


# Optimism and social support moderate the indirect relationship between self-efficacy and happiness through mental health in the elderly

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## Abstract

We examined the role of self-efficacy, social support, optimism, and mental health in the prediction of happiness in the elderly. Moderated mediation analyses confirmed a full mediation in which self-efficacy, through perceived mental health and moderated by social support, predicts happiness moderated, in turn, by optimism. When an elder is self-efficacious, his or her mental well-being seems more likely to be improved and translated into enhanced happiness when social support and optimism are moderate to high. We provide preliminary results on the interplay of these psychosocial resources in improving subjective well-being that may help in designing tailored interventions for promoting happiness in late adulthood.

## Keywords

elderly, happiness, moderated mediation, psychosocial resources, subjective well-being

Happiness or subjective well-being (SWB) is a positive subjective experience that includes a positive hedonic balance (HB) between pleasant and distressing emotions, and life satisfaction (LS) (Diener and Ryan, 2009; Diener et al., 2009). Although some findings are controversial (Blanchflower and Oswald, 2008; Ulloa et al., 2013), and contrary to the “happiness paradox” in old age (Diener et al., 1999; Kunzmann et al., 2000), several cross-sectional and longitudinal studies have demonstrated a lifespan inverted U-shaped pattern, with a decline in happiness as one grows older, particularly after the age of 65 (Baird et al., 2010; Godoy-Izquierdo et al., 2013; Lelkes, 2008; Mroczek and Spiro, 2005; Schilling et al., 2013). This is also evident when a personal time perspective (intertemporal judgments) is adopted and the elderly rate their past, present, and expected future happiness (Godoy-Izquierdo et al., 2013; Lacey et al., 2006; Lachman et al., 2008; Röcke and Lachman, 2008). Moreover, it has been found that happiness declines rapidly with impending death (3–5 last years of life) (Gerstorf et al., 2010).

Understanding and promoting positive aspects of well-being in older adults is important (Diener et al., 2009;

Ferguson and Goodwin, 2010), both at the social and the clinical levels. If happiness declines as age advances, identifying factors responsible for SWB in the elderly may help in preventing such dropping at this life stage (Lara et al., 2014). We explored the role of self-efficacy, optimism, social support (SS), and perceived mental health status (PMH) as psychosocial resources for happiness in old age. Recapitulating the empirical findings we review below, although evidence is relatively extensive of a relationship among optimism, self-efficacy, and SS and several indicators of overall psychological well-being, there is a lack of consistent support for their specific role in such a relationship, that is, which are the predictors and which, if any, do

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play an indirect influence and through which variables?. A deeper understanding of the multiple positive psychological influences, outcomes, and underlying mechanisms would help in the development of interventions aimed at enhancing well-being in the elderly.

Among the elderly, self-efficacy (Bandura, 1997) and related constructs such as perceived competence or perceived control (for maintaining an independent life, being able to solve everyday demands, and filling the day with meaningful activities) have consistently proved to be correlates of SWB (Berg et al., 2006; Caprara and Steca, 2005; Kostka and Jachimowicz, 2010; Pinquart and Sörensen, 2000; Winsor and Anstey, 2010). This relation seems to be even more important in old age, when perceptions of mastery are decreased (Lachman, 2006; Stretton et al., 2006). The autonomy and independence related to self-efficacy and perceived competence have also been associated with well-being (Chirkov et al., 2003). Furthermore, positive associations have been found between self-efficacy beliefs and optimism when happiness is also considered (Caprara and Steca, 2005), and self-efficacy has been found to moderate the mediational effect of (health-specific) optimism in the relationship between objective (i.e. fitness status) and subjective (i.e. perceived physical quality of life) functioning in older adults (Warner et al., 2012). Thus, self-efficacy might participate in any relationship between psychosocial resources and happiness, but this remains largely unexplored, particularly among the elderly (e.g. Kostka and Jachimowicz, 2010).

Among adults entering late adulthood, Cacioppo et al. (2008) found that optimism relates to happiness. Optimistic expectancies and self-efficacy have been found to predict several indicators of well-being, including health status, quality of life, and LS among the elderly under different living conditions, from non-institutionalization to complete institutionalization (Kostka and Jachimowicz, 2010). Optimism partially predicts happiness mediated by meaning in life among elderly women (Ju et al., 2013). Optimism has also been found to predict SWB partially mediated by daily life social activities (Gonzalez and Extremera, 2010). In older individuals with chronic-pain diseases, greater optimism and SS were significantly related to psychological well-being (i.e. greater LS and lower depressive symptoms), with optimism partially mediating the relation of pain to LS (Ferreira and Sherman, 2007). With a similar sample, it has been found that dispositional pessimism was mediated by SS in its relationship with LS both cross-sectionally and longitudinally, controlling for disease symptoms, pain, and disability (Luger et al., 2009). However, Cacioppo et al. (2008) found that optimism fully mediated the relationship between personality traits and happiness, but this effect was canceled when SS (loneliness) and self-esteem were also included as mediators. Moreover, others

have found that optimism cannot predict happiness in the elderly (e.g. Godoy-Izquierdo et al., 2013).

Family, friends, and social activities and support are relevant for quality of life, emotional well-being, HB, and LS among the elderly (Litwin and Stoeckel, 2013; Merz and Huxhold, 2010; Pinquart and Sörensen, 2000; Waldinger and Schulz, 2010; Winsor and Anstey, 2010). Cacioppo et al. (2008) found that indicators of SS and loneliness relate to happiness, being the quality (vs quantity) of social resources the most relevant factor for the younger elderly. They also found that changes in social resources predicted happiness changes during a 2-year period but also the reverse, indicating a reciprocal relationship. Kostka and Jachimowicz (2010) found that optimism and self-efficacy were correlated with social isolation, but only optimism predicted it. SS has been found to partially mediate the influence of pain on depressive symptoms but not on LS (Ferreira and Sherman, 2007). It has also been found that social resources mediate the relationship between optimistic dispositions and SWB among the healthy elderly (Gonzalez and Extremera, 2010) and among chronic-pain elderly patients (pessimism, Luger et al., 2009). Waldinger and Schulz (2010) found that marital satisfaction, but not other types of social exchange, moderated the relationship between daily fluctuations in perceived physical health and a decline in happiness.

In brief, although self-efficacy, optimism, and SS are expected to influence elders' happiness, their relationships and pathways are inconclusive. Furthermore, to our knowledge, only a few studies exploring the relationships among all the aforementioned variables have been conducted on the elderly. Using multilevel regression analytic procedures, Godoy-Izquierdo et al. (2013) found that current levels of happiness among Spanish 65- to 96-year-old elderly were predicted by, among other factors, indicators of PMH and daily functioning, as well as indicators of social resources and self-perceived autonomy and independence. Contrary to the authors' hypotheses, optimism was neither correlated nor able to predict current happiness, and this unexpected finding, given other authors' proposals and evidence of the role of this trait-like factor, compel us to explore its influences more carefully. Ferguson and Goodwin (2010) studied 65- to 94-year-old elderly to determine whether perceptions of control and SS mediated the relationship between optimism and indicators of hedonic (SWB: positive affect) and eudaimonic well-being (psychological well-being: purpose in life). They found positive correlations among these variables. Furthermore, they tested five models for each outcome variable using path analyses; focusing on the findings for the hedonic indicator of SWB, they found that optimism predicted positive affect both directly and indirectly through SS. The model also included a path for a direct relationship between optimism

and perceptions of control and an indirect one with SS mediating this relationship, which could not in turn predict positive affect. Perceptions of control mediated the relationship between optimism and purpose in life.

In addition, mental health has been robustly associated with SWB (Diener et al., 2009; WHO, 2017). Among the elderly, evidence supports that more positive indicators of psychological well-being and functioning are linked with higher levels of LS and HB, and consequently, of SWB (Berg et al., 2006; Blanco-Molina et al., 2019; Waldinger and Schultz, 2010); conversely, anxiety, stress, depression, and other manifestations of psychological distress and pathology are associated with higher levels of negative affect, lower LS, and decreased SWB (Fakouri and Lyon, 2005; Gwozdz and Sousa-Poza, 2010; Kroemeke and Gruszczynska, 2016; Ramírez-Fernández et al., 2018; Rodríguez-Blázquez et al., 2012). Moreover, it has been proposed that mental health might be more important for SWB in the elderly compared to physical health and functionality (Ghubach et al., 2010; Luchesi et al., 2018). The links between psychological ill-being and reduced happiness can be increased in the elderly perceiving little control/self-efficacy and high frailty (Elliot et al., 2018; Freedman et al., 2017). However, the effect of poor PMH can be ameliorated if it is mediated by high levels of optimism (Ferreira and Sherman, 2007; Warner et al., 2012), self-efficacy (Fakouri and Lyon, 2005; Stretton et al., 2006) or social support (Pinquart and Sörensen, 2000; Waldinger and Schulz, 2010).

## Aims

The present correlational, cross-sectional study was conducted to shed more light on the beneficial influences of optimistic expectancies, self-efficacy, and SS on happiness in old age. This study examines whether the effect of these psychosocial resources on SWB (outcome) is complex, and indirect effects of and among self-efficacy, optimism and SS (as predictor, mediator, and moderator variables) should be taken into account; in this case, another relevant variable should be added to the model, and given previous reviewed literature, we selected PMH status. These indirect pathways have not been investigated to date and, consequently, it is not fully understood how such psychosocial factors interact among them and with happiness. As a consequence, our findings would allow us to understand unexplored mechanisms by which four psychosocial variables—PMH, optimism, self-efficacy, and SS—have positive influences on SWB in old age.

Based on the abovementioned previous research, we expected to find that self-efficacy, optimism, and social support would have a positive influence on mental well-being and thus on SWB, yet the lack of research examining the interactions among all these variables impeded us to formulate any definitive hypothesis on their specific direct or indirect role.

## Methods

### Participants

After obtaining written informed consent, 154 Spanish men (50%) and women aged 65 to 96 years ( $M=77.44$ ,  $SD=8.03$ ; women's age range: 65–96 years,  $M=78.19$ ,  $SD=7.17$ ; men's age range: 65–91 years,  $M=76.67$ ,  $SD=8.79$ ;  $t=-1.166$ ,  $p=0.246$ ) voluntarily participated in this study. This convenience sample was recruited from private homes, public places (e.g. parks, churches, health centers), neighborhood associations, nursing and geriatric homes, day centers, recreational centers for adults, and schools for adults in a province in southern Spain. Any individual from the initial larger sample of interested elderly, particularly among those who were institutionalized, with a diagnosis of severe mental or physical illness (e.g. major depression, dementia or any other neurological or psychopathological severe disorder) that could seriously affect their ability to complete the measurement was excluded. None of the participants were indigent. Other sociodemographic data for the participants are presented in Table 1. Participants in this study can be considered as comparable to the general older population in southern Spain in terms of sociodemographic conditions considering national databases, such as the National Statistics Institute, Women Institute, and the Institute for the Elderly and Social Services (IMSERSO) (Lara et al., 2014).

### Measures

Besides a sociodemographic survey, the participants completed the following measures.

The *Happiness Scale* (HS; Godoy-Izquierdo et al., 2013) assesses *current happiness* (i.e. in the last few days or weeks) and general or *past happiness* (during the lifetime) using two questions (“How happy are you . . ./were you . . .” followed by the aforementioned sentences in brackets; from 0=very unhappy to 10=very happy), besides perceived contributors to current SWB. Only current and past happiness scores were used. This self-report has been previously used in research conducted with the Spanish elderly (Godoy-Izquierdo et al., 2013; Lara et al., 2014).

The *28-item General Health Questionnaire* (GHQ-28; Goldberg, 1981, Spanish version by Masson, 1996) assesses the individuals' perceived health status for physical health, absence of anxiety, daily functioning, and absence of depression, with higher scores reflecting better health status. We considered the *total score* and the *physical* and *mental health composite scores*, derived from averaging subscales 1 and 3, and 2 and 4, respectively. Its psychometric properties have been widely established in the Spanish population (Godoy-Izquierdo et al., 2002).

**Table 1.** Sociodemographic data.

		%
Marital status	Single with no history of a regular partner	1.9
	Married or in a stable relationship	56.5
	No current partner but a history of a stable or marital relationship	41.6
Education level	No education	20.8
	Primary	46.1
	Secondary	16.9
	Vocational training	7.1
	University	9.1
Employment status	Working	1.9
	Unemployed	2.6
	Housework	20.8
	Retired	74.7
Monthly family income	<1000 €	47.6
	1000–2000 €	46.2
	2000–3000 €	4.2
	>3000 €	2.1
Number of descendants	0	10.4
	1	3.2
	2	23.4
	3	31.8
	≥4	31.1
Institutionalization	Non-institutionalized (lived in their own home with or without relatives or others)	64.3
	Institutionalized (lived in nursing or rest homes with partial or complete regimens)	35.7
Chronic disease	Yes, of which (more frequent)	74.7
	Cardiovascular diseases including coronary and vascular diseases, hypertension, and high cholesterol	47.9
	Bone and rheumatic diseases including osteoporosis, osteoarthritis, and rheumatoid arthritis	27.1
	Diabetes	6.9
	Hyperthyroidism	4.2
	Neurologic diseases including multiple sclerosis, Parkinson, and limb paralysis	3.5
	Respiratory diseases including asthma and chronic bronchitis	2.8
	Limb amputation	2.8
	Cancer, including prostate diseases	2.8
	Sensorial deficit	2.1
	Any kind of therapy	Yes, of which (more frequent)
Cardiovascular treatments		26.5
NSAIDs		19.7
Calcium and vitamins supplements		6.8
Diabetes treatments		5.1
Hyperthyroidism treatments		4.3
Anxiolytics		3.4

One-third of the participants reported taking some kind of drugs but were unable to specify their correct active principles, names, or aims, and it was not possible to establish this information due to clinical status or records. NSAIDs: Nonsteroidal anti-inflammatory drugs.

The *Self-Efficacy Scale* (SES; Sherer and Adams, 1983, Spanish version by López-Torrecillas et al., 2006) was used to assess self-efficacy beliefs. A *total score* was used, with higher scores indicating greater perceived personal efficacy. Its psychometric properties have been established in the Spanish elderly population (Montorio et al., 2002). Control items were removed to shorten the assessment protocol.

The *Revised Life Orientation Test* (LOT-R; Scheier et al., 1994, Spanish version by Ferrando et al., 2002)

assesses optimism, with higher scores indicating higher optimistic expectancies. Its psychometric properties have been widely established in the Spanish population (Ferrando et al., 2002). Control items were removed to shorten the assessment protocol.

The *Medical Outcomes Study–Social Support Scale* (MOS-SSS; Sherbourne and Stewart, 1991, Spanish version by Remor, 2003) assesses SS, including the emotional/informational, tangible, affectionate, and positive social interaction dimensions. A global score of *perceived social*

**Table 2.** Descriptive results for psychosocial variables and Pearson's correlations among them and with current happiness (with raw scores).

	M	SD	Min	Max	<i>r</i> with current happiness	SE	OPT	SS	GHQPHC	GHQMHC	GHQT
Current happiness	6.59	1.90	0	10							
Past happiness	7.69	1.33	4	10	0.31**						
Self-efficacy	78.67	11.32	46	99	0.23**	1	0.17*	0.29**	0.28**	0.15†	0.24**
Optimism	19.83	2.76	10	29	0.01		1	-0.10	0.03	-0.02	0.00
Perceived social support	72.56	16.81	37	95	0.34**			1	0.12	0.13	0.14†
GHQPHC	13.70	2.74	5.50	18.50	0.38**				1	0.62**	0.88**
GHQMHC	17.10	3.20	6.50	21	0.44**					1	0.92**
Total GHQ	61.62	10.70	26	76	0.46**						1

SE: self-efficacy; OPT: optimism; SS: social support; GHQPHC: General Health Questionnaire–physical health composite score; GHQMHC: General Health Questionnaire–mental health composite score; GHQT: General Health Questionnaire total score.

† $p < 0.10$ ; \* $p < 0.05$ ; \*\* $p < 0.01$ .

support was obtained, with higher scores indicating greater perceived SS. Its psychometric properties in the Spanish population have been well established (Revilla et al., 2005).

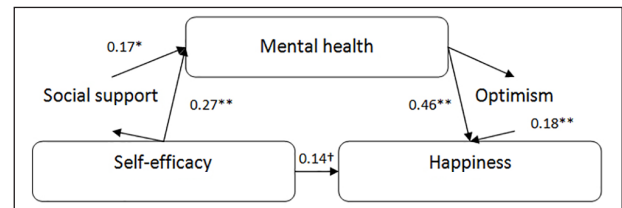
### Procedure

We provided the participants with general information regarding the main objective of the study and requested their voluntary participation. Next, those who decided to participate signed a written consent form, after which they received detailed information regarding the study and specific instructions as to how to complete the questionnaires correctly. The assessment tools were counterbalanced to avoid order bias. Applying was collective in a single session, but due to personal characteristics or circumstances its form was individualized or in an interview format in some cases (e.g. severe vision deterioration or motor difficulties). This study was approved by the Ethics in Research Committee of the authors' institution.

### Analytical procedure

After preliminary and exploratory analyses to verify the data as well as parametric assumptions, descriptive and Pearson's correlation analyses were conducted. Next, we standardized raw scores (except sex) and examined mediation and moderated mediation effects. Mediation, moderation, and derived procedures test the pathway by which a variable transmits its effects or intervenes between two other variables in a causal model (Hayes, 2009).

To examine mediating effects, simple and multiple parallel mediation analyses were computed using the SPSS macro "PROCESS" (Hayes, 2012, 2013), with non-parametric resampling method and bootstrapping (Hayes, 2009; Preacher and Hayes, 2004, 2008; MacKinnon et al., 2004, 2007). When several possible mediators are considered, a multiple mediator model procedure is favored over simple mediation analysis mainly because running simple



**Figure 1.** Mediation effect for self-efficacy–happiness relation through mental health, moderated by social support and optimism (model type 21), controlling for age ( $p > 0.05$ ), gender ( $p > 0.05$ ), and past happiness ( $p < 0.01$ ).  
† $p < 0.10$ ; \* $p < 0.05$ ; \*\* $p < 0.01$ .

mediation analyses for every potential mediator individually increases the probability of type I errors (Preacher and Hayes, 2008).

We also conducted moderated mediation analyses using the "PROCESS" macro (Hayes, 2009, 2012, 2013; Preacher et al., 2007). Preacher et al.'s (2007) approach emphasizes the estimation of conditional indirect effects, that is, the magnitude of indirect effects conditioned on values of the moderator, by bootstrapping those conditional indirect effects. We decided to run these analyses to test whether the strength of mediated effects may be increased or decreased along with levels of other psychosocial variables acting as moderators. For each analysis, 5000 bootstrap random resamples were taken from the obtained data for parameter estimation, ensuring the stability of the analyses. Bias-corrected 95% confidence intervals were then derived from the obtained distribution of  $ab$  scores over the samples, which requires no assumption regarding the underlying data distributions since the statistical significance level is determined non-parametrically.

Sociodemographics can also play a role in our analyses (e.g. Kostka and Jachimowicz, 2010; Pinguart and Sörensen, 2000). In addition, past happiness has been found to be a predictor of current happiness (Godoy-Izquierdo

**Table 3.** Moderated mediation for self-efficacy–happiness relation through mental health, by social support and optimism, controlling for age, gender, and past happiness.

Mediator variable model ( $R^2=0.18$ , $F(6, 147)=5.298$ , $p=0.000$ ) (covariates: gender and past happiness, $p > 0.05$ )						
Variable	St. Coeff.	St. Error	t	p	LLCI	ULCI
Self-efficacy	0.27	0.0875	3.065	0.003**	0.0952	0.4410
Self-efficacy $\times$ social support	0.17	0.0759	2.291	0.023*	0.0238	0.3236
Covariate age	0.31	0.0836	3.759	0.000**	0.1491	0.4797
Outcome variable model ( $R^2=0.33$ , $F(7, 146)=10.425$ , $p=0.000$ ) (covariates: age and gender, $p > 0.05$ )						
Variable	St. Coeff.	St. Error	t	p	LLCI	ULCI
Self-efficacy (direct effect)	0.14	0.0761	1.786	0.076†	-0.0145	0.2862
Mental health	0.46	0.0744	6.131	0.000**	0.3092	0.6035
Mental health $\times$ optimism	0.18	0.0561	3.154	0.002**	0.0660	0.2877
Covariate past happiness	0.20	0.0710	2.814	0.006**	0.0595	0.3400

LLCI: lower level confidence interval; ULCI: upper level confidence interval.

Z-scores. All the coefficients are standardized coefficients. PROCESS model type 21. Number of bootstrap samples for bias-corrected 95% confidence intervals: 5000.

† $p < 0.10$ ; \* $p < 0.05$ ; \*\* $p < 0.01$ .

**Table 4.** Conditional indirect effect(s) of self-efficacy on happiness through mental health at values of the moderators social support and optimism.

Social support	Optimism	Effect	Boot SE	Boot LLCI	Boot ULCI
-1.00	-1.00	0.0264	0.0423	-0.0210	0.1667
	0.00	0.0431	0.0535	-0.0481	0.1660
	1.00	0.0598	0.0718	-0.0682	0.2170
0.00	-1.00	0.0749	0.0577	-0.0094	0.2222
	0.00	0.1224	0.0538	<b>0.0375</b>	<b>0.2541</b>
	1.00	0.1698	0.0719	<b>0.0556</b>	<b>0.3521</b>
1.00	-1.00	0.1235	0.0900	-0.0227	0.3311
	0.00	0.2016	0.0792	<b>0.0711</b>	<b>0.3897</b>
	1.00	0.2798	0.1091	<b>0.1057</b>	<b>0.5481</b>

LLCI: lower level confidence interval; ULCI: upper level confidence interval; SE: standard error.

Bias-corrected 95% confidence intervals. Values for moderators are the mean  $\pm$  1 SD.

Note. Bold values refer to the values of confidence intervals.

et al., 2013). Thus, we included these variables as covariates in the analyses to control for their effects.

Analyses were carried out without missing data. The level of significance was set at  $p < 0.05$  for all the analyses.

## Results

Means, standard deviations, and bivariate correlations for all variables are shown in Table 2.

After discarding simple or multiple mediation effects of any of the study main variables as predictors and mediators (database and results available upon request), we tested

moderated mediation relationships controlling for age, gender, and past happiness. The only moderated mediation effect (all results are available upon request) emerged when using happiness as the outcome, perceived self-efficacy as the predictor, GHQ-28 PMH status as the mediator, and SS and optimism as moderators (model type 21 for PROCESS). In this model, SS was specified as a moderator variable conditioning the self-efficacy–PMH path, and optimism as a moderator of the PMH–happiness path (see Figure 1). Self-efficacy predicted PMH (0.27,  $p < 0.01$ ), as did its interaction with the moderator SS (0.17,  $p < 0.05$ ): the higher the levels of self-efficacy, the better the PMH among those with greater perceived SS. Furthermore, happiness was predicted by PMH (0.46,  $p < 0.01$ ) and this effect was moderated in turn by optimism (0.18,  $p < 0.01$ ): when self-efficacy and SS are considered, the higher the levels of PMH, the higher the SWB of the elderly when they are more optimistic. Moreover, self-efficacy could not directly predict happiness (0.14,  $p > 0.10$ ), but only indirectly by this moderated mediation effect.

Thus, the influence of self-efficacy on happiness through PMH is conditioned to the levels of SS and optimism, so that when perceptions of SS and positive expectancies for the future are both moderate or high (equal to the mean or higher), self-efficacy positively influences happiness through better PMH, but when SS and optimism are both low (below the mean), there is no relationship between self-efficacy and happiness mediated by PMH, as informed by the conditional indirect effect of self-efficacy on happiness through PMH at different values of the moderators.

Overall, 51 percent of the happiness variance was accounted for by the entire model. Table 3 shows the

*t*-values and significance of the *a*, *b*, *c*, and *c'* paths, and Table 4 shows the conditioned effects of the variables at values of the moderators.

The same analyses were repeated with the remaining subjective indicators of perceived health status, namely, GHQ-28 total score and GHQ-28 physical health composite score, but no evidence of moderated mediation was found (database and results available upon request).

## Discussion

This study sheds some light on the specific mechanisms by which three psychosocial resources for which there is compelling evidence on their benefits for well-being influence, in an interactive way, SWB in the elderly. Aside from the pioneering study by Ferguson and Goodwin (2010), there is a lack of research on the potential interplay among optimism, self-efficacy, and SS for SWB among older adults. Nevertheless, such a study explored positive affect instead of a general subjective indicator of SWB, and considered optimism as the predictor and perceptions of controllability and satisfaction with SS as mediators. There is also other evidence obtained from apparently healthy adults (e.g. Karademas, 2006) and from elders with osteoarthritis (e.g. Ferreira and Sherman, 2007) which is limited not only in terms of sample characteristics but also of variables considered simultaneously and the outcome variables used. Moreover, other research has explored whether optimism, self-efficacy, and SS predict general well-being, happiness, and LS among the elderly under diverse living conditions, from non- to full-institutionalization, but analyses on indirect effects were not conducted (e.g. Godoy-Izquierdo et al., 2013; Kostka and Jachimowicz, 2010).

Consequently, this study is the first to examine whether perceptions of generalized self-efficacy, SS, and optimistic expectancies influence the relationship between mental well-being and happiness in old age, including both direct and indirect paths, that is, the possible interaction among the variables, with mediation and moderated mediation analyses. Once the existence of an effect has been demonstrated (e.g. previous findings of regression analyses), focus eventually shifts toward understanding the mechanism(s) by which such an effect operates (*how* it occurs, or mediating effects) and establishing its boundary conditions or contingencies (*when* it occurs, or moderating effects) (Hayes, 2012). Answering such questions results in a deeper understanding of the phenomenon or process under investigation and provides insights into how that understanding can be applied (Hayes, 2012).

This study examined whether the indirect, conditional effect of self-efficacy on happiness through PMH varies as a function of optimism and SS (i.e. whether the mediated relationship occurs at different levels of the two moderators).

Such a model was assessed using a non-parametric bootstrapped multivariate approach to the cross-products of the coefficients (Hayes, 2012; Preacher and Hayes, 2004, 2008). Findings reveal that greater perceptions of personal efficacy contribute to better PMH status and better PMH contributes in turn to enhanced happiness among those elderly with SS and optimistic expectations. Bootstrapped confidence intervals used for inferring the conditional indirect effect given the values of moderators (i.e. mean  $\pm$  1 SD) revealed that the tested effect is consistently positive and different from zero except among those elderly with relatively low SS or relatively weak optimistic expectations; among the latter, there is no indirect effect of self-efficacy on happiness through PMH status.

Among the variables included in this study, none operates as trickily as optimism because, though postulated as a personality disposition for health, well-being, and happiness (e.g. Kostka and Jachimowicz, 2010), contradictory findings do exist (e.g. Godoy-Izquierdo et al., 2013). Our findings demonstrate that, controlling for age, gender, and past happiness, optimistic expectancies participate in the prediction of SWB when health status is considered, yet not as predictor (e.g. Ferguson and Goodwin, 2010) or mediator (e.g. Ferreira and Sherman, 2007), but as a moderator. The results indicate that it conditions the influence of PMH on happiness, so that when optimism reaches at least moderate values (i.e. in those elderly with moderate-to-high optimistic expectancies), better mental well-being contributes to higher SWB. Forgeard and Seligman (2012) stressed that cultivating flexible and relatively realistic optimistic expectancies may be most advantageous, and this has become one of the pathways for improving people's well-being. We thus encourage the consideration of optimism in interventions aimed at increasing the elderly's happiness, particularly if we consider that optimistic expectancies decrease as age advances (Giltay et al., 2006), as individuals must deal with the many challenging events that come with aging. However, as others have stressed (Gonzalez and Extremera, 2010; Ju et al., 2013), the relationship between dispositional optimism and SWB seems not to be direct, as other variables may play an important role.

Our findings do not support either previous empirical findings on the predictive (e.g. Pinquart and Sörensen, 2000) or mediating (e.g. Ferguson and Goodwin, 2010) influences of SS on happiness in the elderly. We found that perceptions of SS moderate the influences of self-efficacy on PMH, so that higher self-efficacy expectations translate into better mental well-being when perceived SS is at least moderate. This result also parallels other evidence demonstrating the independent effects of optimism and SS when both are considered jointly (e.g. Cacioppo et al., 2008). Furthermore, Ferreira and Sherman (2007) found that SS partially mediated the role of pain in depressive symptoms but not in LS, this finding also supporting that it may be

more important for mental well-being than for happiness itself. Emotional and instrumental support may be associated with mental health, providing a protective mechanism for reducing distress, anxiety, and sadness, and strengthening feelings of personal value and self-esteem in old age. Undoubtedly, SS is a resource for well-being and positive outcomes at any level, but with older adults it also seems to be relevant in conditioning the influences of the individual's perceptions of self-efficacy on his(her) mental well-being. Indeed, emotional support is positively associated with SWB; however, instrumental support, even when provided by family or other reliable sources, may have a negative impact on SWB when it is related to a loss of autonomy or to dependence (Reinhardt et al., 2006). Others have also found differential effects of emotional and instrumental SS on well-being and SWB depending on the quality of the relationship (Winsor and Anstey, 2010) or the kinship, type, and quality of the support (Merz and Huxhold, 2010).

Our findings support that self-efficacy is a predictor of happiness in the elderly (e.g. Kostka and Jachimowicz, 2010; Pinquart and Sörensen, 2000). Nonetheless, in our study, it was unable to predict happiness directly, but only through the mediation of PMH and moderated by SS and optimism: higher self-efficacy translates into enhanced PMH among those elderly with moderate-to-high social resources, and simultaneously the elderly benefit from having higher PMH and this feeds their happiness when optimistic expectancies are also moderate to high. Bivariate correlations among these variables were all found to be positive and as expected (e.g. Ferguson and Goodwin, 2010), but findings revealed a complex relationship among them. Our findings support those by Ferguson and Goodwin (2010), who established that perceived control could not directly predict a hedonic indicator of SWB, even considering the influences of optimism and SS. Our model confirmed that, only when considering the mediating role of PMH and the moderating roles of SS and optimism, it is possible to understand the self-efficacy-happiness relationship. Such a moderated mediation model explained half of the variance in happiness; for increasing explained variance, other variables could also be accounted for, such as coping (Schanowitz and Nicassio, 2006), something that should be explored in the future.

In conclusion, self-efficacy, SS, and optimism proved to be essential for happiness in the late adulthood, and interventions should address the enhancement of such psychosocial resources for promoting elders' mental and overall well-being. This is particularly important given that, as occurs with optimistic expectancies and social resources, a significant decline has been observed in perceptions of control over the lifespan (Winsor and Anstey, 2010). Furthermore, older adults show low perceived control over age-related declines, which impacts their cognitive performance, health, and well-being (Lachman, 2006).

In this study, mental health appeared as a strong predictor of happiness in older adults. PMH fully mediated the

influences of self-efficacy on SWB. Thus, it seems that how the elderly perceive their mental health status plays a relevant role in the relationship between their efficacy expectations and their happiness, but an individual's mental health also depends on his or her perceptions of SS, and his or her SWB considering his or her mental health status also depends on the optimistic expectations he or she holds. Approaches to mental health, psychological well-being, and SWB are complex and varied: some consider them as synonyms (e.g. mental health as a complete state of emotional and psychological well-being; Keyes, 2006), some consider SWB as a multi-faceted phenomenon (e.g. Diener et al., 2009) of which mental health is a facet (Diener, 2006), some treat them as interrelated components of the same macrodimension (e.g. overall well-being or wealth, or positive health; Seligman, 2008), others as indicators of mental and psychosocial functioning which can be separated into positive and negative ones (Westerhof and Keyes, 2010), and still others view them in a casual path that starts with one and ends with the other (Keyes and Waterman, 2003; Lent, 2004). Moreover, the distinction between hedonic and eudaimonic indicators of well-being contributes to this debate (Delle Fave et al., 2011; Joshanloo, 2016; McMahan and Estes, 2011). Although the literature is extensive on this issue, space limitations prevent us from discussing the topic.

We agree with Diener's proposal, and even when there can be a reciprocal influence between such multifaceted phenomena (i.e. healthier people feeling happier, and happier people being healthier), mental health (i.e. people's resources for positive emotional, psychological and social well-being and for a successful daily life without psychopathologies) can be viewed as a precursor of happiness (i.e. people's own evaluations of their lives). Recently, Huppert and So (2013) have analyzed the relationship among several indicators of positive mental functioning—including competence, emotional stability, engagement, meaning, optimism, positive emotion, positive relationship, resilience, self-esteem, and vitality—as opposed to the manifestations of common mental disorders, and have found that this *flourishing* profile is positively related to indicators of SWB. In any case, mental health status and positive daily functioning, particularly when they are self-reported subjective indicators, have been consistently related to SWB among the elderly (Berg et al., 2006; Fakouri and Lyon, 2005; Ghubach et al., 2010; Gwozdz and Sousa-Poza, 2010; Schilling et al., 2013), particularly when constraints are not perceived to be attributed to aging.

Consequently, we stress the importance of increasing resources for promoting self-efficacy, holding optimistic expectancies about oneself, life and the future, and enhancing social resources for enjoying improved psychological health and overall well-being, given that all of these variables taken together determine how happy the elderly feel, and consequently how long they will live (e.g. Diener and Chan, 2011). Our findings shed light on the way these



variables might operate in relation to happiness. Considering the evidence to date, the ingredients of a psychological intervention with a favorable impact on happiness should include these variables. Several meta-analyses on psychosocial interventions aimed at increasing SWB in late life based on these variables have proved that such interventions are successful for increasing well-being in the short term, although an effort should be devoted to ensuring long-term benefits (Bolier et al., 2013; Okun et al., 1990; Sin and Lyubomirsky, 2010). Consequently, interventions should ensure that the components and the duration of the intervention are appropriate for promoting happiness and creating a sense of life worth living. In addition, these variables have been found to be components of psychosocial profiles for the prediction of the risk of morbidity, all-cause mortality, and self-rated health in a population of late middle-aged and older men and women, demonstrating their synergistic effects (e.g. Klabbers et al., 2014).

## Limitations

There are some limitations in this study to be noted. First, as participants were volunteers with an adequate health status and cognitive functioning, and overrepresented community-dwelling elderly and individuals with low-to-moderate education and socioeconomic levels, they might not be representative of the elderly in Spain or beyond. Our sample appeared, however, roughly comparative to national databases and other studies conducted in our country. Second, our findings completely rely on self-reported data; the validity of our results would be enhanced with other sources of information (e.g. informant reports, clinical reports, behavioral observations, experience-based sampling). Moreover, a revision of some measures (e.g. dispositional optimism; Luger et al., 2009) might lead to a higher stability of empirical findings. Moreover, anxiety, depression, and other psychopathological issues have different origins, manifestations and outcomes; by using a mental health composite as in this study, we were unable to analyze specific paths for each of these dimensions of mental distress. Thus, we encourage further research addressing the influences of specific domains of psychological distress in the relationships analyzed herein. Third, the cross-sectional design of this study does not allow to state firm causal conclusions. A longitudinal, prospective design examining changes in the relationships among the variables over time, or experimental studies including an intervention aimed at increasing psychosocial resources and SWB, would provide more exact interpretations of the relationships among self-efficacy, optimism expectations, SS, and well-being outcomes. Finally, cultural differences have been established for both optimist–pessimist expectancies for the future (Carver et al., 2010), self-efficacy (Klassen, 2004) and SS (Burlinson, 2003). Diener et al. (2003) have also stressed that cultural variables explain

differences in mean levels of SWB both at the individual and the community levels, and culture has been one of the most visited variables for explaining national differences in SWB (Diener and Biswas-Diener, 2008; Diener and Ryan, 2009). Thus, the results presented herein should be replicated using samples from other nations and with different ethnic and cultural backgrounds.

## Conclusion

Self-efficacy is revealed as a powerful contributor to happiness in the elderly when mental health status is considered, and its effects are conditional on two well-documented psychosocial resources for well-being: optimism and SS. This study elucidates the mechanisms by which *strivings* or *strengths* such as PMH, self-efficacy, SS, and optimism work together in accounting for SWB and thus contributes to the cumulative knowledge on the psychosocial correlates of happiness in old age.

Establishing the relationships among psychosocial resources such as optimism, self-efficacy, and SS with indicators of SWB, and more generally well-being, will allow us to understand underlying processes and to use this information to design effective tailored interventions for promoting happiness, optimal functioning, fulfilling living, and positive, flourishing aging in the elderly.

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## Data availability statement

Research data are not shared but available upon request.

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