



Latent structure of intermittent explosive disorder in an epidemiological sample

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ABSTRACT

Intermittent explosive disorder (IED) is characterized by distinct periods of impulsive aggression marked by assaultive acts or destruction of property. However, impulsive aggression is also a feature of other disorders, all of which are viewed in diagnostic nomenclature as qualitatively distinct from IED. This state of affairs is problematic for categorical models unless it is demonstrated empirically that IED-related impulsive aggression is qualitatively distinct from impulsive aggression observable in other axis I and II disorders. The current study addresses this question using taxometric methods to examine the latent structure of IED. Participants were respondents on the Collaborative Psychiatric Epidemiological Surveys, which obtained data on a range of disorders including intermittent explosive disorder ($N = 20,013$) and a range of psychological variables. Indicator variables used were drawn from the survey items and submitted to select taxometric methods (MAMBAC and MAXEIG) to determine the relative fits of a taxonic versus dimensional model. The results of taxometric analyses provided support for a taxonic, rather than dimensional, structure for IED symptoms in the epidemiological sample. Taxon group membership was associated with treatment seeking, family history of anger attacks, lower age of onset of anger attacks, and male biological sex, providing strong support for the validity of the IED taxon.

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1. Introduction

With the publication of the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-V) imminent, the question of whether specific mental disorders are better conceptualized as classes rather than an extremes on continua remains a key issue (for discussions see Eysenck, 1986; Widiger and Trull, 2007). This question is of particular relevance to the study of aggression, a feature of multiple diagnoses in the current DSM. Intermittent explosive disorder (IED) is the diagnosis used to classify individuals who engage in repeated acts of impulsive aggression that are disproportionate to any provocation, and not better accounted for by the effects of a substance, medical condition, or other psychological disorder (American Psychiatric Association, 2000). In short, IED is a disorder of impulsive aggression; the only such disorder in the DSM-IV. However, impulsive aggression is also a key feature of antisocial behavior in children, adolescents, and adults and may serve as a reliable indicator of oppositional defiant disorder (ODD), conduct disorder (CD), and antisocial personality disorder (ASPD). Impulsive other-directed aggression has also been associated with borderline personality disorder (BPD) (Critchfield et al., 2008), bipolar disorder (Garno et al., 2008), substance use disorders (Eronen et al., 1996; Swanson et al., 1991) paranoid,

and passive aggressive features in axis II disorders (Berman et al., 1998). Given that impulsive aggression is a feature of many disorders it may be of interest to determine whether aggressive symptoms in IED are qualitatively distinct from those manifested in other psychopathology and non-pathology.

The latent structure of aggressive symptoms in IED is central to the appropriateness of a categorical diagnostic model, such as that presented in the DSM manual. Detractors of categorical models argue that diagnostic boundaries are often arbitrary and incorrectly situated (Widiger and Clark, 2000), whereas others argue that categorical models should endeavor to reflect the true discontinuities in the latent structure of disorders to be considered practical (Hinshaw et al., 1993). Evidence of a taxonic structure for IED symptoms may lend some support to the current DSM categorical framework for symptoms of aggression in IED. Although evidence of a taxonic structure may not reconcile whether IED is correctly grouped as an “impulse-control disorder not elsewhere classified,” it could serve as a springboard to further clarification of its boundary with other impulse-control disorders, and other clinical syndromes associated with aggression, including mood, anxiety, substance use, and personality disorders (Coccaro et al., 2005, 2004; Kessler et al., 2006). If empirical research confirms that a categorical model is appropriate, this may also serve as an impetus for further delineation of a taxonic structure, such as investigating the performance of the current IED research criteria at correctly identifying members of an IED taxon, searching for the existence of

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possible IED subtypes, and illuminating the nature of its comorbidity with other clinical syndromes.

In addition, deciphering the true structure of the underlying distribution of aggressive behavior has both clinical and methodological ramifications. The goal of assessment in clinical practice is often to determine whether an individual meets diagnostic criteria for IED. Treatment decisions are then made depending on whether diagnostic criteria are met. However, categorical decision making may be misguided if the underlying distribution of IED is dimensional rather than discontinuous; as it may result in the neglect of subthreshold presentations that may otherwise be experiencing clinically significant impairment in functioning. The practice of dichotomizing scores measured on continuous scales (e.g., the Buss–Perry Aggression Questionnaire) or making diagnostic (yes/no) decisions based on such scales is also only appropriate if the underlying distribution of aggressive behavior is categorical and cutting scores adequately approximate the point separating IED taxon and non-taxon members. In clinical research, classifying cases to IED versus non-IED categories based on a median split or any cutting score when IED symptoms are dimensional will likely reduce the variance of the otherwise continuous measure and attenuate the size or magnitude of the relationship among the variables being investigated. Dichotomizing a dimension can lead to loss of statistical power and inflate type II error rate even when sample sizes and effect sizes are large, and have even more profound results when N is relatively small and effect sizes are minimal to moderate. However, if IED symptoms are categorically distributed, then cutting scores that approximate the boundaries between IED and non-IED groups would perform adequately at sustaining statistical power. The structure of IED symptoms may also be relevant to sampling strategies for clinical research. If IED symptoms are taxonic, then aggression studies should use sampling strategies that increase the likelihood of obtaining taxon group members, sampling individuals who likely meet diagnostic criteria (i.e., clinical samples), as it may be inappropriate to generalize the results of investigations conducted on student samples to clinical populations (for detailed discussions, see (Meehl, 1992; Ruscio et al., 2006).

Taxometric analyses are used to determine the latent structure of constructs; that is, whether constructs are best viewed as taxonic or dimensional, and whether psychiatric diagnoses are better conceived as distinct categories (qualitatively different from non-pathological functioning), or if a disorder is a pathological end of a continuum of normal behavior (i.e., dimensional). Taxometric analyses have suggested some psychiatric disorders, such as post-traumatic stress disorder (Forbes et al., 2005), social phobia (Kollman et al., 2006), generalized anxiety disorder (AM Ruscio et al., 2001), antisocial personality disorder (Marcus et al., 2008), and borderline personality disorder (Rothschild et al., 2003) are dimensional, but other disorders such as schizotypy appear to be categorical (Fossati et al., 2007; Haslam, 2003). A finding that IED is taxonic would suggest that individuals with IED represent a unique class that is qualitatively different from individuals with non-pathological (i.e., non-IED) levels of aggression. Such a finding would also provide evidence that IED is distinct from ASPD, a disorder associated with impulsive violence, which has been shown to be dimensional in nature (Marcus et al., 2008), and other disorders that have been shown to be associated with impulsive aggression. Further, the outcomes of a taxometric study may help evaluate the validity of current DSM criteria, serve as a catalyst to understanding the most distinctive features of an IED putative taxon, and confirm the prevalence rate of IED. Though initially thought to be rare (American Psychiatric Association, 1994), recent studies have shown IED to be an under-diagnosed disorder existing in over 6% of the population (Coccaro et al., 2005; Kessler et al., 2006).

The present study examined the latent structure of IED using a large epidemiological sample and taxometric methods. Conducting taxometric analysis with a large epidemiological sample confers a number of technical advantages. First, epidemiological samples, due to their large sample sizes, provide clearer resolution of taxometric plots (Meehl and Yonce, 1994), allowing statistics computed in sliding slabs (i.e., consecutive subsamples) to be computed with adequate cases per subsample. Second, a nationally representative epidemiological sample allows some confidence that members of the conjectured taxon group are represented in the sample, minimizing the possibility of obtaining false dimensional results due to under-representation of taxon members. Finally, the base rate of the taxon group, if found, can be compared to the prevalence rate of IED in the epidemiological sample, which may be informative in terms of confirming prevalence rates, refining IED diagnostic criteria, and determining optimal thresholds for classifying individuals into IED positive and negative categories (Ruscio et al., 2006).

2. Method

2.1. Participants

The dataset used was the 2001–2003 Collaborative Psychiatric Epidemiological Surveys (CPES; Inter-university Consortium for Political and Social Research [ICPSR], 2003). The CPES dataset ($N = 20,013$) includes data from three nationally representative surveys of people residing in the United States who are 18 years or older and who are not institutionalized. The surveys are the National Comorbidity Survey Replication (NCS-R), National Survey of American Life (NSAL), and the National Latino and Asian American Study (NLAAS). The CPES dataset was created by combining the three surveys using a sample weighting method described by Kessler et al. (2004) and using race/ancestry grouping that breaks down the sample into 12 ethnic groups. Because the three surveys specifically sampled groups of individuals with the NSAL and the NLAAS over-sampling specific ethnic groups, the CPES sampling procedure was able to use apportioned weights to define each individual's ethnic category as well as each individual's geographical location. Using this procedure to estimate the population sample characteristics, the final CPES sample comprised Vietnamese ($n = 527$), Filipino ($n = 525$), Chinese ($n = 619$), Other Asian ($n = 613$), Cuban ($n = 625$), Puerto Rican ($n = 654$), Mexican ($n = 1442$), Other Hispanic ($n = 899$), Afro-Caribbean ($n = 1492$), African American ($n = 4746$), and White and Other ($n = 7871$) participants.

2.2. Measures

The CPES surveys were derived from the World Mental Health Composite International Diagnostic Interview (WMH-CIDI; Kessler and Üstün, 2004). The WMH-CIDI was itself derived partly from the Diagnostic Interview Schedule (Robins et al., 1995) and partly from an earlier version of the CIDI. All three surveys collected data on several constructs, such as criteria for affective disorders, anxiety disorders, personality pathology, substance-related disorders, childhood disorders and other psychiatric conditions. The IED-related portion of the survey comprised 73 questions assessing: frequency of explosive episodes, types of destructive and assaultive behaviors, treatment seeking, family history of anger attacks, IED diagnosis disqualifiers, perceptions of controllability and proportionality of expressed aggression, and functional impairment. The data were collected by the Survey Research Center (SRC) of the Institute for Social Research at the University of Michigan using computer assisted personal interviewing. Data collection began in early 2002 and was completed by December of 2003.

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