COGNITIVE–BEHAVIORAL MODELS OF OBSESSIVE–COMPULSIVE DISORDER

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There are many different theories of obsessive–compulsive disorder (OCD), but comparatively few provide clear, detailed descriptions of the mechanisms thought to cause the disorder (for reviews, see D. A. Clark, 2004; Jakes, 1996; Taylor, McKay, & Abramowitz, 2005b, 2005c). Few theories have been subject to extensive empirical evaluation. Some theories account for only a subset of OCD phenomena or a subset of the empirical findings concerning the disorder. Among the most prominent theoretical approaches are the contemporary cognitive–behavioral models, which are the focus of this chapter.

We begin by introducing the clinical features of OCD and illustrating the disorder with case examples. We then discuss what a good model of OCD ought to accomplish. Contemporary cognitive–behavioral models are discussed, along with a review of how well these models have performed in empirical tests of their predictions. The question of whether the models can account for all the major findings concerning OCD is also considered. We conclude with a discussion of future directions for better understanding and treating this common and often debilitating disorder.
CLINICAL FEATURES

By all appearances, 34-year-old Kyle had it made; he had a great job, a loving wife, and two happy, healthy school-age kids. Yet, as he tearfully told his therapist, he was plagued with “terrible” thoughts and “stupid” habits. Whenever he came across a sharp object such as a knife or a screwdriver, he had a vivid, intrusive, and horrifying image of plunging it into the eyes of one of his children. Although the images were often triggered by the sight of sharp objects, they sometimes simply popped into his mind, seemingly out of the blue. Kyle feared that he might have some sort of unconscious desire to hurt the people he loved. To avoid triggering the upsetting thoughts, he tried to keep all the sharp objects in the house out of sight, and he often insisted that the family eat meals such as burgers or finger foods that didn’t require utensils. Whenever he had one of his upsetting thoughts, which occurred on most days, he felt compelled to check four times on the safety of his children and insisted that they say the words “I’m OK, Dad.” He felt deeply ashamed for continually making his children go through this ritual.

For as long as she could remember, Lynda had been an anxious, overly cautious person. Now in her early 20s, she had started a new job and, for the first time, had moved out of the family home into her own rented apartment. Although she had expected to relish her newly acquired freedom, Lynda found that she was frequently preoccupied with the security of her apartment. Each day she tried to quell her many lingering doubts, which she referred to as her “sticky thinking.” Every morning, when she left for work, she was beset by doubts about whether she’d “properly” locked the door. Although she checked and rechecked each morning, sometimes she set off for work only to drive back for “one more check” in an attempt to assuage her concerns. When she was at home, things were no better; she frequently was troubled by doubts about whether she’d “correctly” performed all kinds of things, such as unplugging or switching off appliances and locking windows and doors. Before going to bed each night, Lynda spent up to an hour checking that things were turned off and that her apartment was “safe and secure.”

Fifty-four-year-old Jim struggled with contamination problems. He was aware that other people worried about dirt and germs, but Jim knew that he was different. He felt a strong need to clean whenever he overheard foul language. Beginning in high school, he would wash until he felt that he had completely “cleaned away” thoughts of the foul word and replaced them with “good” thoughts. As he got older, the problem worsened, such that he washed even when people made disparaging remarks about people he respected (e.g., the Pope) or when people made comments about darkly powerful figures that he feared (e.g., Nostradamus). When it was inconvenient to wash immediately, Jim maintained a checklist of occurrences of unwanted thoughts, and later, when he was alone, he would wash several

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times to "clean away" each unwanted thought. When Jim sought treatment, his hands were red and raw from all the time spent cleaning away "bad" thoughts.

These are three examples of the many faces of OCD. The disorder is characterized by obsessions or compulsions or, most typically, both (American Psychiatric Association, 2000). Obsessions are upsetting thoughts, images, or urges that intrude, unbidden, into the person's stream of consciousness. Common examples include unwanted thoughts or images of harming loved ones (as in the case of Kyle); persistent, unwarranted doubts that one has locked the door (as described by Lynda); intrusive thoughts about being contaminated (e.g., those experienced by Jim); and morally or sexually repugnant sexual thoughts (e.g., intrusive thoughts of behaving in a way that violates one's morals or runs counter to one's sexual preferences).

Compulsions are repetitive, intentional behaviors or mental acts that the person feels compelled to perform, usually with a desire to resist (e.g., Jim's hand washing). Compulsions are typically intended to avert some feared event or to reduce distress. They may be performed in response to an obsession, such as repetitive hand washing evoked by obsessions about contamination. Alternatively, compulsions may be performed in accordance to certain rules, such as Kyle's checking four times that his children were unharmed. Compulsions can be overt (e.g., turning the light switch off and on 10 times) or covert (e.g., thinking a "good" thought to undo or replace a "bad" thought, as in the case of Jim). Compulsions are excessive or not realistically connected to what they are intended to prevent (American Psychiatric Association, 2000).

Epidemiological surveys and factor analytic studies show that OCD is a symptomatically heterogeneous condition (McKay et al., 2004). There are four major types or constellations of OCD symptoms: (a) obsessions (aggressive, sexual, religious, or somatic) and checking compulsions; (b) symmetry obsessions and ordering, counting, and repeating compulsions; (c) contamination obsessions and cleaning compulsions; and (d) hoarding obsessions and collecting compulsions (Taylor, 2005).

Obsessions and compulsions of insufficient frequency or duration to meet diagnostic criteria for OCD are common in the general population (e.g., Frost & Gross, 1993; Rachman & de Silva, 1978; Salkovskis & Harrison, 1984). Compared with clinical obsessions, those found in the general population—so-called normal obsessions—tend to be less frequent, shorter in duration, and associated with less distress (Rachman & de Silva, 1978; Salkovskis & Harrison, 1984). Normal and clinical obsessions and compulsions share common themes such as violence, contamination, and doubt (Rachman & de Silva, 1978; Salkovskis & Harrison, 1984). These similarities suggest that the study of normal obsessions and compulsions may shed light on the mechanisms of their clinically severe counterparts.
CHARACTERISTICS OF A GOOD MODEL OF OBSESSIVE-COMPULSIVE DISORDER

A good model of OCD should be able to do several things (Taylor et al., 2005b, 2005c). It should provide a clear description of the processes and contents of the disorder and the interactions among these conceptual elements, while being as parsimonious as reasonably possible. Thus, a good model of OCD should provide an explanation of the major clinical characteristics of the disorder (obsessions and compulsions and their interrelations) and their origins and clinical course. A good model should be able to explain the symptom heterogeneity of OCD; why do some people, for example, have checking compulsions, whereas others have contamination obsessions, and still others have hoarding rituals?

A good model should be clear in its predictions. There should be no ambiguity about what counts as evidence for or against the model. The model should also lead to predictions that are falsifiable. Finally, a good model should have treatment relevance. The model should enhance our understanding of current treatments and should suggest new ways of improving treatment outcome. For example, it should be able to help clinicians understand why some treatments are effective (e.g., exposure and response prevention) and why other treatments are largely ineffective (e.g., relaxation training; Steketee, 1993).

BRIEF HISTORICAL PERSPECTIVE

Before the development of contemporary cognitive-behavioral models of OCD, conditioning models were the dominant explanations of the disorder, at least in the research literature. Conditioning models of OCD were based on Mowrer's (1960) two-factor model of fear (e.g., Rachman, 1971; Rachman & Hodgson, 1980; Teasdale, 1974), and they proposed that obsessional fears were acquired by classical conditioning and maintained by operant conditioning. According to these models, the obsessional fear of acquiring a serious illness from doorknobs, for example, would arise from a traumatic experience in which a loved one purportedly acquired such a disease (the unconditioned stimulus) from contact with a "dirty" doorknob in a public place (the conditioned stimulus). Obsessional fears were said to be maintained by negative reinforcement—that is, avoidance of doorknobs or compulsive washing after coming into contact with a doorknob. Here, the avoidance or compulsive ritual is negatively reinforced by the reduction in discomfort and by the reduction in the perceived probability of feared consequences such as becoming contaminated.

Conditioning models led to what has been established as one of the most effective treatments for OCD: exposure and response prevention (March, Frances, Carpenter, & Kahn, 1997; also known as exposure and ritual pre-
vention). This treatment involves being purposefully exposed to harmless but fear-evoking stimuli while delaying or refraining from performing the compulsive rituals. In terms of treatment implications, the conditioning models were highly fruitful; no other psychological treatment has consistently outperformed the efficacy of exposure and response prevention (Abramovitz, Taylor, & McKay, 2005). Tests of the mechanisms suggested by the model, however, were not so encouraging (Clark, 2004; Gray, 1982). Major problems include the following:

- Many OCD patients do not appear to have a history of relevant conditioning experiences that might lead to obsessional fears.
- The model has difficulty explaining the emergence, persistence, and content of obsessions (e.g., why would a person experience recurrent, intrusive images of strangling his or her child, even though he or she has never committed or witnessed any harm of this sort?).
- OCD symptoms may change over time (e.g., a person might be compelled to check door locks and then, some weeks later, feel compelled to repetitively check on the safety of his or her spouse).
- The model fails to explain why people with OCD display a broad range of levels of insight into the reasonableness of their obsessions and compulsions and why any given person’s degree of insight can fluctuate across time and circumstance.

These and other limitations led clinical researchers to consider cognitive explanations of OCD.

CONTEMPORARY COGNITIVE-BEHAVIORAL APPROACHES

Contemporary cognitive–behavioral models of OCD fall into two broad classes: Those proposing that OCD is caused by some dysfunction in cognitive processing (general deficit models), and those postulating specific dysfunctional beliefs and appraisals as causes of obsessions and compulsions (belief and appraisal models).

General Deficit Models

Evidence suggests that people with OCD, compared with control participants, have deficits or abnormalities on a range of tasks, including tasks that are seemingly unrelated to threat or obsessional concerns. These findings have been shown for tasks of inductive reasoning, executive functioning (e.g., planning or set shifting), and some forms of learning and memory (Greisberg & McKay, 2003; Jarrard, Junger, Vallejo, Salgado, & Grafman,
These deficits can persist even after successful symptomatic treatment, which suggests that the cognitive impairments are not caused by heightened anxiety or other OCD symptoms (Nielen & Den Boer, 2003). People with OCD, compared with control participants, also show weakened cognitive inhibition; that is, a weakened ability to inhibit responses, even for affectively neutral responses (e.g., Enright & Beech, 1993a, 1993b; Enright, Beech, & Claridge, 1995).

Neuropsychological deficits are not found in all patients, and even when deficits are present, they tend to be mild. Nevertheless, the findings led some theorists to suggest that OCD arises from aberrations in general information-processing systems (e.g., Pitman, 1987; Reed, 1985) or dysfunctional reasoning processes (O'Connor, 2002). The deficits are general in the sense that they affect all information that is processed, including information related to the person's obsessional concerns (e.g., contamination stimuli) and affectively neutral information.

There are five major limitations of the general deficit models. First, the models do not account for the heterogeneity of OCD symptoms (e.g., Why do some people have washing compulsions whereas others have checking rituals?). Second, the models do not account for the fact that mild neuropsychological deficits have been found in many disorders, including panic disorder, social phobia, posttraumatic stress disorder, and bulimia nervosa (Taylor, 2002); the models fail to explain why such deficits give rise to OCD instead of one of these other disorders. Third, some of the models provide only sketches of the putative mechanisms (e.g., O'Connor, 2002). Fourth, most of the models have been subject to little empirical evaluation of their predictions. Fifth, the effectiveness of exposure and response prevention in treating OCD would not be predicted from the models.

If dysfunctional information processing plays any causal role in OCD, it is most likely to be a nonspecific vulnerability factor that might (or might not) play a role in obsessions and compulsions.

Belief and Appraisal Models

Among the most promising contemporary models of OCD are those based on Beck's (1976) cognitive specificity hypothesis, which proposes that different types of psychopathology arise from different types of dysfunctional beliefs. Major depression, for example, is said to be associated with beliefs about loss, failure, and self-denigration (e.g., "I'm a failure"). Social phobia is thought to be associated with beliefs about rejection or ridicule by others (Beck & Emery, 1985; e.g., "It's terrible to be rejected"). Panic disorder is said to be associated with beliefs about impending disaster, insanity, or loss of control (Beck, 1988; D. M. Clark, 1986; e.g., "My heart will stop if it beats too fast").

Several theorists have proposed that obsessions and compulsions arise from specific sorts of dysfunctional beliefs. The strength of these beliefs in-
fluences the person's insight into his or her OCD. Among the most sophisticated of these models is Salkovskis's cognitive-behavioral approach (e.g., Salkovskis, 1985, 1989, 1996) and the models based on Salkovskis's approach (e.g., Frost & Steketee, 2002). Such models form the theoretical foundations for much of the work described in later chapters of this volume. Salkovskis's model begins with the well-established finding that most people experience intrusions (i.e., thoughts, images, and impulses that intrude into consciousness) or normal obsessions. An important task for any model is to explain why almost everyone experiences cognitive intrusions (at least at some point in their lives), yet only some people experience intrusions in the form of clinical obsessions (i.e., intrusions that are unwanted, distressing, and difficult to remove from consciousness).

Salkovskis (1985, 1989, 1996) argued that intrusions—whether wanted or unwanted—reflect the person's current concerns arising from an “idea generator” in the brain. The concerns are automatically triggered by internal or external reminders of those concerns. For example, intrusive thoughts of being contaminated may be triggered by seeing dirty objects (e.g., trash cans). Salkovskis proposed that intrusions develop into obsessions only when the individual appraises the intrusions as posing a threat for which he or she is personally responsible. An example is the intrusive image of swerving one's car into oncoming traffic. Most people experiencing such an intrusion would regard it as a meaningless cognitive event, with no harm-related implications (“mental flotsam”). Such an intrusion can develop into a clinical obsession if the person appraises it as having serious consequences for which he or she is personally responsible. The person might make an appraisal such as the following: “Having thoughts about swerving into traffic means that I'm a dangerous person who must take extra care to ensure that I don't lose control.” Such appraisals evoke distress and motivate the person to try to suppress or remove the unwanted intrusion (e.g., by replacing it with a “good” thought) and to attempt to prevent any harmful events associated with the intrusion (e.g., by avoiding driving).

Compulsions are conceptualized as efforts to remove intrusions and to prevent any perceived harmful consequences. Salkovskis (1985, 1989) advanced two main reasons why compulsions become persistent and excessive. First, they are reinforced by immediate distress reduction and by temporary removal of the unwanted thought (negative reinforcement, as in the conditioning models of OCD). Second, they prevent the person from learning that their appraisals are unrealistic (e.g., the person fails to learn that unwanted harm-related thoughts do not lead to acts of harm). Compulsions influence the frequency of intrusions by serving as reminders of intrusions and thereby triggering their reoccurrence. For example, compulsive hand washing can remind the person that he or she may have become contaminated. Attempts at distracting oneself from unwanted intrusions may paradoxically increase the frequency of intrusions, possibly because the distractors...
become reminders (retrieval cues) of the intrusions. Compulsions can also strengthen one's perceived responsibility. That is, the absence of the feared consequence after performing the compulsion reinforces the belief that the person is responsible for removing the threat.

To summarize, when a person appraises intrusions as posing a threat for which he or she is personally responsible, the person becomes distressed and attempts to remove the intrusions and prevent their perceived consequences. This reaction increases the frequency of intrusions. Thus, intrusions become persistent and distressing. In other words, they escalate into clinical obsessions. Compulsions maintain the intrusions and prevent the person from evaluating the accuracy of his or her appraisals.

Why do some people, but not others, make harm- and responsibility-related appraisals of their intrusive thoughts? Life experiences shape the basic assumptions people hold about themselves and the world (Beck, 1976). Salkovskis (1985) proposed that assumptions about blame, responsibility, or control play an important role in OCD, as illustrated by beliefs such as “Having a bad thought about an action is the same as performing the action” and “Failing to prevent harm is the same as having caused the harm in the first place.” These assumptions are thought to be acquired from a strict moral or religious upbringing or from other experiences that teach the person codes of conduct and responsibility (Salkovskis, Shafran, Rachman, & Freeston, 1999).

Beyond Responsibility

Although Salkovskis (e.g., 1985, 1989, 1996) emphasized the importance of responsibility appraisals and beliefs, a number of cognitive-behavioral theorists have proposed that other types of dysfunctional beliefs and appraisals are also important in OCD (e.g., Freeston, Rheaume, & Ladouceur, 1996; Frost & Steketee, 2002). Thus, contemporary cognitive-behavioral theories have extended the work of Salkovskis to propose that various types of dysfunctional beliefs and appraisals, in addition to those pertaining to responsibility, play an important role in the etiology and maintenance of OCD. Although contemporary belief and appraisal models differ from one another in some ways, their similarities generally outweigh their differences.

To illustrate, Rachman (1997) proposed that “obsessions are caused by catastrophic misinterpretations of the significance of one’s thoughts (images, impulses)” (p. 793). In this model, the misinterpretations are not limited to responsibility appraisals but can include any interpretation that the intrusive thought is personally significant, revealing, threatening, or even catastrophic. Such an interpretation has the effect of “transforming a commonplace nuisance into a torment” (Rachman, 1997, p. 794). The person usually interprets the intrusive thought in a personally significant way and as implying that he or she is “bad, mad, or dangerous.”
TABLE 1.1
Domains of Dysfunctional Beliefs Associated With Obsessive–Compulsive Disorder

<table>
<thead>
<tr>
<th>Belief domain</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>Excessive responsibility</td>
<td>Belief that one has the special power to cause or the duty to prevent negative outcomes.</td>
</tr>
<tr>
<td>Overimportance of thoughts</td>
<td>Belief that the mere presence of a thought indicates that the thought is significant. For example, the belief that the thought has ethical or moral ramifications or that thinking the thought increases the probability of the corresponding behavior or event.</td>
</tr>
<tr>
<td>Need to control thoughts</td>
<td>Belief that complete control over one's thoughts is both necessary and possible.</td>
</tr>
<tr>
<td>Overestimation of threat</td>
<td>Belief that negative events are especially likely and would be especially awful.</td>
</tr>
<tr>
<td>Perfectionism</td>
<td>Belief that mistakes and imperfection are intolerable.</td>
</tr>
<tr>
<td>Intolerance for uncertainty</td>
<td>Belief that it is necessary and possible to be completely certain that negative outcomes will not occur.</td>
</tr>
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</table>

For example, a devoutly religious man experienced obscene images of Jesus with an erection on the cross whenever he tried to pray. He interpreted these images as meaning that he was "a vicious, lying hypocrite and that his religious beliefs and feelings were a sham." In another example, a man whose wife had just given birth to their first child had unwanted thoughts of beating the infant. He interpreted such thoughts as meaning that he was "dangerous and clearly unfit to be a parent." Such interpretations are thought to give rise to anxiety and dysphoria, with the consequence being intense resistance to the obsessions, attempts to suppress them, neutralization, and avoidance behavior. These examples illustrate "thought–action fusion" (Salkovskis, Thordarson, & Rachman, 1996), in which the person believes that his or her thoughts influence the external world (e.g., "I can cause an accident simply by thinking about one") or that thinking about a behavior is morally equivalent to performing the behavior itself (e.g., "Thinking about committing adultery is as bad as actually doing it").

Building on the work of Salkovskis, Rachman, and others, the most comprehensive contemporary belief and appraisal model is that developed by the Obsessive Compulsive Cognitions Working Group (OCCWG; Frost & Steketee, 2002). This is an international group of more than 40 investigators sharing a common interest in understanding the role of cognitive factors in OCD. The group began by developing a consensus regarding the most important beliefs (and associated appraisals) in OCD (Frost & Steketee, 2002; OCCWG, 1997). They identified responsibility beliefs and other belief domains, as listed in Table 1.1, which they conceptualized as giving rise to

In addition to the models designed to account for OCD in general, OCCWG members and others have also developed a number of "mini-models" to account for particular types of OCD symptoms, such as compulsive hoarding (Frost & Hartl, 1996; Frost, Steketee, & Williams, 2002; see also Rachman, 1997, 1998). The development of such models is consistent with the view that OCD may be etiologically heterogeneous as well as symptomatically heterogeneous (McKay et al., 2004; Taylor, 2005). The mini-models account for symptom heterogeneity in various ways, such as by proposing that particular beliefs or patterns of beliefs are important for specific types of OCD symptoms, including highly specific beliefs in addition to the broad belief domains mentioned in Table 1.1. To illustrate, compulsive hoarding is said to arise from a constellation of etiologic factors, including dysfunctional beliefs about the value of possessions (e.g., beliefs that even worthless objects might be highly valuable or useful in the future), perfectionism, intolerance of uncertainty, and difficulty making decisions (Frost & Hartl, 1996; Frost et al., 2002).

These models have led to a promising new cognitive–behavioral therapy. As in exposure and response prevention, the therapy involves exposure and response prevention exercises. However, the exercises are framed as behavioral experiments to test appraisals and beliefs. To illustrate, a patient has recurrent images of terrorist hijackings and a compulsion to repeatedly telephone airports to warn them. This patient is found to hold a belief such as "Thinking about terrorist hijackings will make them actually occur." To challenge this belief, the patient and therapist can devise a test that pits this belief against a more realistic belief (e.g., "My thoughts have no influence on the occurrence of hijackings"). A behavioral experiment might involve deliberately bringing on thoughts of a hijacking and then evaluating the consequences. Cognitive restructuring methods derived from Beck's cognitive therapy (e.g., Beck & Emery, 1985) are also used to challenge OCD-related beliefs and appraisals.

Empirical Tests of the Belief and Appraisal Models

One of the strengths of the belief and appraisal models is that they are clearly falsifiable and have generated a large number of empirical predictions leading to a wealth of research. Twelve predictions derived from these models are listed in Table 1.2, along with a summary of their degree of empirical support. The table shows that there is encouraging support for the models, although some predictions have not been extensively evaluated and some predictions have not been supported by the research. The following sections summarize details of the findings. Space limitations preclude a detailed review of the literature; more detailed reviews can be found elsewhere (e.g., D. A. Clark, 2004; Frost & Steketee, 2002).
### TABLE 1.2
Twelve Predictions Derived From the Belief and Appraisal Models of Obsessive–Compulsive Disorder

<table>
<thead>
<tr>
<th>Prediction</th>
<th>Empirical support</th>
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<tbody>
<tr>
<td>1. The beliefs listed in Table 1.1 are distinct from one another.</td>
<td></td>
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<tr>
<td>2. The beliefs statistically predict or are correlated with OCD symptoms.</td>
<td>++</td>
</tr>
<tr>
<td>3. The beliefs should show specificity; they should be more strongly correlated with OCD symptoms than with measures of general distress (i.e., depression and general anxiety).</td>
<td>+</td>
</tr>
<tr>
<td>4. The beliefs interact with one another to statistically predict OCD symptoms.</td>
<td></td>
</tr>
<tr>
<td>5. OCD patients should generally score higher than control participants on measures of beliefs and appraisals.</td>
<td>++</td>
</tr>
<tr>
<td>6. Experimental manipulations of appraisals (e.g., increases or decreases in responsibility appraisals) lead to corresponding changes in OCD symptoms.</td>
<td>+</td>
</tr>
<tr>
<td>7. Naturally occurring events that increase the strength of beliefs or occurrence of appraisals (e.g., events increasing perceived responsibility) lead to increases in OCD symptoms.</td>
<td>+</td>
</tr>
<tr>
<td>8. OCD patients report learning histories that could give rise to the beliefs.</td>
<td></td>
</tr>
<tr>
<td>9. Efforts to suppress unwanted intrusive thoughts lead to an increased frequency of these thoughts.</td>
<td>+</td>
</tr>
<tr>
<td>10. Treatment-related reductions in OCD symptoms are associated with reductions in the strength of beliefs and frequency of appraisals.</td>
<td>+</td>
</tr>
<tr>
<td>11. Treatments that directly target beliefs and appraisals (e.g., cognitive–behavior therapy) are more effective than treatments that do not directly target these factors (e.g., exposure and response prevention).</td>
<td></td>
</tr>
<tr>
<td>12. Treatments that directly target beliefs and appraisals should be more tolerable for OCD patients (i.e., there should be fewer treatment dropouts).</td>
<td>+</td>
</tr>
</tbody>
</table>

Note: + = Preliminary support; ++ = strong support; − = not supported; ? = not yet adequately tested.

Beliefs and appraisals refer to OCD-related beliefs and appraisals, such as those listed in Table 1.1.

**Prediction 1:** Beliefs should be distinguishable from one another. The first prediction states that the beliefs listed in Table 1.1 should be empirically distinguishable from one another. If beliefs about inflated responsibility, for example, play a specific role in OCD, then it should be possible to demonstrate that the effects of responsibility can be empirically disentangled from other beliefs. In other words, the beliefs should not be so highly correlated with one another that they form a single nonspecific or general OCD belief factor. The research does not support this prediction. Some research has examined the factor structure of two measures: the Obsessive Beliefs Questionnaire (OBQ: a measure of each belief domain listed in Table 1.1), and the Interpretation of Intrusions Inventory (IIL: a measure of appraisals of intrusive thoughts in...
which three appraisal domains are assessed—responsibility, importance of
thoughts, and control of thoughts). Factor analytic research of the III
indicates that the scale is unidimensional instead of consisting of the three
decided factors (OCCWG, 2005). Factor analyses of the OBQ indicate that
it consists of three factors—inflated personal responsibility and the
tendency to overestimate threat, perfectionism and intolerance of
uncertainty, and overimportance and overcontrol of thoughts—instead
of the predicted six (OCCWG, 2005). Hierarchical factor analysis of
the OBQ indicates that there imporare load on the single
higher-order factor and that the three factors account for a small proportion
of the variance in OBQ scores (6%–7%) once the higher-order factor is taken
into consideration (Taylor, McKay, & Abramowitz, 2005a). Thus, the
findings raise the question about the merits of distinguishing among the various
belief and appraisal domains such as those listed in Table 1.1.

Predictions 2 and 3: Beliefs should predict OCD symptoms and show specificity
in correlations. The second and third predictions have received more support, both for the individual scales of the OBQ and III and for their factor
scores. The scales and factors are each correlated with measures of OCD
symptoms. The correlations with OCD symptoms tend to be larger than
correlations with measures of general distress (i.e., depression and general anxiety), and the correlations with OCD symptoms remained significant even
when the effects of general distress were partialled out (OCCWG, 2001, 2003).
Several other studies using the OBQ or similar measures have also shown
that these sorts of dysfunctional beliefs are correlated with many forms of
OCD symptoms (e.g., Foa, Sacks, Tolin, Przeworski, & Amir, 2002; Tolin,

Prediction 4: Beliefs should interact to predict OCD symptoms. Belief and
appraisal models predict that beliefs (and possibly appraisals) should interact
with one another to give rise to obsessions and compulsions, as D. A. Clark
(2004) observed,

Dysfunctional beliefs and appraisals involved in the pathogenesis of
symptoms are complex. . . . Simply defining the cognitive basis of OCD in
terms of single constructs will obscure the true, complex, interactive
and multidimensional nature of cognition in OCD. (p. 109)

To illustrate the potential interactions of beliefs, one’s sense of personal
responsibility could influence the perceived importance of controlling one’s
thoughts so that harm does not occur. Alternatively, beliefs about the
importance of one’s thoughts (T) might inflate responsibility (R) beliefs
(Thorndyke & Shaffer, 2002). If one conceptualizes this in terms of a path
diagram, T and R could have direct effects on OCD symptoms, and T would
also have an indirect (interactive) effect via its influence on R. Perfectionism
(P) and T might also interact. According to Salkovskis et al. (2000),
"Perfectionism is usually defined in terms which suggest more enduring person-ality-type characteristics, which might be expected to interact with the
appraisal of intrusions, particularly when such intrusions concern the completion (or non-completion) of particular actions" (p. 364). Responsibility might also inflate P (Salkovskis & Forrester, 2002). To test these predictions, we conducted a series of regression analyses in which the main effects for each belief (R, P, T) and their two- and three-way interactions were entered as predictors of measures of OCD symptoms. Main effects were significant predictors, but the interactions were not (Taylor, Abramowitz, & McKay, 2005). The findings suggest that the cognitive-behavioral models can be simplified to include only main effects.

**Prediction 5:** OCD patients should score higher than control participants. Research generally supports the prediction that OCD patients, compared with clinical and nonclinical control participants, score highest on the OBQ and III (OCCWG, 2003, 2005), although some of these results are trends (p < .10; Taylor et al., 2005a).

**Prediction 6:** Experimental manipulations of appraisals should influence OCD symptoms. A handful of studies have experimentally manipulated OCD-related appraisals, particularly responsibility appraisals, to assess the effects on compulsive checking (e.g., Bouchard, Rhéaume, & Ladouceur, 1999; Lopata & Rachman, 1995; Rachman, Shafran, Mitchell, Tran, & Teachman, 1996). Research suggests that checking is more frequent when high responsibility is induced (e.g., for checking that a stove is turned off), compared with when low responsibility is induced.

**Prediction 7:** Events that strengthen beliefs or appraisals should increase OCD symptoms. A small number of studies have examined whether naturally occurring events that influence OCD-related beliefs or appraisals are related to the development or exacerbation of obsessions and compulsions. Childbirth, for example, increases the sense of personal responsibility for both parents. The increase in responsibility has been associated with the onset or exacerbation of OCD symptoms, at least in some individuals (Abramowitz, Khandker, Nelson, Deacon, & Rygwall, 2005; Abramowitz, Moore, Carmin, Wiegartz, & Purdon, 2001).

**Prediction 8:** Particular learning histories contribute to the development of OCD-related dysfunctional beliefs. Belief and appraisal models emphasize the role of learning experiences purported to give rise to the development of dysfunctional beliefs ("naïve-learning") such as those listed in Table 1.1. This suggests that it should be possible to identify such learning experiences in people with OCD. This prediction has not been systematically investigated, although case studies have described such learning experiences (e.g., de Silva & Marks, 2001; Salkovskis et al., 1999; Tallis, 1994). Examples include a childhood environment that encouraged the development of rigid or extreme codes of conduct (thereby giving rise to inflated responsibility) and events in which one's thoughts were correlated with a serious misfortune (e.g., wishing that someone would die and then learning that the person had died from some mishap), which could lead to the development of beliefs about the importance of...
of controlling one's thoughts. Controlled research is needed to determine whether most people with OCD report such experiences and whether they are more likely to have these experiences than control participants.

Prediction 9: Excessive attempts to control OCD symptoms should worsen these symptoms. Belief and appraisal models propose that OCD is maintained, in part, by trying too hard to control one's unwanted thoughts or by trying too hard to allay one's doubts. Consistent with this, experimental evidence suggests that repetitive checking actually increases doubt and uncertainty (van den Hout & Kindt, 2003a, 2003b). The research on attempts to control unwanted thoughts has yielded a more complex pattern of results. Experimental studies of non-OCD participants suggest that deliberate attempts to suppress unwanted thoughts often (but not invariably) lead to a paradoxical increase in the frequency of these thoughts (Wenzlaff & Wegner, 2000). Given the degree to which people with OCD strive to avoid their unwanted thoughts, this suggests that deliberate attempts to suppress obsessions should paradoxically increase the frequency of obsessions. There is inconsistent evidence that this occurs in OCD, although research indicates that people with OCD symptoms are more likely to try to suppress their unwanted, intrusive thoughts (Furdon, 2004).

Predictions 10, 11, and 12: Targeting beliefs and appraisals should improve treatment outcome. The final set of predictions concern the treatment relevance of the belief and appraisal models of OCD. Belief and appraisal models underscore the importance of cognitive factors in maintaining OCD and also predict that interventions that reduce the strength of OCD-related dysfunctional beliefs (e.g., the overestimation of threat) should improve treatment outcome. Reducing the strength of these beliefs should also lead patients to be more willing to engage in behavioral and cognitive-behavioral treatments that encourage them to confront the things that they fear, such as exposure to contaminants or to refrain from performing rituals that they believe will avert feared consequences (e.g., by refraining from compulsively repeating a prayer after having a “bad” thought about a family member).

Consistent with the belief and appraisal models, studies have shown that treatments that reduce OCD symptoms also reduce the strength of OCD-related beliefs (Bouvard, 2002; Emmelkamp, van Oppen, & van Balkom, 2002; McLean et al., 2001). Treatments that directly target OCD-related beliefs (i.e., cognitive-behavioral therapy) are associated with a lower proportion of dropouts than treatments that do not directly target these beliefs, such as exposure and response prevention (Abramowitz, Taylor, & McKay, 2005). However, cognitive-behavior therapy for OCD is no more effective than exposure and response prevention (Abramowitz, Taylor, & McKay, 2005). The latter finding might challenge the belief and appraisal models of OCD. Alternatively, these findings may simply indicate that cognitive-behavioral therapy is not as powerful a vehicle of belief changes as is expo
sure and response prevention. As Bandura (1977) mentioned many years ago, behavioral interventions (e.g., exposure and response prevention) may be the most potent agents of cognitive change.

Overall, the predictions summarized in Table 1.2 have mixed but generally positive support. Even so, we agree with D. A. Clark's (2004) conclusion that more research needs to be done to firmly establish that beliefs and appraisals play a causal role in OCD.

**Neglected Realms of Research**

As we described in the previous section, many of the predictions derived from belief and appraisal models have received encouraging empirical support. The predictions that were not supported suggest possible avenues for refining the models. As such, the models can be regarded as open concepts (Meehl, 1977), which are amenable to development and change in response to empirical findings.

A limitation of the belief and appraisal models is that they largely ignore the burgeoning research literature on the neuropsychology and neurobiology of OCD. It is unclear, for example, how the various neuropsychological deficits and reasoning abnormalities are related, if at all, to dysfunctional beliefs and appraisals in OCD. An exception is Frost's mini-model of hoarding (Frost & Hart, 1996; Frost et al., 2002), which describes how information-processing abnormalities, such as decision-making difficulties, might be related to dysfunctional beliefs and appraisals. Yet even this model neglects the extensive research on the neurobiology of OCD.

The brain obviously forms the organic foundation from which beliefs, appraisals, and “idea generators” emerge. And brain structures and circuits are influenced by genetic factors. Thus, a more complete understanding of the etiology of OCD may arise if the belief and appraisal models can be integrated with neurobiological and genetic research. Important questions include the following: How can belief and appraisal models be reconciled with neuroimaging research, which shows that OCD is associated with structural aberrations (e.g., volumetric abnormalities) and functional brain abnormalities, including abnormalities in the orbital frontal cortex and basal ganglia (e.g., Pujol et al., 2004; Szeszko et al., 1999; Whiteside, Port, & Abramowitz, 2004)? How can the belief and appraisal models be reconciled with research suggesting that OCD sometimes abruptly emerges in previously normal people after streptococcal infection and abscess when the infection is treated (e.g., Swee, 2002)?

Belief and appraisal models emphasize the importance of various forms of mal-learning in the development of dysfunctional beliefs and appraisals in OCD. Yet what about the role of genetic factors? Research shows that various forms of beliefs are heritable, including religious and political ideologies.
CONCLUSION

The belief and appraisal models of OCD have many of the properties that a good model ought to have; for example, the models are falsifiable, make clear predictions, and have treatment relevance. Not surprisingly, the models have led to a rich program of research into the etiology and treatment of OCD. Although there is a good deal of empirical support for belief and appraisal conceptualizations, these models have also encountered some difficulties, such as failures to empirically support some predictions. These models are works in progress, and no doubt they will be refined in the coming years to deal with these obstacles. A more important concern, however, is that the models have been developed largely in a cognitive-behavioral vacuum; that is, they have ignored the mounting body of research on the importance of neurobiological and genetic factors in OCD. A more complete understanding of this disorder is likely to arise if theorists and researchers are willing to tackle the challenging task of integrating mind and brain—that is, beliefs and appraisals with neuroscience. Such efforts may eventually lead to a comprehensive model of OCD.

Another potentially important avenue of research is to extend the conceptual and empirical work on OCD subtypes. It is possible that the belief and appraisal models apply only to some forms of OCD. Indeed, some research suggests that some OCD patients have essentially normal scores on dysfunctional beliefs listed in Table 1.1 (Taylor, Abramowitz, McKay, Calamari, et al., 2005). Some models of OCD do not regard dysfunctional beliefs as playing an important role (Jakes, 1996; Swedo, 2002; Szechtman & Woody, 2004). Swedo's (2002) model, for example, proposes that some cases of OCD, as well as some other disorders, arise from pediatric streptococcal infection that damages the basal ganglia and associated structures. Szechtman and Woody (2004) suggested that OCD arises from a dysfunction in a noncognitive and emotion-based security motivation system located in the brain. Neither of these models includes dysfunctional beliefs as explanatory constructs. It is possible that different theoretical models apply to different subtypes of OCD. That is, models emphasizing the role of dysfunctional beliefs and appraisals might apply only to a subgroup of cases of OCD or to particular symptom presentations. Further research is needed to explore this intriguing possibility.
REFERENCES


COGNITIVE-BEHAVIORAL MODELS


