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The impact of economic recessions on depression and individual and social well-being: The case of Spain (European Social Surveys 2006 and 2013)

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Abstract:	ABSTRACT Purpose. Although there is abundant evidence about their impact of economic crises on depression and other mental health problems, little is known about the protective role of variables linked to positive functioning (i.e., psychological well-being). Methods. We analyzed data from Spain, one of the European countries most affected by the 2008-2013 economic recession, collected in Round 3 (R3, 2006) and Round 6 (R6, 2013) of the European Social Survey interviews. Both surveys included measures of psychological well-being, social well-being and depression. Both samples were nationally representative of the general population (R3: 1877 participants, 49.2% men; R6: 1889 participants, 48.9% men). Results. Data from the R6 survey showed that, compared to data gathered in R3 (i.e., before the onset of the recession), Spanish citizens showed significantly less life satisfaction (95% CIs .37 to .63), less personal optimism (95% CIs .03 to .15), less social optimism (95% CIs .75 to .85), and higher levels of depressive symptoms (95% CIs -.74 to -.19). Structural equation modeling revealed that protective factors for depression changed in both rounds. In R3 (2006), social optimism and social trust were significant mediators between well-being and depression. Yet, both buffering variables were no longer significant in R6 (2013). In R6, psychological well-being was directly related to depression with no further mediation. Conclusions. Economic crises are associated with a significant increase of depressive symptoms. Furthermore, financial crises seem to have a corrosive impact on mental health by reducing the buffering effects of positive beliefs regarding the good nature of society.

Reviewer #1: The present manuscript reports a study where authors aimed to investigate the impact of the recent economic crisis on depression and well-being factors in the Spanish population. Particularly relevant, authors explored the potential pathways through which psychological and social well-being factors may contribute to protect against depression, as a function of the ongoing socio-economical context (i.e., before and after the economic recession in Spain: 2006 and 2013, a country where this crisis have had a particularly large impact). To achieve this purpose, data from the European Social Survey interviews conducted in Spain in the Round 3 (R3, 2006) and Round 6 (R6, 2013), both including a full module on personal well-being (measures of individual psychological well-being, IPWB, social well-being, SWB, and depression), were analyzed. Results showed that protective factors against depression may vary depending on the socio-economical context (i.e., different pathways at R3 and R6). Both samples analyzed are nationally representative of the general Spanish population, analyses are well-performed and conclusions are certainly interesting. This is a well written manuscript, with a clear discussion of results. Results are indeed interesting and have the potential to make a relevant contribution to our state of knowledge in this field. Nevertheless, there are some issues with the manuscript in its current form that would deserve further consideration, in order to achieve a greater clarity and impact of these very interesting findings.

We want to thank reviewer 1 for his/her kind and constructive comments on our manuscript.

1) When framing the purposes of the study (i.e. determining pathways of influence of IPWB and SWB on depression at each assessment time), some compelling evidence is discussed regarding the buffering role of some of these factors on individuals' health. First, it is stated that "there is some evidence that eudaimonic psychological resources play a moderating role on the impact of economic crises on physical health". Second, it is referred that "having strong social networks may serve as a buffer to cushion the negative impact of economic hardships on one's happiness level in the aftermath of financial crises (Reeskens &Vandecasteele 2017)". In all these cases, buffering factors were analyzed (and supported) as moderators on the effects of other variables on mental health outcomes. Yet, in their models, authors considered the mediating rather than moderating role of SWB variables on the relationship between IPWB variables and depression. This differentiation seems important given the cross-sectional nature of the surveys. In absence of a temporal precedence of the predictors with respect to the outcome measure, how can we interpret this mediation pathways? Can we conclude that higher IPWB promotes higher SWB resources, in turn, protecting against depression? Note the limitations of the design to perform mediation models, in contrast to alternative moderation pathways. Why did authors opted by the mediation solution instead of a moderation model, more fitted to previous findings on the potential buffering moderating role of several WB factors on mental health?

Thank you for bringing our attention to this important point. The reviewer is correct that in our manuscript we accidentally referred to the “moderating” role of SWB variables when really we intended to refer to the mediating role that SWB variables may have on the relationship between IPWB variables and depression. We apologize for the confusion this created and want to clarify that our objective was to study the mediating role of SWB on mental health outcomes (i.e. depression). In other words, our hypothesis was that greater IPWB promotes greater SWB, which in turn serves as a protective factor against

depression. We have modified the text of our manuscript in order to make clear that we conducted a mediation analysis and we have removed all phrases that suggest or imply the use of moderation analyses (e.g. “buffering role”, “moderating role”, “serve as a buffer to cushion”). We believe our modified manuscript accurately reflects the content of our study and is consistent and up-to-date with the latest literature in the field. Futhermore, we now better explain the mediation analyses we conducted (abstract and hypotheses) and on page 5 we have added a discussion of previous studies supporting the mediational role of SWB on psychological outcomes (Reeskens & Vandecasteele 2017; Fredickson et al. 2003; Vollmann et al. 2011). (Reeskens & Vandecasteele 2017; Fredickson et al. 2003; Vollmann et al. 2011). In addition, in the limitations section (p. 18) of our study we have noted that this is a cross-sectional study, and, therefore, that it is more appropriate to talk about indirect effects instead of mediation. We also mention that our study should be replicated in studies with longitudinal designs (Kline, 2015).

2) Among the main predictions in the study, it is predicted that "eudaimonic components of well-being and closeness of relationships, which both have a trait-like nature, would not be significantly affected by the crisis". Results indeed showed no significant differences in the levels of eudaimonic WB and closeness of relationships at the two surveys, which is interpreted as "explained by the trait-like nature of this type of well-being". Note however that in absence of multiple assessments of the variables for the same individuals at the different times, this "trait argument" (i.e., variable levels remained constant within individuals across time) is not entirely valid. What we can conclude from these results is that the general levels of eudaimonic WB and social support resources in Spanish citizens are unaffected by the recession. Yet, if this is due to the trait-nature of those psychological and social factors or not cannot be really determined in this study, in absence of multiple assessments for the same individuals across the different time assessments.

We thank the reviewer for this observation. We agree that, from a theoretical view, traits reflect individual characteristics that remain relatively constant across time. Yet, in practice, personality or psychological traits are measured by asking questions that require the respondents to make estimations regarding the typical ways they react to life events or on their ways of being. For instance, this is done in standard measures of anxiety (like the STAI where the only difference between the state and trait version of the measure is the temporal frame of the question). What we meant in the text, although perhaps it was not adequately expressed, was that eudaimonic components of well-being and closeness of relationships, as measured in our study (i.e., asking respondents to use a trait-like perspective) would be less likely affected by the economic crisis than those aspects (e.g., affect) that are more immediately influenced by contextual circumstances. Consequently, we have now reworded that part of the manuscript (page 6) to avoid confusion and do not use the “trait argument” to explain why the general levels of eudaimonic WB and social support resources in Spanish citizens were unaffected by the recession.

3) When formulating the hypotheses in the introduction section, authors state that "in regard to the moderating effects of hedonic, eudaimonic, social and physical well-being on depression, as the study was exploratory no specific prediction was made regarding the specific pathways that would appear in the two separate ESS waves". First, note again the mismatch between this sort of formulation (i.e., "potential moderating effects") and the models tested through Structural Equations (i.e. mediation pathways). Second, although the models are proposed as exploratory,

with no predictions on specific pathways in the introduction, Structural Equations implies pre-defining specific models to be tested, which in this case comprised the pre-specification of SWB factors as potential mediators on the pathways between IPWB and depression outcomes. Hypotheses in the introduction section should be reframed accordingly (and justified) to solve this mismatch, as later in the Method can be read that "we hypothesized and tested two distinct plausible structural models. Both models proposed individual well-being (i.e., life satisfaction, optimism, eudaimonic well-being, and physical health) and social well-being (i.e., close relationships, social optimism, and social trust) as predictors of depression".

Thank you for the recommendation. As suggested, we reframed our hypotheses accordingly and provided better justification for why we elected to use a mediation model (see response 1 above). That is, we reformulated our last hypothesis to specify that we predicted that SWB factors possibly mediate the relationship between IPWB and depression (page 6).

4) Relatedly, an alternative model with depression as predictor and life satisfaction as outcome was also tested. Yet, no previous background justifying this alternative model seems to have been provided in the current version of the manuscript.

Thank you for your comment and for bringing this to our attention. We have now included several studies (Rocha & Fleck 2010; Samaranayake, Arroll & Fernando 2011; Vazquez, Rahona, Gomez, Caballero & Hervas, 2015) to justify the alternative model (pp. 3, 11 and 17) and believe they provide sufficient background to support our reasoning for proposing this alternative model.

5) Eudaimonic WB was formulated as the sum of individuals' levels on their different dimensions (purpose in life, sense of control, autonomy, sense of growth, self-acceptance). Since these dimensions are related but independent psychological factors, with separate contributions to mental health, I wonder whether authors have also examined more detailed models entering each of these eudaimonic WB factors as separate predictors.

Yes we have examined more detailed models entering each of these eudaimonic WB factors as separate predictors and what we found is that although all dimensions are maintained in the model, each factor contributes to mental health in a different way. These analyses are now reported as Supplementary material (figure 5 y 6). A detailed explanation of the role played by each psychological factor (in each round) is provided below.

R3:

Autonomy: SWB factors do not have a mediating role on the relationship between autonomy and depression.

Competence: SWB factors partially mediate the relationship between competence and depression.

Purpose in life: Closeness of relationships completely mediates the relationship between purpose in life and depression.

Accomplishment: Closeness of relationships does not have a mediating role on the relationship between accomplishment and depression.

Self-acceptance: SWB factors partially mediate the relationship between self-acceptance and depression.

R6:

Autonomy: Closeness of relationships completely mediates the relationship between autonomy and depression.

Competence: Closeness of relationships does not have a mediating role on the relationship between competence and depression.

Purpose in life: Closeness of relationships do not have a mediating role on the relationship between purpose in life and depression.

Accomplishment: Closeness of relationships do not have a mediating role on the relationship between accomplishment and depression.

Self-acceptance: Closeness of relationships completely mediates the relationship between self-acceptance and depression.

By looking at the AIC (a comparative measure of fit where lower values indicate a better fit), we found that the model that incorporated the sum of the five Eudaimonic WB dimensions hadlower AIC values in both rounds (R3: 126.08 and R6: 87.71) than the corresponding AIC values for the model containing the five dimensions entered separately (R3: 225.87 and R6: 177.85). This confirmed that the model that incorporated the Eudaimonic WB aggregate score had the best fit.

6) While adequately discussing on the absent mediating role of social optimism and social trust in R6 (in contrast to R3), authors do not elaborate too much on another very important finding, such as that close relationships remained (at least partially) as a mediator of the effects of IPWB on depression at R6. Besides my previous concerns on the mediation nature of the pathways tested (comment 1), this specific finding points toward the important relevance of promoting social support resources at times of adversity over other socioemotional factors such as social optimism and social trust. This finding has clear relevance for models of resilience promotion under socio-economic challenging contexts. This finding would deserve a further more elaborated discussion in the manuscript.

Thank you for bringing our attention to this important point. On page 17, we now explicitly mention that close relationships (unlike social optimism and social trust) remained as a mediator of the effects of IPWB on depression at R6 and discuss the potential implications of that finding.

Other relatively minor issues:

7) "economic recessions are associated with … decreases in psychological well-being (Martin-Carrasco et al. 2016) and life satisfaction… ". Please, clarify to what particular dimension WB "psychological well-being" refers to in the study of Martin-Carrasco. In this paragraph, life satisfaction is considered as independent from psychological well-being (PWB), while across the manuscript is framed as an integral component of the PWB factor. Please, use a common terminology and variables framing across the manuscript.

The study by Martin-Carrasco et al. (2016) was a review paper, led by the European Psychiatric Association (EPA), on the effects of economic crises in Europe. Yet, in that

particular review, the authors only used what they considered to be surrogate markers of psychological well-being (e.g., job insecurity or rates of depression/anxiety) but did not use direct measures of constructs related to well-being. We thank the reviewer for allowing us to correct this piece of information.

8) Reibling's study is referenced twice in the same sentence: Reibling et al. (2017) (Reibling et al. 2017). Please, adjust all references in the text to APA norms.

This has been corrected and we double checked the rest of the references to make sure they adhere to the specific norms of the journal.

9) "Hedonic wellbeing relates to having more positive than negative emotions (e.g., depression)". I do not think this is the best example to refer to the affective dimension of hedonic well-being, basically comprising a higher balance of positive over negative affective states. This is typically measured with affective scales, such as the PANAS. Depression do not merely refer to this positive over negative affective balance but to a large number of symptoms, not exclusively referred to the affective domain but also to other dimensions (e.g., anhedonia, sleep problems). The current definition seems to assume that the affective dimension of well-being and depression are interchangeable concepts (which they are not).

The example that we chose to as an example of negative emotions was not the most appropriate. Although the word depression can be used as a synonym of a negative sad emotion (e.g., sadness), it is also used to label a syndrome (e.g., major depressive episode) or a disorder (e.g., major depressive disorder). Thus, we have now chosen a different emotion (i.e., feeling 'upset', which is one of the items in the PANAS).

10) "Some authors have argued that economic crises favor the corrosion of character (Sennett 1998)". Please, clarify what do you specifically mean here by "corrosion of character" and how it relates to the absence of buffering effects for social trust during times of economic recession in the study.

We originally referenced the concept "corrosion of character" from Sennett´s book (1998) in order to support the idea that economic crises have significant psychological and moral consequences on society. We aimed to use "corrosion of character" just as an example of other possible negative outcomes of economic crises that might relate to the protective role of SWB variables. However, after considering the reviewer´s comment, we realize this phrase may be a little unclear for our readers and opens the door to maybe some questions we did not directly set to explore in this study. Therefore we have decided to remove it from our manuscript.

11) Abstract: "Although there is abundant evidence about their impact of economic crises". Change for "about the impact of economic crises…"

This has been changed. Thank you.

Reviewer #2: The authors present the results of an analysis of public access data that has great relevance. Specifically, they compare the relationships between different variables of well-being and health, before and during the recession that affects Spain, to assess the impact of economic crises on mental health.

In this sense, the research problem is clearly justified, its data analysis strategy is adequate for its purpose and the discussion is supported by recent literature. In short, the article meets the requirements to be published.

However, it is suggested to review and / or modify some aspects to improve the document.

1. Numbering the pages would have facilitated the revision, its absence obliges me to mention in my comments only the corresponding section,

We understand the lack of page numbers made reviewing our paper more difficult and sincerely apologize for the inconvenience. We were under the impression that the system would automatically number the pages which clearly was not the case. This has been corrected and the pages are now numbered.

2. The authors propose that "These consequences were and continue to be particularly severe (in Spain) compared to other European nations". It would be interesting to mention what possible explanations exist for this fact (first page of the introduction)

The sentence the reviewer mentioned has now been revised to include an additional part at the end that reads: "These consequences were and continue to be particularly severe compared to most other European nations that were less affected economically by the crisis." Hopefully this helps make clear the economic explanations for this fact. As mentioned in the manuscript, "economic recessions are associated with increases in depression and suicide rates (Martin-Carrasco et al. 2016) and the explanation for why mental health outcomes were greater in Spain as compared to some other countries relates to the greater severity of the financial crisis in Spain compared to other European nations. To demonstrate how severe the economic crisis was in Spain, we provide information related to unemployment levels (e.g. "unemployment increasing from 8.2% in 2007 to 26.1% in 2013"). Due to word limits, we did not initially provide more evidence (e.g. levels of job insecurity, homelessness, and evictions) demonstrating the greater impact the crisis had in Spain compared to other nations but we are happy to do so if the reviewers feel it is necessary. For example, if need be, we can also provide the unemployment levels in other European nations in 2013 for comparison purposes.

3. There are very long paragraphs in the introduction. The second page of the introduction is occupied by almost a single paragraph.

Thank you for calling this to our attention. The introduction has been broken up into smaller paragraphs.

4. There is a lack of references to support this statement: "eudaimonic components of well-being and closeness of relationships, which both have a trait-like nature"

We thank the reviewer for this observation. Please, see our responses to Reviewer 1's second point. The sentence has been now modified to clarify what we meant and prevent confusion. Moreover, references related to this topic are now included in the revised manuscript.

5. In Instruments: although it is not possible to calculate the internal reliability of several scales of a single item (for obvious reasons), information should be indicated about the validity of some of them, for example, the measure of satisfaction with the life, is commonly used in research and there may be information about it. Not having validity information in this or other instruments should be recognized as a limitation.

This has now been added in the limitation section.

6. The evaluation of the Close relationships variable is measured with two different items in both times. This is a limitation when comparing results in both times, so it must be recognized as a limitation.

The slight difference in the wording of the two items (see p. 18) is now acknowledged as a limitation in the Discussion section.

7. The information on the indirect effects assessment method (mediation) should be in the section on "Data analysis" and not in "Results". In the latter they should only show the results of that analysis

The paragraph that explains the model (i.e. the indirect effects assessment method) and the potential mediators has been moved to the "Data analyses" section. Only the results of the analyses remain in the "Results" section.

8. In one figure they call the endogenous variable CESD and in another they call it depression. It has to be uniformed.

The name of the variable depression is now uniform across figures.

9. I suggest arguing in the introduction the existence of the alternative model that includes satisfaction as an endogenous variable.

We have now included several studies (Rocha & Fleck 2010; Samaranayake, Arroll & Fernando 2011; Vazquez, Rahona, Gomez, Caballero & Hervas, 2015) to justify the alternative model (p. 3, 11 an17) and believe they provide sufficient background to support our reasoning for proposing this alternative model.

The impact of economic recessions on depression and individual and social well-being: The case of Spain (2006-2013)

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ABSTRACT

Purpose. Although there is abundant evidence about the impact of economic crises on depression and other mental health problems, little is known about the protective role of variables linked to positive functioning (i.e., psychological well-being).

Methods. We analyzed data from Spain, one of the European countries most affected by the 2008-2013 economic recession, collected in Round 3 (R3, 2006) and Round 6 (R6, 2013) of the European Social Survey interviews. Both surveys included measures of psychological well-being, social well-being and depression. Both samples were nationally representative of the general population (R3: 1877 participants, 49.2% men; R6: 1889 participants, 48.9% men).

Results. Data from the R6 survey showed that, compared to data gathered in R3 (i.e., before the onset of the recession), Spanish citizens showed significantly less life satisfaction (95% CIs .37 to .63), less personal optimism (95% CIs .03 to .15), less social optimism (95% CIs .75 to .85), and higher levels of depressive symptoms (95% CIs -.74 to -.19). Structural equation modeling revealed that protective factors for depression changed in both rounds. In R3 (2006), close relationships, social optimism and social trust were significant mediators between well-being and depression. However, social optimism and social trust were no longer significant in R6 (2013) whereas close relationships remained a partial mediator of the effects of psychological well-being on depression.

Conclusions. Economic crises are associated with a significant increase in depressive symptoms. Furthermore, financial crises seem to have a corrosive impact on mental health by reducing the mediating effects of positive beliefs regarding the good nature of society.

Keywords: Depression; Economic issues; Mental Health; Social Factors; Population Survey; Stressful Life Events

INTRODUCTION

Since 2008, many European countries have been suffering from an economic crisis, which has led to a variety of negative economic and mental health consequences including increased rates of unemployment and depression (European Commission 2009; Mental Health Commission 2011). These consequences have been especially severe in countries characterized by austerity policies (Karanikolos *et al.* 2013).

Southern European countries have been particularly affected by this economic crisis and the case of Spain is particularly interesting. Being the fourteenth largest economy in the world based on nominal GPD, and the fifth in largest Europe, Spain has faced serious economic problems during this period. The economic crisis led to the largest increase in unemployment in the country's history, with unemployment increasing from 8.2% in 2007 to 26.1% in 2013 (European Commission 2013).

With some exceptions (e.g., Ruhm 2000; Abebe *et al*., 2016), most studies have found a negative impact of economic crises on health-related outcomes. In the case of mental health, economic recessions are associated with increases in depression and suicide rates (Martin-Carrasco *et al.* 2016), especially in working age men (Lopez Bernal *et al.* 2013; Reibling *et al.* 2017), as well as lower life satisfaction (Helliwell *et al*. 2014).

With respect to the 2008-2013 economic crisis, several studies have found an increase in the prevalence of poor mental health in Spain (Bartoll *et al.* 2014; Bacigalupe *et al.* 2016). These consequences were and continue to be particularly severe compared to most other European nations that were less affected economically by the crisis (Fernandez-Rivas & Gonzalez-Torres 2013). For example, by analysing consecutive data from the European Social Survey (ESS), Reibling *et al.* (2017) found that feelings of depression decreased in most parts of Europe from 2006 to 2012, whereas in Spain and Cyprus they

significantly increased. Similarly, the comprehensive and large-scale European Study of the Epidemiology of Mental Disorders (ESEMed) conducted in 2002 found a 4% annual prevalence of major depression in Spain, indicating a relatively lower prevalence of depression before the recession, in comparison to other Western countries (Gabilondo *et al.* 2010). Yet, the diagnosis of major depression by physicians increased by 19.4% after the onset of the crisis in Spain, with unemployment, evictions and debt being found as significant risk factors for depression (Gili *et al.* 2013).

This increase in depression rates has had negative consequences since it has been associated with lower levels of life satisfaction (Rocha & Fleck 2011; Samaranayake *et al.* 2014; Vazquez *et al.* 2015) and greater disability (Kessler & Bromet 2013). Although there is strong evidence of the role that socioeconomic factors (e.g., job insecurity or unemployment) play in the onset and maintenance of depression during economic crises, little is known about how these factors may affect, in parallel, different components of positive mental health (Glonti *et al.* 2015). Positive aspects of mental functioning include three distinct domains: 1) hedonic well-being, 2) eudaimonic well-being and 3) social well-being (Ryff & Keyes 1995; Gallagher *et al.* 2009). *Hedonic well-being* relates to having more positive than negative emotions (e.g., distress) and reporting having a satisfactory life. *Eudaimonic well-being* refers to optimal psychological functioning and includes having good social relationships, purpose in life, sense of control, autonomy, sense of growth, and self-acceptance. Finally, *social well-being* can be defined as how people evaluate their social circumstances and functioning in society, and it encompasses several components including feelings of belongingness to society and the belief that one can significantly contribute to society.

The well-being modules of the European Social Survey (www.europeansocialsurvey.org) (European Social Survey 2017b) used this

comprehensive theoretical framework to systematically assess these three domains of well-being in Europe, thus providing a unique opportunity to assess the roles of various of psychological factors in contributing to or influencing individual's resilience when confronting turbulent financial circumstances. The module also included measures of other psychological factors that are potentially related to well-being and health-related outcomes such as perceived physical health (Ngamaba *et al.* 2017), quality of social relationships, personal and social optimism (i.e., positive expectations for oneself or one's country), and social trust (Huppert & So 2013). While a few studies have examined the general relationship between depression and discrete well-being factors like life satisfaction (Clark *et al.* 2017), optimism (Carver *et al.* 2010), and eudaimonic well-being (Ryff & Keyes 1995; Huppert & So 2013) these factors have yet to be examined simultaneously in the context of economic recessions.

Besides these physical and psychological factors, recent evidence also suggests that other social well-being factors such as closeness of one's social relationships and whether one has a partner may impact one's level of well-being (Helliwell & Putnam 2004) and reduce the risk for mental health disorders (Keyes 1998; Clark *et al.* 2017). Likewise, social trust is associated with positive outcomes such as physical health (Kawachi & Berkman 2000) and good mental health (De Silva 2005).

Few studies have examined the protective role played by psychosocial factors in preventing the development of mental health problems in times of economic recession. For instance, some recent research has shown that, besides indebtedness, job insecurity, economic inequalities, and housing instability, lack of social connectedness is a key risk factor for mental health problems during times of economic downtown (Martin-Carrasco *et al.* 2016). In Europe's current economic climate, social trust has been shown to modify the relationship between increased unemployment and increased rates of suicide in men

(Reeves *et al.* 2015). Additionally, in Greece social trust has been found to be a protective factor against major depression (Economou *et al.* 2014). Furthermore, social support accounted for declining life satisfaction in European countries with a hard recession (Helliwell & Huang 2013).

Similarly, there is also evidence of the mediating effect of psychosocial factors during times of crisis. People experiencing economic hardship have fewer social contacts and lower political trust (Reeskens & Vandecasteele 2017) and these two variables mediate the impact of economic hardships on one's happiness level in the aftermath of financial crises (Reeskens & Vandecasteele 2017). In addition, high levels of psychological well-being may build a range of durable social resources (e.g., a supportive social network) that in turn promote resilience in the aftermath of crisis (Fredrickson *et al.* 2003). Research has also shown that some dimensions of individual well-being (e.g., optimism) foster social support, which in turn can improve one's mechanisms for coping with stress (Vollmann *et al*. 2011).

The well-being modules of the European Social Surveys afford the unique opportunity to explore and compare the role of psychosocial factors on mental health before and after the 2008-2013 economic crisis in representative population samples. The objective of this study was to explore, using structural equation modelling, the effect of variables related to psychological health (i.e., life satisfaction, eudaimonic well-being, and optimism) and variables regarding social well-being (i.e., close relationships, social optimism, and social trust) on levels of depression in the wake of an economic crisis. Also, because a secondary aim of our study was to examine the interplay between mental and physical health during economic crises, we also included perceived physical health as a variable.

Based on previous literature on the impact of economic crises on psychological well-being, we predicted that, compared to data from the ESS-R3 (2006), in ESS-R6 (2013) participants in Spain would have: a) higher levels of depression; b) lower levels of life satisfaction; c) lower levels of perceived physical health; and d) lower levels of individual and social optimism. Given that closeness of relationships and the eudaimonic components of well-being measured in the ESS surveys are constructs that seem to be stable across life (Springer, Pudrovska & Hauser, 2011) and have been associated with personality traits (Schmutte & Ryff 1997), it was also predicted that the economic crisis would not affect those areas of psychological well-being. Furthermore, considering the results of previous studies (Fredrickson *et al*. 2003; Vollmann *et al*. 2011), we expected that social well-being factors would act as mediators of the pathways between individual psychological well-being and depression. As the study was exploratory no specific prediction was made regarding the specific pathways that would appear in the two separate ESS waves.

METHODS

Participants

The current study examines data collected in Spain from Round 3 (R3, 2006/2007) and Round 6 (R6, 2013) of the ESS (European Social Survey 2017b, www.europeansocialsurvey.org), a biennial survey with a repeated cross-sectional design. Over 20 European countries participate in each round of the ESS, and in each participating country, a random sample is interviewed using standardized face-to-face interviews (Jowell 2007; European Social Survey 2014). ESS information is representative of the general population aged 15 years and older living in a private household, irrespective of language, citizenship, and nationality.

R3 was conducted when Spain had a positive annual GDP, just before the start of the financial crisis, whereas R6 was collected in the last year of the crisis when Spain had

a negative annual GDP after six consecutive years of negative growth and rampant economic crisis (European Commission 2013). In Spain, R3 data were collected between October 2006 and March 2007, with a response rate of 65.94%. R6 data were collected between January and May 2013 with a response rate of 70.28%. We applied post-stratification weights to account for sample selection bias.

The sample from R3 consisted of 1877 participants (49.2% men) with a mean age of 46.06 years (SD = 18.90; age range = 15-97). The sample from R6 consisted of 1889 participants (48.9% men) with a mean age of 46.87 years (SD = 18.01; age range = 16-103).

Measures

Depression was measured using the 8-item version of the Centre of Epidemiologic Studies Depression Scale (CES-D8, Radloff 1977). Previous studies have demonstrated the scale's validity and reliability (Van de Velde *et al.* 2010). The CES-D8 measures the frequency of depressive symptoms in the week prior to the interview. For each item, respondents had four possible response categories ranging from *none or almost none of the time* (score 0) to *all or almost all of the time* (score 3). Items included are (1) "felt depressed," (2) "felt lonely," (3) "felt sad," (4) "were happy," (5) "enjoy life," (6) "felt everything was an effort," (7) "restless sleep," and (8) "could not get going." A mean depression score was calculated from the sum of all responses (items 4 and 5 were reversely scored due to their positive phrasing). Thus, CES-D8 scores ranged from 0-24. In the present study, Cronbach's alphas were $\alpha = .86$ for R3 and $\alpha = .85$ for R6, indicating high scale reliability.

Life satisfaction: This 1-item measure assessed the extent to which people were satisfied with their life as a whole. This item was rated on a 10-point scale from 'extremely dissatisfied' to 'extremely satisfied'.

Eudaimonic well-being: A eudaimonic well-being scale was created by selecting items from the ESS well-being modules that collectively encompass the concept of eudaimonic well-being (Ryff & Keyes 1995). These items included autonomy (i.e., 'Free to decide how to live my life'), competence (i.e., 'Little chance to show how capable I am'), purpose (i.e., 'Feel what I do in life is valuable and worthwhile'), accomplishment (i.e., 'Feel accomplishment from what I do') and self-acceptance ('In general feel very positive about myself', 'At times feel as if I am a failure'). Items were rated on a 5-point scale from 'strongly agree' to 'strongly disagree'.

Close relationships were assessed with a 1-item measure. In R3, the item was 'There are people in my life who care about me' and it was rated on a 5-point scale. In R6, the item was 'Receive help and support from people you are close to' and it was rated on a 6-point scale. For this study, both items were rescaled on a 5-point scale from 'strongly disagree' to 'strongly agree'.

Personal optimism was assessed with a 1-item measure (i.e., 'I am always optimistic about my future'). This item was rated on a 5-point scale from 'strongly agree' to 'strongly disagree'. For this study, this item was reversely scored.

Social aspects of well-being included aspects of optimism about the country and trust in others. Social optimism was assessed with a 2-item measure (i.e., 'Hard to be hopeful about the future of the world' and 'For most people in country life is getting worse'). Items were rated on a 5-point scale from 'strongly agree' to 'strongly disagree'. Social trust was assessed with a 3-item measure (i.e., 'Most people can be trusted or you can't be too careful', 'Most people try to take advantage of you, or try to be fair', 'Most of the time people helpful or mostly looking out for themselves'. Items were rated on a 5-point scale from 'you can't be too careful' to 'most people can be trusted'.

Physical health. This 1-item measure assessed subjective general health (i.e., 'How is your health in general?'). The item was rated on a 5-point scale from 'very good' to 'very bad'. For this study, this item was reversely scored.

Procedure

The R3 well-being module had a total of 55 items and the R6 had 39 items (http://www.europeansocialsurvey.org/data) (European Social Survey 2017a). Although both modules shared an identical theoretical framework, the ESS-R6 module included some new items and omitted others as compared to the R3 module. Thus, the present study included only items that were pertinent to the aims of the research and that were used in both surveys. All items included in the modules were carefully selected by teams of international scholars and subjected to a well-controlled process of translation and back-translation. The survey has strict random probability sampling and, for any participating country, a minimum target response rate of 70% is required. Participants were interviewed at home and interviews were monitored for quality control norms in all participating countries. The average length of the interviews was 60 minutes (Loosveldt & Beullens 2013).

Data analyses

Since the sample was relatively large and the percentage of missing data for the variables included in this study is random and low (range between .1% – 2.6%), corrected subject mean substitution was employed to address missing data (Acock 2005).

Descriptive and correlation analyses were initially conducted. Then, different path models were tested to assess which showed best fit, using path analysis through SEM.

We hypothesized and tested two distinct plausible structural models including the seven selected variables that have theoretically shown a significant relationship with

depression: four regarding individual well-being (i.e., life satisfaction, optimism, eudaimonic well-being, and physical health) and three regarding social well-being (i.e., close relationships, social optimism, and social trust). Both models were tested for R3 and R6 separately. Both models proposed the aforementioned individual well-being (i.e., life satisfaction, optimism, eudaimonic well-being, and physical health) and social well-being (i.e., close relationships, social optimism, and social trust) factors as predictors of depression. Age and gender were used as covariates.

The hypothesized structural equation models were tested using AMOS v18.0 (SPSS). The full information maximum likelihood (FIML) estimation method was used to generate the standardized parameter estimates. The following criteria (Hu & Bentler 1999) were utilized: a) χ^2: a perfect fit is indicated by a non-significant value; b) χ^2/gl: a good fit is indicated by a value lower than 2; c) CFI and TLI: an acceptable fit is indicated by a value ≥ .90, whereas a good fit is indicated by a value ≥ .95; d) RMSEA: an acceptable fit is indicated by a RMSEA value ≤ .08 (90% CI≤ 0.10), whereas a good fit is indicated by a RMSEA ≤ .05 (90% CI≤ 0.08); e) AIC: a comparative indicator, where lower values favor the choice of model.

Mardia coefficient yielded a value of 19.30. Even though it falls outside the range ±5 suggested to assume multivariate normality (Bentler 2006), its deviation from normality is minimal and because this value does not exceed the critical value of ±70, it is still possible to use the ML estimation method (Rodríguez & Ruiz 2008).

RESULTS

Participant characteristics

There were no significant differences in age [$t(3753) = -1.34$, $p = .18$] or sex [$\chi^2(1) = .02$, $p = .87$] between participants in R3 and R6.

Depression, well-being, and associated variables in R3 and R6

Table 1 shows means and standard deviations of all variables included in the study. As shown in this table, whereas depression and social trust showed a significant increase at R6, life satisfaction, personal optimism, and social optimism were significantly lower in R6 than in R3. Physical health, eudaimonic well-being and close relationships did not significantly change from R3 to R6. Table 2 shows a correlation analysis of all the variables included in the study.

TABLE 1

TABLE 2

Structural Equation Model

We tested whether individual well-being predicted depression directly or through social well-being variables (Figure 1, Supplementary material). Since depression is usually associated with poorer life satisfaction (Rocha & Fleck, 2011; Samaranayake *et al*. 2014; Vazquez *et al.* 2015), an alternative model with depression as predictor and life satisfaction as an outcome was also tested (Figure 2, Supplementary material). Goodness of fit indicators for each model are shown in Table 3.

FIGURE 1, Supplementary

FIGURE 2, Supplementary

TABLE 3

According to the criteria described above, model 1 presented better fit indices for both rounds. However, since the fit of this model was poor, re-specification was conducted. In the case of R3, paths with non-significant *p* values were removed (consecutively, Physical health → Social trust; Physical health → Close relationships; Eudaimonic well-being → Social trust; Social trust → CESD-8). Following the recommendations of the modification indices, two new significant paths were added (i.e., Gender → Close relationships; Social trust→ Social optimism). Model 1R (R3) yielded favorable fit indices (Table 3). This model showed indirect effects of individual well-being variables (i.e., eudaimonic well-being, optimism, and life satisfaction) on depression through social well-being variables. The model also showed an indirect effect of physical health on depression through social optimism. According to the model, social optimism fully mediated the relationship between social trust and depression. In other words, for the R3 data, the direct relationship between social trust and depression was no longer significant after this mediator was factored into the model (see Figure 1).

FIGURE 1

In the case of R6, paths with non-significant *p* values were removed (consecutively, Physical health → Social optimism; Physical health → Close relationships; Optimism → Social trust; Eudaimonic well-being → Social optimism; Social trust → CESD-8; Social optimism → CESD-8). Model 1R (R6) yielded favorable fit indices (Table 3). This model showed a direct effect of physical health on depression. The relationships between individual well-being variables (i.e., optimism, eudaimonic well-being and life

satisfaction) and depression were partially mediated by close relationships. Social optimism and social trust did not demonstrate a significant mediating role in this relationship (see Figure 2).

To analyze whether the indirect effects were significant, a bias-corrected bootstrap estimation (2000 bootstrap samples with 95% confidence interval) was performed (Mackinnon *et al.* 2004). Mediation is supported if zero is not included in any confidence interval. Results showed that all indirect effects were significant for R3 and R6 (Table 4)[1].

FIGURE 2

TABLE 4

FIGURE 3, Supplementary

FIGURE 4, Supplementary

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[1] We also examined more detailed models entering each of the five eudaimonic WB factors as separate predictors. It was found that although all dimensions are maintained in the model, each factor contributes to mental health in a different way (Figures 3 Supplementary and Figure 4, Supplementary). The analyses revealed that the model that incorporated the sum of the five Eudaimonic WB dimensions had lower AIC values in both rounds (R3: 126.08 and R6: 87.71) than the corresponding AIC values for the model containing the five dimensions entered separately (R3: 225.87 and R6: 177.85). This confirmed the model that incorporated the Eudaimonic WB aggregate score had the best fit.

DISCUSSION

The study of depression has recently broadened its focus on deficits and risk factors to include positive mental health resources and well-being (Keyes 2005). The present study explored the changes and relationships between individual and social well-being factors and depression in Spain during the economic crisis using data collected from R3 and R6 of the European Social Survey.

Regarding the first and second hypotheses, our findings confirmed that levels of depression in Spain significantly increased from R3 to R6 whereas levels of life satisfaction decreased after the onset of the recession. These results are consistent with prior findings in the literature, where reported levels of mental health and life satisfaction in Spain decreased after the recent economic crisis (Bartoll *et al.* 2014; Bacigalupe *et al.* 2016). These findings are also similar to what was observed in many other European countries that were greatly impacted by the economic crisis (Economou *et al.* 2014). These diminished levels of well-being were associated with economic hardships or the national rate of unemployment (Gili *et al.* 2013; Helliwell *et al*. 2014; Reibling *et al.* 2017).

Regarding the third hypothesis, our findings showed that perceived physical health did not vary significantly over the course of the economic crisis in Spain. Although this result was unexpected, there are previous studies consistent with this finding (Abebe *et al.* 2016). It is possible that relatively wealthy countries have a high resistance to the negative effects of economic crises, based on factors like the quality of their healthcare systems (Karanikolos *et al.* 2013; Organisation for Economic Co-operation and Development 2017) as well as community-specific resilience factors. In addition, previous studies indicate that the harmful, short-term effects of recessions are especially apparent on mental health, while other negative health consequences may not be as apparent immediately following a crisis (Regidor *et al.* 2014).

With regard to the fourth hypothesis, our results indicated that personal optimism and social optimism decreased in the population surveyed. Although optimism is often considered to be relatively stable across life (Matthews *et al*. 2004), it can diminish under certain stressors such as the conditions found during times of great economic recession, especially when the newly-experienced stressors differ substantially from previous experience and result in high amounts of uncertainty (Carver *et al.* 2010).

As predicted, the results showed no change during the economic crisis in eudaimonic well-being, which can be explained by the way in which this type of well-being is operationalized both in the ESS study and current models of eudaimonia (Huta 2013; Ryff & Singer 2008). In Spain there is a strong sense of community as evidenced by the fact that 95% of Spanish people believe that they know someone they can rely on in times of need, a figure that is higher than the OECD average of 89% (Organisation for Economic Co-operation and Development 2015). During the six-year period between 2007 and 2013, the reported high levels of closeness of relationships remained high and did not show statistically significant change. In the case of social trust, results showed a significant increase after the economic crisis, which indicates that social trust may be a specific cultural and community resource that is enhanced during turbulent economic times (Olivera 2015).

The present study aimed to explore protective factors for depression before and after the economic crisis. Results from our structural models suggest that protective factors for depression are not the same for both rounds. In the case of R3 (2006), the model showed that individual well-being (i.e., life satisfaction, optimism, eudaimonic well-being and physical health) and social well-being (i.e., close relationships, social optimism, and social trust) were inversely related to depression, which is consistent with previous studies (Ryff & Keyes 1995; Lyubomirsky *et al.* 2005; Carver *et al.* 2010; Huppert & So 2013; Clark *et*

al. 2017). Moreover, this model showed that individual well-being variables are related to depression through social well-being variables. Close relationships, social optimism, and social trust partially mediated the association between individual well-being and depression. Therefore, as previous studies have suggested, people who have high levels of individual well-being are likely to report less depression, and this is, at least in part, due to their social well-being (Keyes 1998; Westerhof & Keyes 2010). Furthermore, the relationship between social trust and depression was fully mediated by social optimism, suggesting that social trust may help an individual develop social optimism, which in turn, helps reduce one's risk of depression. This result is consistent with previous research that found that average trust at the country level may predict individual outcomes such as life satisfaction (Boarini *et al.* 2012).

However, the model for R6 (2012) revealed a significant change in the pattern of variables associated with depression. Results from that survey indicated that only individual well-being and closeness of relationships were related to depression. While feeling supported by people close to oneself was negatively associated with depression both before and after the crisis, protective social aspects of well-being such as optimism about the country and trust in others (i.e. social well-being variables) were no longer significant under the conditions of the 2013 economic recession. According to the resulting model (Figure 1), the economic crisis resulted in an explanatory model of depression in which societal variables (i.e., social trust and social optimism) that had a significant role in the previous survey no longer mediated the relationship between well-being and depression. This finding possibly suggests that individuals undergo a process of individualization of the psychological processes associated with depression during times of economic crisis. In other words, it is likely that economic crises may weaken the

protective role that positive beliefs regarding the good nature of society (i.e., trust, optimism) have on preventing psychological distress.

At the same time, it is important to emphasize that close relationships remained (at least partially) a mediator of the effects of individual well-being on depression in R6. This specific finding points to the relevance of promoting close social support resources during times of adversity as their protective effect appears to remain more stable than that of social optimism or social trust. Interestingly, fostering strong social relationships has often been considered a crucial factor in many preventative health interventions (Kawachi & Berkman 2000). Consistent with this, our results suggest that it is important to promote social connectedness in order to increase resilience under challenging socio-economic contexts.

Moreover, testing mediators through multiple mediation analyses allowed us to determine the relative regression weights of the different factors. Interestingly, eudaimonic well-being was a stronger mediator of depression in both rounds than other variables typically associated with depression, such as physical well-being. These results are consistent with previous studies that have investigated the impact of different psychological and physical problems on individuals' functioning. In a recent study, Vazquez *et al*. (2015) showed that although both physical and psychological problems both had an impact on life satisfaction, greater effect sizes were generally found for psychological rather than for physical illness. Our analyses likewise indicated that although physical illness may place people at a greater risk of depression (Graham *et al.* 2011), individual well-being plays an important role in reducing it.

This study has some limitations. First, it is not a longitudinal study as the ESS uses different samples in each wave. Thus, sampling variations could contribute to the extant differences found between Rounds 3 and 6. This also limited the conclusions we could

draw from our meditational analyses, as not having the same sample of participants across both time points prevented the examination of the dynamics of well-being and resilience in facing adverse economic circumstances (Trafimow 2017). Therefore, it is more appropriate to talk about indirect effects instead of mediation, and future studies should attempt to replicate these findings using longitudinal designs (Kline 2015).

Second, the study is limited only to the variables included in the ESS. Although this survey covers important aspects of well-being, it does not include certain hedonic components (e.g., anxiety, worrying, calmness, etc.) or eudaimonic components (e.g., psychological strengths) that the literature has also found to be linked to well-being (Peterson & Seligman 2004). Finally, there are some limitations regarding the measures used. For instance, although closeness of relationships was measured by two very similar items in R3 and R6, the wording of the item varied slightly in each round. Lastly, since some measures are represented by a single item, reliability information for these scales cannot be reported.

In conclusion, these findings provide new evidence that protective factors for depression may change along the course of economic crises. Moreover, our study highlights the important role that closeness of social relationships likely plays in certain socio-economic contexts in mediating depression, suggesting that social connectedness should be fostered during times of adversity in order to help promote resilience and positive mental health (Martin-Beristain 2006).

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Conflict of interest

None

Ethical Standards

The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008.

Provenance and peer review

Not commissioned; externally peer reviewed.

Availability of Data and Materials

All data are already available on the ESS web, via the links provided.

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Figure

Figure 1. *Respecified model R3 (2006)*

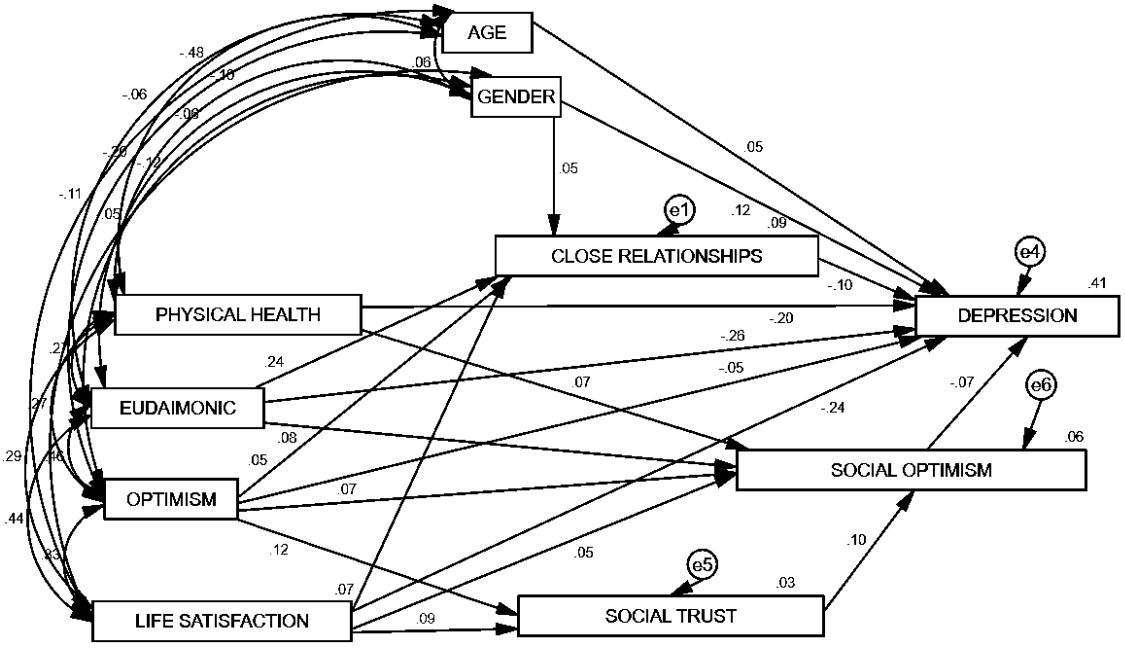
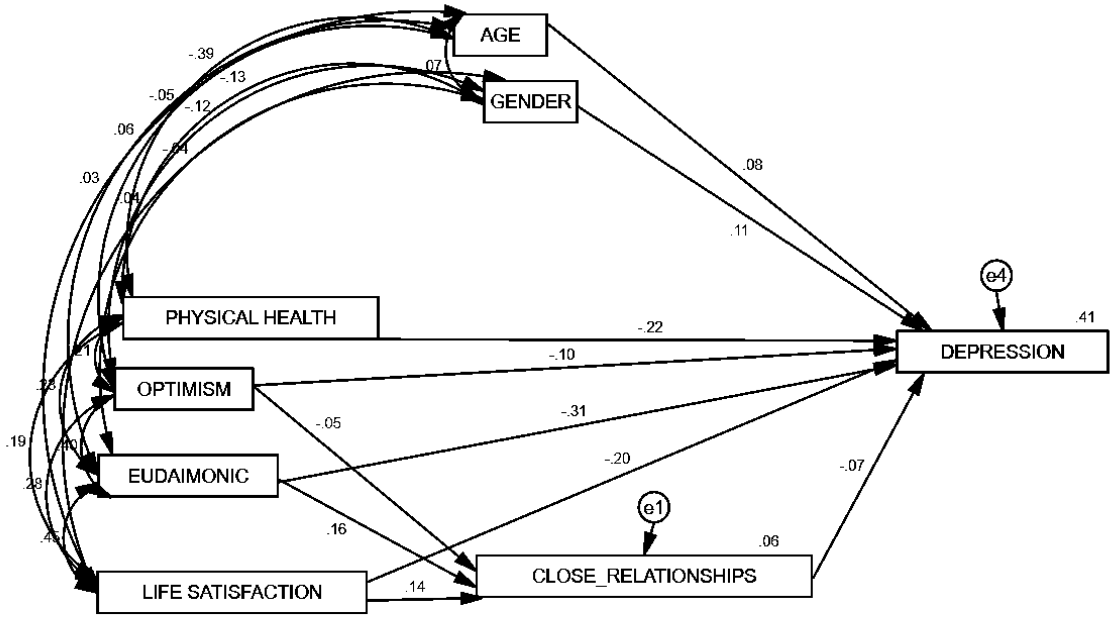


Figure 2. *Respecified model R6 (2013)*



Table

Table 1. *Means and standard deviation of variables included in Sample for R3(N=1877) and R6 (N=1889).*

	M	SD	*t*	*p*
Perceived physical health				
R3	3.66	.90	-.02	.53
R6	3.68	.92		
Individual Optimism				
R3	3.69	.90	.09	.006
R6	3.61	1.00		
Eudaimonic Well-being				
R3	2.67	.63	.03	.22
R6	2.64	.69		
Life satisfaction				
R3	7.45	1.79	.50	<.001
R6	6.94	2.29		
Close relationships				
R3	4.50	.60	.04	.09
R6	4.46	.80		
Social optimism				
R3	2.87	.79	.80	<.001
R6	2.07	.72		
Social trust				
R3	4.99	1.49	-.11	.04
R6	5.10	1.69		
Depression (CES-D8)				
R3	5.60	4.23	-.47	.001
R6	6.07	4.41		

Table 2. *Bivariate correlations among the variables included in the study for R3 and R6.*

	1	2	3	4	5	6	7	8
1. Perceived physical health	1	.20***	.18***	.24***	.09***	.77**	.14***	-.40***
2. Individual Optimism	.27***	1	.27***	.40***	.05*	.21***	.11***	-.34***
3. Life satisfaction	.30***	.33***	1	.45***	.20***	.16***	.21***	-.42***
4. Eudaimonic well-being	.27***	.47**	.44***	1	.20***	.15***	.16***	-.49***
5. Close relationships	.04	.16***	.18***	.28***	1	-.03	.11***	-.19***
6. Social optimism	.13***	.16***	.15***	.17***	.07**	1	.18***	-.13***
7.Social trust	.07**	.15***	.12***	.11***	.02	.13***	1	-.17***
8. Depression (CES-D8)	-.40***	-.37***	-.47***	-.50***	-.24***	-.20***	-.09***	1

Note. Correlations for R3 are reported under the diagonal, and correlations for R6 are reported above the diagonal.
* $p < .05$. ** $p < .01$. *** $p < .001$. CESD-8 = Centre of Epidemiologic Studies Depression Scale.

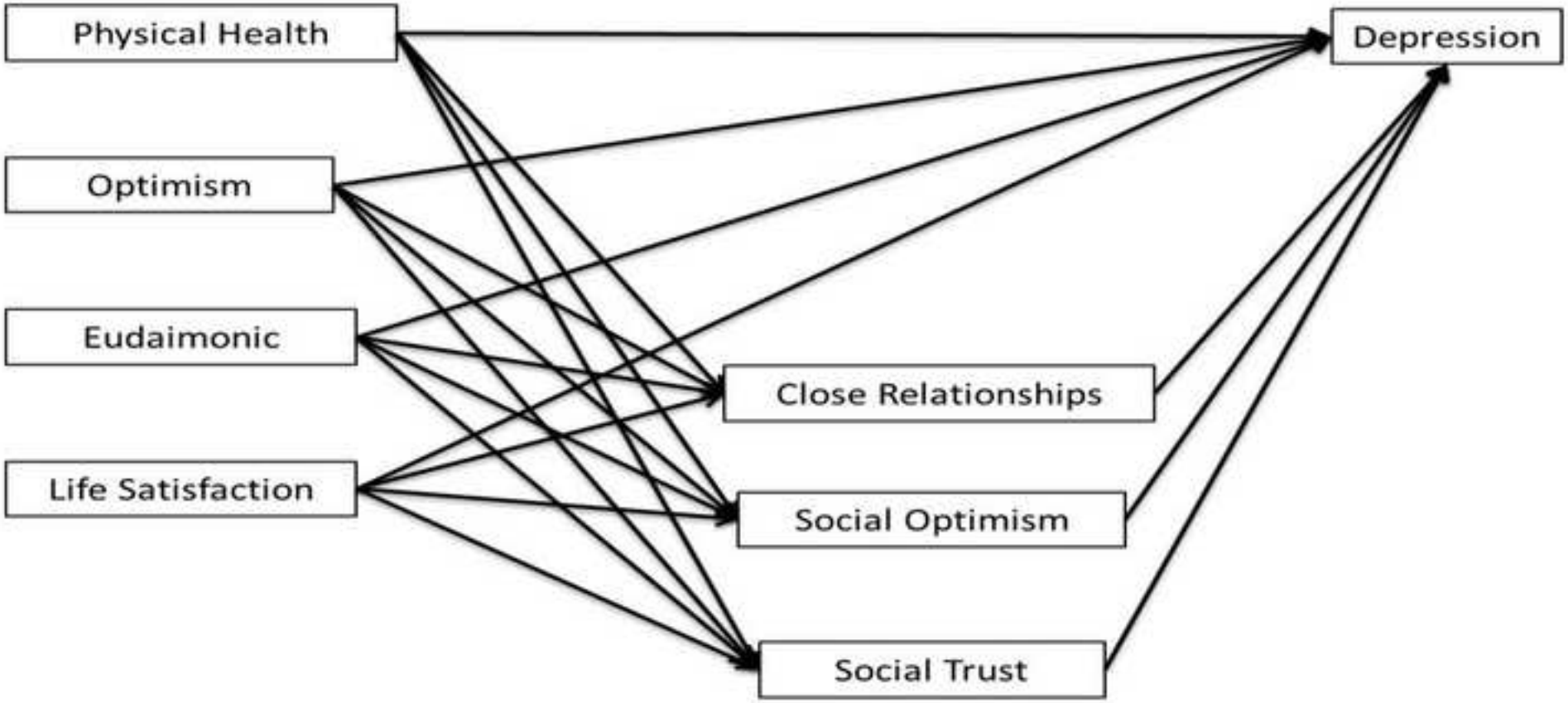
Table 3. *Fit Indices for Round 3(2006) and Round 6 (2012) (N = 1876, N = 1889, respectively).*

	χ^2 (gl)	p	χ^2/gl	CFI	TLI	NFI	RMSEA (90% CI)	AIC
Model 1 (R3)	33.91 (9)	<.001	3.77	.99	.96	.99	.04 (.02 - .05)	145.91
Model 2 (R3)	37.73 (9)	<.001	4.19	.99	.95	.99	.04 (.03-.06)	149.73
Model 1(R6)	70.01 (9)	<.001	7.78	.98	.89	.98	.06 (.05 - .07)	182.01
Model 2 (R6)	81.53 (9)	<.001	9.06	.98	.87	.97	.06 (.05-.08)	193.53
Model 1R (R3)	18.08 (11)	.08	1.64	.99	.99	.99	.02 (.00 -.03)	126.08
Model 1R (R6)	5.71 (3)	.13	1.90	.99	.99	.99	.02 (.00 - .05)	87.71

Note. CFI = comparative fit index; TLI = Tucker-Lewis index; NFI = Normed Fit Index; RMSEA= root mean square error of approximation; AIC = Akaike information criterion.

Table 4. *The standardized indirect effects, the 95% CI for the estimates (lower and upper bound), their standard errors, and p-values for Round 3(2006) and Round 6 (2013).*

Variable	Indirect effects		
	Estimates (95% CI)	SE	p
Round 3 (2006)			
Physical health → CES-D8	(-.01) – (-.002)	-.005	.002
Social trust → CES-D8	(-.01) – (-.003)	-.007	.001
Eudaimonic well-being → CES-D8	(-.05) – (-.02)	-.03	.001
Optimism → CES-D8	(-.02) – (-.004)	-.01	.001
Life satisfaction → CES-D8	(-.02) – (-.004)	-.01	.001
Life satisfaction →Social optimism	.003 – .02	.009	.001
Optimism → Social optimism	.006 – .02	.12	.001
Round 6 (2013)			
Life satisfaction → CES-D8	(-.02) – (-.003)	-.01	.001
Optimism → CES-D8	.001 – .009	.004	.02
Eudaimonic well-being → CES-D8	(-.02) – (-.004)	-.01	.001



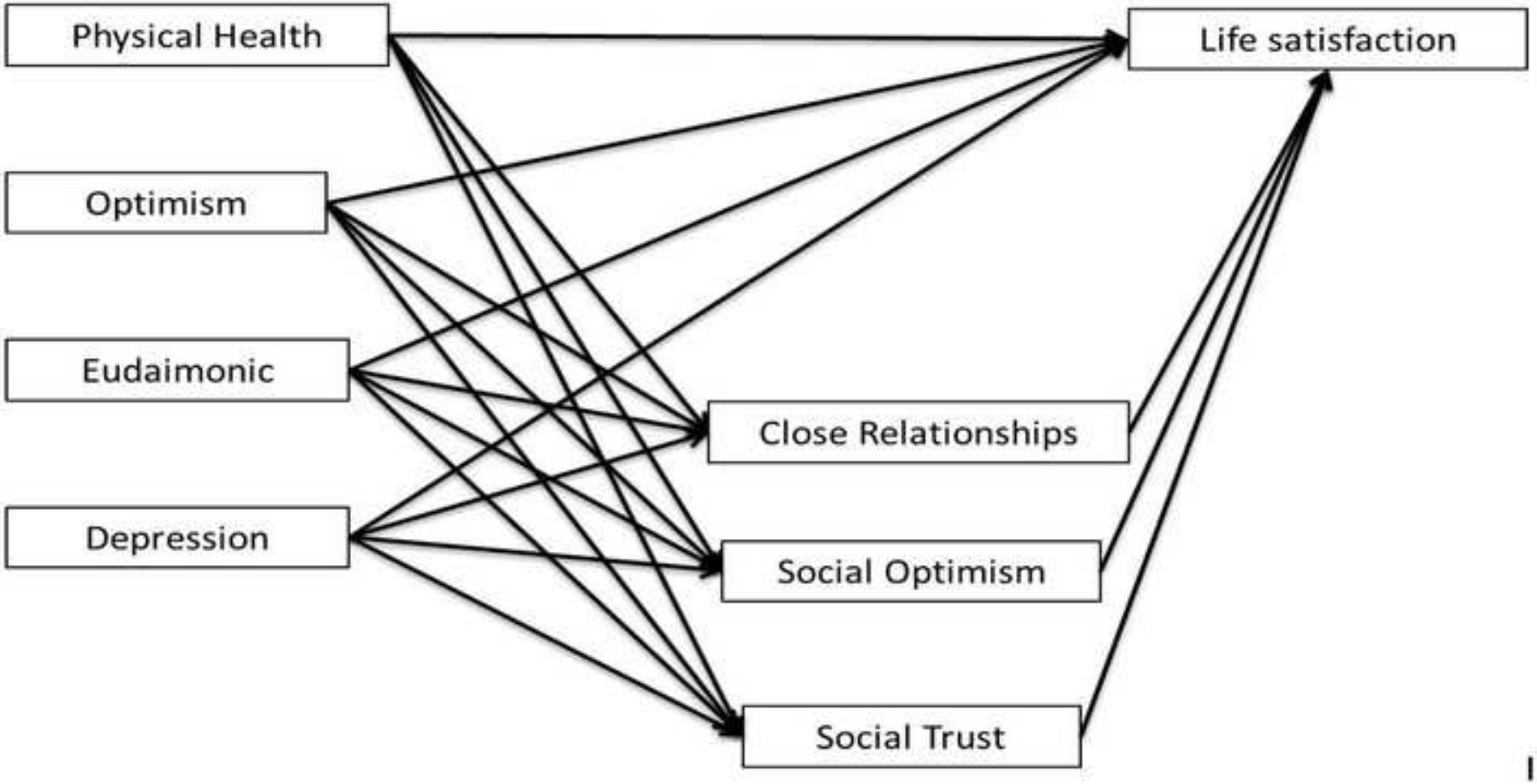


Figure 3. Respecified model containing the five dimensions of eudaimonic well-being entered separately (R3, 2006)

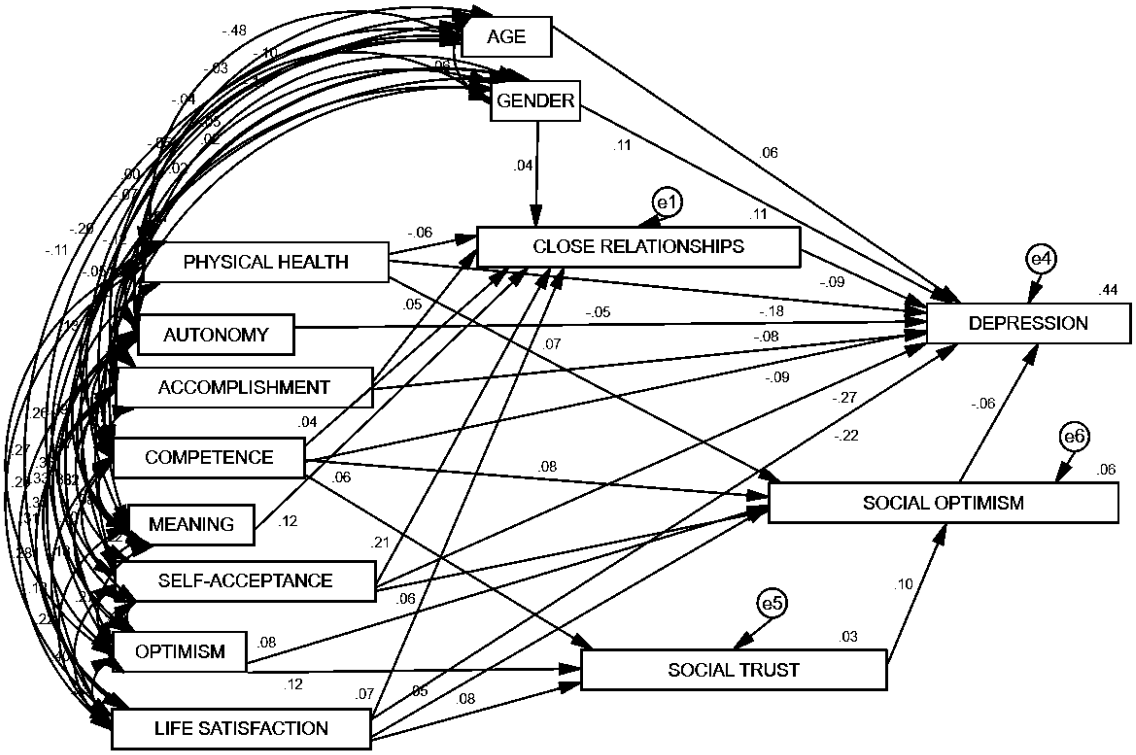


Figure 4. Respecified model containing the five dimensions of eudaimonic well-being entered separately (R6, 2013)