Latent class analysis of obsessive–compulsive symptoms in a clinical sample

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Abstract

Objective: Obsessive–compulsive disorder (OCD) is probably a heterogeneous condition. To date, research investigating the symptom structure of OCD has generally focused on variable-classification approaches, primarily factor analysis. Our aim was to use the latent class analysis, an advanced individual-classification method, in order to define homogeneous sub-groups based on the Yale–Brown Obsessive–Compulsive Scale Check List (Y-BOCS CL) assessments within 193 outpatients with OCD.
Method: Latent class analysis of 13 obsessive–compulsive symptom-clusters measured by the Yale–Brown Obsessive–Compulsive Scale Check List was performed. Associations of demographic and clinical features with latent class membership were tested by using logistic regression models. Differences in severity of obsessive–compulsive symptoms, obsessive beliefs, and depressive symptomotology between latent classes were evaluated with the chi-square likelihood test.
Results: Latent class analysis models of best fit yielded 3 latent classes: "autogenous obsessions", "reactive obsessive–compulsive", and "reactive obsessions". Outpatients in reactive obsessive–compulsive group reported significantly higher scores on the Y-BOCS global, obsessions, and compulsions scales than outpatients in other two sub-groups. Participants in reactive obsessive–compulsive group were predominantly female, single, and had a history of family psychopathology; whereas autogenous and reactive obsessions groups were predominantly male. There were no differences in severity of depression and obsessive belief domains.
Conclusions: The results provide support for the validity of autogenous/reactive distinction for OCD. These three classes may have important implications for research and clinical purposes.
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1. Introduction

OCD is a common psychiatric disorder affecting 2% of adults and almost 2% of children in the population [1–3]. People with OCD usually exhibit a wide variety of symptoms (eg, contamination, sexual, religious, or aggressive fears; hoarding; checking behaviors; repeating rituals) and a range of comorbid neuropsychiatric conditions (including tic disorders, depression, generalized anxiety, grooming disorders, eating disorders, and others) [4–6]. However, further examination of the phenomenological, etiological, and treatment traits of OCD shows a marked

heterogeneity [7–11]. But also other some phenomenological aspects of the disorder also reflect heterogeneity, including differences in gender, age of onset, and comorbidity patterns [12–15]. Given the theoretical debates on heterogeneous nature of OCD, not only the treatment of OCD but also a permanent classification of the illness is challenging. Recently, DSM-5 classified the disorder under obsessive–compulsive and related disorders after a long period of ongoing debates [16], however, the issue still seems to be unresolved yet [17].

A number of approaches have been employed in studies of OCD to increase the power of genetic and neurobiological surveys in identifying more homogeneous subgroups [18,19]. So far, there has been an increasing interest in defining OCD subgroups by developing psychometric instruments and analyzing factor structure of symptoms [20–22]. In an attempt to better understand OCD, previous studies have used data reduction methods to identify

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subgroups of symptoms due to the etiologic and treatment characteristics of patients with OCD [23–26]. Recent advances in statistics such as latent class analysis (LCA) have been preferred by researchers to define more clearly the underlying symptom structure of OCD by deriving homogeneous sub-groups.

In a previous study, researchers used four variables (ie, neurologic signs, electroencephalographic abnormalities, attention deficit, and developmental disorder) in an LCA to examine birth complications and neurologic abnormalities in patients with OCD and controls. The model with two latent classes was the most reliable one, and the scholars proposed a distinction based on these four predictive variables as organic and non-organic sub-groups. Individuals with OCD were primarily classified in the non-organic sub-group, suggesting that OCD is not likely to be the result of organic brain diseases [27].

Two studies published by Nestadt et al. [27,28], examined latent classes in OCD patients and their family members based on patterns of comorbidity. The first study identified four latent classes: a minimal disorders class, a recurrent major depression and generalized anxiety class, a highly comorbid psychiatric disorders class, and tic disorders with panic and agoraphobia class in which first 3 classes represented a single nosological pattern distributed sequentially along a severity spectrum, whereas the fourth one represented a separate subgroup [27]. The other study was conducted based on comorbid disorders, and examined the associations of the latent classes identified with the clinical characteristics such as sex, age at onset, and OCD symptom type [28]. In that study a three-class solution has emerged from the analysis which was characterized by: an OCD simplex class, in which major depressive disorder (MDD) was the most frequent additional disorder; an OCD comorbid tic-related class, in which tics were prominent and affective syndromes are considerably rarer; and an OCD comorbid affective-related class in which personality disorders and affective syndromes were highly represented. Male predominance was reported in the OCD comorbid tic-related class and it was also characterized by high conscientiousness. On the other hand, the OCD co-morbid affective-related class was predominantly female, had a younger age at onset, obsessive–compulsive personality disorder (OCPD) features, high scores on the 'taboo' factor of OCD symptoms, and low conscientiousness.

In their study Althoff, Rettew [29] have examined the latent structure of the 8-item obsessive–compulsive scale of the Child Behavior Checklist in community-based samples of children, including twin pairs. 4-class solution fitted all samples best. The resulting four classes were as follows; (i) "no or few symptoms", (ii) "worries and has to be perfect", (iii) "thought problems", and (iv) "obsessive–compulsive symptoms". The post-hoc group comparisons revealed higher heritability in "obsessive compulsive symptoms" class than the other three classes. In a recent study, Delucchi, Katerberg [30] fit a three-class solution that latent classes differed only in

frequency of symptom endorsement. Higher symptom endorsement was associated with earlier age of onset, being male, higher Yale–Brown Obsessive–Compulsive Scale symptom severity scores, and comorbid tic disorders. Besides, there were no differences between classes in terms of treatment response.

Defining accurate subgroups of OCD would bring out the advantages of potentially refining the OCD phenotype, ultimately increasing our ability to identify the underlying causes of OCD, developing targeted treatments specific to subgroups, and predicting more precisely the treatment outcomes. Factor analytic approaches providing evidence for underlying dimensions of psychological constructs have been used to find associated variable categories such as symptom clusters; whereas recent advances such as the latent class analysis (LCA) can be used to find latent homogeneous sub-groups of individuals and provides a more profound knowledge about dimensions of symptoms. The aim of this study was to elucidate the underlying symptom structure of OCD by deriving homogenous latent classes according to symptoms assessed with the Yale–Brown Obsessive Compulsive Check List. We hypothesized that patients with OCD who are assigned into different obsessive–compulsive symptom clusters based on the latent class analysis would probably reveal significant differences in their clinical characteristics and obsessive–compulsive features.

2. Materials and method

2.1. Participants

The sample consisted of 193 OCD patients consecutively admitted to the psychiatry clinic of a university hospital. Patients ranged from 16 to 60 years of age. Patients with current or history of any neurological disorders, psychotic disorder like schizophrenia, brief psychotic disorder, schizophreniform disorder, schizoaffective disorder, bipolar disorders, dysthymic disorder, alcohol/substance dependence, mental retardation, and serious medical condition were excluded. As can be seen in Table 1, mean age of the sample

Table 1
Sample characteristics (N = 193).

Gender	Male	N = 60 (31.09%)
	Female	N = 133 (68.91%)
Marital status	Married	N = 105 (54.40%)
	Single	N = 88 (45.60%)
Type of onset	Acute	N = 46 (23.83%)
	Insidious	N = 147 (76.17%)
Family history of psychopathology		N = 65 (33.68%)
Presence of a significant life event (s)		N = 91 (47.15%)
Presence of a stressor (s)		N = 61 (31.61%)
Age		Mean = 28.92 (SD = 9.89)
Education		Mean = 9.28 (SD = 4.30)
Age at onset of the disorder		Mean = 21.48 (SD = 8.32)
Duration of the disorder		Mean = 7.33 (SD = 8.48)