Journal of Affective Disorders 201 (2016) 171–178

Contents lists available at ScienceDirect

Journal of Affective Disorders

journal homepage: www.elsevier.com/locate/jad

Late-life depression symptom dimensions and cognitive functioning in the Longitudinal Aging Study Amsterdam (LASA)

Anamaria Brailean [a,*], Hannie C. Comijs [b], Marja J. Aartsen [c], Martin Prince [a], A. Matthew Prina [a], Aartjan Beekman [b], Martijn Huisman [d,e]

[a] King's College London, Institute of Psychiatry, Psychology and Neuroscience, Department of Health Service and Population Research, Centre for Global Mental Health, London, UK
[b] VU University Medical Centre, Department of Psychiatry and the EMGO Institute for Health and Care Research, Amsterdam, the Netherlands
[c] NOVA - Norwegian Social Research, Center for Welfare and Labor Research, Oslo, Norway
[d] VU University, Department of Sociology, Amsterdam, the Netherlands
[e] VU University Medical Center, Department of Epidemiology and Biostatistics and the EMGO Institute for Health and Care Research, Department of Sociology, Amsterdam, the Netherlands

ARTICLE INFO

Article history:
Received 8 February 2016
Accepted 18 May 2016
Available online 19 May 2016

Keywords:
Late-life depression
Depression symptom dimensions
Cognitive aging
Cognitive abilities
Differential item functioning

ABSTRACT

Background: Depression often co-occurs in late-life in the context of declining cognitive functions, but it is not clear whether specific depression symptom dimensions are differentially associated with cognitive abilities.
Methods: The study sample comprised 3107 community-dwelling older adults from the Longitudinal Aging Study Amsterdam (LASA). We applied a Multiple Indicators Multiple Causes (MIMIC) model to examine the association between cognitive abilities and latent dimensions of the Center for Epidemiologic Studies Depression Scale (CES-D), while accounting for differential item functioning (DIF) due to age, gender and cognitive function levels.
Results: A factor structure consisting of somatic symptoms, positive affect, depressed affect, and interpersonal difficulties fitted the data well. Higher levels of inductive reasoning were significantly associated with lower levels of depressed affect and somatic symptoms, whereas faster processing speed was significantly associated with lower levels of somatic symptoms. DIF due to age and gender was found, but the magnitude of the effects was small and did not alter substantive conclusions.
Limitations: Due to the cross-sectional context of this investigation, the direction of influence between depression symptom levels and cognitive function levels cannot be established. Furthermore, findings are relevant to non-clinical populations, and they do not clarify whether certain DIF effects may be found only at high or low levels of depression.
Conclusions: Our findings suggest differential associations between late-life depression dimensions and cognitive abilities in old age, and point towards potential etiological mechanisms that may underline these associations. These findings carry implications for the prognosis of cognitive outcomes in depressed older adults.

1. Introduction

According to the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision, depression is a multi-dimensional construct consisting of depressed affect (i.e., dysphoria), low positive affect (i.e., anhedonia), and somatic symptoms (American Psychiatric Association, 2000). Compared to their younger counterparts, older adults have a lower prevalence of Major Depressive Disorder (Kessler et al., 2010), but a higher prevalence of subsyndromal depression (Meeks et al., 2011). Also, older adults express lower levels of depressed affect (e.g., feeling

Abbreviations: CES-D, Center for Epidemiologic Studies Depression Scale; CFA, Confirmatory Factor Analysis; CFI, Comparative Fit Index; DIF, Differential Item Functioning; DSM, Diagnostic and Statistical Manual of Mental Disorders; GDS, Geriatric Depression Scale; LASA, Longitudinal Aging Study Amsterdam; MDD, Major Depressive Disorder; MIMIC, Multiple Indicators Multiple Causes; RCPM, Raven Colored Progressive Matrices; RMSEA, Root Mean Square Error of Approximation; TLI, Tucker Lewis Index; WLSMV, Weighted Least Squares Mean and Variance-Adjusted

* Correspondence to: King's College London, Institute of Psychiatry, Psychology and Neuroscience, David Goldberg Center, De Crespigny Park, London SE5 8AF, UK.
E-mail address: brailean.anamaria@gmail.com (A. Brailean).

http://dx.doi.org/10.1016/j.jad.2016.05.027

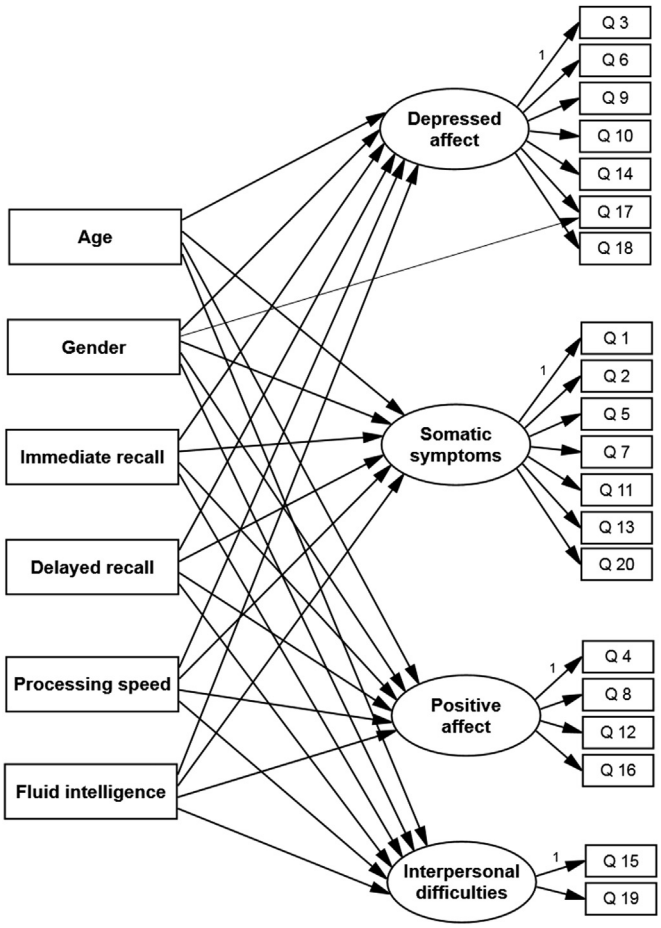

Fig. 1. MIMIC model showing the impact of age, gender and cognitive abilities on the CES-D measurement model with four factors. Due to space constraints, residual variances are not presented in the figure. Also, only one example of direct effect is illustrated, indicating gender differences in the probability of endorsing the CES-D item 17 (crying spells).

sad), but more pronounced somatic symptoms (e.g., fatigue, sleep disturbance, loss of appetite) and motivational symptoms (e.g., lack of interest or enjoyment) (Gallo et al., 1997; Hegeman et al., 2012a, 2012b). Studies conducted in older adults suggest a differential association between specific late-life depression dimensions (e.g., depressed affect, positive affect, somatic and motivational symptoms) and various health outcomes, such as brain function (Kirton et al., 2014), functional disability and distress (Gallo et al., 1997), mortality (Blazer and Hybels, 2004; Gallo et al., 1997; John and Montgomery, 2009), cognitive impairment and decline (e.g., Baune et al., 2007; Castro-Costa et al., 2007; Turner et al., 2015), and incident dementia (Lugtenburg et al., 2016). A dimensional approach of depression could help clarify how different symptom presentations relate to various aging-related health outcomes and what etiological mechanisms may underlie these associations.

Although extensive evidence suggests that late-life depression co-occurs with impairment and decline in cognitive abilities such as memory, executive function, processing speed, and visuo-spatial abilities (e.g., Baudic et al., 2004; Comijs et al., 2001; Lockwood et al., 2002; Sheline et al., 2006), it is not clear whether the nature and severity of cognitive impairment differs among persons with specific symptom presentations. Existing reports suggest that motivational and somatic symptoms may be more strongly associated with vascular and degenerative processes (Naarding et al., 2005), as well as with cognitive impairment and Alzheimer Disease (Bartolini et al., 2005; Berger et al., 1999; Gallo et al., 1997; Kumar et al., 2006; Potvin et al., 2010), compared to mood symptoms. Ageing-related dysfunctions in fronto-striatal structures and cerebrovascular disease have been postulated as possible mechanisms underlying the co-occurrence of executive dysfunction and motivational symptoms of depression (Alexopoulos, 2001). Instead, dysphoric symptoms may manifest as a psychological reaction to perceived cognitive decline in the early stages of impairment when older adults are aware of their cognitive dysfunctions. Low positive affect could also affect cognitive functioning by influencing dopamine levels (Ashby et al., 1999), cardiovascular risk (Davidson et al., 2010), and the attention scope (Fredrickson, 2001). The pattern of associations between specific depression dimensions and cognitive functioning and the neurobiological and psychological mechanisms that may underlie these associations are poorly understood. This is partly due to the scarcity of studies that employed a dimensional approach to depression, and partly due to methodological differences such as the assessment of depression symptom dimensions based on factor analytic studies of different depression scales, and the inclusion of clinically depressed patients or community-dwelling older adults.

Cross-sectional studies conducted in non-clinical populations using the Center for Epidemiologic Studies Depression Scale (CES-D) (Radloff, 1977) suggest that: lower levels of depressed affect and somatic symptoms were related to better performance on tasks assessing speed, attention and executive function, whereas higher levels of positive affect were related to poorer verbal fluency performance (Baune et al., 2007); higher levels of positive affect (but not lower levels of depressed affect, somatic symptoms or interpersonal difficulties) were related to better everyday problem solving (Paterson et al., 2015); positive affect was the most robust predictor of cognitive performance across a variety of tasks assessing memory, processing speed, verbal fluency, visual retention, temporal orientation, and global cognition (La Rue et al., 1995). Studies using the Euro-D depression scale (Prince et al., 1999) found that verbal fluency performance was more strongly associated with motivational symptoms of depression than with affective suffering symptoms (Brailean et al.; Castro-Costa et al., 2007). Cross-sectional studies conducted in persons with MDD suggest that greater levels of apathy on the Hamilton Psychiatric Rating Scale for Depression (Williams, 1988) were associated with lower executive function and processing speed performance (Feil et al., 2003); greater levels of motivational symptoms on the Inventory of Depressive Symptomatology (Rush et al., 1996) were associated with poorer episodic memory and processing speed, whereas greater levels of mood symptoms were associated with poorer working memory and processing speed (Korten et al., 2014). A longitudinal study by Turner et al. (2015) suggests that lower levels of positive affect on the CES-D scale predicted decline in global cognition, episodic memory, and perceptual speed, whereas higher levels of anhedonic symptoms on the Geriatric Depression Scale (GDS) (Yesavage et al., 1982) predicted steeper decline in episodic memory, and higher levels of negative affect on the GDS predicted steeper decline in global cognition, as well as in episodic, semantic, and working memory.

Cognitive function levels may influence not only the severity of depressive symptoms, but also the type of symptoms reported. Given similar levels of depression severity, persons with poor cognitive functioning may be more likely to endorse certain items (e.g., concentration difficulties) than persons with normal cognitive functioning. Previous studies suggest that cognitive status may be related to response bias to several items assessing depression (Fieo et al., 2015; Mast, 2005). If items from depression scales measure different constructs in persons with low versus high cognitive functioning, measurement bias can impact on conclusions about the association between late-life depression and cognitive ageing; hence, the influence of measurement bias should be accounted for. In light of previous findings, it is also important