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RESEARCH ARTICLE

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Loneliness and social support: Differential predictive power on depression and satisfaction in senior citizens

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Abstract

The lack of social support and the feelings of loneliness among older adults are associated with physical and mental health negative outcomes. This study attempts to test for their differential predictive power on depression and satisfaction in seniors. Data were drawn from a sample of 335 older adults ranging from 55 to 80 years old, with a mean age of 63.97 years (standard deviation = 5.56) attending a learning program at the University of Valencia during the academic year 2014–2015. In addition to health and wellbeing outcomes, we used the Functional Social Support Questionnaire DUKE-UNC, and two scales of loneliness, the de Jong Gierveld Loneliness Scale and the University of California Loneliness Scale version 3. Using structural equations models with Mplus, two models were proposed to assess the predictive power of social support and loneliness on wellbeing outcomes, specifically life satisfaction and depression, while controlling for health. Results confirm the negative association between loneliness and satisfaction with life and the positive one with depression.

KEYWORDS
loneliness, old people, quality of life, social support, structural models

1 | INTRODUCTION

Loneliness among older people is related to mental and physical health and wellbeing, and will influence both the needs for health services and care and the need for social support among the elderly. In short, loneliness has been

recognized as an important and serious public health problem (Hawkley & Cacioppo, 2010). A variety of studies have shown that feelings of loneliness on older people are associated to various aspects of physical and mental health, such as lower reported wellbeing (Mellor, Stokes, Firth, Hayashi, & Cummins, 2008), depressive symptoms (Cacioppo, Hawkley, & Thisted, 2010), sleeping disorders (Hawkley, Thisted, Masi, & Cacioppo, 2010), reduction of physical activity (Hawkley, Thisted, & Cacioppo, 2009), and increased risk of developing dementia and Alzheimer's disease (Hawkley & Cacioppo, 2010; O' Luanaigh & Lawlor, 2008; Wilson et al., 2007). Loneliness is also associated with social isolation (being alone), but it is not synonymous to it, rather loneliness is a subjective experience.

In addition, many researchers agree that the feelings of loneliness and social isolation predict an increase in the morbimortality (Patterson & Veenstra, 2010; Shiovitz-Ezra & Ayalon, 2010; Tilvis, Laitala, Routasalo, & Pitkälä, 2011). This happens because the effects of loneliness accumulate as the years pass by and it speeds the physiological aging (Hawkley & Cacioppo, 2010). When combined with depression, loneliness seems to increase the mortality rates of old people (O'Luanaigh & Lawlor, 2008). In a 10-year follow-up of 75-, 80-, and 85-year-old citizens of Helsinki, both cognitive decline and mortality were doubled among people feeling lonely.

Many investigations point out that social factors have the greatest influence on feelings of loneliness. High levels of loneliness have been associated to living alone (Routasalo, Savikko, Tilvis, Strandberg, & Pitkälä, 2006), little contact (or absence of contact) with friends and family (Bondevik & Skogstad, 1998; Hawkley, Browne, & Cacioppo, 2005), lower levels of satisfaction with life circumstances (Hector-Taylor & Adams, 1996), small social networks (Hawkley et al., 2005), absence of a confident person in the social network (Hawkley et al., 2008), low quality of the social relationships (Routasalo et al., 2006), and being a widow, widower or being divorced (Dugan & Kivett, 1994; Samuelsson, Andersson, & Hagberg, 1998).

There are no firm conclusions about the relationship between age and loneliness. Some studies show a higher prevalence of loneliness in old adults, particularly those of advanced age (Dykstra, 2009; Dykstra, van Tilburg, & de Jong Gierveld, 2005). However, a meta-analysis found the effect of age on loneliness was only significant in the oldest age group (80+; Pinquart & Sörensen, 2001). Many studies support that the process of aging is full of changes which result from the stressful events common in this phase of life (Nicolaisen & Thorsen, 2014). From the role losses associated with retirement, kids' emancipation, and the death of their partners, to changes caused by health and functional declines as well as the emotional impact of losing their peers, all contribute for the older people to have more limited social networks when compared to younger people. These social losses contribute to making older people more vulnerable to loneliness, but luckily, some authors have recognized the ability of old adults to adapt themselves to this new social reality, for example, using the coping strategies described by M. M. Baltes and Cartensen (1996). With these strategies, the older people who count with reduced social networks and few social activities may not feel lonely, or at least they might be able to reduce their feelings of loneliness (P. B. Baltes & Baltes, 1990). On the other hand, as people grow older they increase the importance of emotional bonds. When one gets older, you may feel running out of time and the fact of having many social contacts is perceived as something superficial; they prefer deepening the bonds with the closer contacts and trying to achieve the emotionally significant goals (Carstensen, Isaacowitz, & Charles, 1999). Therefore, in old age, a decrease in the size of the social network may not be synonymous to loneliness.

The effects of loneliness on wellbeing have been less studied than the effects of social support (Golden et al., 2009). A recent study in Spain found social support, especially emotional support, as a protector against feelings of loneliness in the general population. Moreover, the association between perceived social support and loneliness affects wellbeing: the lonelier a person feels, the less wellbeing he/she has (Hombrados-Mendieta, García-Martín, & Gómez-Jacinto, 2013).

Furthermore, the association between gender and loneliness is inconclusive. Some studies report that women are consistently more likely to report being lonely than men (Jylhä, 2004; Victor & Yang, 2012), but other authors have not found gender differences (Pinquart & Sörensen, 2003). Studies using the de Jong Gierveld dimensions of loneliness found men being less emotionally lonely, but more socially lonely than women (de Jong Gierveld & van Tilburg, 2010; Dykstra & de Jong Gierveld, 2004). Steed, Boldy, Grenade, and Iredell (2007) found gender

differences regarding social networks and loneliness only when loneliness was measured by the De Jong Gierveld Loneliness Scale (DJGLS).

Regardless of the measure of loneliness used, marital status and living arrangements are consistently found to be correlated with loneliness. Those who are married or living with someone are less likely to be lonely than those who live alone (Nicolaisen & Thorsen, 2012; Pinquart & Sörensen, 2003).

As people approach advanced age, various changes and events become more likely: deteriorating health and functional capacity, more limited networks and the loss of a partner become more prevalent. Being in poor health is also associated with loneliness: first, being in poor health predicts loneliness (Cohen-Mansfield, Shmotkin, & Goldberg, 2009) and loneliness predicts poor health (Luo, Hawkley, Waite, & Cacioppo, 2012; Nummela, Seppänen, & Uutela, 2011). Several studies have identified loneliness as the mediator variable between social support and wellbeing (Kong & You, 2013). Other researchers have found evidence that social support diminishes loneliness and has direct and indirect effects on wellbeing (Gencöz & Ozlale, 2004). There is abundant empirical evidence on the effects of social support on wellbeing, but very few studies have examined social support, loneliness, and wellbeing from a multidimensional perspective. Hombrados-Mendieta et al. (2013) analyzed these variables on the general population, they found a negative association of social support and wellbeing and loneliness. These data also showed that lack of emotional support appears as a main predictor of loneliness.

Loneliness studies have used different direct and indirect instruments for its measurement. There are few previous studies using different measures of loneliness on older people in the same survey and comparing the results. In Australia, Victor, Grenade, and Boldy (2005) compared the results of two approaches to measuring loneliness: a direct question of loneliness and DJGLS. Some years after, Steed et al. (2007) added to this comparison to the University of California (UCLA) Loneliness Scale. Shiovitz-Ezra and Ayalon (2012) explored the degree of concordance between a single direct question of loneliness and the UCLA Loneliness Scale and investigated whether the same people were classified as lonely by each approach. Many of the respondents (57%) who reported being lonely on the direct item were classified as not lonely with the scales.

In the Spanish context, Velarde-Mayol, Fraga-Gil, and García-de-Cecilia (2015) measured feelings of loneliness and associated variables in two samples of people 65 years old or older, one sample comprised people who were living alone while in the other sample they lived with others. They found women had a 2.5 greater probability of living alone than men. When feelings of loneliness were studied, they found the majority of those living alone scored as clinically lonely in the UCLA Loneliness Scale, they were above the cut-off criterion indicative of moderate to severe degrees of loneliness.

Lack of social support and loneliness cause a negative impact on physical and mental health (O'Luanaigh & Lawlor, 2008). Thus, it is necessary to evaluate both constructs in older populations. This study has used the Functional Social Support Questionnaire DUKE-UNC, and two scales of loneliness, the DJGLS and the University of California Loneliness Scale version 3 (UCLA-3) with the aim of testing their differential predictive power on depression and satisfaction in seniors.

2 | MATERIALS AND METHODS

2.1 | Sample and procedure

Data were drawn from the second wave of longitudinal survey research. It consists of a panel design of older adults attending University of Valencia Lifelong Learning programs during the academic year 2014–2015. University Ethics Committee gave its approval and all those attending the program were asked to give their informed consent. Only those participants providing their consent were invited to answer the survey. They answered the survey in their classroom setting, in the presence of trained interviewers, with a response rate of 77%. The sample consisted of 335 people ranging from 55 to 80 years old, with a mean age of 63.97 years (standard deviation = 5.56) and 67.5% were women. More frequent marital status was married (72.3%), followed by 10.1% of divorced, 9.1% of

widows or widowers, and 8.5% of singles. About 54.3% of the sample declared not being informal caregivers, 12.7% do these tasks several times in a year, 10.6% in a month, 8.6% in a week, and 13.9% do daily caregiving. For the overall sample, the average number of sons or daughters was 2, the same number as grandsons and granddaughters, who ranged up to 10. The most usual situation for respondents is not having any alive parents (63.4%), although 31.7% still have one, or even both of them (3.5%). Most of them were retired (75.1%), some declared being unemployed (11.1%), 6.9% were currently working, others (mostly housekeepers) was 5.2%, and living with a disability pension were 1.7%.

2.2 | Instruments

The questionnaire comprised two sections: questions requesting demographic information (age, gender, and marital status are considered); and scales to assess personality dimensions, attitudes, perceptions, and behaviors related to the aging process. This research deals with life satisfaction, depression, perceived health, social support, and loneliness.

Life satisfaction was assessed using the Satisfaction with Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985). Subjective wellbeing is defined by Diener, Suh, and Oishi (1997) as judging life positively and feeling good. SWLS has five items with a 5-point Likert response scale and an internal consistency measured by the alpha of 0.91. The Spanish version was translated and adapted by Atienza, Pons, Balaguer, and García-Merita (2000).

Depression symptoms were measured by the Center for Epidemiologic Studies Depression Scale (CES-D), which was originally developed by Radloff (1977) with 20 items. It was used in its short version validated for the Spanish-speaking context (Herrero & Gracia, 2007). It consists of seven items (symptoms) with a scoring method ranging from 0 ("Less than 1 day per week") to 3 ("5–7 days per week"), with internal consistency (alpha) of 0.83.

Perceived health was measured with an overall health indicator from the SF-8 (Ware & Kosinski, 2001): "In general, how do you assess your health during the last month?" It has a Likert-type item response scale ranging from 1 ("very bad") to 5 ("Very good").

Social Support was measured with the Spanish adaptation of the Functional Social Support Questionnaire DUKE-UNC by Bellón, Delgado, Luna, and Lardelli (1996). Originally created by Broadhead, Gehlbach, Degruy, and Kaplan (1988), this scale has 11 items with a 5-point Likert rating from 1 ("Much less than I would like") to 5 ("As much as I would like"). Cronbach's alpha was 0.92. This questionnaire measures the degree of perceived social support.

Finally, to assess loneliness, we used two scales: the UCLA-3 (Russell, 1996) and the DJGLS. UCLA-3 includes 20 items with scale response ranging from 0 ("Never") to 3 ("Always"). By the time we started our investigation, there was no adapted version of the UCLA-3 to be used in the Spanish population. Thus, the scale was backtranslated following the guidelines recommended by the International Test Commission (van de Vijver & Hambleton, 1996). Alpha in this sample was 0.89. The DJGLS (de Jong Gierveld & Kamphuis, 1985) is a well-known scale used in international research (van Tilburg, Havens, & de Jong Gierveld, 2004) and it is composed of 11 items. Although the original scale had three categories of response ("Yes", "More or less", and "No"), authors recommended to collapse them into "Yes" and "More or less" ("More or less" plus "No") for negatively worded items and categories "No" and "More or less" ("More or less" and "Yes") for positively worded items. The Spanish version of the scale recently translated and adapted by Buz, Urchaga, and Polo (2014) was used. Alpha estimate for this sample was 0.74.

2.3 | Statistical analyses

Structural equation models to predict outcomes were both specified and estimated in Mplus 8.2 (Los Angeles, CA) (Muthén & Muthén, 2007). Missing data were handled with Full Information Maximum Likelihood procedures. Weighted least square mean and variance corrected method of estimation was used to overcome the non-normality and ordinal nature of the observed variables. Model overall fit was assessed with the χ^2, the robust comparative fit index (CFI), and the robust root mean square error of approximation (RMSEA). As approximate criteria to evaluate

TABLE 1 Means, standard deviations, asymmetries, kurtosis, and correlations among the constructs in the model

	Mean	*SD*	As	Ku	SS	DJGLS	UCLA	Health	LS
Social support	4.04	0.81	−1.16	1.02	1				
Loneliness DJGLS	0.48	0.37	0.94	0.44	−0.667*	1			
Loneliness UCLA	0.85	0.43	0.40	−0.47	−0.644*	0.680*	1		
Health	3.91	0.79	−0.68	0.82	0.189*	−0.176*	−0.201*	1	
Life satisfaction	3.69	0.84	−0.48	0.19	0.457*	−0.371*	−0.465*	0.324*	1
Depression	1.70	0.82	1.31	0.98	−0.249*	0.309*	0.303*	−0.338*	−0.381*

Notes. As: asymmetry; DJGLS: de Jong Gierveld Loneliness Scale; Ku: kurtosis; LS: life satisfaction; *SD*; standard deviation; SS: social support; UCLA; University of California Loneliness Scale.
*$p < 0.001$.

a good fit, we set a CFI above 0.90 (better fit above 0.95) and RMSEA below 0.08 (Marsh, Hau, & Wen, 2004). Regarding the plausibility of each model, the magnitude and interpretability of the parameter estimates and the absence of meaningful modification indices were also considered as an indication of acceptable fit. Reliability (internal consistency) of the scales was estimated using coefficient alpha calculated in SPSS 21 (IBM Corp. Released 2013, IBM SPSS Statistics for Windows, Version 21.0. Armonk, NY).

3 | RESULTS

3.1 | Descriptive statistics

Table 1 shows means, standard deviations, asymmetries, and kurtosis of the observed variables included in the structural models. Table 1 also offers the correlations among these variables.

3.2 | Structural models predicting depression and satisfaction with life

Two structural equation models with latent variables were proposed and tested to provide evidence in lifelong Spanish learners' context about what affect their successful aging. These structural models propose that social support and loneliness significantly predict two markers of successful aging, one positive (life satisfaction) and one negative (depression). Age, gender, marital status, and perceived health were statistically controlled for. Results from these two structural equation models (named A and B) are shown in Figure 1.

Model A provides parameter estimates of the impact of social support and loneliness (DJGLS) on life satisfaction and depression, and also the effects of the variables controlled for. Therefore, it offers evidence on the different predictive power of social support and loneliness on life satisfaction and depression. Model B was very similar to model A, but loneliness was measured with the UCLA-3 instead of being measured with the DJGLS. Therefore, Model B offers evidence on the different predictive power of social support and loneliness on life satisfaction and depression, but using UCLA-3 as the measure of loneliness. Model B also has another difference: given the UCLA-3 had too many (20) items and the sample size is not extremely large, 10 item parcels were made and included in the model to measure loneliness. In item parceling, items or questions posed to the participants are grouped to form "packages" of information, and then they are treated like a directly observed variable. Item parceling offers parsimony with respect to the sample size, and it has been recommended in structural equation modeling (Little, Rhemtulla, Gibson, & Schoemann, 2013) when dealing with lengthy scales or small samples (Yang, Nay, & Hoyle, 2010). Monte Carlo studies have also proved the efficiency of item parceling (Nasser & Wisenbaker, 2003). When unidimensionality is warranted, almost any way to group the items into parcels produces adequate results (Bandalos & Finney, 2001). In this particular research, adjacent pairs' method has been used.

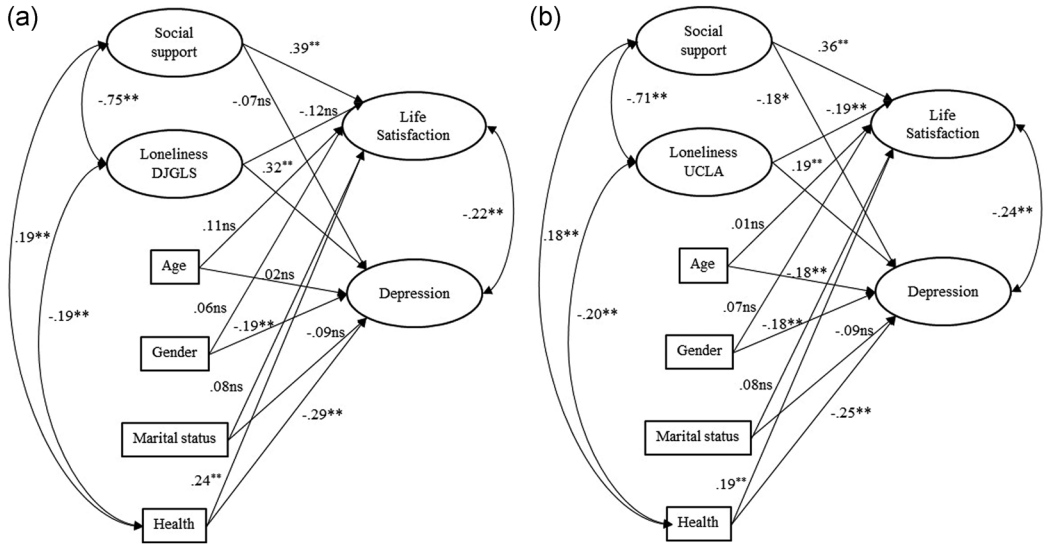

FIGURE 1 Model (A) using DJGLS for loneliness measurement. Model (B) using UCLA-3 for loneliness measurement. Final structural models to predict life satisfaction and depression. *Note.* For the sake of clarity observed indicators of latent variables and error terms not shown

Goodness-of-fit indexes showed that both models were good representations of observed data. Goodness-of-fit indices for model A were very good (χ^2 [649] = 1153.27, $p < 0.001$, RMSEA = 0.051 [90% CI 0.046–0.055], CFI = 0.969). Regarding to the factor loadings relating the latent variables with their indicators, all of them were statistically significant and large, ranging from: 0.54–0.94 for social support, 0.56–0.87 for loneliness (DJGLS), 0.76–0.95 for life satisfaction, and 0.34–0.96 for depression. The model found an effect of loneliness and social support on successful aging indicators (depression and life satisfaction). Social support had a large effect on life satisfaction, but a nonsignificant effect on depression. On the contrary, loneliness (DJGLS) was a significant predictor of depression, but not of life satisfaction. These results showed that social support and loneliness may differently affect several outcomes of successful aging, even when several sociodemographic variables and health status were controlled for. The amount of variance explained in both outcomes may be considered large ($R^2 = 0.38$ for life satisfaction and $R^2 = 0.32$ for depression).

Model B also fitted the data very well ($\chi^2(614) = 1061.74$, $p < 0.001$, RMSEA = 0.048 [90% CI 0.043–0.053], CFI = 0.967). Factor loadings for all the latent variables were adequate with ranges from: 0.56–0.94 for social support; 0.58–0.77 for loneliness (UCLA-3); 0.84–0.96 for life satisfaction; and 0.33–0.96 for depression. Among the effects, the main ones parallel the ones in model A. In model B, social support had a positive and large effect on life satisfaction and a negative and smaller one on depression. On the other hand, loneliness (UCLA-3) had a negative and significant effect on life satisfaction and a positive one on depression. Overall, model B had similar effects as the R^2 for life satisfaction was 0.36 and the R^2 for depression was 0.30. Social support again had a large impact on life satisfaction, but a lower (but significant) effect on depression. UCLA-3 significantly predicted life satisfaction (negatively) and depression.

4 | CONCLUSIONS AND DISCUSSION

Previous studies have pointed out that, although depression and subjective wellbeing are related to loneliness and to social support, the direction of its association is not clear (Adams, Sanders, & Auth, 2004). Studies, as this one, try to deepen in this association.

In an investigation conducted by Penning, Liu, and Chou (2014), the DJGLS and the UCLA-R (a previous version of the UCLA-3) were used to compare the results of loneliness assessed by different instruments. The results of this study suggested that DJGLS is more appropriate to measure loneliness in samples composed of middle age and older adults because it posed fewer problems than the UCLA-R. The authors' critiques about the UCLA-R refer to the problematic nature of some specific items, such as item 4, which presented a weak fit to the other items; the susceptibility of the scale to the method's effects associated to the way the items were written; and the inadequacy of the unidimensional model. By contrast, these problems were less evident in the DJGLS. Our own results point out that both scales of loneliness have differential predictive power on the outcomes. Although both scales had a positive effect on life satisfaction, the effect was slightly larger for the UCLA-3 than it was for the DJGLS. On the contrary, the negative effect of the DJGLS was larger on depression than it was the effect of the UCLA-R. Therefore, both scales are not interchangeable.

The results from our study confirm previous findings regarding the negative association between loneliness and satisfaction with life in Spanish elderly populations. The same association was found in the studies conducted by Buz and Perez-Arrechaederra (2014) and by Buz, Urchaga et al. (2014), in which loneliness was also measured with the DJGLS and satisfaction with life with Diener's SWLS.

The data obtained from our analysis indicate that loneliness (measured with the DJGLS) was a significant predictor of depression in this elderly sample. Likewise, another investigation with community-dwelling Spanish older adults also reported moderate to high positive associations between loneliness and depression (Buz & Perez-Arrechaederra, 2014). Other negative associations found in the same research were between loneliness and functional status; social network size; and satisfaction with the nuclear family relationships. The highest ratings for loneliness were found in women, non-married people, older adults who lived alone, the ones with poor perceived health, and those who do not participate in social activities, like going to bars.

According to Buz, Urchaga et al. (2014), the Spanish people are marked by a collectivist culture, which influences the way Spanish old people perceive the experience of feeling lonely. The feelings of loneliness in Spain are based especially in the emotions resulted from the lack of people emotionally attached to them. Older Spanish people have a great expectation regarding the support received from their families, and then the perception of lack of care and the availability of their loved ones would have a more negative effect on loneliness when compared to what happens in more individualist cultures (Sánchez-Rodríguez, de Jong Gierveld, & Buz, 2012). In those countries, loneliness results especially from the lack of a broad and diverse social network. In contrast, in Spain, the basic elements for feeling lonely are the perception of abandonment and the lack of close friends and family.

In summary, the present study provides useful evidence to deepen our understanding of the relationship between these variables. This is the first time both of the most used scales of loneliness (DJGLS and UCLA-3) undergo an exhaustive comparison about their functioning, paying special attention to their differential predictive power on positive and negative outcomes for old people's wellbeing. Based on our results, some future lines of research in this arena may be foreseen: (a) To gather evidence on the differential predictive power of different scales measuring loneliness, and deepening the understanding of what specificities of these scales lead to this differential predictive power; (b) To study the association among different sources of social support as well as specific sources of support (emotional vs. instrumental) across different cultures, for example individualistic versus collectivist cultures; and (c) To use longitudinal data to better understand the causal sequence among social support, loneliness feelings and positive versus negative outcomes in aging (e.g., wellbeing and depression).

4.1 | Implications of the findings

The findings of this study may also have several implications. In the academic, the need to better understand the mechanisms that lead to better aging, that are related by social factors, such as social support, but that may be modulated by more "internal" or affective states of the individual. It also has implications for policymaking. Social intervention programs should be developed to promote social support and positive relationships, and analyze

existing community support resources, but should also carefully attend emotional states such as a feeling of loneliness for its important negative consequences.

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