



Externalizing spectrum or spectra? Underlying dimensions of the externalizing spectrum



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ABSTRACT

Background: Major psychiatric disorders have been conceptualized to comprise of two dimensions namely, the internalizing and externalizing spectrum. Externalizing spectrum disorders consist of childhood disruptive behaviour disorders (DBD), antisocial personality disorder (ASPD) and substance use disorders. They are supposed to share common underlying personality traits. However, there is a need to explore the underlying dimensionality of externalizing spectrum of both disorders and traits in a mixed clinical and nonclinical sample from a non-western cultural-ethnic backdrop.

Materials and methods: One hundred consecutive subjects with alcohol dependence (AD) and an equal number of biologically unrelated non-substance-dependent control subjects were recruited for the study. Subjects were examined for evidence of DBD and ASPD using Semi-Structured Assessment for Genetics of Alcoholism (SSAGA-IV). Validated instruments were used for the assessment of impulsivity, sensation seeking and hostility. Continuous scores generated from these instruments were converted to standardized Z scores to ensure comparability among different types of scales. Data were tested for normality of distribution by Kolmogorov–Smirnov test. Analysis was done by using principal component factor analysis with varimax rotation.

Results: Factor analysis revealed two broad factors underlying the externalizing spectrum. The first factor included conduct, antisocial personality and oppositional defiant disorder. This factor was labelled as *disruptive–dissocial*. The second factor, which included AD and all personality traits, was labelled as *impulsive–hostile*.

Conclusion: Within the externalizing spectrum, there are at least two distinct underlying dimensions: *disruptive–dissocial* and *impulsive–hostile*. If confirmed in other samples as well, this may have important implications for understanding and managing psychiatric and psychological issues.

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1. Introduction

Spectrum with regard to psychiatric disorders refers to establishing coherent association amongst nosologically distinct disorders or traits supported by their similarities of presentation and similar putative causation. Research based on factor analysis endeavoured to find out fewer but broader overarching groups culminated into two higher level spectra, the internalizing spectrum and the externalizing spectrum (Maser and Akiskal, 2002).

The disorders typically subsumed under externalizing spectrum are childhood disruptive behaviour disorders (comprised of conduct disorder and oppositional defiant disorder), adult antisocial personality disorder and substance use disorders (Krueger and

Markon, 2000). Large epidemiological samples, both cross-sectional as well as longitudinal, have documented extensive comorbidity among antisocial behaviour disorders, alcohol use disorders, and other substance use disorders. These disorders exhibit greater comorbidity among themselves than with other disorders. Hence, the concept of externalizing spectrum has been invoked to explain patterns of comorbidity (Markon and Krueger, 2005). Couple of studies from India also supported the concurrence of alcohol dependence and childhood disruptive disorders (CD/ODD) (Ghosh et al., 2014a). Phenotypic co-occurrence alludes to the possibility of common liability for the development of this group of disorders. Liability could be in the form of common underlying personality traits and further upstream genetic vulnerability. Extensive evidence documents significant correlations between personality traits and externalizing forms of psychopathology. In particular, the most relevant specific traits include aggression and impulsivity (Acton, 2003; Casillas and

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Clark, 2002; Lynam et al., 2003; Sher et al., 2000; Slutske et al., 2002). Impulsivity has been defined as “the failure to resist an impulse, drive or temptation to perform an act which is harmful to the person or others” (Barratt, 2000), whereas aggression is defined as, “the intentional infliction of some form of harm on others” (Baron and Byrne, 2000). In the higher order structure of personality, these specific traits fall in the domains of Disagreeableness and Unconscientiousness at the five-factor level, and these five-factor-level domains combine to form the broader domain of disinhibition, or lack of constraint (Markon and Krueger, 2005). Moreover, multivariate biometric studies of the spectrum conceptualization indicate that the reason these disorders co-occur is because they share a common underlying genetic predisposition (Krueger et al., 2003). There has been converging evidence that the common genetic liability acts through the personality traits to manifest as externalizing disorders (Krueger et al., 2005).

Research has demonstrated that the liability to externalizing spectrum disorders is graded, continuous and normal in distribution (Markon and Krueger, 2005). Besides, despite commonalities, there are diversities amongst the disorders of externalizing spectrum. For example, for conduct disorder, two distinct traits are aggressiveness and lack of compliance. Two seemingly different traits, behavioural dyscontrol and negative affectivity, putatively mediate the entire externalizing spectrum (Maser and Akiskal, 2002). Moreover, evidence indicates specific genetic vulnerability amongst externalizing disorders (Markon and Krueger, 2005). Hence, it is quite intuitive to look into the microstructure of externalizing spectrum to explore further its underlying dimensions.

However, studies conducted so far in this area were mainly focussed on a specific geographic and ethnic population. There is a need to explore the externalizing spectrum in a different culture and ethnic group, as different cultural-ethnic groups have been shown to differ in the structure and patterns of externalizing (McLaughlin et al., 2007; Zwirs et al., 2011; Yarnell et al., 2013). Presumably, this is the first such study from India aimed at empirical exploration of the externalizing spectrum disorders and underlying basic personality traits in a mixed clinical and non-clinical sample.

2. Materials and methods

2.1. Subjects

Sample consisted of subjects recruited from the patient population attending the Outpatient and the Inpatient services of the Drug De-addiction and Treatment Centre (DDTC) of a tertiary care institute in northern India. One hundred subjects with alcohol dependence (AD) were recruited for the purpose of this study over a period of 13 months (May 2010–June 2011). This comprised the index group. Additionally, one hundred control subjects accompanying AD subjects, hailing from similar socio-economic background and who had never (or only occasionally) used any substance in their lifetime were recruited. Hence overall 200 subjects were recruited for the purpose of the study. The control subjects were neither biologically related nor were the spouse of the subjects. They were other male persons accompanying the subjects, like their neighbours, their colleagues or someone from their in-laws. The cohesive socio-familial environment of India has perhaps enabled us to obtain such a unique control group. Ethical clearance was obtained from the institutional ethics committee.

2.1.1. Inclusion criteria for study subjects in index group

- (1) Fulfilling ICD10/DSM IV criteria of alcohol dependence past/present.
- (2) Age 20–50 years.

2.1.2. Exclusion criteria for the study subjects in index group

- (1) Childhood psychotic illness.
- (2) Subjects who were dependent/used substance other than alcohol (except tobacco).
- (3) History suggestive of mental retardation.
- (4) Any organic disease – Visual, hearing problem, pervasive development disorders and seizure disorder.
- (5) Not willing for participation in the study.

2.1.3. Inclusion criteria for study subjects in the control group

- (1) Not fulfilling ICD 10/DSM IV criteria for any substance dependence.
- (2) Age 20–50 years.
- (3) Male subjects.

2.1.4. Exclusion criteria for study subjects in the control group

- (1) Biologically related to the cases.
- (2) Not willing to participate in the study.

2.2. Assessment

The following instruments were applied for the study purpose. Sociodemographic data were collected from the subjects using the proforma developed in the department of psychiatry. The Semi-Structured Assessment for the Genetics of Alcoholism (SSAGA-IV), which was designed to assess the physical, psychological, and social manifestations of alcohol abuse or dependence and other psychiatric disorders, was used to assess AD in this study (Hesselbrock et al., 1990). This same instrument was also applied to diagnose antisocial personality disorder (ASPD), conduct disorder (CD) and oppositional defiant disorder (ODD) in the study subjects. Symptom scores for each of these conditions (AD, ASPD, CD, and ODD) were used for this study analysis as continuous variables rather than categorical diagnoses because we were interested in the dimensional factor structure of the externalizing spectrum).

Barratt Impulsiveness Scale (BIS) was administered for measuring impulsivity. It has a total score of 30 and contains three subscales related to impulsiveness (Barratt, 2000). The first subscale measures motor impulsiveness and lack of perseverance. The second measures cognitive impulsivity by assessing inattention. The third subscale evaluates non-planning impulsivity by scoring lack of self-control and intolerance of cognitive complexity. The Hindi version of BIS was used (Singh et al., 2008).

Buss Durkee Hostility Inventory (BDHI; Buss and Durkee, 1957) was used for measurement of trait hostility. It is a true–false questionnaire with established psychometric properties and it has been used widely in Indian studies.

Finally, Zuckerman Sensation Seeking Scale (SSS) was developed to evaluate sensation seeking construct (Zuckerman, 1994). The latest version (SSS-V) contains four subscales: thrill and adventure seeking (TAS), boredom susceptibility (BS), experience seeking (ES) and disinhibition (DIS). Total SSS score is obtained by summing up the subscale scores. Indian adaptation of SSS-V was used in the present study (Basu et al., 1993).

2.3. Procedure

Index group for our study consisted of subjects fulfilling criteria for ICD-10 alcohol dependence attending DDTC. Those who satisfied the selection criteria were invited to participate in the study. For each subjects a written informed consent was

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