

Positive ageing: Objective, subjective, and combined outcomes

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Abstract

Positive ageing and other related terms (optimal, healthy, successful, active, productive ageing) are viewed as scientific concepts, most of them operationally described by a broad set of bio-psycho-social factors, assessed through objective and subjective indicators, as well as being closely related to lay concepts reported cross-culturally by older persons. From a semantic perspective most of these terms emphasize a diversity of positive conditions across the ageing process and during old age, such as physical fitness and health, optimal cognitive functioning, positive emotional states, and social involvement. Three important methodological issues emerge from the field: (1) although it is generally considered a multidimensional concept there are also researchers who reduce positive ageing to just one of its components, (2) moreover, those components can be assessed by objective and/or subjective indicators; and, finally, (3) this conceptual and methodological diversity determines that the prevalence of positive ageing reported is extremely broad. Since empirical definition of any scientific concept requires consensus, this paper discusses several definitions of ageing well with reference to the results yielded by the ELEA Study (Longitudinal Study of Active Ageing). Results support a multidimensional concept of positive ageing, composed of objective and subjective measures, with a similar structure to well considered definitions of positive ageing: health, cognition, activity, positive affect, and physical fitness are the major domains for ageing well and this structure is not affected by age or gender. Also, when prevalence of ageing well is calculated through simple and multi-domain measure assessed by objective and subjective indicators, multi-domain measures show more realistic results.

Keywords: Optimal; Successful; Productive; Active; Healthy ageing; Ageing well; Subjective and objective measures

Introduction

Positive ageing can be placed in the nomological network of ageing well: optimal, successful, active, productive, and healthy ageing are relatively new concepts emerging during the last decades of the twentieth century. All these terms share the linguistic structure of two words with opposite meaning (positive and negative), a seeming paradox (Freund & Baltes, 2008). Nevertheless, since the meaning of abstract words such as “ageing” is culturally biased, the

consideration of this new concept as an oxymoron could serve to express, precisely, the negative images about ageing which the positive ageing perspective wants to combat.

This nomological network has been treated by the field of gerontology as a new paradigm emerging from a set of assumptions accepted both from a biomedical (Fries, 1989) and a psychosocial perspective (Baltes & Baltes, 1990). Summarizing, one can postulate that ageing well or positive ageing is supported by three main assumptions. (1) Ageing is a complex phenomenon dealing with change across the lifespan and that this change has a broad *interindividual variability* in level, rate and direction. This broad heterogeneity is expressed by several commonly accepted ways of ageing: *normal, optimal, and pathological* (Rowe & Khan, 1987). (2) The capacity of learning, modifiability and positive change have been characteristic of human beings across the history of the species and are also present across the lifespan; therefore, along with ageing, individuals can optimize their biological, behavioural and social resources and compensate for their deficits during old age. (3) Nevertheless, it is also true that at the end of life, the limitations of this capacity mean that the *balance between gains and losses* becomes less positive; this decline or negative balance is also associated with death and dying and it depends on individuals' subjective evaluation as well as some of the negative social images about ageing, age, and the aged. Thus, as Fries and Crapo (1981) and Fries (1989) emphasized, the variability of the ways of ageing, and the plasticity of ageing, expressed through the modifiability of major manifestations of senescence, suggest that disease through old age may be postponed by personal decisions (for example, changing lifestyles), and there is broad empirical evidence that during the ageing process and in old age there are also growth and positive trends.

In sum, throughout the history of gerontology, literature and research have focused much more on negative than positive aspects of the process of ageing; this new paradigm argues that much more research on those positive aspects is necessary in order to obtain a more realistic and broader vision of ageing, age and the aged, as well as to reduce negative images and their

consequences on individuals and society (Fernández-Ballesteros & Piquart, 2010).

Thus, this new paradigm from the last decades of the twentieth century gives a positive view of ageing and is described by several terms in scientific literature: “Healthy” (World Health Organisation [WHO], 1990), “Successful” (Rowe & Khan, 1987; Baltes & Baltes, 1990), “Optimal” (Palmore, 1995), “Vital” (Erikson, Erikson, & Kivnick, 1986; Fernández-Ballesteros, 2005), “Productive” (Butler, 1969), “Active” (WHO, 2002), “Positive” (Gergen & Gergen, 2001) and, simply, “Ageing well” (Fries, 1989).

As emphasized by Bowling (2006) and Bowling and Illiffe (2006), however, this positive view about the way people age is not only a scientific concept but is also in the mindset of elderly people themselves, and therefore in their everyday vocabulary. In fact, “ageing well” (and related concepts such as “active”, “productive”, “positive”, and “optimal” ageing) is also a “lay” construct. Several studies have been conducted in order to test how older adults (and other social groups) defined, described or perceived successful ageing or to identify the “ingredients” for ageing well or ageing positively, and some of these studies made comparisons between countries or cultures. An extensive review and cross-cultural research in ten countries allow us to conclude the following: (1) a multidimensional conceptualization of successful ageing clearly emerged, that is, biophysical, emotional, cognitive and social domains are present in most lay concepts of ageing studies; (2) lay definitions cannot be reduced to biomedical indicators such as health or disability or to physical or subjective conditions such as life satisfaction or well-being; and (3) there are minor cultural differences between studies, lay persons in several continents and cultures, seem to share most of the components also present in expert definition of positive ageing (Fernández-Ballesteros et al., 2008; Fernández-Ballesteros, Garcia, et al., 2010; Matsubayashi, Ishine, Wada, & Okumiya, 2006; Phelan, Anderson, LaCroix, & Larson, 2004).

Our goal is to arrive at a commonly accepted definition which permits us to determine to what extent people in a given context and/or population are ageing positively. As has been pointed out elsewhere (Fernandez-Ballesteros, 2008), from a scientific perspective, most of the terms used under the umbrella term of “ageing well” are defined through a set of outcomes (including bio-psycho-social indicators) but, we are far from having a commonly accepted set of components or ingredients. Moreover, it is also true that there are experts who define some of these concepts from a single perspective; for example, Britton, Shipley, Singh-Martouz and Marmot (2008) described *successful ageing* as “be[ing] free from major disease ... having good physical and mental functioning (p. 1999)”, in other words reducing it to *healthy ageing*. Also, under the assumption that ageing is a social

construct, *positive ageing* is reduced by Gergen and Gergen (2001) to the experience of ageing during this life period of high human enrichment. It is important to mention that the importance of psychosocial factors of ageing does not ignore, as claimed by some constructivists, the existence of illness, decline or impairment linked to biological ageing. Therefore, in this paper “positive ageing” is used from a broad perspective, equivalent to other terms of this semantic field, and not from a “positive” or constructivist position.

In order to obtain a panorama of empirical definitions of positive ageing and related terms, let us consider two review papers. In the former, Peel, McClure and Bartlett (2005) reviewed from 1985 to 2003 most of the articles in peer-reviewed scientific journals written in English. The study's main objective was to arrive at healthy or successful ageing defined and measured as a multidimensional construct. Dependent variables were defined as measures across several domains of health to identify the subset of individuals who were functioning well in most or all measured thereby arriving at the prevalence of positive ageing; but, also, were included risk/protective factors or determinants

Following this method, a total of 341 articles were identified. Criteria defining “healthy” or “successful ageing” were: survival ($n=4$); high level of functioning ($n=2$); free of major life-threatening illness and maintaining mental capacities ($n=2$); sustained independent living in the community ($n=1$); living to an advanced old age ($n=1$); having little or no disability prior to death ($n=1$); survival with high level of physical, mental and social well-being ($n=1$); remaining free of major life-threatening disease ($n=1$), having normal physical and cognitive functioning ($n=1$), maintenance of health in old age (being alive and remaining independent). Regarding determinants or risk factors, only lifestyles are mentioned, for example smoking ($n=8$), alcohol consumption ($n=6$), exercise/physical activity ($n=5$), diet ($n=2$), and Body Mass Index (BMI) ($n=3$).

In conclusion, although successful or positive ageing is seen by authors as a multidimensional concept, outcome definitions of health and successful ageing were mostly reduced to biomedical indicators and their determinants or risk factors for lifestyles or behavioral habits. Moreover, when authors focused on the proportion of successful agers reported in each study reviewed, a high variability was found, from 12.7 to 49%.

The second review paper was conducted by Depp and Jeste (2006). They searched on PubMed and Google Scholar (1978-2005) looking for the following terms: successful ageing, healthy ageing, productive ageing, optimal ageing and ageing well. Four hundred and seven articles were identified for “successful ageing,” 490 for “healthy ageing,” 12 for “productive ageing,” 1 for “ageing well” or “robust ageing.” From this list, 28

articles (seven of them were coincident with those reviewed by Peel et al., 2005) were selected according to 29 definitions (27 categorical and two dimensional measures) of positive ageing. The components of the definitions were classified in ten different domains, measured in various ways from self-report to performance-based and other objective indicators. These domains were present in a limited number of studies: disability/physical functioning ($n=26$), cognitive functioning ($n=15$), life satisfaction/well-being ($n=9$), social/productive engagement ($n=8$), presence of illness ($n=6$), longevity, ($n=4$), self-rated health ($n=3$) personality ($n=2$), environment/finances ($n=2$), self-rated successful ageing ($n=2$). It is interesting that, again, the outcome variables included (physical fitness and health, cognitive, emotional and physico-social variables) imply multidimensional domains but at the same time are listed as predictors or determinants of ageing well such as environment, finances, and personality.

From this study an important finding is the broad variability in the prevalence of successful ageing elders depending on the components used to describe the concept. Taking into consideration those 22 studies that described a disability/physical function and reported a proportion of successful agers the mean proportion was 27.2%, ranging from .4 to 63 ($Mdn = 20.8$; $SD = 27.1$). Moreover, the proportion of successful agers among these studies that included both cognitive and disability/physical functions ranges from 3 to 95% ($M = 20.4$; $Mdn = 19$, $SD = 14.8$). The broad range of ageing well or positive ageing prevalence is explained by variability in age range (rate of young elders in comparison with old elders, differences in gender rate), the type of empirical definition the authors used (among those assessed) and, also, the type of method used for collecting data of those objective or subjective indicators or procedures.

Taking into consideration both review studies, as has already been underlined by Fernández-Ballesteros et al. (2004), beyond the definitional difficulties of competence and successful ageing and the variety of prevalence yielded, two problematic issues emerge: the confusion between which of these variables are outcomes of positive ageing (that is, our dependent variable) and which are predictors (independent variable) of positive ageing. On the basis of the EXCELSA-P study (Cross-European Longitudinal Study on Ageing-Pilot), using structural equation modeling, they arrived at a model of cognitive (digit symbol and digit backward) and physical competence (peak flow and tapping) explained by historical determinants such as education and income and concurrent factors such as social relationships, perceived internal control, lifestyles and, also, subjective appraisal of fitness. In other words, objective (physical and cognitive) competence could be explained both by objective and subjective conditions. This model

of competence fitted quite well across seven European countries and across age (that is, in the younger (30-49) and older (50-85) age groups).

From a similar perspective, Pruchno, Wilson-Genderson and Cartwright (2010) proposed a conceptual two-factor model of successful ageing including objective and subjective measures. Confirmatory factor analyses provided support for a multidimensional concept of positive ageing using objective measures and subjective perceptions about ageing. The authors concluded that age is associated with more objective measures but gender seems to be more strongly associated with the subjective component of ageing well.

A very important topic is approach in this paper, to what extent "positive ageing" is measured through objective or subjective measures. As it is commonly accepted in scientific literature objective events are those which can be observed and subjective events are internal events and/or the subjective appraisal of external or observed events (for a review see Fernández-Ballesteros, 2004). Therefore, it must be taken into consideration that the so-called "objective measures" by Pruchno et al. (2001) are not really objective because they were assessed through the appraisal of the difficulty in "walking a quarter of a mile, walking up 10 steps, standing two hours and stooping" (p. 679). In other words, the so called "objective measure" is reduced to subjective information, and this must be seen as a subjective condition rather than an objective one.

There is clearly no consensus on the definition (multidimensional or simple) or the diversity of components implied in the concepts under study, objective and subjective. As there is a diversity of methods for data collection and different types of variables there are no reliable prevalence studies. From this and other research, it can be concluded that much more work has to be done in order to consider positive ageing as a scientific concept clarifying components or ingredients, type of event assessed (objective or subjective), and prevalence of people ageing well.

In summary, after a brief review of lay and scientific conceptualizations of positive ageing, three problematic issues emerged from research: first, it is not clear whether ageing well has a multidimensional or a simple conceptual structure and, second, when studies on successful ageing were analysed, prevalence of older adults ageing successfully yielded a variety of ranges depending on the type of measures used or to what extent multidimensional indexes were combined in the conceptualization of positive ageing concepts; finally, whether subjective and objective measures must be distinguish or, at least, whether subjective components (such as life satisfaction) and objective indicators (such number of illness diagnosed) must be distinguish when objective measures are "subjectified".

This article reports results from the ELEA (Estudio Longitudinal sobre Envejecimiento Activo) study trying to answer two main questions: (1) the structure of ageing well when subjective and objective indicators are included; (2) the extent to which several simple (objective or subjective) and combined measures of positive ageing, yield different prevalence.

Method

Participants

Data from the baseline of ELEA were examined (Fernández-Ballesteros et al., 2006, 2011). ELEA is the “Longitudinal Study of Active Ageing” supported by the National Institute of the Elderly and Social Services (IMSERSO). Four hundred and fifty-eight individuals (170 men and 288 women; mean age: 66.47, range: 55-75) participated in this study. As regards educational status, 21% had no formal education (but they were literate), 41% had primary education; 14% secondary education; 11.6% high school education; and 12.3% college education. Regarding marital status, 5.3% were single, 70.5% were married, 7.2% were divorced, and 17.1% were widowed. Finally, in terms of working status, 53.3% were retired, 10% were still working, and 33.3% were housewives. The *criteria for inclusion* in our sample were ages within the 55-75 year range and independence in terms of basic activity daily living (ADL). The sample is incidental; individuals were selected from four settings: a probabilistic representative sample of the Madrid population, volunteers from senior citizens' clubs in rural and urban areas, and volunteers from university programs for the elderly. Depending on the context of each participant, the protocol was administered in home, in the participant's apartment at Residences, or at the University by trained interviewers and after informed consent was obtained.

Measures

Participants were assessed through the European Survey on Ageing Protocol (ESAP) already tested through the EXCELSA-P study (Cross-European Longitudinal Study on Ageing-P) (Fernández-Ballesteros et al., 2004). The ESAP contains 500 variables, assessing 23 functions and grouped into nine domains: *anthropometry* (e.g., height, weight, BMI, etc.); *health* (e.g., subjective health, number of diagnosed illnesses, reported sensory functions, need for help, etc.); *physical and physiological functions* (e.g., blood pressure, gait, speed, vital capacity, strength, subjective fitness, as well as appraisal of fitness); *lifestyle* (physical activity, nutrition, smoking, drinking, etc.); *cognitive functioning* (e.g., working memory, cognitive plasticity, learning, mental status); *emotional-motivation functioning* (e.g., life satisfaction, well-being, emotional regulation, self-efficacy for

ageing); *personality* (extroversion, neuroticism, openness, agreeableness, conscientiousness); *social functioning and participation* (social and family networks and support, social satisfaction, helping others, receiving care, leisure activities, social productivity); and *sociodemographics* (age, gender, marital status, education, income, etc.).

Data regarding the reliability and construct validity of this measure have been reported elsewhere (Fernández-Ballesteros et al., 2004; Fernández-Ballesteros, Zamarrón, Díez-Nicolás, López, et al., 2010); Alpha coefficients range from .94 to .59; test-retest reliability range from .95 to .14. Protocol construct validity yielded a factorial concordance among countries, age and factors running from high to medium (ranging from .93 - .64).

From our ESAP, it must distinguish between the types of variables (subjective, such as life satisfaction or subjective health, and objective or observable event variable) and measures used for assessing the variables. Sometimes there is confusion when an objective performance is assessed asking the individual for his/her appraisal (for example, the “difficulty of standing two hours and stopping”). Through our protocol, several of our domains were assessed both objectively (e.g., strength, measured by grip strength; vital capacity, measured by a peak flow; speed, measured by a tapping test; cognitive functioning, measured by digit symbol, digit backward, Mini-Mental State Examination [MMSE] or verbal learning-AVLT, etc.), and subjectively (e.g., fitness appraisal, subjective health, etc.) but other objective (observable) variables were self-reported (for example, “How many pills do you take in a day” or “How many illnesses have been diagnosed by the doctor?”). Finally, all subjective domains such as satisfaction, self-efficacy, affect, etc. were self-reported by the individual through the protocol. Table 1 shows examples of objective and subjective outcome measures assessed by our protocol.

Statistical analysis

In order to answer our research questions, two types of analysis were performed: (1) an exploratory factor analysis (principal components, oblimin rotation) was performed using the most common *outcome variables* assessed *objectively* and *subjectively* in positive ageing studies but excluding any of those posited as predictor variables (lifestyle, personality, social networks, education, income, utilization of health and social services etc.). Also, factorial concordance among different age and gender subsamples were performed. Finally, (2) on the basis of the most frequent definitions of positive ageing (simple and combined) we obtained percentages of participants ageing well using single domains assessed through objective or subjective indicators and multi-domain operational descriptions through objective and subjective measures.

Table 1.
Examples of objective and subjective measures in the protocol of longitudinal study of active ageing

Outcome domains	Type of measure
Health	Number of illness reported (O)
	Number of medicine taken (O)
	Health Self-evaluation (S)
Physical and physiological functioning	Grip Strength (O)
	Tapping test (O)
	Body Mass (O)
	Balance static & dynamic (O)
	Fitness self-evaluation (endurance, strength, speed, balance, etc.) (S)
Cognitive functioning	Digit backward (O)
	Digit Symbol (O)
	Cognitive plasticity (O)
	MMSE (O)
Emotional motivational functioning	Life satisfaction (S)
	Emotional balance (S)
Activity	Self-efficacy for ageing (S)
	Productivity (hrs per year) (O)
	Leisure (hrs. per year) (O)

Note: S = Subjective; O = Objective; MMSE = Mini-Mental State Exam

Results

In order to test the internal (conceptual) structure of positive ageing, several factor analyses were performed, including *only outcome* variables; in other words, neither predictors nor determinants of positive ageing were introduced in these analysis. Outcomes variables were the following: *objective health* (number of illnesses diagnosed, number of oral medications) and *subjective health* (three questions assessing appraisal of health), *objective physical fitness* (static and dynamic balance and Body Mass Index) and *subjective fitness* (appraisal of strength, endurance, flexibility, etc.), *cognitive functioning* (assessed objectively through Digit Symbol and Digit Backward, Cognitive Plasticity and MMSE), *affect* (assessed subjectively through life satisfaction, affect comparisons, emotional balance, i.e. positive affect divided by negative affect, and self-efficacy for ageing), and *activity* (assessed through the frequency of productive and leisure activities). In order to test whether the factor structure of our outcome measures of positive ageing yielded in the total sample is influenced by gender (men and women) and age (two age group, 55-64 and 65-75), concordance coefficients were obtained.

Table 2 shows results from our factor analysis (principal component, oblimin rotation (eigenvalues greater than one). Five factors explain a 53.73% the total variance. Factor 1, called HEALTH, explains the highest percentage of variance (Eigenvalue 3.43; accounted variance 21.43%), is loaded by two objective measures (Chronic illness and Medication intake) in its negative pole and by two Subjective measures, (Health and Fitness appraisal) in its positive pole. Factor 2 is

called COGNITION (Eigenvalue 1.76) explains 10.98% of the total variance; it is loaded by all our measures of cognitive function (MMSE total score, Digit Symbol, Digit Backward, and Plasticity, AVLT learning gains). Factor 3 is called ACTIVITY (Eigenvalue 1.22) is accounting for 7.60% of the total variance is loaded by the frequency of productive and leisure activities. Factor 4 is called AFFECT (Eigenvalue 1.12), explains 7.02% of the total variance is loaded by all subjective measures containing satisfaction, emotional balance (positive affect reported divided by negative affect), and self-efficacy for ageing. Finally, Factor 5 is called PHYSICAL FITNESS (Eigenvalue 1.07) is accounting for a 6.71% of the total variance, and is loaded by statistic and dynamic Balance in its negative pole and BMI in its positive one.

In order to test whether this 5 factor structure is replicated by age and gender, several concordant coefficients were calculated. Results yielded that the factor structure obtained in the total sample has very high concordance coefficients (running from .88 to .80 for gender and .80 and .64 for age) and to those yielded by gender (men and women) and age (55-64 and 65-75 year old) subsamples.

Taking this factor analysis into consideration we selected a set of outcome variables to examine the prevalence of the simple outcomes (subjective and objectives) as well as, several combined measures were developed. Thus, we are reporting here to what extent simple measures of health, physical parameters, cognitive and, emotional functioning and activity factors in comparison with multidimensional or multi-domain measures, yield different rates of successful agers.

First of all, simple measures of successful ageing have been: "No illness reported" (Objective [O]), High Mental Status (O, 29 or higher), "High physical dynamic balance" (O, higher than 9.0), High productivity (O, higher than 4.0 hours a month), "High or very high reported health" (Subjective [S]), "High or very high life satisfaction" (S), "High emotional balance" (S, higher than 2.0).

From these operational definitions, prevalence of positive ageing in our sample is as follows: 80% ("High or very high life satisfaction"), 63.5% ("More than nine steps dynamic physical balance"), 57.2% ("Good or very good reported health"), 46% ("MMSE total score more than 29"), 40.7% (High or very high fitness appraisal), 27.4% ("No illness reported"), 26.7% (High or very high self-efficacy for ageing), 18.6% (more than four hours per month of productive activities; see Fernández-Ballesteros, Zamarrón, Díez-Nicolás, Molina, et al., 2010), and 16.3% (higher than 2.0 emotional balance, dividing positive by negative emotions, see Fredrickson & Losada, 2005).

Table 2.

Factor analysis (principal components, oblimin rotation) of a set of variables from the baseline of ELEA

Variables	Components				
	1 Health	2 Cognition	3 Activity	4 Affect	5 Physical fitness
Medication	-.796	-.079	-.035	-.113	.156
Illness diagnosed	-.760	-.105	.067	-.225	.030
Subjective health	.657	.164	-.131	.591	-.169
Fitness appraisal (strength, flexibility etc.)	.627	.168	-.097	.507	-.216
Digit symbol	.263	.791	-.046	.187	-.218
MMSE total score	.147	.782	-.021	.092	-.165
Digit backward	.014	.730	-.132	.218	-.099
Cognitive plasticity	-.169	.403	.315	-.039	-.231
Productive activities	-.041	-.081	.706	-.150	.036
Leisure activities	.028	-.013	.701	.216	.027
Emotional balance	.276	.153	-.139	.766	.010
Life satisfaction	.121	.064	.026	.732	-.295
Self-efficacy for ageing	.240	.222	.128	.612	-.051
Dynamic balance	-.011	.008	.087	.099	-.734
Body mass index	-.231	-.257	.097	-.115	.650
Static balance	.169	.323	-.126	.110	-.434
Eigenvalues	3.43	1.76	1.22	1.12	1.07
Variance %	21.43	10.98	7.60	7.02	6.71
Cum variance %	1.43	32.41	40.01	47.03	53.73

Note: MMSE = Mini-Mental Status Exam

Given that positive ageing is a multidimensional concept, three combined measures were developed to take into consideration health (subjective or objective), basic and instrumental ADL, mental status, life satisfaction, and productivity: (1) Subjective health (good or very good) and all basic and instrumental ADL & Mental Status ≥ 29 and life satisfaction (good to very good); (2) Illness diagnosed ≤ 1 and all basic and instrumental ADL and mental status ≥ 29 and life satisfaction (good or very good); and (3) Subjective health (good or very good) and all basic and instrumental ADL and mental status ≥ 29 and life satisfaction (good or very good) and productivity \geq mean. When combined measures of successful ageing were calculated, the percentage range of elders ageing well was found to depend on the measure analysed, as has been already reported (Fernández-Ballesteros, Zamarrón, Díez-Nicolás, Molina, et al., 2010). First, the highest percentage of participants ageing well was 41.4%, obtained when the combination was “*subjective health*, all ADL, high mental status, and high life satisfaction.” Second, 27.9% of successful ageing people were found when subjective health was

substituted by a more objective index of health such as “*one or fewer illnesses reported*.” Finally, only 15.5% of successful agers were found when “*productive activities*” were added to our first formula.

In conclusion, several definitions of positive ageing show a broad diversity in the percentage of people ageing well run from 80% (using a simple subjective measure of life satisfaction) to 15.5 (a combined objective measure). Combined objective and subjective measures give a lower range of positive ageing, from 41.4 to 15.5%.

Discussion

First of all, regarding our search for an internal structure of the outcome components (dependent variables) of positive ageing, the exploratory factor analysis, in which a set of relevant objective and subjective measures of positive ageing were included, supports the multidimensionality of this set of positive ageing outcomes. The exploratory factor analysis (Principal component, Oblimin rotation) yielded a structure with five independent factors of positive ageing (account variance 53.73%): Health, Cognition,

Activity, Affect, and Physical Fitness. These factors were also included in most of the theoretical and empirical works about positive ageing. Thus, the most important factor is *Health* (account variance 21%), it is loaded by two objective measures such as number of chronic illnesses diagnosed and medicine taken and by two subjective measures such as subjective health (composed of three questions) and fitness appraisal (composed of six questions about strength, speed, endurance, balance, etc.). Thus, health is the ever-present domain claimed by expert and lay elders as a condition for ageing well and it must be emphasized the importance in including subjective and objective measures since both are indicators of mortality and survival (De Salvo, Bloser, Reynolds, He, & Munter, 2006; Idler & Benyamini, 1997). Our second factor is *Cognition* (account variance 10.98%), it is loaded by MMSE but also by consolidated intelligence measures such as Digit Symbol and Digit Backward (assessing, respectively, learning and working memory), and Cognitive plasticity (assessed by gains across a verbal learning curve). This result supports that cognitive measures not only predict, a long lifespan, education and professional success but also other adaptation processes such as ageing, which is also emphasized by the new cognitive epidemiology (Deary & Der, 2005). The third factor is *Activity* (account variance 7.59%); it is loaded by leisure and productive activities. It can be considered that activity and productivity are also essential for successful ageing because activity is a leading theory in gerontology and active ageing (Havighurst, 1963), as has been emphasized by many authors who underline the importance of social commitment (Andrews, Clark & Luszcz, 2002; Baltes & Baltes, 1990; Rowe & Khan, 1989). The fourth factor called *Affect* (account variance 9.2%), is loaded by three subjective measures of satisfaction, emotional balance, and self-efficacy for ageing supporting the importance that positive affect has in ageing well as it has been posited as one of the criteria from Havighurst (1963), Palmore (1979), WHO (2002) and many other authors (see, Fernández-Ballesteros, 2008). Finally, the fifth factor, *Physical fitness* (account variance 6.7%), is loaded by the three measures of static and dynamic balance and the BMI. These measures are a consequence of physical activity and nutrition and are taken into account as indicators of healthy ageing (Cesari et al., 2009).

Nevertheless, our exploratory factor analysis does not support the existence of subjective and objective independent concepts of successful ageing as claimed by Pruchno et al. (2010; see also, Strawbridge, Wallhagen, & Cohen, 2002). Our results suggest that subjective conditions are present in several domains; for example, subjective health (or health perceived) and fitness appraisal as well as objective measures, such as number of illnesses diagnosed and number of medicines taken, are loaded on the factor called *Health*. As has

been pointed out, subjective conditions are not only life satisfaction or emotional balance but also any subjective transformation of an objective event (Ericsson & Simon, 1980; Fernández-Ballesteros, 2004). Unfortunately, there is confusion between objective and subjective variables when authors compare "objective" measures requiring a self-report with the appraisal of difficulty (that is, the subjective report) of objective events (e.g.: walking a quarter of a mile). In sum, our results support the multidimensionality (multi-domain) of positive ageing and also the importance of including the objective and subjective aspects of objective measures. Moreover, our results do not support the existence of different positive ageing structures due to gender or age as Pruchno et al. (2010) claimed. Although there are age and gender differences in most of measures of positive ageing (as has been published elsewhere: Fernández-Ballesteros et al., 2004; Fernández-Ballesteros, Zamarrón, Díez-Nicolás, Molina, et al., 2010) the internal structure of this concept is quite similar as shown by our concordance coefficients.

Regarding our search of prevalence of positive ageing, it must be emphasised that we have no external criteria for establishing positive ageing at the individual level. At the population ageing level it can be found indexes of successful ageing by means of Healthy Life Expectancy or Disability Life Expectancy (see: Robine, Jaegger, Mathers, Crimminis, & Suzman, 2003) or the prevalence of disability in a given population (in Spain about 33% is older than 65, IMSERSO, 2003). As supported by most of the experts from bio-medical (Fries, 1989; Rowe & Khan, 1987) or psychosocial (Baltes & Baltes, 1990) fields, or even by the World Health Organization (WHO, 2002), individual positive ageing (and related concepts) cannot be reduced to healthy ageing (subjectively or objectively assessed) or to disability. But, if we reduce positive ageing to healthy subjective ageing, approximately 30% of Spaniards older than 65 considered their health as "very good" or "good" (IMSERSO, 2006).

Our results, from simple, combined, objective or subjective measures yielded a very broad range of prevalence. Percentages obtained from simple objective measures run from 63.5% to 18.6%, and from subjective simple indicators range from 80% to 16.3%. Also, combined measures range from 41.4% to 15.5%. Nevertheless, combined measures of objective and subjective indicators (such as: Illness diagnosed ≤ 1 , all basic and instrumental ADL and Mental Status ≥ 29 , and Life satisfaction [good or very good]) yielded 27.9% of successful ageing people; this percentage is closer to other data from the population (IMSERSO, 2003, 2006), and the average of those yielded by Peel et al. (2005) and Depp and Jeste (2006). Furthermore, the broad variability of prevalence coming from objective and subjective measures are in agreement with Strawbridge et al. (2002) who found that while self-

rated positive ageing was 50.3%, this coming from objective data was 18.8%. Much more research and conceptual consensus are required in order to arrive at an acceptable prevalence of successful ageing.

Finally, the limitation of this paper must be underlined: our sample is incidental, the criteria for inclusion make our participants independent, that is, the high prevalence yielded is to be expected. Also, it must be said that our results come from an exploratory factor analysis, this study is cross-sectional in design because the data comes from the baseline of a planned longitudinal design; this study is ongoing and we are expecting results from our first follow-up. These data are required to conduct a confirmatory factor analysis through equation modelling to test a model of positive ageing and causal hypotheses. The strength of this study lies in the protocol used which has been developed from the ESAP (European Survey on Ageing Protocol administered in the EXCELSA-P study in seven European countries, see Fernández-Ballesteros et al., 2004) which contains a broad set of objective and subjective measures which has been administered cross-culturally and tested.

Conclusion

This study supports a multidimensional concept of positive aging with a similar structure to well considered definitions of positive aging: health, cognition, activity, positive emotions, and physical fitness are the major factors for aging well; also, the most suitable prevalence of positive aging in our sample is yielded by a combined measure (with objective and subjective indicators) of 27.9%. This result is supported by population data from Spain as well as by other authors. Nevertheless, much more research on positive aging, both at theoretical and methodological level, must be conducted.

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