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## Symptom Dimensions in Obsessive-Compulsive Disorder: Phenomenology and Treatment Outcomes with Exposure and Ritual Prevention

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### Abstract

Obsessive-compulsive disorder (OCD) is a severe condition with varied symptom presentations. The cognitive-behavioral treatment with the most empirical support is currently exposure and ritual prevention (EX/RP); however, clinical impression and some empirical data suggest that certain OCD symptoms are more responsive to treatment than others. Prior work identifying symptom dimensions within OCD is discussed, including epidemiological findings, factor analytic studies, and biological findings. Symptom dimensions most reliably identified include contamination/cleaning, doubt about harm/checking, symmetry/ordering, and unacceptable thoughts/mental rituals. The phenomenology of each of these subtypes is described and research literature is summarized, emphasizing the differential effects of EX/RP and its variants on each of these primary symptom dimensions. To date it appears that EX/RP is an effective treatment for the various OCD dimensions, although not all dimensions have been adequately studied (*i.e.*, symmetry and ordering). Modifications to treatment may be warranted for some types of symptoms. Clinical implications and directions for future research are discussed.

### Keywords

obsessive-compulsive disorder; treatment; symptoms; treatment outcome; cognitive-behavioral therapy; exposure and ritual prevention

## Background

### Overview of OCD

Obsessive-compulsive disorder (OCD) is a severe anxiety disorder involving distressing obsessions and repetitive compulsions. Obsessions are intrusive, unwanted thoughts, images, or impulses that increase anxiety, whereas compulsions are repetitive behaviors or mental acts used to decrease anxiety. OCD presents with a wide range of varied symptom profiles, also termed subtypes or symptom dimensions, which can pose unique diagnostic and treatment challenges [1].

The OCD symptoms reported in the National Comorbidity Survey Replication epidemiological study (NCS-R) include checking (79.3%), hoarding (62.3%), ordering (57.0%), moral concerns (43.0%), sexual/religious concerns (30.2%), contamination (25.7%), harming (24.2%), concerns about illness (14.3%), and other (19.0%), with 81% of respondents endorsing symptoms in multiple areas [2]. It should be noted, however, that the categories used in the NCS-R were not empirically derived; rather, they represent symptom categories commonly reported by individuals diagnosed with OCD. Our understanding of these symptoms and how to best classify them is continually shifting, thus it is critical to have a good understanding of current research in this area. This paper includes an overview of research to date. Although we have attempted to be as inclusive and comprehensive as possible, it is not possible to include every study in this review, so in some cases we summarize several studies or present well-designed representative examples.

### Yale-Brown Obsessive Compulsive Scale for Classification of Symptoms

The Yale-Brown Obsessive Compulsive Symptom Checklist (Y-BOCS) is a comprehensive list of over 50 obsessions and compulsions representing the majority of obsessive-compulsive symptoms observed clinically [3]. Since its development, there have been several attempts to establish an empirically-based classification system that corresponds to the symptoms listed in the Y-BOCS. Baer was the first to conduct a principal components analysis (PCA) of the 13 major symptom categories from the measure [4], identifying three factors: symmetry/hoarding, contamination/checking, and pure obsessions. The pure obsessions category corresponded to individuals with religious, aggressive, and/or sexual obsessions for whom no overt compulsions were readily distinguishable. Leckman et al. extended Baer's work using the same Y-BOCS categories [5]. Four factors were identified: obsessions and checking (including aggressive, sexual, and religious obsessions), symmetry and ordering (including repeating and counting), cleanliness and washing, and hoarding.

Mataix-Cols et al. used factor-analyzed symptom dimensions to predict the outcome of serotonin reuptake inhibitor antidepressants (SRI's) in the treatment of OCD[6]. Their PCA yielded a five-factor solution symmetry/ordering, hoarding, contamination, aggression/checking, and sexual/religious concerns. Abramowitz et al. conducted a cluster analysis of the Y-BOCS and obtained a similar five-factor solution consisting of symptom groups with themes including harming, contamination, hoarding, unacceptable thoughts, and symmetry [7]. Both the harming and unacceptable thoughts dimensions (*i.e.*, sexual and religious fears)

included aggressive obsessions. The unacceptable thoughts cluster also included mental compulsions.

There have since been several other studies of this type utilizing the Y-BOCS categories, with the same major patterns consistently replicated; however, a few differences in clusters are sometimes found. For example, in Baer's study, the symmetry/ordering and hoarding dimensions were grouped while, in other studies, the harming/checking and sexual/religious clusters sometimes formed a unique factor and sometimes separate factors [5, 8].

One study that helped to explain some of the mixed findings surrounding the placement of checking and aggression symptoms was based on an observation by Pinto et al. [9], who proposed that aggressive obsessions on the Y-BOCS were best divided into *taboo* versus *doubting* obsessions. Taboo thoughts or obsessions included worries about impulsive and aggressive behaviors, in addition to sexual and religious concerns, whereas the doubting thoughts concerned obsessions about accidental harm. In a subsequent exploratory factor analysis of 44 items utilizing a large sample, Pinto et al. found a five-factor solution: contamination/cleaning, hoarding, symmetry/ordering, taboo thoughts, and doubt/checking [10]. At present, this model is one of the most compelling as it allows for aggressive obsessions to be divided into those surrounding accidental harm (pathological doubt) versus those concerning acts of impulsive aggression (unacceptable thoughts). Impulsive aggression is a better fit in the sexual and religious concerns category as fewer overt compulsions are associated with these types of obsessions [11]. For a comprehensive review of factor analytic studies of OCD symptoms, see Bloch et al. [12].

Although the Y-BOCS and its associated severity scale continue to be the preferred assessment tool for OCD, new measures are being developed to better capture the dimensionality inherent in OCD. Two of the most recent measures are the Dimensional Obsessive-Compulsive Scale (DOCS) and the Obsessional Intrusive Thoughts Inventory (INPIOS) [13-15]. Recent studies using these measures have found that typical obsessive beliefs relate to the various symptom dimensions in a meaningful way [16, 17].

### Autogenic versus Reactive Symptoms

Lee and Kwon proposed that the most parsimonious classification system for OCD emerges from categorizing obsessions into two broad subtypes: *autogenous obsessions* and *reactive obsessions* [18]. These subtypes appear to differ in their frequency, triggers, content, subjective appraisal, and cognitive strategies used to cope with the obsessions. Autogenous obsessions are those that tend to come abruptly to mind in an uncued manner, without clear evoking stimuli. As mapped onto the Y-BOCS derived categories, autogenous obsessions best match with the taboo/unacceptable thoughts dimension as they include sexual, aggressive, or immoral thoughts, which are experienced as highly ego-dystonic and aversive. Individuals with autogenous obsessions tend to have difficulty identifying obsessional triggers, and often believe their obsessive thoughts pose a threat to their moral nature. Thus, those who experience these obsessions typically make frequent attempts to suppress them or otherwise avoid them via distraction or other means (e.g., mental rituals).

Reactive obsessions, in contrast, tend to be cued by identifiable stimuli that appear to be connected in a logical manner. Thus, these obsessions are typically perceived as more realistic and, therefore, more deserving of a rational response. As a result, reactive obsessions more often result in overt physical compulsions that are carried out in direct response to the thoughts that preceded them. Reactive obsessions may include such things as concerns about contamination, mistakes, accidents, asymmetry, and loss (*i.e.*, mapping onto cleaning, checking, arranging, and hoarding dimensions). People with reactive obsessions tend to easily identify what triggered them, believe their thoughts to be realistic, and feel compelled to try to do something to prevent possible negative consequences from occurring as a result of these of thoughts.

Although the autogenic-reactive dichotomy is empirically supported [19, 20], it may be less useful for describing and understanding the phenomenology of OCD. The reactive category corresponds to potentially four of the categories of the five-factor model dimensions and is therefore less specific.

### Family Studies

Family studies indicate heritability of specific OCD symptom dimensions. Taberner et al. [21] found small to moderate correlations in several symptom areas, especially among mother-daughter dyads, indicating possible genetic transmission of these traits. Hasler et al. [22] found significant correlations for all factors between siblings, particularly in the hoarding dimension, unacceptable thoughts, and checking compulsions. Interestingly, this relationship was strongest between sisters. Pinto et al. also found strong evidence of a familial association, especially in the dimensions of hoarding and taboo thoughts [10].

Katerberg et al. conducted heritability analyses in 52 multigenerational families affected by OCD [23]. Similar to the findings by Pinto et al., these researchers found a significant genetic correlation for the taboo and doubts factor and the contamination and symmetry/hoarding factor. However, as with all correlational findings, familial correlations should be viewed with caution, since there may be other factors responsible for the relationship (*e.g.*, a shared environment).

### Biologically-Based Symptom Clusters

The differential response to medication by symptom dimension also lends support to the notion of biologically-based symptom subtypes. For example, Jenike et al. [24] found that individuals with symmetry and somatic obsessions improved on a monoamine oxidase inhibitor (MAOI), whereas individuals with other symptom presentations did not. Further, those with hoarding and symmetry symptoms have tended to show less improvement on SSRI's than others, although this has not been found in all studies [6, 25, 26]. Findings with regard to unacceptable thoughts have been similarly equivocal [25, 27].

Neuroimaging studies provide more compelling evidence for biologically-based symptom subtypes [28]. Mataix-Cols et al. found that individuals with OCD demonstrated a distinct pattern of brain activation associated with specific symptom dimensions [29]. The authors concluded that OCD may be best conceptualized as a spectrum of “multiple, potentially

overlapping syndromes” (p. 564) rather than as a single disorder. Van den Heuvel et al. came to a similar conclusion in their study of the brain structure of OCD patients [30]. They found distinct differences in white matter and gray matter volumes in critical regions for each of three major OCD symptom dimensions (*i.e.*, symmetry/ordering, contamination/washing, and harm/checking).

Most recent to lend credence to the notion of separate symptom dimensions in OCD are genotyping studies, including one that identified an association between estrogen receptor genes and the presence of the contamination/cleaning symptom dimension in OCD [31]. Specifically, while no differences in the distribution of alleles or genotypes were found between OCD subjects and controls considered as a whole, researchers found that a specific estrogen receptor significantly differentiated individuals with contamination/cleaning concerns from those with other OCD symptoms.

It should be noted, however, that genetics only accounts for a portion of the variance in observed symptom dimensions, with additional contributions from dysfunctional beliefs and environmental factors [32, 33]. Behavior genetics research suggests a more general risk, irrespective of symptom dimension. OCD is not currently traceable to a single gene, rather the literature indicates that OCD is associated with and shaped by “multiple genes that incrementally increase the odds of developing the disorder” [34]. Genes found to be particularly relevant, as reviewed in a meta analysis by Taylor, included polymorphisms associated with the modulation of neurotransmitters including serotonin and catecholamines (COMT and MAOA)[34]. Gender based differences have also been detected in that the expression of catecholamine polymorphisms is influenced, as mentioned, by estrogens. The heterogeneity noted in the magnitudes of the gene-based effects found in the meta analysis and other studies may, in conclusion, be due to both sex differences and pooling of forms of OCD which have different genetic bases.

## Symptom Dimensions and Treatment Outcomes

### Exposure and Ritual Prevention for OCD

Beginning with the work of Meyer in 1966, the treatment of choice for OCD has generally been a specialized form of cognitive behavioral therapy (CBT) termed Exposure and Ritual/Response Prevention (EX/RP) with the majority of patients showing both substantial short- and long-term symptom reductions [35-38]. As the name suggests, EX/RP is comprised of two main treatment components: (1) prolonged and repeated exposure to anxiety-provoking thoughts or situations (*i.e.*, exposure), and (2) voluntary abstinence from ritualization (*i.e.*, ritual prevention). Through this process, patients habituate to once-feared stimuli while simultaneously learning new information that helps to alter dysfunctional cognitions and behaviors. In addition to the core components of EX/RP, these programs typically include a cognitive restructuring component [39]. EX/RP has been used in a variety of formats, including individual and group treatment, family-based treatment, computer-based treatment, and intensive programs [40].

Cognitive Therapy (CT) for OCD focuses on these maladaptive thoughts, although, as noted, they are typically addressed in EX/RP as well. Given the salience of cognitive distortions in

OCD, some have argued that a solely cognitive-based approach would offer treatment gains similar to that of EX/RP. CT, based on categories of dysfunctional beliefs, has been shown effective [41]. CT alone does not have the same evidence base as EX/RP [37], but it may be a viable alternative for those who do not respond to a more behaviorally-based treatment [18, 42].

### **Clinical Importance of Understanding Symptom Dimensions**

Understanding OCD symptom dimensions is important because it can help clinicians to better appreciate variations in symptom presentation and guide initial treatment choices and management of individual patients [43]. Although EX/RP and its CBT variants are effective for OCD as a whole, it is not definitively known whether certain symptom dimensions may be more responsive to this type of treatment than others or whether the length, format, and components of treatment should be altered substantively based on specific symptom profile [41]. In the remainder of this paper, we describe the research to date on CBT treatment outcomes for each of the major OCD symptom dimensions as identified in recent studies: contamination/cleaning, doubt about harm/checking, unacceptable thoughts/mental compulsions, and symmetry/ordering [7, 10, 11]. Hoarding is not included as it is being reclassified as a separate disorder in the upcoming DSM-5 [44].

### **Contamination and Cleaning**

**Description of contamination fears and cleaning rituals in OCD**—Although one of the most widely studied presentations and the one most often associated with OCD in the popular press, fear of contamination may account for only a quarter of obsessional fears among individuals with OCD in the general population [2, 45]. Contamination concerns are prevalent in OCD research studies conducted worldwide, and appear to be twice as prevalent in African Americans as compared to European and European Americans [12, 40].

Fear of contamination typically involves excessive concern regarding the threat of illness or disease, the sensation of being physically unclean, or even a feeling of being mentally polluted [46]. Feared contaminants are not simply limited to dirt, germs, and viruses, but may include such things as blood, household chemicals, sticky substances or residues, as well as people who appear unclean or unkempt, and various types of insects or animals.

To minimize exposure to contamination, individuals with contamination/cleaning OCD may go to great lengths to avoid places and situations associated with feared contaminants (e.g., public bathrooms, crowded parties, etc.) and/or may involve themselves in a myriad of protective rituals. Such rituals may include disinfecting and sterilizing, throwing away “contaminated” objects, frequently changing clothes, and designating “clean” areas within the home that are off limits to others. If contaminants cannot be avoided, however, individuals will often resort to excessive hand washing, body washing, or housecleaning in an attempt to decontaminate themselves and their possessions. Among individuals with this form of OCD, contact with a feared contaminant often results in feelings of fear, disgust, and general discomfort, and in some cases may result in feelings of responsibility for possibly spreading contamination to others [47].

**Comparing treatment for contamination/cleaning to treatment for other symptom dimensions**—The treatment of contamination-focused OCD via CBT is among the first such studies detailed in the literature [35, 48]. In these early studies, researchers often compared “washers” to “checkers,” with washers defined as those with contamination concerns, and checkers as those who engaged in rituals to prevent accidental harm. In general, these studies reported no differences in treatment outcome as a function of symptom dimension [48-50]. However, a more recent study by McLean and colleagues suggests that individuals with contamination obsessions may be more resistant to treatment than those with other primary symptom presentations, as they did not fare as well as individuals with other types of symptoms [51].

In contrast, individuals with contamination concerns have done well in other studies of EX/RP [7]. Additionally, people with washing compulsions had superior outcomes in a study of computer-based behavioral therapy administered by phone (BT-STEPS) [52]. It may be that the more concrete nature of washing and cleaning rituals facilitated greater success, given the limitations of a computerized treatment.

**Findings relevant to just patients with contamination/cleaning symptoms**—Both exposure and ritual prevention have been found to be important components in the treatment of OCD-related contamination concerns [53]. One departure from this finding, however, comes in the form of cognitive therapy designed specifically for OCD patients with concerns about germs (titled Danger Ideation Reduction Therapy or DIRT) [54]. Although when initially studied in a group format, the small gains patients made were not maintained post treatment, more recent findings have been more promising. A study comparing DIRT directly with EX/RP in an individually administered format found comparable gains for patients receiving DIRT, and these individuals showed ongoing improvements once treatment had ended [55]. It should be noted, however, that the EX/RP treatment program in the comparison group involved shorter and fewer sessions than typically administered and recommended. Given this caveat, the difference in treatment format (*i.e.*, individual vs. group), and in light of the contradictory outcomes of the two DIRT studies conducted thus far, additional controlled studies should be carried out before any conclusions are drawn.

Contamination concerns fall into two distinct groups, one relating to the discomfort of feeling dirty (disgust-based) and the other to fear of contaminants (harm-based) [47]. Given that disgust takes longer to habituate than the other types of anxiety that are typical of OCD, it makes sense that contamination concerns would take longer to treat among those with disgust-based concerns [56-58]. It is not known how many people with contamination fears have disgust-based concerns, but in the study by Pinto et al., 10.9% endorsed the Y-BOCS item indicating “no concern from contamination other than how it might feel.” [10]

### **Doubt about Harm and Checking**

**Description of pathological doubting and compulsive checking rituals**—The OCD symptom dimension we refer to as “doubt about harm/checking” has also been titled “fear of harm” or “over responsibility for harm” [7, 10, 59]. Individuals whose primary

obsessions fall within this category typically experience intrusive images, impulses, and fears related to the possibility of harming themselves or someone else by means of carelessness or negligence. For example, two of the more common harming fears include the fear of hitting a pedestrian while driving, and forgetting to turn off the stove before going to bed, thereby leading to the accidental death of a loved one in a house fire. Accompanying this fear of harm and heightened sense of responsibility is often an excessive feeling of doubt, dread, or uncertainty. Repetitive checking behaviors are used as a means to neutralize negative feelings by attempting to avert the perceived dangerous consequence [59]; thus, individuals demonstrating such behaviors have often been referred to as “checkers.” In the NCS-R, checking behaviors made up the bulk of compulsive acts, with a prevalence rate of 79.3% among those with lifetime OCD. In addition to checking, those with fears of harming often report other physical or mental rituals, which may include repeating “safety” words, phrases, or prayers; counting, or even withholding certain words or phrases.

The research literature on checking compulsions has found that individuals with these behaviors generally demonstrate more frequent and severe cognitive biases (*e.g.*, thought-action fusion) than OCD patients with other symptom presentations [60]. They also tend to report being doubtful of their own recollections of past actions, and there has been some research into the idea that people who repeatedly check may have some actual memory deficits. Some studies have found that these patients are less confident in their memories and have poorer performance on certain types of memory tasks [61]. It is not completely clear if this is an actual neuropsychological deficit or simply an interference effect resulting from high levels of anxiety [62]. However, research suggests that in those with OCD, repeated checking results in natural reductions in memory confidence, which is then intensified by an increased perception of responsibility for potential harm [63].

In addition to questions surrounding memory difficulties, it has also been proposed that OCD sufferers with primary checking compulsions may experience higher levels of anger than those who endorse other primary compulsions [64]. Radomsky et al. found that compulsive checkers reported more trait anger than controls, but contrary to predictions, greater self-reported checking was associated with less and not more trait anger [65]. Despite these findings, the proposed association between inflated responsibility and self-reported anger expression in individuals with checking was confirmed, suggesting that anger may be an important emotion to be assessed and addressed in the treatment of compulsive checking in OCD. However, more work needs to be done in this area to replicate and extend these findings before any firm conclusions can be drawn with regard to treatment implications.

To further evaluate the role of inflated responsibility for harm in OCD, Foa et al. conducted a clinical investigation comparing those with checking compulsions to those with various other OCD symptom presentations and non-anxious controls [66]. They found a unique association of inflated responsibility for harm with the checking dimension of OCD. In written descriptions of low- and medium-risk situations, checkers reported greater urges to rectify the situation, greater relief upon rectifying the situation, and greater perceived responsibility for harm. It was recommended that clinicians systematically assess for



inflated perception of responsibility to determine the relationship between these beliefs and compulsive checking behaviors [66].

Finally, recent research also suggests a relationship between both the checking and ordering subtypes of OCD and the experience of traumatic life events. For example, Cromer et al. found a significant, positive correlation between self-reported traumas and factor scores on both the Y-BOCS obsessions/checking symptom dimension and symmetry/ordering symptom dimension, which remained significant despite controlling for age, age of OCD onset, and total comorbidity [67]. In contrast, there was no association found linking the experience of traumatic life events to either the contamination/cleaning symptom dimension or hoarding.

**Comparing treatment for doubt and checking to treatment for other symptom dimensions**—As mentioned in the previous section, early treatment studies focused on “washers” and “checkers.” While these studies generally found no differences in treatment outcome between the two groups some studies found that checkers fared worse than washers, while others found the reverse [48-50, 68, 69]. There has been very little treatment outcome research, recent or otherwise, relevant to solely patients with doubt and checking concerns. These types of patients are typically well-represented in outcome studies due to the greater numbers presenting for treatment, therefore there is little perception of a need for a specialized EX/RP treatment for doubt and checking [49, 70]. However, patients may benefit from a more specialized approach if they have extremely ritualized checking behavior or are combatting the “not just right” feeling as they may not be able to clearly articulate feared consequences [71].

### Unacceptable Thoughts and Mental Rituals

**Description of unacceptable thoughts and mental rituals**—The “taboo” or “unacceptable thoughts” symptom dimension characterizes individuals with unwanted obsessions that are often of a religious, violent, or sexual nature. Traditionally, this group was referred to as “pure obsessionals” due to their lack of observable compulsive behaviors [4]. It is now apparent that these individuals do engage in ritualizing behaviors; however, these rituals tend to be primarily mental in nature (*e.g.*, praying, mental counting, etc.) or more covert (*e.g.*, reassurance-seeking) than typically found in other symptom dimensions [5, 7, 11]. This symptom dimension captures individuals whose obsessions often manifest as intrusive, unwanted thoughts, impulses or “mental images” of committing acts that severely violate their personal morals or values. Examples include thoughts of sexually molesting children, blasphemous thoughts about religious figures, and the experience of sudden urges or impulses to act out violently. Individuals who have these thoughts typically have no history of violence, nor do they act on their OCD impulses; however, because OCD patients often *appraise* their thoughts as dangerous and overly important, they believe them to be so, and, thus, devote a large amount of their mental effort attempting to suppress them [72]. Conversely, attempts at thought suppression have the unwanted effect of actually increasing anxiety and perpetuating symptoms [73]. Purposefully trying not to think of a specific thing often has the contrary effect of making the thought more likely to return.

Other ways individuals with this form of OCD typically try to control intrusive thoughts include mental ritualization (*e.g.*, arguing with oneself over the morality of one's character), neutralizing (*e.g.*, mentally “cancelling out” bad thoughts by replacing them with good thoughts, engaging in excessive prayer or confession), and/or performing some form of checking (*e.g.*, reviewing one's behaviors, seeking assurance from others, etc.). Avoidance of known triggers is also especially common in this group. For example, sufferers may make excuses to avoid child-care responsibilities or religious ceremonies.

Some research suggests that individuals with unacceptable thoughts may suffer with more severe obsessions than those with other forms of OCD [27]. For example, patients reporting obsessions about sexual orientation experience significantly greater distress than individuals with other primary obsessional content, and more interference in their lives as a result of their symptoms [74].

**Comparing treatment for unacceptable thoughts to treatment for other symptom dimensions**—

Individuals with unacceptable thoughts have often been described as more treatment-resistant than those with other types of OCD. For example, Grant et al. conducted a prospective study of OCD with patients from a variety of CBT treatment settings, and found that, in addition to reporting greater depressive symptomatology, patients with sexual obsessions often remained in treatment for a longer period of time [75]. A follow-up study of OCD patients treated with SRI's and behavior therapy found that nonresponders were significantly more likely to have sexual or religious obsessions [27]. Among this group, there was also a trend indicating fewer past treatments and a longer history of OCD symptomatology.

Those with unacceptable thoughts may take longer to treat, but it is not clear if this is because these type of obsessions are more resistant to treatment in general or if there is some other reason as of yet unidentified [76, 77]. In addition, EX/RP for this group may be more challenging to implement given that recent research indicates compulsions tend to be primarily mental and reassurance-seeking behaviors may be easily overlooked as rituals [11]. Additionally, the cues that prompt obsessions may be difficult to identify and access, hence limiting the ability of clinicians to develop effective exposures. Treatment will likely require more imaginal exposures, and ritual prevention will need to include the suppression of mental compulsions, which are more difficult to monitor [78].

**Findings relevant to just patients with unacceptable thoughts**—

Freeston et al. conducted a study to test the effectiveness of EX/RP on OCD patients lacking overt compulsions [79]. The treatment consisted of psychoeducation; in-vivo and imaginal exposure; ritual prevention, including practice in suppressing and mental neutralizing; cognitive restructuring; and relapse prevention. Treated patients improved significantly over pretest and wait-list, and gains were maintained at follow-up. Thus, EX/RP was shown to be effective with a group of patients often considered resistant to treatment, although, it should be noted that not all patients in this sample endorsed unacceptable thoughts as their primary obsession.

Subsequently, a smaller study of CBT in six OCD patients with primarily unacceptable thoughts was conducted using the same treatment [79, 80]. Triggering obsessive thoughts was achieved by making a looped recording of anxiety-provoking situations that patients listened to repeatedly in session and as part of their homework. Since compulsions were primarily mental, ritual prevention mainly consisted of suppressing neutralizing strategies and mental reviewing. At treatment's end, all patients demonstrated a significant improvement in symptoms, although it should be noted that this study lacked a comparison group and that the treatment protocol was considerably longer than what is typically administered for other forms of OCD.

In a pilot study, EX/RP was administered EX/RP to six OCD patients with obsessional thoughts and mental rituals who were not adequately responding to SRI medication [81]. Similar to the Freeston et al. study, the treatment included the use of customized audio recordings to trigger obsessional thoughts along with the teaching of ritual prevention strategies [79]. In addition, patients were encouraged to confront real life situations that elicited unwanted thoughts (in vivo exposure). Significant improvement in both depressive symptoms and OCD symptomatology occurred for all patients. More recently, CT was tested against Stress Management Training [82]. At completion, all participants receiving an active treatment improved significantly compared to waitlist.

## Symmetry and Ordering

**Description of symmetry obsessions and ordering rituals**—Perfectionism is a common symptom of OCD patients who tend to be primarily preoccupied with order, symmetry, and exactness. In an effort to reduce anxiety, these patients tend to engage in compulsive behaviors that include repetitive arranging, organizing, or lining up of objects until certain subjective conditions are met. For example, patients may experience intense discomfort if the objects on their desk are not symmetrically aligned or a certain distance apart from one another. It has been proposed that a common theme in the symmetry and ordering category is a feeling of “incompleteness” which has also been associated with compulsive slowness [83]. Individuals with this type of OCD may also engage in tapping and touching behaviors or fear not saying just the right thing [5]. These behaviors are sometimes accompanied by magical thinking – *i.e.*, the belief that a thought can cause an unrelated event to occur (e.g., “If I don't align the dinner plates, my husband might have a car accident and die on his way home from work.”)[84, 85]

Compared to those with other OCD symptom dimensions, individuals with symmetry and ordering symptoms are significantly more likely to experience dissociative symptoms [86]. Those with symmetry compulsions are also more likely to have comorbid tic disorders, be male, and have an earlier age of onset [5, 6, 87]. Radomsky and Rachman conducted a series of studies on symmetry/ordering concerns with nonclinical populations and demonstrated that most people are more comfortable and less anxious in an orderly environment [46]. Thus, it may be that the compulsion to arrange things has its foundation in an adaptive desire for orderliness; however, this need for order is taken to an extreme in patients with this particular form of OCD. It should also be noted that while those with OCD appear to be at higher risk for comorbid obsessive-compulsive personality disorder (OCPD)

than the general population, there is some evidence that individuals with symmetry obsessions and ordering compulsions have the highest risk [4, 88-92].

Another finding that appears to be unique to the symmetry/ordering symptom dimension concerns suicide. One large study of patients being followed post CBT-treatment found that this group more likely to attempt or complete suicide in the six years after treatment than individuals with other symptom presentations. These patients were also more likely to have responded to treatment initially only to have relapsed at a later point [93]. Whiteside and Abramowitz found that ordering symptoms had the most consistent association with anger, including expression of anger toward others, holding in or suppressing anger, and controlling angry feelings [64]. It may be that anger mediates the relationship between ordering symptoms and the higher risk of suicide. As an example, a naturalistic study of adolescent psychiatric patients followed for up to 13 years found that anger was a significant factor in predicting suicide attempts [94]. Alternatively, as noted previously, the experience of traumatic life events may also serve to mediate this relationship, given the association between symmetry/ordering symptoms and trauma [67]. Taking into account these findings, it is recommended that clinicians treating patients with symmetry and ordering assess for past trauma, monitor and address feelings of anger during treatment, and closely watch for suicidal ideation.

**Comparing treatment for symmetry and ordering to treatment for other symptom dimensions**—At present, there is little research on treatment outcomes specifically for individuals reporting symmetry and ordering symptoms [45]. Summerfeldt hypothesizes that this reflects a greater likelihood for such patients to either refuse treatment or to be excluded from treatment outcome studies due to difficulty designing suitable behavioral interventions [83]. This is a plausible hypothesis, given that up to 57% of individuals with OCD endorse at least some symmetry and ordering symptoms, yet very few such individuals are actually represented in published research studies and they are likewise underrepresented at OCD clinics [2, 49]. While Mataix-Cols et al. found few differences between the symmetry/ordering dimension in predicting compliance with, or response to, CBT, Abramowitz and colleagues found that, along with hoarding, symmetry-related symptoms predicted a poorer response to EX/RP [7, 77]. To date, no treatments have been developed specifically for this type of OCD.

## Conclusions

### One Disorder or Many?

As is evident from both clinical observation and research findings, OCD is a heterogeneous disorder with a wide range of symptom profiles. This heterogeneity lends support to the notion that OCD is not just one disorder, but possibly a cluster of related disorders. Unlike many disorders that are diagnosed by the presence of a certain number of discrete symptoms, an individual can be diagnosed with OCD having only one obsessive-compulsive concern. In patients with OCD, symptom dimensions are typically stable across time, and, in those cases where the obsessional content does change, symptoms tend to stay within their division, based on the autogenous versus reactive model discussed previously [19, 95].

Furthermore, there appear to be biological correlates associated with the different symptom dimensions, including response to medication, inheritance patterns, comorbid OC spectrum disorders, and possibly the size of various brain structures. For at least one dimension (*i.e.*, hoarding), the evidence is so compelling that it is likely to be distinguished as a separate disorder in the next revision of the DSM[96].

However, evidence also suggests that OCD is actually a single disorder with many different manifestations. The fact that most people with OCD actually have symptoms in multiple dimensions lends evidence to the idea that, despite the varied phenomenology, all are the same disorder[2]. Also, the theoretical CBT model of OCD provides a compelling explanation of how the disorder is maintained and why EX/RP is an effective treatment for all symptom dimensions, despite some differences in the degree of response observed. In terms of biological findings, the correlations are modest, indicating more differences in inheritance patterns than similarities [10, 22, 34]. And, although there are differences in the size of brain structures by symptom dimension, it has not yet been discerned whether this is the cause of OCD or the result of years of experiencing obsessions and/or engaging in certain compulsive rituals.

### **Classification of Symptoms**

The majority of classification studies have been based on a factor analysis of the Y-BOCS, although more studies are increasingly examining the relationships among partial scales and individual items [5, 9]. A five-factor model including contamination/cleaning, symmetry/ordering, taboo thoughts, doubt about harm/checking, and hoarding is one of the more compelling organizational systems, although it is worth noting that not all OCD symptoms fit neatly into these categories [10, 23]. The autogenous versus reactive dichotomy also appears empirically sound, but is less useful for describing the phenomenology of OC symptoms and corresponding treatment considerations.

### **Summary of Relevant Issues by Symptom Dimension**

Given the growing appreciation for the usefulness of formalized OCD symptom categories, it is likely that these dimensions will be described in the DSM-5 for the first time, although whether they will be introduced as specifiers in the diagnostic criteria remains to be seen [44]. Evidence suggests that treatment tailored to each unique symptom dimension may be beneficial. Symptom dimensions involving cleaning and checking compulsions are among the most studied and respond well to EX/RP, although contamination concerns may be more resistant when disgust is a primary factor in the obsessional distress. Doubt and checking concerns seem to involve a unique component surrounding inflated perception of responsibility that should be addressed in treatment.

Symmetry/ordering is a well-known clinical symptom dimension, which typically includes counting, repeating, and feelings of incompleteness. To date, few treatment outcome studies have examined this specific type of OCD. Biologically, however, it appears to have a number of unique correlates including high comorbidity with tic disorders, which could be evidence of key differences at a more basic or biological level [4, 97]. Patients in this group

are also more likely to report dissociative symptoms, the experience of past trauma, and suicidal thoughts, all of which may pose special treatment challenges [67, 86, 93].

Unacceptable or taboo thoughts in OCD include sexual, aggressive, and religious obsessions. It appears that individuals with this type of primary OCD experience more obsessions and fewer overt compulsions, and thus, may take longer to treat [75]. The use of imaginal exposures, addressing reassurance-seeking behaviors, and repeated practice in mental ritual prevention strategies all appear to be important components of treatment for this population. CT is a promising alternative.

### Future Directions

Systematic research has helped to develop excellent CBT treatments for OCD. However, due to the many presentations of this disorder, additional work is needed to ensure that there are maximally effective treatments for each of the primary symptom presentations. Treatment manuals for OCD have tended to address symptoms more generally, as it would be cumbersome to include detailed approaches for each possible symptom in a single manual [41]. In many cases it may simply be a matter of building enough tools into treatment protocols so that clinicians can choose from among several empirically-supported techniques. However, given the empirical differences in phenomenology, cognitions, and even number of required sessions, manuals focused on specific symptom dimensions may facilitate improved treatment outcomes. Although EX/RP for all forms of OCD uses the same principles, it could be helpful for clinicians to have intervention materials with highly relevant examples of exposures and information about research findings specific to the type of OCD being addressed.

One complicating issue is that in the majority of cases, people with OCD have symptoms from multiple categories[2], therefore, clinicians may need to utilize more than one approach. More research will be needed to determine how to best tailor treatments to each patient's unique symptom profile.

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