Measurement equivalence of the CES-D 8 depression-scale among the ageing population in eleven European countries

Sarah Missinne [a,b,*], Christophe Vandeviver [c,1], Sarah Van de Velde [a,b,2], Piet Bracke [a,2]

[a] HeDeRa (Health and Demographic Research), Department of Sociology, Ghent University, Belgium
[b] Research Foundation (FWO), Flanders, Belgium
[c] Institute for International Research on Criminal Policy, Department of Penal Law and Criminology, Ghent University, Belgium

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ABSTRACT

Depression is one of the most prevalent mental disorders in later life. However, despite considerable research attention, great confusion remains regarding the association between ageing and depression. There is doubt as to whether a depression scale performs identically for different age groups and countries. Although measurement equivalence is a crucial prerequisite for valid comparisons across age groups and countries, it has not been established for the eight-item version of the Centre for Epidemiological Studies Depression Scale (CES-D8). Using multi-group confirmatory factor analysis, we assess configural, metric, and scalar measurement equivalence across two age groups (50–64 years of age and 65 or older) in eleven European countries, employing data from the Survey of Health, Ageing, and Retirement (SHARE). Results indicate that the construct of depression is comparable across age and country groups, allowing the substantive interpretation of correlates and mean levels of depressive symptoms.

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1. Introduction

1.1. Age differences in depression: a methodological note to an unresolved debate

Depression is the most common mental disorder (World Health Organization, 2000), with a high prevalence in almost every society (Baumeister and Harter, 2007; Van de Velde et al., 2010b; Wittchen and Jacobi, 2005). It has been identified as the greatest contributor to burden of disease in the Western World (WHO, 2000). Research on the correlates of depression has established clear associations with socioeconomic position and gender, among other factors. It is well-documented that people in a weaker socioeconomic position (Hollingshead and Redlich, 1958; Lorant et al., 2003) and women (Bebbington, 1996; Piccinelli and Wilkinson, 2000) are at greater risk of suffering from depression. Unlike these well-established associations, there is no consensus on the relationship between depression and age, despite a large number of studies focusing on the elderly population (Beekman et al., 1999; Brault et al., 2012; Jorm, 2000). Some studies have shown an increase linked to age (Castro-Costa et al., 2007; Prince et al., 1999; Stordal et al., 2001, 2003), while others have shown no clear association

* Corresponding author. Address: Korte Meer 5, B-9000 Ghent, Belgium. Fax: + 32 9 264 69 75.
  E-mail addresses: sarah.missinne@ugent.be (S. Missinne), Christophe.Vandeviver@UGent.be (C. Vandeviver), Sarah.VandeVelde@UGent.be (S. Van de Velde), piet.bracke@ugent.be (P. Bracke).
  [1] Address: Universiteitstraat 4, B-9000 Ghent, Belgium. Fax: +32 9 264 69 71.
  [2] Address: Korte Meer 5, B-9000 GHENT, Belgium. Fax: + 32 9 264 69 75.

(Litwin, 2002; Verropoulou and Tsimbos, 2007) or a negative association (Blazer et al., 1991; Jorm, 2000; Jorm et al., 2005; Kessler et al., 2010a,b). Some authors have even argued that the association between age and depression is spurious and that age by itself has no explanatory power (Beekman et al., 1999; Buber and Engelhardt, 2011; Verropoulou and Tsimbos, 2007). In light of the rapidly ageing societies, it is especially important to understand the relationship between age and depression. By 2025, about one-third of Europe's population will be aged 60 or above, with a particularly rapid increase in the number of oldest old citizens (Börsch-Supan and Jürges, 2005). If older people are at a higher risk of suffering from depression, an increasingly large public health issue will come to the fore. The elderly are considered a particular risk group, as getting older is accompanied by important biological, psychological, and social changes (Brault et al., 2012). In later life, people are confronted with a higher number of risk factors for depression, including bereavement, cognitive decline (Cole, 2003), poor physical health, disability (Braam et al., 2005; Lenze et al., 2001), poverty (Ploubidis et al., 2012), widowhood, and living alone (Hughes and Waite, 2002).

A promising approach to examine the relationship between age and depressive symptoms is by making cross-national comparisons, as these can provide insights into the aetiology of health and the macro-level influences on it (Beekman et al., 1999; Ploubidis et al., 2012). Studies have shown that national characteristics are relevant to explain cross-national variations in mental health among the general population (Levecque et al., 2011; Seedat et al., 2009; Van de Velde et al., 2012), often relating the individual distribution of health risks to the level of economic development, type of welfare system, social political situation, and health care systems (Bambra and Eikemo, 2009; Eikemo et al., 2008; Levecque et al., 2011; Seedat et al., 2009). A meta-analysis of available community-based single country research has shown a wide variance in prevalence rates across the world, ranging from less than one percent to more than half of the elderly population suffering from depression (Barua et al., 2011). Unfortunately, cross-national comparable research covering a multitude of countries is not widely available. However, in Europe, two large-scale projects have aimed to fill this gap. First, the EURODEP consortium aimed to harmonize data on late-life depression in 11 European centers and developed the EURO-D scale to this end (Copeland et al., 1999, 2004; Prince et al., 1999). Second, the ongoing Survey of Health Ageing and Retirement (SHARE) covers the elderly population in eleven European countries.[3] This project is especially designed for making cross-national comparisons (Börsch-Supan and Jürges, 2005) and provides a large number of respondents in age categories that are often underrepresented in large international research projects. Both the EURO-D scale and the CES-D8 depression scale are incorporated in the SHARE questionnaires. The latter is a shortened 8-item version of the commonly used Center for Epidemiologic Studies Depression Scale (CES-D) and is focused on in this paper. In its original version, the CES-D scale consists of 20 self-reported items to identify populations at risk of developing depression. This quick self-test measures the frequency and severity of certain depressive symptoms, as defined in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-V) criteria for major depressive disorders (Radloff, 1977).

A prerequisite for substantive and valid cross-national comparisons is the establishment of measurement equivalence of the depression scale. In other words, it is necessary to ensure that the same concept is being interpreted identically in the different countries (Billiet, 2003; Rensvold, 1998; Van de Vijver and Leung, 1997). It is common practice to compare means of depression scales across groups or countries, but this can only be done directly if scalar equivalence has first been established (Meredith, 1993; Steenkamp and Baumgartner, 1998; Steinmetz, 2011; Van de Vijver, 2011; Van de Vijver and Tanzer, 2004). The psychometric properties of the EURO-D scale have been found to be satisfactory for the elderly population in the different centers of the EURODEP sample (Prince et al., 1999, 2004) and for the different countries in the SHARE project (Castro-costa et al., 2007, 2008; Ploubidis and Grundy, 2009). Except for Ploubidis and Grundy (2009) for the EURO-D, no distinction has been made across age groups in the different countries. Likewise, research on the validity of the CES-D8 has not examined measurement invariance across age groups. Although (cross-cultural) research on the 20-item version of the CES-D scale is abundant, studies employing the shortened 8-item version (CES-D8) are scarce. In the United States, it has only been included in the questionnaires of the Health and Retirement Study (HRS) and the Ageing and Health Dynamics (AHEAD) study (Steffick, 2000). However, the CES-D8 scale has only been subjected to explorative techniques to identify the best factorial structure. By means of principal component analysis two factors were retrieved, a 'depressed mood' factor (five items: felt depressed, was happy, felt lonely, enjoyed life, and felt sad) and a 'somatic complaints' factor (three items: everything was an effort, restless sleep, and could not get going). In Europe, the CES-D8 scale was included in the European Social Survey, and it has been used to assess depression across the general population (Huijts et al., 2011; Levecque et al., 2011; Missinne and Bracke, 2012; Van de Velde et al., 2010a; von dem Knesebeck et al., 2011). Its validity has been confirmed by Van de Velde et al. (2010b), who established partial scalar invariance across gender in the general population of 25 countries included in the dataset. The authors identified that a one-dimensional model with correlated errors of the reverse-worded items ('was happy' and 'enjoyed life') fits the data best.

This study also did not distinguish between age groups. There are reasons to suggest that depression scales such as the EURO-D and the CES-D8 do not perform identically for different age groups. A major concern relates to the bias that can occur due to items that measure somatic manifestations of depression (e.g., fatigue, poor sleep, listlessness) (Hertzog et al., 1990). Because health deteriorates with age, it is possible that increased levels of depression actually reflect comorbid physical illness (Beekman et al., 1999; Bolla-Wilson and Bleecker, 1989; Mirowsky and Ross, 2003). On the other hand, empirical research has suggested that this concern is not warranted for the measurement instrument that will be assessed here: the

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[3] The later waves of the SHARE include more countries, but do not incorporate the CES-D8 scale.