A dimensional liability model of age differences in mental disorder prevalence: Evidence from a national sample

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Nicolas Hoertel [a, b, c, d, *], Kibby McMahon [a], Mark Olfson [a], Melanie M. Wall [a, e], Jorge Mario Rodríguez-Fernández [a], Cédric Lemogne [b, c, d], Frédéric Limosin [b, c, d], Carlos Blanco [a]

[a] Department of Psychiatry, New York State Psychiatric Institute/Columbia University, New York, NY 10032, USA
[b] Assistance Publique-Hôpitaux de Paris (APHP), Corentin Celton Hospital, Department of Psychiatry, 92130 Issy-les-Moulineaux, Paris, France
[c] Paris Descartes University, PRES Sorbonne Paris Cité, Paris, France
[d] INSERM UMR 894, Psychiatry and Neurosciences Center, Paris, France
[e] Department of Biostatistics, Mailman School of Public Health, Columbia University, New York, USA

ABSTRACT

Recent theories have proposed a metastructure that organizes related mental disorders into broad dimensions of psychopathology (i.e., internalizing and externalizing dimensions). Prevalence rates of most mental disorders, when examined independently, are substantially lower in older than in younger adults, which may affect this metastructure. Within a nationally representative sample, the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC; N = 43,093), we developed a dimensional liability model of common psychiatric disorders to clarify whether aging affects specific disorders or general dimensions of psychopathology. Significant age differences existed across age groups (18–24, 25–34, 35–44, 45–54, 55–64, 65–75 and 75+), such that older adults showed lower prevalence rates of most disorders compared to younger adults. We next investigated patterns of disorder comorbidity for past-year psychiatric disorders and found that a distress-fear-externalizing liability model fit the data well. This model was age-group invariant and indicated that the observed lower prevalence of mental disorders with advancing age originates from lower average means on externalizing and internalizing liability dimensions. This unifying dimensional liability model of age and mental disorder comorbidity can help inform the role of aging on mental disorder prevalence for research and intervention efforts, and service planning for the impending crisis in geriatric mental health.

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1. Introduction

The rapid growth of the geriatric population in the U.S calls for a better understanding of lifespan psychopathology and how prevalence rates of mental disorders progress into late adulthood (Jeste et al., 1999). Because mental disorders often co-occur (Beekman et al., 1998; Kessler et al., 2005b; Lenze et al., 2000; Schoevers et al., 2003; Manetti et al., 2013; Schuster et al., 2013b), recent theories have proposed a metastructure of psychiatric diagnoses that organizes disorders into broad dimensions of psychopathology

(i.e., internalizing and externalizing dimensions) (Eaton, 2015). This dimensional internalizing-externalizing model has been well established in the general population (Blanco et al., 2013; Insel et al., 2010; Kendler et al., 2003; Kessler et al., 2011; Kotov et al., 2011; Krueger et al., 2011; Krueger and Markon, 2006; Krueger et al., 2003; Krueger, 1999; Krueger et al., 1998; Vollebergh et al., 2001) and has been shown to be invariant across numerous nationalities and cultures (Krueger et al., 2003), race/ethnicity (Eaton et al., 2013), gender (Eaton et al., 2012) and sexual orientation (Eaton, 2014), but it has never been examined specifically in geriatric populations.

When examined independently, the prevalence rates of most common psychiatric disorders are substantially lower in older than in younger adults (Donnellan and Lucas, 2008; Gum et al., 2009; Hasin et al., 2005; Hoertel et al., 2013; Jorm, 2000; Kessler et al.,

* Corresponding author. Department of Psychiatry, New York State Psychiatric Institute/Columbia University, 1051 Riverside Drive, Unit 69, New York, NY 10032, USA. Tel.: +1 646 774 8111; fax: +1 646 774 8105.
E-mail address: nico.hoertel@yahoo.fr (N. Hoertel).

2005a; Manetti et al., 2013; Schuster et al., 2013a; Seitz et al., 2010; Sunderland et al., 2014; Weissman et al., 1985), which may affect the structure of comorbidity. Three previous studies (Buchan et al., 2014; Eaton et al., 2011; Sunderland et al., 2013) have suggested that the structure of comorbidity may hold in individuals as they age. However, their conclusions are mainly based on models of a limited number of psychiatric disorders (i.e., internalizing disorders). In addition, since dimensions underlying psychopathology (i.e., internalizing and externalizing dimensions) are positively correlated (Blanco et al., 2013), it remains unclear whether age differences in prevalence rates of mental disorders are due to a decrease in the prevalence of specific disorders (and thus to a different metastructure of mental disorders in older adults) or to a decrease in the predisposition to one or more broad dimensions of psychopathology, which would be the case if this structure holds across age groups.

Testing these competing hypotheses may help explain variations in psychiatric disorders prevalence across the lifespan and would inform the utility of the dimensional liability model to frame key aspects of psychiatric nosology in older age groups (Andrews et al., 2009; Blanco et al., 2013). If the latent structure of common psychiatric disorders is not invariant between younger and older adults, the liability model of internalizing and externalizing dimensions would not apply to older adults, suggesting that the mechanisms underlying predisposition to psychopathology might vary with age. By contrast, if invariance were found, it would indicate that age group differences in latent psychopathological liabilities account for the observed age group differences in prevalence rates of psychiatric disorders. It might also be possible to develop a dimensional liability model of age and disorder comorbidity to inform the role of aging in mental disorder prevalence for research and intervention efforts (Eaton et al., 2012, 2011).

This report used a nationally representative sample of 43,093 individuals to examine the age invariance of a liability model of common psychiatric disorders in the US. We *a priori* divided adult participants into seven age groups, i.e., 18–24, 25–34, 35–44, 45–54, 55–64, 65–75 and >75 years. First, we sought to determine the latent comorbidity structure of common psychiatric disorders in these seven age groups separately. Secondly, we tested whether the structure of psychopathology was similar across the seven age groups (i.e., age group invariant). Finally, if invariance were found, we sought to examine whether the lower predisposition to mental disorders among older adults would concern externalizing or internalizing dimensions or both dimensions.

2. Material and methods

2.1. Participants

This study utilized data from 43,093 individuals who participated in the first wave of the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC), conducted in 2001–2002. The design of the NESARC has been detailed elsewhere (Grant et al., 2009, 2003). The first wave of NESARC was a representative sample of the civilian, non-institutionalized United States population, aged 18 and older. The overall survey response rate was 81%. Young adults, African Americans, and Hispanics were oversampled. Data were weighted at the individual and household levels in order to adjust for oversampling and nonresponse on demographic variables (e.g., age, race/ethnicity, sex, region, and place of residence) to be representative of the U.S. civilian population based on the 2000 census (Grant et al., 2009). The research protocol, including written informed consent procedures, received full human subjects review and approval from the U.S. Census bureau and the Office of Management and Budget.

2.2. Measures

2.2.1. Definition of age groups

To provide a finer-grained examination of the effects of age on the structure of psychiatric disorders that has been possible in previous national studies, we divided participants into seven age groups, i.e., 18–24, 25–34, 35–44, 45–54, 55–64, 65–75 and >75 years. The two later age groups offer the opportunity to detect a change of the metastructure of common psychiatric disorders that could occur later in life and would thus have been blurred by merging all participants older than 65 years of age (Reynolds et al., 2006). The five other age groups comprised participants 18–64 years of age. In the NESARC, participants aged 18–24 years (N = 5199), 25–34 years (N = 7759), 35–44 years (N = 9090), 45–54 years (N = 7625), 55–64 years (N = 5215), 65–75 years (N = 4685) and >75 years (N = 3520) included, respectively, 13.0% (SE = 0.3), 18.5% (SE = 0.3), 21.2% (SE = 0.3), 18.8% (SE = 0.3), 12.3% (SE = 0.2), 9.6% (SE = 0.2) and 6.6% (SE = 0.2) of the sample.

2.2.2. Assessments of DSM-IV mental disorders

Mental disorders were assessed using the Alcohol Use Disorder and Associated Disabilities Interview Schedule, DSM-IV version (AUDADIS-IV), a structured diagnostic instrument administered by trained lay interviewers (Grant et al., 2009). Axis I diagnoses included nicotine dependence, alcohol dependence, dependence on drugs (i.e., cannabis, amphetamine, hallucinogen, cocaine, heroin, opioid and inhalant), major depressive episode, dysthymic disorder and anxiety disorders (panic disorder with and without agoraphobia, social anxiety disorder, specific phobia, and generalized anxiety disorder). For all Axis I disorders, diagnoses were made in the past 12 months. Antisocial personality disorder was assessed on a lifetime basis (Grant et al., 2009). The test–retest reliability and validity of AUDADIS-IV measures of past year DSM-IV psychiatric disorders and lifetime antisocial personality disorder range from good to excellent for substance use disorders and fair to good for other disorders (Canino et al., 1999; Chatterji et al., 1997; Grant et al., 2003, 1995; Hasin et al., 1997). Further, the AUDADIS-IV includes assessment of clinically significant distress and impairment after the syndrome is fully characterized (Hasin et al., 2005).

2.3. Statistical analyses

Weighted percentages and their corresponding standard errors were calculated to provide descriptive information about the prevalence of past year psychiatric disorders and lifetime antisocial personality disorder across the 7 age groups. We performed a set of bivariate logistic regressions to yield odds ratios (ORs) and 95% confidence intervals (CIs) characterizing the association between disorders and the 7 age groups (Le Strat and Hoertel, 2011). Odds ratios used younger age group (participants aged 18–24 years) as the reference comparison group.

Next, we used confirmatory factor analysis (CFA) to identify the latent structure underlying individual mental disorders assessed at Wave 1. We built upon the CFA model fit in prior work (Insel et al., 2010; Kendler et al., 2003; Kessler et al., 2011; Kotov et al., 2011; Krueger et al., 2011; Krueger and Markon, 2006; Krueger et al., 2003; Krueger, 1999; Krueger et al., 1998; Vollebergh et al., 2001), including on these data (Eaton et al., 2012; Blanco et al., 2013; Magidson et al., 2014), which generated two broad dimensions of psychopathology: (1) an internalizing dimension defined by two latent factors, i.e., distress (measured by major depression,