



Review article

Statistical modelling studies examining the dimensional structure of psychopathology experienced by adults with intellectual disabilities: Systematic review



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ABSTRACT

Diagnosing mental ill-health using categorical classification systems has limited validity for clinical practice and research. Dimensions of psychopathology have greater validity than categorical diagnoses in the general population, but dimensional models have not had a significant impact on our understanding of mental ill-health and problem behaviours experienced by adults with intellectual disabilities. This paper systematically reviews the methods and findings from intellectual disabilities studies that use statistical methods to identify dimensions of psychopathology from data collected using structured assessments of psychopathology. The PRISMA framework for systematic review was used to identify studies for inclusion. Study methods were compared to best-practice guidelines on the use of exploratory factor analysis. Data from the 20 studies included suggest that it is possible to use statistical methods to model dimensions of psychopathology experienced by adults with intellectual disabilities. However, none of the studies used methods recommended for the analysis of non-continuous psychopathology data and all 20 studies used statistical methods that produce unstable results that lack reliability. Statistical modelling is a promising methodology to improve our understanding of mental ill-health experienced by adults with intellectual disabilities but future studies should use robust statistical methods to build on the existing evidence base.

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## 1. Introduction

Classification systems for the diagnosis of mental ill-health are central to clinical practice and research. A categorical model of psychopathology is the basis for existing classification systems, such as ICD-10 and DSM5. Although some authors disagree (Lawrie, Hall, McIntosh, Owens, & Johnstone, 2010), there has been a developing consensus that classification systems based on a categorical model of psychopathology lack sufficient validity for research to investigate the aetiology and pathophysiology of mental ill-health (Insel, 2012). Dimensional models of psychopathology, empirically derived using statistical modelling, have been examined as the main alternative to categorical models and been found to have improved reliability and validity in the general population (Markon, 2010).

Concerns about categorical models of psychopathology have centred around the limited discriminant and predictive validity. To examine the discriminant validity of categorical models, researchers have examined categories with a postulated overlap, with most studies focused on psychopathology in the psychoses. Early studies examining such psychopathology, failed to identify points of rarity, or a bimodal distribution, that could distinguish between schizophrenia and the affective psychoses (Kendell & Brockington, 1980; Kendell & Gourlay, 1970). High levels of comorbidity in epidemiological studies have also been cited as evidence for the poor discriminant validity of diagnostic categories (Mineka, Watson, & Clark, 1998). For example, in one study of comorbid depressive and anxiety diagnoses, 57% of 1,127 participants had current co-morbid mood and anxiety disorders and the rate of lifetime comorbidity was 81% (Brown, Di Nardo, Lehman, & Campbell, 2001). Regarding predictive validity, two studies reported that the dimensional models of psychopathology were more strongly associated with measures of longitudinal outcome of mental ill-health (Van Os et al., 1996, 1999) and one concluded that they were similar and complementary (Dikeos et al., 2006), compared with categorical models.

One focus of early research on dimensional models examined psychopathology experienced by children and young people. This initial evidence supported the concept of internalising and externalising dimensions of psychopathology (Achenbach, 1966; Achenbach, Edelbrock, & Howell, 1987). More recent studies also support the existence of internalising and externalising dimensions in adults (Krueger, 1999; Slade, 2007). The internalising dimension is characterised by problems with negative emotions, and includes psychopathology cutting across the boundaries of the commonly co-morbid mood, anxiety, fear/phobic and obsessional disorders. The externalising dimension includes problems with aggression and other problem behaviours, overactivity and inattention, and disinhibition, cutting across the commonly co-morbid conduct, personality, attention-deficit and hyperactivity and substance misuse disorders.

The findings suggesting that a dimensional approach may have advantages over categorical diagnoses lead to work to examine how to incorporate the evidence from dimensional models into DSM-V (Helzer et al., 2009). Since categorical classification systems for the diagnosis of mental ill-health have good utility in clinical practice dimensional models are best considered as complementary rather than an alternative to categorical diagnoses (Kotov et al., 2011). Whilst recognising the ongoing questions about the validity of categorical diagnoses and the research supporting the internalising and externalising frameworks it was decided that there was insufficient scientific evidence to support wholesale changes in the structure of DSM-V. Instead, in recognition of the fact that dimensional and categorical models can be complementary in clinical care, cross-cutting, dimensional assessments of psychopathology were included in the DSM-V manual.

We have argued above that dimensional modelling studies have helped our understanding of psychopathology experienced by individuals who do not have intellectual disabilities. They may also offer useful insights into psychopathology experienced by individuals with intellectual disabilities. Psychopathology, and the presentation of mental disorders experienced by adults with intellectual disabilities, can differ from that seen in the general population. For example, aggression and other challenging behaviours are the type of psychopathology most commonly experienced by adults with intellectual disabilities (Cooper, Smiley, Morrison, Williamson, & Allan, 2007), and have sometimes been conceptualised as being equivalents of depressive symptoms (DC-LD; Royal College of Psychiatrists, 2001). This conceptualisation of challenging behaviours as depressive equivalents contrasts with the position above that mood symptoms are best thought of as part of an internalising dimension of psychopathology and problem behaviours in the separate externalising dimension. However, given the differences in psychopathology experienced by individuals with intellectual disabilities, it cannot be assumed that the results from statistical modelling studies using data from individuals who do not have intellectual disabilities can be generalised to understanding psychopathology experienced by individuals with intellectual disabilities. Therefore, this review examined the methods and findings from studies using a statistical approach to model the dimensional structure of psychopathology experienced by adults with intellectual disabilities.

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