical Psychology Review, 21*, 683–703.
- Beck, A. T., Ward, C., & Mendelson, M. (1961). Beck Depression Inventory. *Archives of General Psychiatry, 4*, 561–571.
- Berman, N. C., Wheaton, M. G., McGrath, P., & Abramowitz, J. S. (2010). Predicting anxiety: The role of experiential avoidance and anxiety sensitivity. *Journal of Anxiety Disorders, 24*, 109–114.
- Bjork, R. A. (1988). Retrieval practice and the maintenance of knowledge. In M. M. Gruneberg, P. E. Morris, & R. N. Sykes (Eds.), *Practical aspects of memory II* (pp. 396–401). Chichester, UK: Wiley.
- Bjork, R. A., & Bjork, E. L. (1992). A new theory of disuse and an old theory of stimulus fluctuation. In A. Healy, S. Kosslyn, & R. Shiffrin (Eds.), *From learning processes to cognitive processes: Essays in honor of William K. Estes* (pp. 35–67). Hillsdale, NJ: Erlbaum.
- Bjork, R. A., & Bjork, E. L. (2006). Optimizing treatment and instruction: Implications of a new theory of disuse. In L.-G. Nilsson, & N. Ohta (Eds.), *Memory and society: Psychological perspectives* (pp. 116–140). New York: Psychology Press.
- Bouton, M. E. (1993). Context, time and memory retrieval in the interference paradigms of Pavlovian learning. *Psychological Bulletin, 114*, 90–99.
- Bouton, M. E., Woods, A. M., Moody, E. W., Sunsay, C., & Garcia-Gutierrez, A. (2006). Counteracting the context dependence of extinction: Relapse and tests of some relapse prevention methods. In M. G. Craske, D. Hermans, & D. Vansteenwegen (Eds.), *Fear and learning: From basic processes to clinical implications* (pp. 175–196). Washington, DC: American Psychological Association.
- Brown, T. A., Antony, M. M., & Barlow, D. H. (1995). Diagnostic comorbidity in panic disorder: Effect on treatment outcome and course of comorbid diagnoses following treatment. *Journal of Consulting and Clinical Psychology, 63*, 408–418.
- Brown, T. A., & Barlow, D. H. (1995). Long-term outcome in cognitive-behavioral treatment of panic disorder: Clinical predictors and alternative strategies for assessment. *Journal of Consulting and Clinical Psychology, 63*, 754–765.
- Clark, D. A. (2004). *Cognitive-behavioral therapy for OCD*. New York, NY: Guilford.
- Craske, M. G., Kitcanski, K., Zelokowsky, M., Mystkowski, J., Chowdhury, N., & Baker, A. (2008). Optimizing inhibitory learning during exposure therapy. *Behavior Research and Therapy, 46*, 5–27.
- Craske, M. G., Liao, B., Brown, L., & Vervliet, B. (2012). Role of inhibition in exposure therapy. *Journal of Experimental Psychopathology, 3*, 322–345.
- Foa, E. B., & Kozak, M. J. (1986). Emotional processing of fear: Exposure to corrective information. *Psychological Bulletin, 99*, 20–35.
- Foa, E. B., Liebowitz, M. R., Kozak, M. J., Davies, S., Campeas, R., Franklin, M. E., . . . Tu, X. (2005). Randomized, placebo-controlled trial of exposure and ritual prevention, clomipramine, and their combination in the treatment of obsessive-compulsive disorder. *American Journal of Psychiatry, 162*, 151–161.
- Foa, E. B., Steketee, G., & Milby, J. (1980). Differential effects of exposure and response prevention in obsessive-compulsive washers. *Journal of Consulting and Clinical Psychology, 48*, 71–79.
- Foa, E. B., Yadin, E., & Lichner, T. K. (2012). *Exposure and response (ritual) prevention for obsessive-compulsive disorder*, (2nd ed.) New York, NY: Oxford University Press.
- Franklin, M. E., & Foa, E. B. (1998). Cognitive-behavioral treatments for obsessive-compulsive disorder. In J. M. Gorman (Ed.), *A guide to treatments that work* (pp. 339–357). New York, NY: Oxford University Press.
- Goodman, W. K., Price, L. H., Rasmussen, S. A., Mazure, C., Fleischmann, R. L., Hill, C. L., Heninger, G. R., & Charney, D. S. (1989a). The Yale-Brown Obsessive Compulsive Scale. I. Development, use, and reliability. *Archives of General Psychiatry, 46*, 1006–1011.
- Goodman, W. K., Price, L. H., Rasmussen, S. A., Mazure, C., Delgado, P., Heninger, G. R., & Charney, D. S. (1989b). The Yale-Brown Obsessive Compulsive Scale. II. Validity. *Archives of General Psychiatry, 46*, 1012–1016.
- Hermans, D., Craske, M., Mineka, S., & Lovibond, P. F. (2006). Extinction in human fear conditioning. *Biological Psychiatry, 60*, 361–368.
- Kircanski, K., Lieberman, M. D., & Craske, M. G. (2012). Feelings into words: Contributions of language to exposure therapy. *Psychological Science, 23*, 1086–1091.
- Kozak, M. J., & Foa, E. B. (1997). *Mastery of obsessive-compulsive disorder: Therapist Manual*. San Antonio: The Psychological Corp.
- Landauer, T. K., & Bjork, R. A. (1978). Optimal rehearsal patterns and name learning. In M. M. Gruneberg, P. E. Morris, & R. N. Sykes (Eds.), *Practical aspects of memory* (pp. 625–632). London: Academic Press.
- Lang, A. J., & Craske, M. G. (2000). Manipulations of exposure-based therapy to reduce return of fear: A replication. *Behaviour Research and Therapy, 38*, 1–12.
- Lieberman, M. D. (2007). Social cognitive neuroscience: a review of core processes. *Annual Review of Psychology, 58*, 259–289.
- Lieberman, M. D. (2011). Why symbolic processing of affect can disrupt negative affect: Social cognitive and affective neuroscience investigations. *Social Neuroscience: Toward understanding the underpinnings of the social mind*, 188–209.
- Meyer, V. (1966). Modification of expectations in cases with obsessional rituals. *Behaviour Research and Therapy, 4*, 273–280.
- Miller, W. R., & Rollnick, S. (2013). *Motivational interviewing: Helping people change*, (3rd ed.) New York, NY: Guilford.

- Mineka, S., Mystkowski, J. L., Hladek, D., & Rodriguez, B. I. (1999). The effects of changing contexts on return of fear following exposure therapy for spider fear. *Journal of Consulting and Clinical Psychology, 67*, 599–604.
- Mystkowski, J. L., Craske, M. G., & Echiverri, A. M. (2002). Treatment context and return of fear in spider phobia. *Behavior Therapy, 33*, 399–416.
- Mystkowski, J. L., Craske, M. G., Echiverri, A. M., & Labus, J. S. (2006). Mental reinstatement of context and return of fear in spider phobia. *Behavior Therapy, 37*, 49–60.
- Olatunji, B. O., Davis, M. L., Powers, M. B., & Smits, J. A. (2013). Cognitive-behavioral therapy for obsessive-compulsive disorder: A meta-analysis of treatment outcome and moderators. *Journal of Psychiatric Research, 47*, 33–41.
- Powers, M. B., Smits, J. A. J., & Telch, M. J. (2004). Disentangling the effects of safety-behavior utilization and safety-behavior availability during exposure-based treatment: A placebo-controlled trial. *Journal of Consulting and Clinical Psychology, 72*, 448–454.
- Rachman, S. (1997). A cognitive theory of obsessions. *Behaviour Research and Therapy, 35*, 793–802.
- Rachman, S. (1998). A cognitive theory of obsessions: Elaborations. *Behaviour Research and Therapy, 36*, 385–401.
- Rachman, S., & de Silva, P. (1978). Abnormal and normal obsessions. *Behaviour Research and Therapy, 16*, 233–248.
- Rachman, S., & Hodgson, R. J. (1980). *Obsessions and compulsions*. Englewood Cliffs, NJ: Prentice-Hall.
- Rachman, J., Shafraan, R., Radoemsky, A., & Zysk, E. (2011). Reducing contamination by exposure plus safety behaviour. *Journal of Behaviour Therapy and Experimental Psychiatry, 42*, 397–404.
- Rescorla, R. A. (2006). Deepened extinction from compound stimulus presentation. *Journal of Experimental Psychology: Animal Behavior Processes, 32*, 135–144.
- Rescorla, R. A., & Wagner, A. R. (1972). A theory of Pavlovian conditioning: Variations in the effectiveness of reinforcement and nonreinforcement. In A. H. Black & W. F. Prokasy (Eds.), *Classical conditioning II: Current research and theory* (pp. 64–99). New York, NY: Appleton-Century-Crofts.
- Rowe, M. K., & Craske, M. G. (1998). Effects of varied-stimulus exposure training on fear reduction and return of fear. *Behaviour Research and Therapy, 36*, 719–734.
- Salkovskis, P. M. (1985). Obsessional-compulsive problems: a cognitive-behavioural analysis. *Behaviour Research and Therapy, 23*, 571–583.
- Sloan, T., & Telch, M. J. (2002). The effects of safety-seeking behavior and guided threat reappraisal on fear reduction during exposure: An experimental investigation. *Behaviour Research and Therapy, 40*, 235–251.
- Tabibnia, G., Lieberman, M. D., & Craske, M. G. (2008). The lasting effect of words on feelings: Words may facilitate exposure effects to threatening images. *Emotion, 8*, 307–317.
- Taylor, S., & Jang, K. L. (2011). Biopsychosocial etiology of obsessions and compulsions: An integrated behavioral-genetic and cognitive-behavioral analysis. *Journal of Abnormal Psychology, 120*, 174–186.
- Taylor, S., Jang, K. L., & Asmundson, G. J. (2010). Etiology of obsessions and compulsions: A behavioral-genetic analysis. *Journal of Abnormal Psychology, 119*, 672–682.
- Vansteenwegen, D., Vervliet, B., Iberico, C., Baeyens, F., Van den Bergh, O., & Hermans, D. (2007). The repeated confrontation with videotapes of spiders in multiple contexts attenuates renewal of fear in spider anxious students. *Behaviour Research and Therapy, 46*, 1169–1179.
- Wilhelm, S., & Steketee, G. (2006). *Cognitive therapy for obsessive-compulsive disorder: A guide for professionals*. Oakland, CA: New Harbinger.
- Wolpe, J. (Ed.). (1959). *Psychotherapy based on the principle of reciprocal inhibition*. Oxford: Prentice-Hall.

Address correspondence to Jonathan Abramowitz, Ph.D., Department of Psychology, University of North Carolina at Chapel Hill, Campus Box 3270 (Davie Hall), Chapel Hill, NC 27599; e-mail: jabramowitz@unc.edu.

Received: April 6, 2013

Accepted: June 18, 2013

Available online 15 July 2013