Subtyping OCD: Prospects and Problems

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<u>Abstract</u>

Obsessive-compulsive disorder (OCD) is characterized by the presence of obsessions and/or compulsions which fall into a variety of well-established categories. Some recent arguments have been made supporting the creation of OCD subtypes in order to better understand the psychopathology of different manifestations of OCD. It is hoped that recent advances in our knowledge of the cognitions associated with OCD could be beneficial in this endeavor. This paper will review the advantages, possible obstacles and problems that may result from this effort. Ultimately, the creation of OCD subtypes could hold promise for improved assessment and treatment strategies, although a series of theoretical, conceptual and practical considerations must be addressed before this categorization of OCD is undertaken.

Subtyping OCD: Prospects and Problems

<u>Why Subtypes?</u>

The rationale for seeking subtypes of obsessive-compulsive disorder (OCD) is essentially the same as the rationale for classifying mental disorders in the first place. Researchers and clinicians hope that by identifying relatively homogenous constellations of psychopathologic features they may identify discrete sets of mechanisms, and thereby find distinctive types of treatments. One of the major trends in psychiatric classification is to increasingly split psychiatric disorders into smaller, more homogeneous units. Schneider's (1959) anankastic personality, for example, has been split in two distinct disorders; OCD and obsessive-compulsive personality disorder (OCPD). While there are many important differences between these two disorders, one of the key differentiating features between OCD and OCPD is that symptoms in OCD tend to be ego-dystonic, whereas the traits of OCPD tend to be ego-syntonic. Thus, the two disorders are each more homogeneous than was the broader syndrome of anankastic personality.

The tradition of splitting disorders continues in contemporary efforts to identify subtypes of currently defined disorders. Although DSM-IV implies that OCD is a unitary syndrome, an increasing number of investigators hold that there are discrete subtypes (categories or taxa) of OCD (e.g., Calamari et al., 1999; Calamari et al., 2004; Swedo et al., 1998; Zohar et al., 1997). Subtypes are defined on the basis of being, in some way, more homogenous than OCD in general. A subgroup could be defined, for example, by whether or not OCD is associated with tic disorders. The two subgroups – OCD with a history of tics versus OCD without a history of tics – each likely define a more homogeneous cluster of signs and symptoms than does OCD in general.

In contrast to the subtyping approach to OCD is the view that OC phenomena are dimensional, not categorical. In other words, these phenomena arise from a set of loosely coupled dimensions, where each dimension corresponds to a type of mechanism. From the dimensional perspective, "subtypes" of OCD do not exist in nature; they are simply extreme points of the psychopathologic dimensions that underlie OC phenomena.

Dimensional approaches posit different mechanisms and treatment responses than subtype models (Strube, 1989). Subtypes presumably arise from a small set of causal factors (e.g., the presence versus absence of some critical learning experience). Dimensional variables are the result of a multitude of factors. Conceptually, typologies lead us to expect that disorders have an all-or-nothing state, with no intermediaries; either the person has an OCD subtype or does not. Typologies imply that treatments should have a similar effect on the disorder; once the critical mechanism is addressed, the disorder should rapidly remit (Strube, 1989). In comparison, dimensional approaches assume a continuum of disorder severity (ranging from absent to very severe), and that treatments similarly may have a continuum of effects (ranging from weak to very strong interventions). While it may be possible to integrate categorical and dimensional approaches to understanding psychopathology, the theoretical differences between the two are important and must be considered.

To summarize, investigators have sought to identify OCD subtypes in an effort to better understand and treat obsessive-compulsive problems. At the present time it is unclear whether OCD is better regarded as dimensional or categorical. Taxometric statistical procedures (Waller & Meehl, 1998) are one set of methods that can be used to determine whether a variable is dimensional or categorical, but to our knowledge, only one taxometric study has been applied to OCD (Haslam et al., this issue), and so the dimensional versus categorical nature of OCD remains to be firmly established.

In order for such methods to be applied, it would be necessary to identify the critical variables for testing dimensional versus subtype models. Dimensional and subtype models have been based on studies of OC symptoms. For example, factor analytic studies have yielded dimensional models of OC symptoms (e.g., Mataix-Cols et al., 1999; Summerfeldt et al., 1999), whereas cluster analytic studies have yielded categorical (subtype) models (e.g., Abramowitz et al., 2003; Calamari et al., 1999; Calamari et al., 2004). It remains to be seen whether a focus on phenotypes (symptoms) is a useful method of helping us determine whether OC phenomena arise from taxonic or dimensional constructs.

Before we can fruitfully compare dimensional and subtype models – either with taxometric methods or other procedures – it is necessary that these models be developed to such an extent that explicit, testable predictions can be derived. It is difficult, and perhaps impossible, to falsify a vaguely-formulated, still-evolving model. With clearly defined, falsifiable subtype models, researchers would be in a better position to (a) evaluate competing subtype models, (b) examine whether these models have any advantages over a unitary or "unsplit" conceptualization of OCD, and (c) empirically evaluate subtype models against dimensional models (and against hybrid models that propose some mix of categories and dimensions). The purpose of this article is to consider the possible methods with which we could usefully formulate, use and test subtype models of OCD, and to elucidate some of the problems inherent in this endeavor.

Conceptual Guidelines for Defining Subtypes

Rather than reinventing the wheel, OCD subtyping investigators can benefit from the guidelines that have evolved over the years for developing general psychiatric classification systems, such as the DSM-IV (American Psychiatric Association, 2000). This has been substantially influenced by the framework developed by Robins and Guze (1970), who strongly advocated the delineation and study of homogeneous groups of psychiatric problems.

To identify and validate such groups, Robins and Guze outlined five domains of investigation, which interact with one another so that new findings in any one of the domains may lead to modifications in one or more of the other domains. The entire process is therefore one of continuing self-rectification and increasing refinement leading to more homogeneous diagnostic grouping. The five domains are as follows:

1. Clinical description. The clinical description of a proposed diagnostic syndrome (e.g., subtype) may be based on some striking clinical feature (e.g., the presence or absence of obsessional slowness), or on a combination of features that are thought to be associated with one another (e.g., inflated responsibility and checking compulsions). The clinical description need not simply be based on signs and symptoms; it can include demographic features (e.g., age, sex, ethnicity), age of onset, precipitating factors, and any other descriptive features that can define the clinical picture most precisely. When it comes to OCD subtyping based on clinical features, subtyping researchers will need to explain the seeming continuity of OC phenomena, ranging from very mild (e.g., the so-called "normal" obsessions and compulsions: Rachman & de Silva, 1978) to very severe.

2. Laboratory studies. These may include chemical, physiological, radiological (e.g., neuroimaging), and anatomical (biopsy and autopsy) findings as well as results from psychological studies (e.g., tests of cognitive processing, experimental psychopathology). When laboratory tests are consistent with the defined clinical picture, they permit a more refined classification. If laboratory studies are inconsistent with a syndrome defined by clinical features, then the unity of the syndrome may be questioned. For example, if cognitive tests established that memory deficits do occur in association with compulsive checking and doubting, but are found only in a small subset of people with compulsive checking and doubting, then that would challenge the notion that "checking and doubting" forms a homogeneous subtype of OCD.

3. Exclusion of other disorders. Exclusionary criteria (including criteria for discriminating subtypes) are developed on the basis of clinical descriptions and laboratory findings. The criteria should permit exclusion of borderline or doubtful cases so that the index group may be as homogeneous as possible. To illustrate, OC phenomena can arise when a person develops schizophrenia. A person who develops compulsive checking and doubting in the context of paranoid schizophrenia would not be considered to have a "doubting and checking" subtype of OCD. The OC phenomena in this person would be attributed to, or seen as part of, a schizophrenic disorder.

4. Follow-up studies. These studies can be used to determine whether the diagnostic category (or subtype) is stable over time. Do patients with one putative OC subtype, for example, tend to switch to another subtype over time? For example, do people with contamination obsessions and washing compulsions go on to develop prominent checking and doubting problems? Follow-up studies can also investigate whether members from a putative homogeneous group differ in their course of disorder or treatment response. A group may not be a homogenous disorder if it can be clearly divided into patients with good versus poor prognosis. To illustrate, the response to treatment may depend on whether or not the person has overvalued ideation. If the treatment response of a putative "doubting and checking" subtype varies with the presence or absence of overvalued ideation, then the homogeneity (and utility) of that subtype would be called into question. Of course, the simple fact that treatment response may depend to some extent on the presence or absence of some factor does not guarantee the presence of multiple subtypes, but it could provide a starting point for an empirical investigation into the homogeneity of the construct of interest.

5. Family studies. The validity of a proposed type or subtype of psychiatric disorder would be supported by showing that it runs in families, reflecting the effects of genetic or shared environmental factors. To continue our example, the homogeneity of a putative "checking and doubting" subtype

would be challenged if we found that some subset of people with this subtype had a strong family history of OC problems, while no such family history was found in other people with this putative subtype.

Extending Robins and Guze's guidelines. Clearly, these are not the only ways of defining and refining subtypes, but they are among the most useful, widely used methods for identifying type (and subtypes) of psychiatric disorders. Other subtyping guidelines could be added to this list. One could classify the context in which the disorder developed. Some types of checking and doubting, for example, could develop in the context of specific learning experiences and reinforcement contingencies (e.g., parental modeling of excessive personal responsibility, along with parental reinforcement when the child exhibits responsible, harm-avoiding behavior, such as checking door locks and switches on electrical appliances). Other forms of checking and doubting might not be associated with such contextual factors, thereby suggesting that disorder context may be important for developing subtypes (and for developing models of how OC problems might arise).

Although one can expand on the Robins and Guze (1970) guidelines for developing homogeneous types (and subtypes) of disorders, this does not undermine the value of their guidelines. There is no *a priori* reason for rejecting any potentially useful piece of data in developing OCD subtypes. A fruitful, robust subtype system should be able to account for all pertinent data, including clinical features, family history, laboratory findings, and patterns of treatment response.

Empirical Approaches to Subtyping

A general approach. The discussion in the previous section implies several methods that could be used to develop subtype models. The previous section also suggests that researchers should not rely too heavily on any one method; multiple methods would be needed to examine multiple domains of investigation (e.g., statistical analyses of the co-occurrence of clinical features; laboratory tests of

cognitive processing; treatment studies of patterns of response). Although OCD subtyping research may best proceed by looking at all of the domains defined by Robins and Guze, subtyping researchers have typically examined only one or two of these domains. The following are the three most widely used subtyping methods: (a) cluster analyses of symptoms, (b) clinical observations of the concordance of clinical features, and (c) laboratory-based studies. The following sections describe and illustrate these subtyping approaches. Later in this article we will describe some of the challenges presented by these and other approaches.

Cluster analyses of symptoms. Most commonly, subtyping researchers have cluster analyzed OC symptoms, measured at a single point in time, to identify OCD subtypes (e.g., Abramowitz et al., 2003; Calamari et al., 1999; Calamari et al., 2004). In principle, the resulting subtype models could be tested to see whether the putative subtypes differ on other variables, such as family history, subtype stability in the absence of treatment, and patterns of treatment response. Researchers could also examine whether each subtype is homogeneous in terms of variables such as family history and treatment responses.

Although cluster analytic methods may be useful in subtyping OCD, researchers should not lose sight of the numerous limitations of cluster methods. First, cluster analyses do not "prove" that OCD is composed of subtypes. Cluster analysis partitions or forces the data into categorical groups, just like factor analysis imposes a dimensional model on the data. Second, cluster solutions may vary with the type of cluster algorithm that is used, the criteria for selecting the number of clusters to be extracted, and the variables that one enters into the cluster analysis. Although simulation studies reveal that some cluster algorithms are better than others at extracting known clusters (Overall et al., 1993), one's confidence in a cluster solution is greater when the solution can be shown to be replicated across algorithms (and across samples). An example of this difficulty can be seen from two cluster analyses of

OCD participants which were not completely consistent with each other (Calamari et al., 1999; Calamari

et al., 2004). This problem was resolved when two large samples were combined and it was

demonstrated that the most reliable solution for the larger data set was one with seven subgroups or

clusters (Contamination, Harming, Symmetry, Obsessional, Certainty, Hoarding and

Contamination/Hoarding/Harming – Calamari et al., 2004), but potential difficulties with cluster analytic

investigations remain. If one is planning to use OC symptoms as a basis for cluster analysis, then a broad

range of these symptoms should be assessed. In the past, cluster analyses of OC symptoms have not

fully assessed obsessions and cognitive compulsions (Abramowitz et al., 2003). Cluster solutions may

change when a broader range of OC symptoms are included.

Clinical observations of concordance. Another widely used, if subjective approach to identifying

subtypes is to draw on the observations made when clinicians assess and treat patients with OCD. This

approach has led to various subtype models. One example uses three features – early age at onset of

OCD, history of tics, and family history of OCD or tics – to define subtypes of OCD (Geller et al., 1998).

There is suggestive evidence that OCD has a bimodal age of onset; most cases develop in

adolescence or early adulthood, while a subgroup develops the disorder in childhood (Geller et al., 1998;

Pauls et al., 1995). Childhood-onset OCD is probably more likely to be comorbid with tic disorders, such

as Tourette's disorder (Geller et al., 2001). Aggressive, sexual, symmetry, and exactness obsessions may

also be more common in OCD with comorbid tics (e.g., Leonard et al., 1999; Miguel et al., 1997). Tic-like

compulsions – touching, blinking, rubbing, tapping, staring – are more common in OCD patients with

comorbid tics (e.g., Holzer et al., 1994; Miguel et al., 1997). People with childhood-onset OCD,

compared to those with later-onset OCD, are more likely to have first-degree relatives with OCD or tics

(e.g., Nestadt et al., 2001, 2002). Adults with early- versus late-onset OCD also may tend to differ in

patterns of regional cerebral blood flow in the frontal-subcortical regions implicated in OCD (Busatto et

al., 2001). These results offer preliminary evidence that brain mechanisms in, or correlates with OCD could differ depending on the age at which the disorder first arises.

In summary, three features – early age at onset, comorbid tics, and family history of OCD or tics – tend to co-occur and may define a particular subtype of OCD. However, the co-occurrence of these features is far from perfect. A number of people with childhood-onset OCD, for example, do not have tics or tic-like compulsions, and do not have a family history of OCD (Pauls et al., 1995). Therefore, the three features may not define a clear-cut OC subtype.

Laboratory-based studies. This approach strives to identify pathophysiological features or biological markers of OCD subtypes. Perhaps the most provocative example is that of Swedo and colleagues (1998). They observed that some cases of childhood OCD are rapidly acquired after the child develops a Group A β-hemolytic streptococcal infection (GABHS), which is associated with illnesses such as scarlet fever or streptococcal pharyngitis. Streptococcus-related OC symptoms are thought to be commonly associated with tics, separation anxiety, motoric hyperactivity, and neurological symptoms such as clumsiness and choreiform movements (such as those found in Hungtington's Disease). Swedo et al. (1998) referred to this syndrome as Pediatric Autoimmune Disorder Associated with Streptococcal Infection (PANDAS). This highly controversial proposed syndrome is defined when the following five conditions are met: Presence of OCD or a tic disorder; Symptom onset between age 3 and puberty; Episodic course, with abrupt and substantial symptom exacerbations; Symptom onset and exacerbations are associated temporally with GABHS infection; and the Presence of neurologic abnormalities during symptom exacerbations.

The major distinguishing feature of the PANDAS subgroup appears to be the temporal association between neuropsychiatric symptom exacerbations and GABHS infection – that is, positive (or rising) antistreptococcal antibody titers or a positive throat culture during neuropsychiatric symptom relapses

and evidence of GABHS negativity during periods of remission (Swedo, 2002). While controversial, available research provides some support for a PANDAS subtype of OCD (see Taylor, in press, for a review). Note that the PANDAS subgroup of OCD resembles the subgroup defined in the previous section of this article (early age of onset, tics, and family history of tics or OCD). This is just one example of how biomedical research could inform our conceptualization of OCD subtypes. Others (such as cognitive, neuropsychological or experimental psychopathological investigations) may be of equal or even greater promise in this regard.

<u>Problems Associated With Subtype Development</u>

Of course, developing a classification system for subtypes within the construct of OCD is unlikely to be a straightforward endeavor. In addition to some of the limitations described above, there are likely to be many obstacles to overcome in order to establish both a set of meaningful, reliable and valid OCD subtypes as well as a meaningful, reliable and valid method by which individuals diagnosed with OCD will be allocated to a specific subtype or subtypes. In addition to some of the concerns raised earlier, it is important to remember that whatever methods might be employed to subdivide the symptoms, types and/or manifestations of OCD, they carry with them the statistical and other limitations of the measures used to assess these symptoms, types and/or manifestations in the first place. That is, whether the method is factor analytic or based in cluster analyses, the results are limited by the validity and reliability of the scales and interviews subjected to these analyses. None of the semi-structured interviews or self-report questionnaires has perfect reliability or validity. As such, a subtyping system based on the results of factor or cluster analyses utilizing these assessment measures may be limited by the validity and reliability of the measures themselves.

Furthermore, some of the items in standardized assessment measures of OCD pertain to other diagnostic categories altogether. In fact, there are entire constructs assessed by the measures

developed by the Obsessive Compulsive Cognitions Working Group (OCCWG, 1997, 2001, 2003) which are highly relevant to other disorders (e.g., Intolerance of uncertainty is a core construct in cognitive-behavioral models of generalized anxiety disorder (Dugas, et al., 1998)). While this does not necessarily present a statistical challenge, it may present a conceptual one. Should a subtyping system in OCD produce a subtype that is equally or perhaps more relevant to another disorder, it may bring into question the diagnostic integrity of obsessive-compulsive problems. While there are theoretical constructs that might be consistent with OCD subtypes being relevant to other disorders (e.g., the OC spectrum), support for such constructs is inconsistent (Anholt, Emmelkamp & Cath, 2002; Cath, 2002). More importantly, adding multi-disorder-relevant subtypes to OCD may detract from the validity of the diagnostic category of OCD itself, making the diagnosis of OCD a greater challenge.

Finally, it may be determined that different OCD subtypes have different longitudinal courses. That is, certain manifestations of OCD may be more stable over time than others. Despite some recent evidence demonstrating that symptoms of OCD are quite likely to be very stable over a two-year period of time (Mataix-Cols, et al., 2002), clinical reports often indicate that this is not the case. Patients often report that while they currently engage in one type of compulsive behavior, they used to engage in other compulsions or were troubled by obsessions that were altogether different. It may be that the two-year period in the Mataix-Cols, et al. (2002) investigation was insufficient to detect this fluctuation in symptoms. If so, and if it is determined that different manifestations of OCD have different longitudinal courses, this too may have detrimental effects on the diagnostic integrity of OCD. At the very least, the results of such evidence will have implications that are not simple and that would require careful thought and interpretation. Other similar issues, such as how to deal with co-occurring (comorbid?) subtypes, will present other challenges to address, both statistical and conceptual.

Problems Associated With Individual Subtype Allocation

The problems associated with OCD subtypes become much more complex when one considers that in addition to carefully and empirically determining the specific subtypes that characterize OCD, a system through which individuals would be allocated to OCD subtypes must also be developed. If our primary goal in this effort is to improve treatments for OCD, we must find an objective way to match individuals suffering from this disorder to the specific subtypes that are developed. While this may not appear to present much of a problem, a consideration of even some of the more simple manifestations of the disorder reveals how difficult this endeavor may become.

One of the simplest examples of difficulties associated with subtype allocation might be found in the multitude of functions that compulsive checking may serve. Would an individual who compulsively checks her stove to ensure that it is off, trying to protect her family from a household fire belong in the same OCD subtype as someone who compulsively checks her stove to ensure that it is clean, trying to protect her family from contamination and disease? Assuming that subtypes of 'compulsive washing' and 'compulsive checking' are generated, the allocation of these two individuals to one or both of these two subtypes could present difficult challenges. If the first case were allocated to the subtype of 'compulsive checking', would the second case be allocated to 'compulsive checking', 'compulsive washing' or both? Unfortunately, this simple illustration is unlikely to be representative of the actual cases of OCD seen in clinics and hospital settings. A much more typical manifestation of OCD could involve someone who repeatedly checks in 8s to ensure that the knobs on their stove are exactly symmetrical, properly oriented, clean and off, until they feel 'just right', safe and protected from fire, burglary, disease and some unknown impending danger, and until the horrible images of their children being burned are neutralized. Is such an individual best and simply classified as a 'compulsive checker'? It is unlikely that this case could be easily assigned to a single subtype of OCD. Possible relevant subtypes could include 'compulsive checking', 'compulsive counting', 'compulsive ordering/arranging', 'symmetry compulsions', 'exactness/perfectionistic compulsions', 'just-right compulsions', 'just right

obsessions', 'threat-overestimation obsessions', 'cleanliness obsessions', 'responsibility-related obsessions', 'repugnant obsessions', 'doubting obsessions' and possibly others. Decisions about primary, secondary and tertiary subtype allocations would likely be necessary and a system for determining how to approach this is required. Would subtypes be based on symptoms, cognition, neurology, some other set of factors, or a combination of these? Furthermore, would the allocation of individuals to specific subtypes be based on the same approaches or methods that were used to develop the subtypes or on different methods or approaches?

Within a cognitive-behavioral framework, perhaps the easiest way to allocate individuals to specific subtypes would be based on the *functions* that their symptoms serve. That is, the act of checking itself would not be sufficient to determine that the individual who checks compulsively belongs in the 'compulsive checking' subtype; instead, this allocation would be determined by the *function* of their checking behavior or the cognitive aspects associated with this behavior. In this regard, the work of the OCCWG could be invaluable because the belief domains and interpretations of intrusions endorsed by individuals with OCD may help to identify the functions that various obsessions and compulsions serve. It has already been demonstrated that certain belief-related functional components correspond well with a factor analytic investigation of different types of obsessions (Lee & Kwon, 2003).

Unfortunately, just as symptoms alone may be insufficient for determining subtypes, some of the constructs developed by the OCCWG may also be incomplete on their own to construct a meaningful OCD subtype system. That is, it is very unlikely that a 'responsibility' subtype will emerge as inflated responsibility is likely a central feature in a number of manifestations of OCD (Salkovskis, 1985, 1999). Other belief domains are equally unlikely to produce subtypes in their own right or to allow the easy allocation of individuals to established subtypes. Allocating individuals to subtypes based solely on their symptoms is also likely to present problems, not only because of the necessity of evaluating the function

of their symptoms and the primary, secondary and tertiary symptoms that may be present (as in the example above), but also because symptoms alone lack the depth of information that may be required. A symptom-only based diagnostic system in eating disorders is likely flawed for similar reasons (see Fairburn, Cooper & Shafran, 2003). Fairburn et al. (2003) recommend that the diagnosis and treatment of eating disorders incorporate not only the symptoms that are presented by an individual, but also take into account some of the mechanisms (beliefs, maintaining factors, functions) that moderate and/or mediate symptoms. It is quite likely that without this kind of integrated subtype classification and allocation system, efforts to produce a valid, reliable and easy-to-use set of OCD subtypes will present challenges that may be impossible to overcome. It could be argued that the creation of OCD subtypes would be meaningless without a proper understanding of these functional connections between symptoms and beliefs. To our knowledge, a large scale functional analysis of the connections between OCD beliefs and symptoms has not yet been conducted.

Strategies to Assist in Subtype Development

There have been many advances in our knowledge of OCD during recent years and much of this new information will be highly useful to proponents of creating OCD subtypes. Many of the most impressive advances have been in theoretical conceptions of manifestations of OCD that improve upon earlier, broader models (e.g., Salkovskis, 1985). New theories are now available for compulsive checking (Rachman, 2002), compulsive hoarding (Frost & Hartl, 1996; Shafran & Tallis, 1996), and obsessions without compulsions (Rachman, 1997, 1998). The most immediate advantage of these new cognitive and behavioral models of specific manifestations of OCD is that some problems that professionals were previously quite reluctant to treat (e.g., obsessions without compulsions) are now more approachable in the clinic. Furthermore, new treatment strategies have been developed to target these problems (e.g., Frost & Steketee, 1998; Rachman, 2003). In addition, these advances in theory now allow researchers to

investigate some of the specific mechanisms associated with specific manifestations of OCD, and it is likely this interaction between mechanisms and symptoms that will prove most helpful in the endeavor to develop the subtypes and a system through which individuals can be allocated to specific subtype categories.

It is exactly this type of investigation that has been fruitful in elucidating meaningful distinguishing features between subtypes in recent studies. Lee and Kwon (2003) investigated whether there could be a meaningful distinction made between different types of obsessions in OCD.   Their study combined the results of factor analytic investigations of symptom measures with data from measures that assess interpretations, appraisals and beliefs about thoughts. Together, they were able to separate obsessions into two probably meaningful and useful groups: autogenous and reactive obsessions. Autogenous obsessions are defined as those intrusions which tend to come abruptly into awareness without identifiable triggering stimuli, whereas reactive obsessions are those thoughts which are cued by identifiable external cues (Lee & Kwon, 2003). This distinction will likely be quite useful in determining the functions served by different kinds of obsessions. This could also be useful in the development of subtyping both obsessions and compulsions in OCD. In a related example of this type of inquiry, Watson, Wu, & Cutshall (2004) chose to separate "OCD subtypes" according to symptom reports and to evaluate their different relationships with a typically non-OCD symptom – that of dissociation. Their results indicated that some manifestations of OCD (checking and obsessive intrusions) are significantly more associated with measures of dissociation than others (cleaning, ordering and hoarding). Again, results of this type may be useful for differentiating between manifestations of OCD.

A variation on the above approach of separating participants with OCD into various groups and investigating the differences between these groups is to conduct investigations using only one homogeneous subtype or group. This type of investigation has already produced useful information

about the psychopathology of specific subtypes of OCD. This includes beliefs and magical thinking in

association with compulsive washing/cleaning (Tolin, Worhunsky & Maltby, 2004), aspects of memory or

information processing in association with compulsive washing/cleaning (Radomsky & Rachman, 1999)

and compulsive checking (Radomsky, Rachman & Hammond, 2001) as well as information about the

phenomenology of symmetry, ordering and arranging compulsive behavior (Radomsky & Rachman,

2004). The combination of theoretical advances and new investigations of homogeneous groups of

individuals with OCD would certainly help to solidify any subtype system that is developed. Other

research into homogenous groups of individuals with OCD is strongly encouraged for both the

replication and extension of earlier research findings in OCD and also to investigate new issues which

may be 'subtype-specific'.

Additional benefits are likely to follow from treatment outcome studies that evaluate empirically

supported treatments both across and within different proposed OCD subtypes. If individuals within a

given subtype respond similarly to a standardized treatment, and differently from those in another

subtype, this will provide support to the integrity of the subtyping system, and also to promote advances

in treatment strategies which may be better suited to some subtypes than to others. A recent

investigation of the effects of cognitive-behavioral therapy (CBT) across different "symptom

presentations" showed that standardized CBT produced poorer gains among patients with compulsive

hoarding concerns than among those who presented with other symptoms (Abramowitz, et al., 2003).

This finding helps to elucidate a possible 'compulsive hoarding' subtype, as well as to encourage

alterations or refinements of currently accepted CBT techniques to be better suited to compulsive

hoarding problems.

Clinical Implications

The clinical implications of the development of an easy-to-use, reliable, valid and meaningful subtype system could be numerous. In addition to providing a more fine tuned description of the psychopathology of OCD, subtypes would likely enable the creation and use of better assessment methods and tools that should allow a better understanding of the nature of these specific manifestations of OCD. Some new existing scales such as the Saving Inventory-Revised (Frost, Steketee, & Grisham, 2004) and the Symmetry, Ordering and Arranging Questionnaire (Radomsky & Rachman, 2004) may already serve this purpose, however future revisions to these and other scales and interviews may well profit from subtypes and from an anticipated growing amount of subtype-specific data.

Refined information about cognitions and behaviors associated with specific OCD subtypes could aid in the development of specific new cognitive and behavioral treatment strategies. The application of these to relatively neglected or poorly understood manifestations of the disorder are likely to be both welcome and useful. An example of the effects of this type of advance can be seen in obsessions without compulsions. Exposure and response prevention, an established behavioral technique often used in the treatment of OCD would likely not work well for manifestations of the disorder where compulsions are not evident (Rachman, 1997, 1998). Instead, theoretical and empirical advances have produced promising new, primarily cognitive intervention strategies (Rachman, 2003) for obsessions without compulsions. Other similar advances in treatment are evident for compulsive hoarding (Frost & Steketee, 1998). While, generally speaking, all cognitive-behavioral interventions for OCD are based on the same set of guiding principles, the techniques that are employed in the clinic can be vastly different from one another. Advances in the conceptualization of subtypes could help us to further refine our techniques and to develop new ones for use with subtypes of OCD. This would produce a refreshing alternative to situations where techniques are attempted following from limited research findings and the clinical intuition of the therapist.

These advances would likely have some important clinical benefits. Progress in theory, assessment and intervention strategies should be well demonstrated by future outcome research which can evaluate the effectiveness of matching particular treatment strategies with particular subtypes. If this endeavor is fruitful, improvements in the efficacy of cognitive and behavioral treatments for OCD should ensue. For those subtypes that respond well to either existing or new treatment strategies, clinicians can be more confident about the effects of their interventions. For subtypes that present obstacles to improvement in the clinic, our better ability to assess and investigate aspects of subtypes will no doubt help us to target our efforts more directly on areas where treatments are not performing well.

It is our belief that the recent advances in theoretical approaches to understanding the different symptom presentations in OCD, in combination with empirical advances in understanding the functional mechanisms underlying OCD, particularly in the domains of cognition and belief, will ultimately have strong benefits in the clinic. Whether or not this occurs in association with the construct(s) of OCD subtypes will depend on the success of researchers and clinicians at addressing some of the problems outlined here. However, we are optimistic that whether a set of OCD subtypes is developed or not, empirical investigations within and across homogeneous groups of individuals with OCD can only serve to improve both our understanding of and treatments for this challenging disorder.

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