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Emotional Intelligence in Older Adults: Psychometric Properties of Trait Meta Mood Scale

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ABSTRACT

Nowadays, ageing in a healthy way is one of the greatest challenges of our era. The management of emotions is a powerful predictor of psychological well-being and health during all periods of life. However, to date, such evidence cannot be extended accurately to the older adult population since young adults have been the primary target of valid and reliable measures. Therefore the aim of this article is to analyse the validity and reliability of the Trait Meta Mood Scale (TMMS) in a sample of middle-aged and older adults, and its relation to personality traits and subjective well-being. Findings show that the TMMS represents a useful tool in examining social and psychological adjustment of older adults. The TMMS-22 will allow the analysis of emotional regulation development, explaining differences in psychosocial adaptation and perceived emotional competence. Finally, a TMMS for the older adult population is a complementary resource to the ability measures of EI and encourages increasing awareness of emotional abilities and self-evaluation in an individual.

Keywords: Perceived Emotional Intelligence, Older Adults, Psychometric Properties.

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Introduction

Healthy emotional ageing is characterized by an overall enhancement of emotional experience across the life span, and as part of human growth (Hirst, 2015; Reed & Carstensen, 2012). However, cognitive function and health tend to decline as people get older but emotional well-being does not appear to be compromised by the natural ageing process (Charles & Carstensen, 2013; McAuley, Mullen, & Hillman, 2013). Emotions play an essential role in personal motivation, social interactions (Gratch & Marsella, 2013), decision-making, behavior and quality of life (English & Carstensen, 2014) in general and especially in ageing, where older people must cope with different physical, social and personal challenges related to the ageing process (Bernarás, Garaigordobil, & Las Cuevas, 2011; Hogan & Warren, 2012). The study of emotions is necessary to understand developmental trajectories throughout the lifespan (Álvarez-Bermejo et al., 2013; Lynchard & Radvansky, 2012). One possible way to fill the existing gap in this context is to offer a valid and reliable tool for measuring perceived emotional abilities in middle and older adults.

There are several skills associated with the emotional functioning of an individual which are necessary for managing and regulating emotional life, such as perceiving and understanding emotions and being able to regulate them. Such abilities are well encompassed by the Emotional Intelligence (EI) construct (Petrides, 2011). Salovey and Mayer (1990) first proposed the term EI to refer to a set of interrelated skills that allow an individual to perceive, understand, use and regulate emotional episodes in an efficient and adaptive manner, thereby allowing effective dealings with the environment.

The EI field has more recently focused on two construct models of EI; Ability EI is hypothesized to be a mental ability or facet of intelligence that is distinct from other abilities (MacCann, Joseph, Newman, & Roberts, 2014), and must be measured by performance tests (Pérez, Petrides, & Furnham, 2005). The Mayer-Salovey-Caruso Emotional Intelligence Test or MSCEIT (Mayer, Salovey, & Caruso, 2002) is the most recent of a series of ability scales of EI. Models of EI combining cognitive capacities with personality traits are called Mixed EI models (Joseph, Jin, Newman, & O'Boyle, 2014), and are usually measured by self-report scales of intelligence. These scales are used to assess Perceived Emotional Intelligence (PEI); one of the most widely used self-report measures with regard to PEI is the Trait Meta Mood Scale or TMMS (Salovey, Mayer, Goldman, Turvey, & Palfai, 1995). Facets of incremental validity of TMMS and other PEI measured can be observed in Siegling, Vesely, Petrides and Saklofske (2015).The TMMS was designed to measure general beliefs concerning one´s own emotional Attention (perceived attention paid to one´s own emotional states), Clarity (perceived understanding of one´s emotional states), and Repair (perceived ability to regulate one´s emotional states). Although PEI is hypothesized to be a component of personality space that is distinct from other traits such as the Big Five (O'Boyle, Humphrey, Pollack, Hawver, & Story, 2011), evidence has been found of discriminant validity within the TMMS dimensions (Salguero, Fernández-Berrocal, Balluerka & Aritzeta, 2010).

Regarding predictive validity, growing empirical evidence has shown that PEI is associated with a higher degree of life satisfaction (Amdurer, Boyatzis, Saatcioglu, Smith, & Taylor, 2014); better psychological well-being (Xu & Zheng, 2014); better physical and psychological health (Aust, 2013; Petrides, 2011). However, and despite the growing evidence suggesting that trait EI is a powerful predictor of psychosocial well-being and health during all periods of life (Zeidner, Matthews, & Roberts, 2012) and its positive effects in predicting anxiety symptoms (Weaving, Orgeta, Orrell & Petrides, 2014), to date such evidence cannot be extended to the

older adult population, either because samples were composed of adolescents and young adults, or because there are no studies using valid and reliable measures of perceived EI adapted to the older adult population.

Test developers for the more widely available EI measures have all reported that EI-levels in their normative samples increase with age (Bar-On, 2002), because it is an adaptive function that develops in concert with cognitive and social skills. However, some authors believe that EI remains constant, because the structure of personality generally remains stable across time (Chapman & Hayslip, 2006). In this field, the presence of age effects has been identified, in fact, it is an important requirement in the validation of assessment tools for the EI construct (Mayer, Salovey, & Caruso, 2000). In spite of this, the TMMS has been widely used in adult populations but, until now, no data have reported on its validity among middle-aged and older adults (between 50 and 90 years). The availability of a valid and reliable tool for measuring PEI in this age group could be essential to having a life course perspective with regard to PEI and its evolution, as well as to knowing the relationship between PEI and other life domains such as health and well-being in older people. Therefore, and given the above concerns, the aim of this study was to analyze the validity and reliability of the TMMS in a sample of middle-aged and older adults and its relationship to personality traits and subjective well-being.

Methods

Participants

The sample consisted of 338 older adults between the ages of 50 and 90 years (M=67.08; SD=7.80; 226 women and 112 men) and all of them were recruited from the province of Gipuzkoa in Basque Country (North Spain). At all times, participants anonymity was guaranteed so that their answers would be as truthful as possible, and confidentiality of data handling was also guaranteed for participants.

Procedure

Data collection was carried out in groups during a normal working day by two psychologists. Informed consent was obtained from the participants and the organization. The study followed the ethical guidelines of the Spanish Psychological Society and was approved by the Ethics Committee for Research Involving Humans of the institution participating in the study. In the data collection, the order for administering the tools was: TMMS, PANAS, NEO-FFI and SWLS.

Instruments

Trait Meta-Mood Scale (TMMS; Salovey et al. 1995): The TMMS was developed as a general measure of Meta-Mood Experience. The total scale is composed of three sub-scales, measuring the three components of Meta-Mood Experience using a 5-point Likert scale with responses ranging from 1= strongly disagree and 5= strongly agree: (a) Attention to Feelings Subscale, measures attention to one's moods and emotions and that of others (b) Clarity of Feelings Subscale measures one's ability to discriminate among them and (c) Mood Repair Subscale, which tests one's ability to regulate them in self and in others. In this study, we used the short Spanish version of the TMMS (Fernández-Berrocal, Extremera, & Ramos, 2004) which includes 24 items (eight for each sub-scale) using the same Liker scale as in the original version. The original TMMS-24 shows high reliability coefficients in all the subscales ($α_{Attention}$=0.90, $α_{Clarity}$=0.90, $α_{Repair}$=0.86), and a proper test-retest reliability. However, the sample of the Spanish validation study did not taken into account people over 65 years (the samples' age range was between 18 and 57 with an average age of 22), therefore it is necessary to examine the psychometric characteristics of the TMMS-24 in an older persons' sample.

Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). Total scores for Positive Affect and Negative Affect were calculated using a translated

version of the widely used Positive and Negative Affect Schedule (Spanish version by Sandín, et al., 1999). Participants rated on a 5-point scale, where 1=Very slightly or not at all and 5= extremely, how often they had experienced 20 emotions over the previous year: 10 of the emotion words were positive (e.g., enthusiastic, excited, proud), and 10 were negative (e.g., distressed, afraid, upset). Cronbach's alphas were high for the 10 positive items (α= 0.83) and for the 10 negative items (α= 0.84).

Shortened Spanish version of the NEO-Five Factor Inventory (NEO-FFI; Costa & McCrae, 1999) was used to provide a concise measure of the five basic personality factors: Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness. The instrument uses a 5-point Likert response format (1= strongly disagree to 5= strongly agree). Two-week retest reliability is uniformly high, ranging from 0.86 to 0.90 for the five scales (Robins, Fraley, Roberts, & Trzesniewski, 2001), and internal consistency ranges from 0.68 to 0.86 (Costa & McCrae, 1999). The NEO-FFI has been translated into several different languages and shown validity and utility in a number of different contexts; it is one of the most widely used measures of the Five-Factor Model (Zillig, Hemenover, & Dienstbier, 2002). In this study, all personality factors showed adequate internal consistency, with indexes between .75 and .82.

Satisfaction with Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985): The SWLS is a five-item scale developed as a measure of the judgmental component of subjective well-being using a 7-point Likert scale with responses ranging from 1= strongly disagree to 7= strongly agree. Previous research with the Spanish version of this scale using exploratory and confirmatory factorial analyses indicated that it has adequate psychometric properties in elderly samples (Pons, Atienza, Balaguer, & García-Merita, 2002). Likewise, this scale has good psychometric properties and the internal consistency coefficient for the present study was found to be 0.82.

Results

Descriptive Analysis

Means of the TMMS items ranged from 2.30 to 3.62, and standard deviation was between 0.90 and 1.26. Except for item 23 for the skewness and kurtosis values of the 24-item scale were close to or below the relative values of 0.30 and 0.70, respectively, which indicates similarity with the normal curve (Curran, West, & Finch, 1996). Moreover, Mardia's coefficient was 35.81, which indicates multivariate non-normality and, for this reason, the Confirmatory Factor Analysis was deemed appropriate.

Confirmatory Factor Analysis

With the aim of testing whether the data for the older sample corroborated the three-factor model found in the original version of the TMMS, confirmatory factor analysis was carried out using AMOS 20.0. The original three factor model proposed by Salovey et al. (1995) was assessed. Missing data were handled with the full information maximum likelihood method as implemented in AMOS. The goodness-of-fit index (GFI, value above 0.90), the comparative fit index (CFI, value above 0.80), and the root mean square error of approximation (RMSEA, value smaller than .10) as suggested are used to assess the adequacy of model fit (Schumacker & Lomax, 1996).

According to Browne and Cudeck (1993) in this study, results of the confirmatory factor analysis (CFA) for the three factor confirmatory models indicated an inadequate model fit for the older sample [χ^2 (338) = 713.312; p= 0.000; χ^2/df-ratio= 2.86 GFI= 0.84, CFI=0.87 and RMSEA= 0.07]. The factor loadings of the items ranged between 0.49 and 0.81 (Item 23 and 18 of the Repair subscale respectively). All the factor loadings were significant (p<0.05). The variances of the error terms were analyzed through the Modification Indices (MIs) as suggested by Kaplan (1989), determining that some variables were abnormally correlated

thus error covariances were added between the error terms of the same subscale. Moreover, and taking into account the inadequate fit of the model, items loadings and modification indexes were explored in order to conduct some respecification of the model. First, Items 5 and 23 showed the lower factor loadings on their respective subscales; second, they also showed the lowest covariations with their respective factors than the rest of the items; third, the examination of the modification indexes indicated that Item 5 which is in the Attention subscale, could be included in the Repair subscale and Item 23, which belongs to the Repair subscale, could be included in any of the other two subscales (Attention and Clarity). Finally, we look at the standardized residual covariance matrix to examine if there were discrepancies between our proposed model and the estimated model and observed that Items 5 and 23 showed an average value above 2 when 0.4 is considered an appropriate cutoff.

A new CFA was conducted using the model of three subscales of Attention, Clarity and Repair with 7, 8 and 7 items respectively. Although the value of the chi-square statistic, χ^2 (198, $N =$ 338) = 419.99; p = 0.001, indicated a statistically significant lack of fit of the model; the sensitivity of the chi-square statistic to the violation of the assumptions on which it is based (Bollen, 1989) and, specifically, its dependence on sample size (Floyd & Widaman, 1995), mean that the fit assessment should be based mainly on alternative indices. In fact, when measures of fit less sensitive to sample size and to deviations from normality were used, the results showed a good fit, with values of GFI (0.91), CFI (0.93) close to 1.00 and RMSEA value (0.058) between the cut-off points of 0.05 (good fit) and 0.08 (acceptable fit). Thus the data showed a better fit for the model of 22 items than for the original 24 items in older population.

Reliability

The internal consistency of each dimension of scale was estimated by means of Cronbach's α coefficient. Values on this index were 0.84; 0.87 and 0.85 for the subscales of Attention, Clarity and Repair, respectively. Considering the 22-item respecified model, after eliminating Item 5 and Item 23 from the subscales of Attention and Repair, respectively, the internal consistency of the subscales remained the same (0.84 and 0.85). These values permit us to conclude that internal consistency is high in all the dimensions, exceeding the cut-off point of 0.75 generally accepted for instruments in the area of health sciences.

Correlations between TMMS and Other Variables

With the aim of providing some evidence of construct, convergent and discriminant validity, correlations between the three TMMS-22 dimensions were calculated. These three subscales were also correlated with NEO-FFI, PANAS and SWLS scales using Pearson correlation coefficient. Table 1 shows, together with the descriptive statistics, the correlations between the three TMMS-22 subscales with aforementioned variables.

As can be seen in Table 1, the correlation between Attention and Clarity (r=0.39; p<0.01) is moderate and between Clarity and Repair (r=0.54; p<0.01) is of considerable magnitude. The correlation observed between Attention and Repair, though statistically significant, is small (r=0.18; p<0.01). On the other hand, as expected participants' scores in the Attention, Clarity and Repair dimensions of the TMMS did not show considerable correlations with any of the NEO-FFI personality factors indicating an absence of large overlap between them. Furthermore, while Attention showed very low and non significant correlation with all personality factors, except for Neuroticism (r=0.22; p<0.01), Clarity and Repair showed positive correlations with Extraversion, Agreeableness, Conscientiousness and Openness, and a negative correlation with Neuroticism.

Table 1. Mean, Standard Deviation and Correlations between TMMS, NEO-FFI, PANAS and SWLS dimensions

	1	2	3	4	5	6	7	8	9	10	11
1. Attention	--										
2. Clarity	.39**	--									
3. Repair	.18**	.54**	--								
4. Extraversion	-.08	.21**	.33**	--							
5. Agreeableness	.02	.22**	.21**	.25**	--						
6. Conscientiousness	.11	.29**	.35**	.28**	.32**	--					
7. Neuroticism	.22**	-.23**	-.30**	-.29**	-.21**	-.36**	--				
8. Openness	.02	.19**	.18**	.28**	-.07	.18**	-.15*	--			
9. Positive Affect	.12*	.37**	.49**	.44**	.10	.35**	-.22**	.33**	--		
10. Negative Affect	.22**	-.13*	-.26**	-.22**	-.20**	-.13*	.44**	-.03	-.05	--	
11. LifeSatisfaction	-.06	.28**	.22**	.25**	.07	.11	-.27**	.09	.29**	-.35**	--
M	2.95	3.31	3.26	2.40	2.77	2.62	1.56	2.04	2.95	1.83	4.88
SD	0.79	0.77	0.82	0.57	0.46	0.51	0.57	0.50	0.60	0.55	0.97

Note * p < 0.05

** p< 0.01

Finally, as expected the correlation between TMMS subscales and Positive Affect and Life Satisfaction were positive and of moderate magnitude with Clarity and Repair and low and non significant with Attention. Negative Affect correlated positively with Attention and negatively with Clarity and Repair, although in this case the values were of low magnitude.

Sex and Age Differences

The multivariate analysis of variance (MANOVA) indicated a non significant sex effect in the three subscales ($F_{3,334} = 1.61$, $p=$ 0.18; $\eta2=0.014$) as well as a non significant age effect ($F_{111,890} = 1.18$, $p= 0.101$; $\eta2=0.129$).

Path Analysis

Finally path analysis was performed to examine the predictive validity of the TMMS in older adults. As mentioned earlier skewness and kurtosis values indicated similarities with the normal curve and the multivariate normality value was 2.89 indicating the adequacy of using the maximum likelihood estimation method. Such method is robust even when there are deviations from multivariate normality (Tomás & Oliver, 1998).
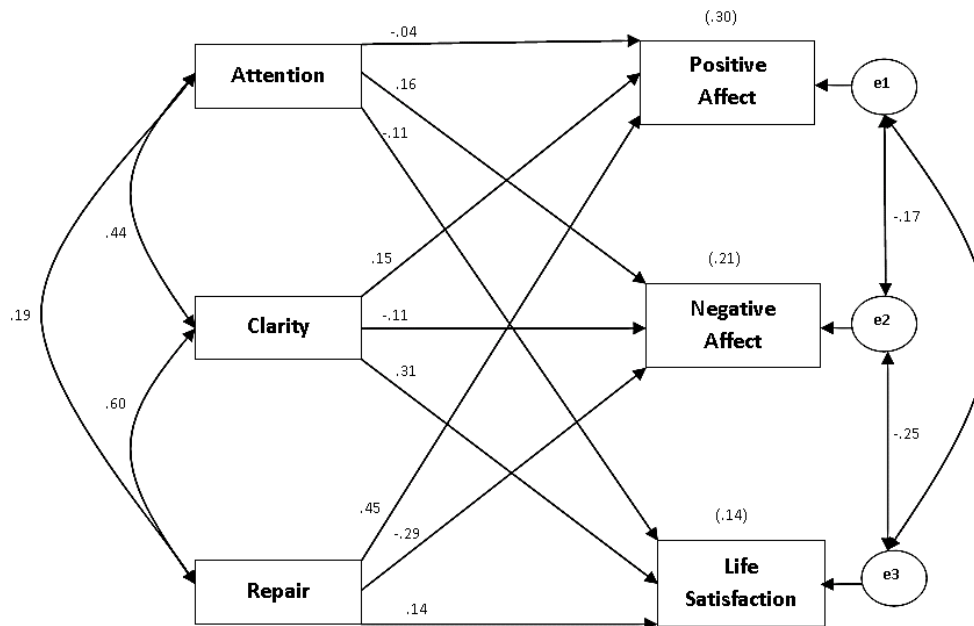
Figure 1. Structural model with path coefficients. Standardized regression weights are above the arrows and explained variances are between parentheses

The results showed in Figure 1 indicated an adequate fit with all parameters being significant (GFI= 0.90, CFI=0.919 and RMSEA= 0.05). Similarly, the values between the diverse path variables were coherent with the pattern predicted in the original model in which the three factor correlated significantly and positively (Mayer & Salovey, 1997). Finally, the 30, 21 and 14% of the variances for Positive Affect, Negative Affect and Life Satisfaction were explained.

Discussion

The present work has attempted to add evidence of validity and reliability to the Spanish shortened version of the TMMS in a sample of older adults. The psychometric analyses conducted indicated its usefulness for assessing individual differences in PEI in this population.

The confirmatory factor analysis corroborated the three-factor structure of Attention, Clarity and Repair, in accordance with the original structure of the scale (Salovey et al., 1995) and its Spanish adaptation (Fernández-Berrocal et al., 2004). Of the 24 items in the Spanish version of the TMMS, only items five and 23 from the Attention and Repair subscales failed to obtain a clear saturation so they were eliminated. These two items have also shown poor saturation indexes and conceptual mis-specification in previous studies (Gorostiaga, Balluerka, Aritzeta, Haramburu, & Alonso-Arbiol, 2011).

The internal consistency of the 22-item version of the TMMS revealed satisfactory values in the three dimensions, similar to that which was found in other adaptations (Fernández-Berrocal & Extremera, 2008). The functional sequence in the emotional regulation process is observed in the correlations of greater magnitude between Attention and Clarity and between Clarity and Repair. Such a sequence indicates that a certain level of attention to feelings is necessary to the ability to understand emotional states and a certain level of clarity of feelings is required for being able to moderate or regulate them (Fernández-Berrocal, Cabello, Castillo, & Extremera, 2012).

As regards to the discriminant validity, the correlations between the TMMS subscales and the NEO Five Factor Inventory personality factors showed moderate to low correlations between its three dimensions and the Big Five. As in previous works (Siegling, Furnham, &

Petrides, 2015; O´Boyle et al., 2011), the results of this study demonstrate that PEI is a distinct construct of personality factor, because the correlation between meta mood experience and many personality traits are not even close to r=0.30, ranging from -0.19 to 0.35. The analysis of this study indicate that Attention is only related with Neuroticism, meanwhile Clarity and Repair subscales are positively connected with Extraversion, Agreeableness, Conscientiousness and Openness and negatively with Neuroticism. Moreover, not all personality dimensions are equally related to the sub-scales of Meta Mood Experience; in this study, Neuroticism and Conscientiousness are the two personality factors that have a close relationship with the three components of Meta Mood Experience. Previous studies have shown that Neuroticism was more closely related to experiences of negative emotions, whereas Conscientiousness predicted the relative balance of positive to negative emotional experiences (Galla & Wood, 2015).

As for the differences in the TMMS dimensions according to age and sex, the Multivariate Analysis of Variance analyses carried out showed no significant differences for sex and age in any of the three subscales. Typically, both ability and trait EI measures show higher mean scores for females, although gender differences vary across different facets of trait EI (Fernández-Berrocal, et al., 2012). Some studies revealed that women tend to have higher EI than men; however, this study has shown no differences between men and women.

With regard to age differences, self-reported EI measured by the TMMS is configured similarly in middle-aged and older adults. The dimensions of EI, at least those measured by the TMMS, may be more associated with the structurally invariant personality system than with differentiating cognitive abilities. Meanwhile, Mayer et al. (2000) suggested that ability-based EI meets the criteria for a standard intelligence; hence, it should increase with age and experience.

The predictive validity of the TMMS was supported by the path analysis, as the subscales of Clarity and Repair positively predicted Positive Affect and Life Satisfaction and negatively predicted Negative Affect. The Attention subscale requires a different interpretation as it showed an inverse path to Negative Affect (0.16) and to Life Satisfaction (-0.11) showing a null and non-significant value for Positive Affect. In this sense ruminative thinking (a precursor of negative affect and emotional distress) has been related to high level of attention to one's own feelings (Salguero, Extremera, & Fernandez-Berrocal, 2013). A longitudinal study (Shulman & Hemenover, 2006) showed that attention to feelings predicted emotional distress, whereas clarity and repair predicted psychological well-being. Therefore, although attention is needed in order to understand emotions, too much attention may heighten the risk of Negative Affect and reduce life satisfaction.

One caveat of this study is the use of self-report measures to examine EI. These measures focus on individual beliefs about EI rather than emotional abilities. Future studies should therefore include both ability and self-report measures of EI. This being said, several studies have demonstrated positive relationships between self-perceived EI (measured with the TMMS) and actual behavior (Salguero, Extremera, Cabello, & Fernandez-Berrocal, 2015).

While acknowledging these limitations, the study nevertheless also offers some benefits for older adults. First, taking into account that abilities collected in the TMMS represent a useful and significant predictor for social and psychological adjustment of people's lives, it will allow a reliable assessment of aspects associated with EI in a priority group such as older adults. Second, the TMMS-22 will allow the analysis of how the characteristics of the emotional regulation process evolve over the

course of development. Third, the TMMS-22 dimensions can help us to explain differences in older adults' psychosocial adaptation and to determine the importance of perceived emotional competence in this age group. Fourth, old age is a period of life in which the organism´s physical and cognitive capabilities may diminish, however the abilities to perceive and understand emotions may become fundamental to improve interpersonal relations and expand social support which is a basic source of individual well-being at this stage of life (Di Fabio, 2015). Therefore, the availability of the TMMS for the older adult population, besides being an important complementary resource for the ability measures of EI, will allow increasing awareness of an individual's own emotional abilities and will give accurate information about their self-evaluation of emotional abilities. This information can be used to design, implement and evaluate programmes not only focused on increasing EI competencies, but also on improving an individual's awareness of emotional abilities.

In conclusion this study provides a valid and reliable tool to examine self-reported EI in middle age and older adults, which can help to improve the knowledge of their emotional life and the emotional well-being of elderly. Through this understanding we expect to improve the quality of life of older adults and outline the growing evidence that suggests that emotional well-being is a key element in quality of life across the life course.

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