The Importance of Emotional Intelligence and Cognitive Style in Institutionalized Older Adults' Quality of Life

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Abstract

Despite previous evidence showing a positive relationship between emotional intelligence (EI) and quality of life (QoL), associating older adults' emotional processing with several health indicators, few studies have explored both the IE and the mechanisms through which they affect QoL. This cross-sectional study analyzes themediator role of optimistic and pessimistic cognitive styles in the relationship between perceived EI (PEI) and QoL in 115 institutionalized older adults from Southern Spain. Regression analyses showed, after controlling for cognitive style, that PEI predicted a significant percentage of variance in: Health ($\beta = .25$, $p < .01$), Functional abilities ($\beta = .20$, $p < .05$), Activity and leisure ($\beta = .17$, $p < .05$) and Life satisfaction ($\beta = .21$, $p < .05$). Additionally, multiplemediation analysis revealed that cognitive style partially mediated the relationship between PEI and Health, Activity and leisure and Life satisfaction. Thus, PEI could promote personal but not external or environmental QoL aspects, highlighting the importance of developing emotional skills for healthy aging.

Keywords: Institutionalized older adults; optimistic and pessimistic cognitive style; perceived emotional intelligence; quality of life.

Background

Quality of Life in Institutionalized Older Adults

Promoting quality of life (QoL) in older people is a special priority for those institutionalized (Almomani, McDowd, Bani-Issa, & Almomani, 2014), that is, those adults over 65 living in nursing homes. However, some controversy about QoL study is due to the lack of an agreed definition. According to Browne et al. (1994, p. 235), refers to "the product of the dynamic interaction between external conditions of life of an individual and internal perception of these conditions". Given the variety of factors that affect an individual's life, Santacreu, Bustillos, and Fernández-Ballesteros (2016) proposed a two-factor classification: 1) related to internal or personal circumstances, including health, life satisfaction and functional abilities; 2) associated with external or environmental aspects, including wages, education, social relations or environmental amenities. Furthermore, following researchers from the health promotion field, they proposed distinguishing between internal and external determinants (Veenhoven, 2013), arguing that the first represents *personal QoL*, whereas the latter represents *external QoL*. Thus, it is a multidimensional concept not independent of the contexts in which an individual's life arises and develops (Fernández-Ballesteros, 1997).

In our study, a broader vision of QoL is addressed including the psychological and social variables related to the construct. In this sense, emotional intelligence (EI) is one of the variables positively related to several indicators of QoL and health. Defined as "the ability to monitor feelings and emotions of oneself and others, to discriminate among them and to use this information to guide their own thinking and action" (Salovey & Mayer, 1990, p. 189), is receiving great interest from positive psychology researchers. Most studies have used self-report measures that are based on the

perceptions that people have about their emotional ability; called Perceived Emotional Intelligence (PEI; Salovey, Stroud, Woolery, & Epel, 2002).

Much of the scientific interest in EI has focused on exploring the role of emotional skills as a significant predictor of an individual's mental, social, and physical health (Martins, Ramalho, & Morin, 2010). In continuous interaction with cognitive processes, older people's emotions are significantly associated with many health indicators (Márquez, Izal, Montorio, & Pérez-Rojo, 2004). However, few studies have investigated EI in older populations. Moreover, the possible relationship between EI and QoL has usually considered "subjective QoL" (Camfield & Skevington, 2008) and not the multidimensional construct measured with specific instruments assessing it objectively and subjectively.

A revision about the positive relationships of PEI with other health and QoL variables in older adults living in their homes or in other groups, likely make us hypothesize that perceived emotional abilities may also be associated with QoL in institutionalized older adults. The mechanisms underlying this association must be still identified, as well as the reasons of perceived emotional abilities predicting QoL levels.

Optimistic and pessimistic cognitive styles as mediators of the PEI-QoL relationship

Optimistic (OCS) and pessimistic (PCS) cognitive styles refer to a general tendency of an individual to expect negative or positive results in life (Scheier & Carver, 1985). The OCS has demonstrated positive relationships with several variables, such as subjective well-being, adaptive coping, physical health, stress at school, future income and interpersonal relationship skills (see Carver, Scheier, & Segerstrom, 2010,

for a review). Moreover, there is evidence that people with an OCS enjoy a higher well-being and QoL (Conversano et al., 2010). In fact, the bias the optimistic have when thinking about the future (Schacter & Addis, 2007) is a strong functional and adaptive component. This is especially of interest in a population as the elderly who have to face severe health problems or even to the proximity of his/her death. O'Brien (2013) raises some of the explanatory mechanisms that would lead to protect the perception of future well-being, despite those accessible metacognitive keys could compromise it.

Regarding EI, OCS is positively, whereas PCS is negatively related to PEI (Augusto-Landa et al., 2011; Extremera, Durán, & Rey, 2007). In this sense, some authors have defended the existence of a theoretical link between the two constructs (Extremera et al., 2007). When a person thinks that has some effective emotional resources to successfully solve socioemotional situations, he/she will likely turn into a competent person and will usually expect positive outcomes in life, and the way around for pessimists. Optimistic or pessimistic expectations, (i.e., cognitive style) determine how people perceive, feel and face different situations (Carver et al., 2010) and result in different QoL levels. Thus, some studies suggest that the mechanism that enables the OCS to have a positive impact on QoL is related to the way in which critical situations in life are handled by optimists. In particular, individuals who have confidence in their future are continually striving (even in situations of great adversity), whereas those who have doubts about their future try to ward off adversity by evading the situation as if they could magically escape (Wrosch & Scheier, 2003). In the specific case of the elderly, some authors argue that older people with a high sense of self-efficacy would be prone to an optimistic view in which negative events are experienced as challenges instead of threats, generating greater levels of well-being in the final stage of life (Jopp

& Rott, 2006). This suggests that optimistic people are able to adapt more effectively than pessimists to emotionally demanding situations, which would have an impact on higher QoL (Conversano et al., 2010).

Our overall objective is to investigate whether PEI is related to a cognitive style and also to understand the role that OCS and PCS have in the hypothesized relationship between PEI and QoL levels in institutionalized older adults.

Thus, in agreement to adolescents and young adults' findings (Augusto-Landa et al., 2011; Extremera et al., 2007), we expect positive OCS and PEI and negative PCS and PEI relations (*H1*). Given previous results in young and middle-aged adults (Extremera & Fernández-Berrocal, 2002, 2006) we expect positive relationships between PEI and older adults' QoL dimensions (*H2*). Furthermore, we expect that both PEI and cognitive styles would explain a significant percentage of certain QoL dimensions in institutionalized older adults (*H3*). More specifically, as the cognitive-emotional processing promotes adaptive functioning (Fernández-Berrocal & Extremera, 2009), we hypothesized that PEI would have a positive impact on the personal dimensions of QoL (Health, Functional abilities and Life satisfaction) but not on the external dimensions (Social integration, Environmental quality, Income and Education). Despite being closely related to both the personal and external components of QoL (Zamarrón & Fernández-Ballesteros, 2000), we expected that PEI would explain part of the Activity and leisure dimension. Finally, we expect that OCS and PCS partially mediate the relationship between PEI and the levels of *personal QoL* in institutionalized older adults after controlling for the effect of sex and age (*H4*).

Method

Participants and Procedure

Before performing this cross-sectional study, we obtained approval from the Delegation of the Ministry of Equality and Social Welfare of the Junta de Andalucía, and from the Ethics Committee of the University of Jaén. However, it should be noted that, according to the general standards document of the Committee, it is not compulsory to have approval of such committee when research is conducted in adults, using non-clinical questionnaires, and in non-health centers (i.e., residences for older adults). Thus, they gave approval without evaluation or number. However, the study was conducted strictly following the guidelines of the Declaration of Helsinki (59th General Assembly of the World Medical Association, Seoul, October 2008) and current Spanish legislation governing research on human subjects (Royal Decree 561/1993 on clinical trials). Then, permission was obtained from the Junta de Andalucía and the Heads of the nursing homes. The residents were informed about the study objectives and decided to voluntarily participate (n = 351). However, only the 33% of the participants had "no cognitive impairment" assessed by the Spanish adaptation of the Mini Mental State Examination (MMSE; Folstein, Folstein, & McHugh, 1975) and using a cutoff of 23/24 of 35 possible points (Vinyoles et al., 2002).

Thus, participants were 115 institutionalized older adults (47.82% women) convenience sampled (intentional and non-probabilistic) from three nursing homes in South of Spain between 65 and 101 years of age.

All the instruments were administered individually and took one hour approximately with each participant.

Instruments

Brief Quality of Life Questionnaire (CUBRECAVI; Fernández-Ballesteros & Zamarrón, 1997). This instrument evaluates QoL in older adults from a multidimensional perspective. It is composed by 21 multiple-choice items that assess the frequency and presence of satisfaction with a number of objective and subjective behaviors, thoughts and feelings related to QoL. Items are grouped into eight areas: Health, Social integration, Functional abilities, Activity and leisure, Life satisfaction, Environmental quality, Education, and Income. It has adequate internal consistency, with α values ranging from .66 to .92 (Fernández-Ballesteros & Zamarrón, 1997).

Life Orientation Test-Revised (LOT-R; Scheier, Carver, & Bridges, 1994). On a 5-point Likert scale, this 10-item questionnaire evaluates the OCS and PCS. Three of the items score OCS, three score PCS and four are distracting items. This instrument has shown adequate psychometric properties (Ferrando, Chico, & Tous, 2002).

Wong and Law Emotional Intelligence Scale (WLEIS; Wong & Law, 2002). This instrument evaluates perceived emotional ability using 16 items with a 7-point Likert scale. For the purposes of this study, we used the overall score. Cronbach's alpha coefficients are adequate (.83-.90).

Statistical analyses

All statistical analyses were performed with IBM SPSS Statistics for Windows, v.20. In all cases an alpha level of .05 was used to determine the statistical significance of the results.

Univariate analysis was first conducted via descriptive analysis of predictor and criterion variables. Bivariate analysis was then conducted via Pearson correlation to assess associations between the variables of the study. Next, to analyze the relevance of cognitive style as a potential predictor of the dimensions of QoL, as well as the incremental validity of the PEI, a series of multiple linear regression analyses were conducted. Finally, we performed several multiple mediation analyses to explore whether the relationship between PEI and QoL is mediated by the institutionalized older adults' cognitive style. Previously, we tested and confirmed the compliance with the four assumptions (Baron & Kenny, 1986) for each QoL dimensions. Due to the relatively small sample size, a nonparametric bootstrapping procedure was used, with 5000 repetitions to reliably test the significance of the hypothesized mediational models (MacKinnon, Lockwood, & Williams, 2004). Using the SPSS macros created by Preacher and Hayes (2004), we tested a multiple mediational model with two mediating variables (OCS and PCS), controlling for the effect of two covariates (sex and age). Bias-corrected 95% confidence intervals were estimated for all tests of the indirect effect. If zero was not included in the confidence interval (CI), the indirect effect was a significant mediator.

Results

Correlation analyses

Summary of the bivariate correlations between the study variables is presented in Table 1. Except for educational level and income, all QoL dimensions were significantly positively related to OCS but negatively to PCS. Regarding the relationship between PEI and QoL, Health, Functional abilities, Activity and leisure and

Life satisfaction showed positive correlations. In addition, the cognitive style-PEI relationships were significant in both cases.

Multiple linear regression analysis

Because previous research has found that demographic variables, such as sex and age, affect QoL in older people (Fernández-Ballesteros, 1997, 2006), we controlled for these variables by introducing them in a first step of the regression analysis as covariates. Cognitive style was introduced in a second step and PEI in the third.

Regarding the Health QoL dimension, the model accounted for 33% of the variance (F[1,109] = 10.75, $p < .01$). Specifically, demographic factors accounted for 11% (β = .31, $p < .01$ age; β = .19, $p < .05$ sex) of the criterion variable; dispositional variables accounted for an additional 17% (β = .38, $p < .01$) for the OCS; and PEI added 5% of the variance (β = .25, $p < .01$). For the Social integration dimension, the results yielded a significant model (F[2,110] = 4.70, $p < .01$), in which 12% of the variance was predicted by the PCS (β = -.28, $p < .05$). Regarding Functional abilities, the regression model accounted for 16% of the variance (F[1,109] = 4.18, $p < .05$). Specifically, demographic variables accounted for 7% (β = .27, $p < .01$ for sex); cognitive style accounted for 6% (β = .14, $p < .05$ for OCS; β = -.14, $p < .05$ for PCS); and PEI for 3% (β = .20, $p < .05$). As for Activity and leisure, a significant model (F(1,109) = 7.77, $p < .05$) accounted for 26% of the variance. Specifically, 3% was predicted by sex (β = .18, $p < .05$), 21% by PCS (β = -.45, $p < .01$), and 2% by PEI (β = .17, $p < .05$). Regarding Life satisfaction, a significant regression model (F(1,109) = 9.04, $p < .05$) accounted for 29% of the variance of the criterion variable. Thus, age accounted for 9% of the variance (β = .30, $p < .01$); cognitive style accounted for 17%

of the variance ($\beta = .24$, $p < .05$ for OCS; and $\beta = -.22$, $p < .05$ for PCS); and finally, PEI added 3% ($\beta = .21$, $p < .05$). The other three dimensions (Environmental quality, Education and Income) did not yield a valid regression model because they did not explain any of the above variables.

Multiple mediational analyses

The relationship between the predictor variable (PEI) and criterion variables were not significant for Social integration, Environmental quality, Education and Income dimensions); therefore, we decided to only run mediational models for the other QoL dimensions (Table 2).

The mediational effect on Health yielded both a non-significant indirect effect of PCS (95% CI: -.003 to .004) and a significant indirect effect of OCS (95% CI: .001 to .010), showing that OCS partially mediates the PEI-Health relationship (Figure 1). Moreover, neither of the two covariate variables (sex, age) significantly affected this relationship.

Similarly, we analyzed the mediational effect on Functional abilities, finding that the indirect effect of both PCS and OCS were no significant, showing the absence of mediation in the PEI-Functional abilities relationship (Figure 1). However, covariate sex has a significant influence. Specifically, male sex was associated with increased functionality.

Likewise, the mediational effect on Activity and Leisure yielded both a non-significant OCS (95% CI: -.003 to .002) and a significant PCS (95% CI: .002 to .007) indirect effect, revealing that PCS partially mediates the PEI and Activity and leisure relationship (Figure 1). None of the covariates affected this relationship.

Finally, the mediational effect on Functional abilities showed both a non-significant OCS (95% CI: -.001 to .010) and a significant PCS (95% CI: .001 to .009) indirect effect, indicating that PCS partially mediates the PEI-Life satisfaction relationship (Figure 1). None of the covariates affected this relationship.

Discussion

QoL is an essential element in science, in the development of public policies and in the thinking of individuals (Santacreu et al., 2016). In the elderly population, the emotional experiences and how they affect their levels of QoL have been a target of study in the context of the socioemotional selectivity theory (Carstensen et al., 2011; Carstensen, Isaacowitz, & Charles, 1999). However, the study of QoL among patients in nursing homes has not yet received the attention and resources it deserves (Almomani et al., 2014). Therefore, this paper attempted to explore the factors affecting the QoL levels in institutionalized older adults. In this study, PEI demonstrates a moderate positive relationship with the OCS and vice versa for the PCS, supporting our H1. This result supports the idea that PEI and cognitive style are related but differ in nature (Extremera et al., 2007).

Despite H2 was not completely fulfilled, positive relationships between PEI and four out of eight QoL dimensions (Health, Functional abilities, Activity and leisure and Life satisfaction) were established. These data confirm the relationship between PEI and HRQoL in other samples (Extremera & Fernández-Berrocal, 2002, 2006). However, a closer view of the results indicates that only the individual´s components of QoL yielded significant associations with PEI.

The H3 was mostly confirmed. Thus, PEI, cognitive style or both, completely explained QoL dimensions. Specifically, in line with studies focused on older adults at home (Bain et al., 2003), the disposition of expecting positive results in life was able to predict the levels of Health, Functional abilities and Life satisfaction dimensions of QoL. Similarly, the PCS predicted, in a negative sense, the levels of Social integration, Functional abilities, Activity and leisure and Life satisfaction. Moreover, PEI was able to explain an additional percentage, apart from that accounted for by the cognitive style, in the variance of four QoL dimensions. Thus, as hypothesized, institutionalized older adults´ PEI was able to predict the QoL dimensions that were strongly associated with an individual's life (Health, Functional abilities, Activity and leisure and Life satisfaction), but not those mainly associated with the environment. This finding aligned with the idea that healthy aging depends on successfully regulating emotions (Suri & Gross, 2012).

This study supports that institutionalized older adults with higher PEI levels can positively influence their *personal QoL* through internal factors for which they have a degree of control over certain behaviors. One possible explanation is that more emotionally intelligent people may be more willing to ask for support and advice from the professionals involved in their care (Ciarrochi & Deane, 2001), resulting in a greater number of healthy behaviors that benefit certain aspects of their QoL (Schutte, Malouff, Thorsteinsson, Bhullar, & Rooke, 2007). This hypothesis could explain why the PEI or cognitive style of older adults affect their dimensions of Health, Life satisfaction, Functional abilities and Activity and leisure but not their Income, Education, Social integration and Environmental quality dimensions. In fact, the latter dimensions will be hardly modified by practicing healthy behaviors and habits. Thus, older adults, as active

agents in the aging process (Van Malderen, Mets, De Vriendt, & Gorus, 2013), may have some control over QoL factors related to themselves rather than to their circumstances. The lack of relationship between PEI and Social integration could be explained by the mediating role of empathy level, which in this age group, in general, shows lower levels than the middle-aged adults do(Labouvie-Vief, 2009; O'Brien, Konrath, Grühn, & Hagen, 2013). Furthermore, the limited opportunities for social interaction in the residences (mainly with other residents or personnel) could explain the lack of relationship between PEI and the QoL Social Integration dimension.

H4 in which cognitive style is expected to partially mediate the PEI-*personal QoL* relationship, was nearly fulfilled. Significant mediational models were established in three of the four expected dimensions related to *personal QoL*. In general, a partial mediation effect of cognitive style in the relationship between PEI and *personal QoL* was confirmed, suggesting a double track (direct and indirect), through which PEI could contribute to certain QoL of the older adults. In a direct sense, adequate PEI levels would be able to promote decreased physical and psychological symptoms, greater satisfaction with life and more frequent and satisfying physical and leisure activities in older adults. As previously mentioned, this improvement in the QoL of older people with higher PEI levels could be due to better monitoring guidelines recommended by health professionals (Schutte et al., 2007). An alternative or even complementary explanation could be that older adults with higher PEI are more skilled in their interpersonal relationships, which could make them interact more actively with their caregivers and engage in their own health care compared to other older adults (Luque-Reca, Pulido-Martos, Lopez-Zafra, & Augusto-Landa, 2015). In an indirect sense, adequate perceived emotional abilities are associated to positive life expectations

(Extremera et al., 2007), which result in higher levels of Health, Life satisfaction, Activity and leisure in nursing homes residents. At the same time, this perceived ability decreases the number of negative ruminative thoughts (Salovey, Mayer, Goldman, Turvey, & Palfai, 1995) in the "inner monologue" that characterizes PCS people (Carver et al., 2010). Improved QoL levels could occur because someone who expects to maintain control over future events (OCS) likely plays an active role in key aspects of their QoL by perceiving, feeling and dealing with the situations that they face. This proactive attitude could make them engage more persistently in healthy behaviors. Logically, this inversely acts in the case of PCS.

We also observed that the OCS mediates the relationship PEI and certain QoL factors, while in other cases, the PCS acts as a mediator. Specifically, this finding indicates that to promote higher levels of Health in residents, it is insufficient to not have future negative expectations, and it would be necessary to also have an OCS. Similarly, older adults with reduced leisure activities, who are dissatisfied with their lives, do not only have a low OCS, but a pessimistic view of the future (PCS) as well. These findings support the idea that cognitive style is an important factor associated with promoting healthy aging (Steptoe, Wright, Kunz-Ebrecht, & Iliffe, 2006).

Following Santacreu et al. (2016), our results support the division of QoL into two sub-constructs: *personal or internal* and *environmental or external.* Thus, older adults´ perceived emotional abilities are positively related only to the QoL components associated with the person (Health, Functional abilities and Life satisfaction) and the Activity and leisure (whose nature has common aspects with these QoL sub-dimensions). However, in this study the two dimensions that have proven to be of great importance to the QoL in older adults (Van Malderen et al., 2013): Activity and leisure

and Life satisfaction were not included in the structural model. In fact, our results support their inclusion within *personal QoL*, further suggesting that PEI and cognitive style may be important determinants for older adults´ QoL, but not those associated with their environment.

Previous studies have suggested that psychosocial interventions could improve the QoL levels of institutionalized older adults (Almomani et al., 2014). Thus, future studies should develop tools to improve the QoL of institutionalized older adults. OCS and PCS are associated aspects of the personality that stabilize over time, but emotional abilities are modifiable and can be improved (Schutte, Malouff, & Thorsteinsson, 2013). In fact, the design of programs aimed to improve levels of emotional intelligence might include individual aspects, as well as situational, to achieve, among other, an increase in levels of empathy and an improvement in social relations (Schutte et al., 2001).

Among the limitations of the study, both the use of self-reports and the use of a convenience sample suggest to be cautious in the generalization of results. Also the mediational analysis performed presents some disadvantages (Trafimow, 2017). Due to the cross-sectional design used, with no temporal analysis, it is more appropriate to talk about indirect effects instead of mediation (Kline, 2015). Furthermore, as this is not an experimental design, the existence of measurement errors in the variables can not be discarded. Thus, we propose to be controlled in future studies using SEM methodology. Finally, despite the advantages of using the bootstrapping procedure and using confidence intervals to analyze the indirect effects, Kline (2015) maintain that the findings with relatively small samples such as the current one should be later replicated in studies with wider samples and/or longitudinal designs.

Beyond the aforementioned limitations, the findings of this paper underscore the importance that both the cognitive style and the perceived emotional abilities have in a healthy aging process, especially on those personal aspects of the QoL of the institutionalized elders.

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Table 1

Descriptives and Pearson correlation coefficients among the variables

	M (*SD*)	1	2	3	4	5	6	7	8	9	10	11
1. OCS	9.15 (2.98)	.77										
2. PCS	8.50 (2.90)	-.70**	.62									
3. PEI	79.36 (13.31)	.41**	-.34**	.88								
4. Health	2.79 (0.50)	.48**	-.38**	.42**	†							
5. Social integration	2.55 (0.46)	.31**	-.36**	.14	.14	†						
6. Functional abilities	2.63 (0.75)	.22*	-.23*	.26**	.41**	-.04	†					
7. Activity and leisure	1.84 (0.36)	.33**	-.46**	.30**	.41**	.24**	.51**	†				
8. Environmental quality	2.80 (0.31)	.25**	-.26**	.12	.29**	.24*	.03	.25**	†			
9. Life satisfaction	2.56 (0.79)	.44**	-.43**	.38**	.54**	.15	.33**	.39**	.22*	†		
10. Education	0.52 (0.38)	.13	-.13	.17	.05	-.01	-.01	.15	.12	.13	†	
11. Income	1.09 (0.33)	-.01	-.01	.16	-.09	.35**	-.05	.03	.05	-.05	.04	†

Note. OCS = Optimistic Cognitive Style; PCS = Pessimistic Cognitive Style; PEI = Perceived Emotional Intelligence.

*p < .05; **p < .01; α values in diagonal; † The instrument is corrected via Internet and α cannot be calculated.

Table 2

Multiple mediating effects of OCS and PCS on the PEI and QoL using bootstrapping

Predictor	Mediators	Criterion	Predictor effect on mediators a	Mediators effects on criterion b	Predictor total effect on criterion c	Predictor direct effect on criterion c'	Covariate effect on criterion	Confidence Interval 95%. Upper and Lower Limit
PEI		Health			.014**	.009**	Sex: .150 ns Age: .010 ns	
	OCS		.083**	.051**				.001 - .010
	PCS		-.067**	.007 ns				-.003 - .004
PEI		Functional abilities			.015**	.011**	Sex: .366** Age: -.006 ns	
	OCS		.083**	.019 ns				-.004 - .008
	PCS		-.067**	-.030 ns				-.002 - .008
PEI		Activity and leisure			.008**	.005*	Sex: .100 ns Age: -.003 ns	
	OCS		.083**	.003 ns				-.003 - .002
	PCS		-.067**	-.053**				.002 - .007
PEI		Life Satisfaction			.020**	.012*	Sex: .120 ns Age: .017 ns	
	OCS		.083**	.045 ns				-.001 - .010
	PCS		-.067**	-.055 *				.001 - .009

Note. OCS = Optimistic Cognitive Style; PCS = Pessimistic Cognitive Style; PEI = Perceived Emotional Intelligence.
$^{*}p < .05$, $^{**}p < .01$. All presented coefficients are unstandardized.

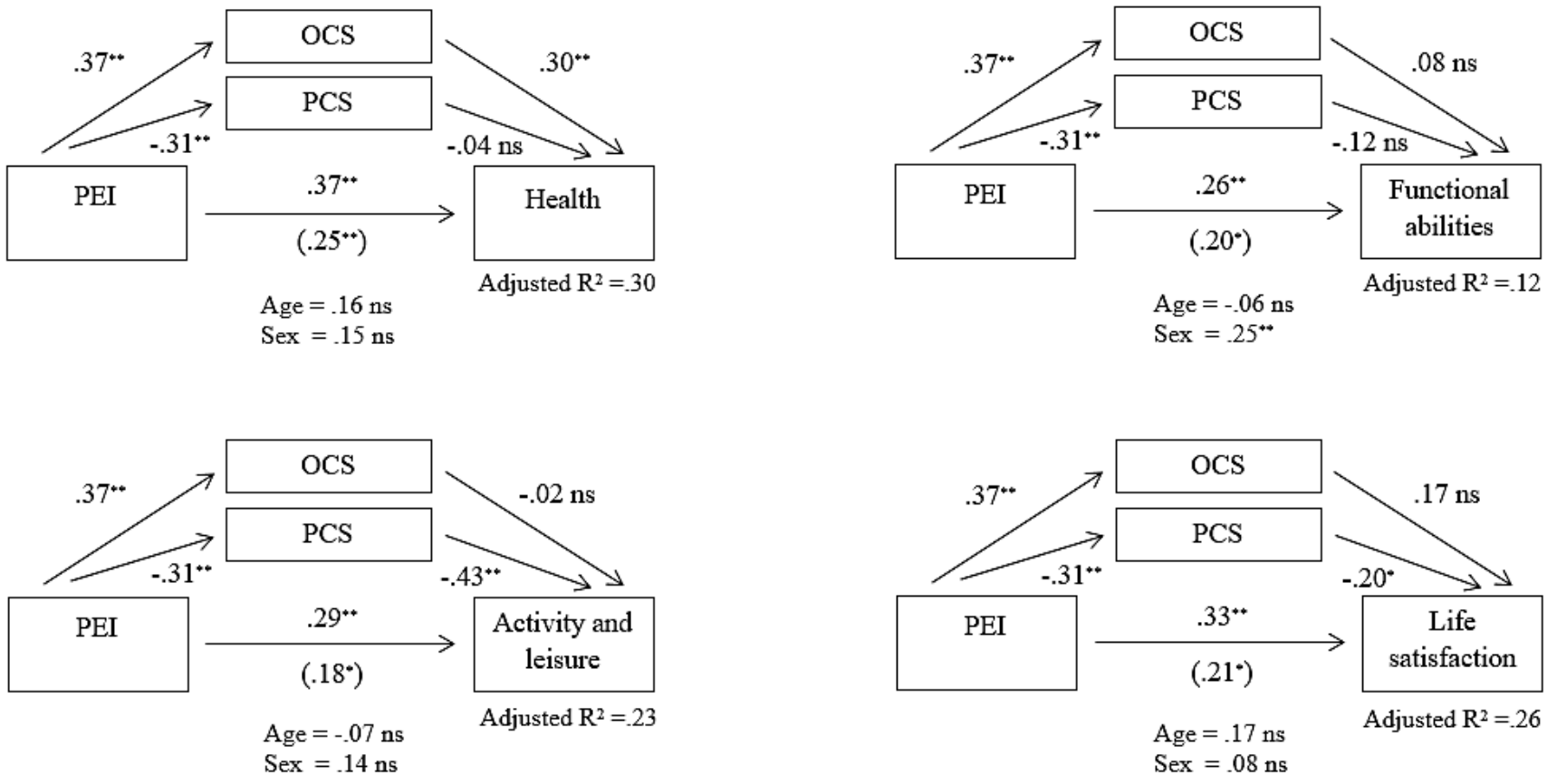

Figure 1. Multiple mediation models for the OCS and PCS on the PEI and Health, Functional abilities, Activity and leisure and Life satisfaction, relations controlling age and sex. Values presented are standardized regression coefficients.

$^{*}p < .05$, $^{**}p < .01$;