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Predicting life satisfaction of the Angolan elderly: A structural model

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Satisfaction with life is of particular interest in the study of old age well-being because it has arisen as an important component of old age. A considerable amount of research has been done to explain life satisfaction in the elderly, and there is growing empirical evidence on best predictors of life satisfaction. This research evaluates the predictive power of some aging process variables, on Angolan elderly people's life satisfaction, while including perceived health into the model. Data for this research come from a cross-sectional survey of elderly people living in the capital of Angola, Luanda. A total of 1003 Angolan elderly were surveyed on socio-demographic information, perceived health, active engagement, generativity, and life satisfaction. A Multiple Indicators Multiple Causes model was built to test variables' predictive power on life satisfaction. The estimated theoretical model fitted the data well. The main predictors were those related to active engagement with others. Perceived health also had a significant and positive effect on life satisfaction. Several processes together may predict life satisfaction in the elderly population of Angola, and the variance accounted for it is large enough to be considered relevant. The key factor associated to life satisfaction seems to be active engagement with others.

Keywords: MIMIC models; African context; well-being; aging

Introduction

A large amount of research has been accumulated in the area of subjective well-being (e.g., Diener, Oishi, & Lucas, 2003; Momtaz, Ibrahim, Hamid, & Yahaya, 2011; Pethtel & Chen, 2010), existing an increasing awareness among researchers that well-being is not the absence of mental illness (Cacioppo & Berntson, 1999), which is consistent with the definition of health by the World Health Organization. Well-being is a complex construct concerning optimal experience and functioning (Deci & Ryan, 2008; Ryan & Deci, 2001). From the very beginning, life satisfaction was identified as a part of subjective well-being (Andrews & Withey, 1976; Diener & Emmons, 1984). Life satisfaction is referred to a cognitive, judgmental process (Diener, Emmons, Larsen, & Griffin, 1985), in which a person's quality of life is globally assessed according to his/her chosen criteria (Shin & Johnson, 1978). Thus, life satisfaction arises as a potential indicator of psychological adaptation and successful aging (Baltes & Baltes, 1990; Gow, Pattie, Whiteman, Whalley, & Deary, 2007; Rowe & Kahn, 1998). Therefore, its determinants in older age should be identified so that to be promoted as people grow older (Rowe & Kahn, 1998; Steverink & Lindenberg, 2006).

One of the main theoretical frameworks to understand well-being and its antecedents in the old age is that of successful aging (Rowe & Kahn, 1998). Successful aging has been characterized as maintaining physical health, sustaining good cognitive function, having active engagement with other people and productive activities (Berg, Smith, Henry, & Pearce, 2007). Therefore, from this perspective, four components or dimensions are interrelated with well-being and its final indicators. Another theoretical contribution linked to aging comes from the literature on human development, suggesting that generativity represents a hallmark of psychosocial maturity in adult years (Cheng, 2009; Hofer, Busch, Chasiotis, Kärtner, & Campos, 2008; Huta & Zuroff, 2007; McAdams, Aubin, & Logan, 1993; Schoklitsch & Baumann, 2011). Generativity, conceived as 'primarily the concern in establishing and guiding the next generation' (Erikson, 1963, p. 267), is linked to actively passing knowledge and/or experience to others, and is in line with the dimension of participating in productive activities pointed by the successful aging paradigm.

Perceived health has long been considered an indicator of general health (Idler & Benyamini, 1997), and it is seen as an essential complement to the traditional indicators in health studies (Hunt et al., 1980). There is substantial evidence relating perceived health with life satisfaction. Berg, Hassing, McClearn, and Johansson (2006) found that perceived health was a moderator. Borg, Hallberg, and Blomqvist (2006) found that self-reported health had the strongest main effect on life satisfaction. Longitudinal data on elderly showed that subjective self-assessment of health is a more powerful predictor of well-being than objective measures (Kunzmann, Little, & Smith, 2000; Smith,

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Borchelt, Maier, & Jopp, 2002). Fernández-Ballesteros, Zamarrón, and Ruíz (2001) found significant positive effects of activity level and perceived health on life satisfaction, and negative effects of physical illness on life satisfaction. Meléndez, Tomás, Oliver, and Navarro (2009) found evidence of a significant positive relation between physical conditions and life satisfaction, in a structural model to explain life satisfaction.

In several papers, active engagement with others measured with indicators of social network and social support has shown to benefit well-being and life satisfaction in later life (Gow et al., 2007; Okabayashi, Liang, Krause, Akiyama, & Sugisawa, 2004; Theurer & Wister, 2010). Okabayashi et al. (2004) found, in a study in older population, a relation between social support and life satisfaction, in which the effect of social support on life satisfaction depended on participants having or not a spouse. Gow et al. (2007) studied the relation between social support and satisfaction with life in a sample of elder people, too. Taken together, social network and support factors accounted for 23% of the variance in satisfaction with life ratings. Therefore, these findings strongly suggest that active engagement with others accounts for benefits on life satisfaction in the elderly.

Another component in aging literature usually related to health, life satisfaction, and well-being is individual's activity, conceived as functional status or the ability to autonomously perform activities, which is linked to the productivity component in the successful aging literature (Rowe & Kahn, 1998). Generally, researchers on aging and activity have highlighted the importance of understanding self-efficacy beliefs, so that they are linked to perceived diminishment or maintenance of quality of life and life satisfaction (Fry, 2001), and positive effects of activity have been found on the well-being of the elderly (Everard, Lach, Fisher, & Baum, 2000). For example, Meléndez et al. (2009) found a significant and positive correlation between autonomy and life satisfaction, quantified in 0.24, and between environmental mastery and life satisfaction, rated in 0.49. Moreover, these authors related Barthel's index, a measure of daily life autonomy, to satisfaction with life, and found a significant relation of 0.38 (Meléndez et al., 2009).

Finally, generativity, also partially related to the dimension of productivity, has emerged as a potential predictor of life satisfaction in older adults (e.g. Efklides, Kalaitzidou, & Chankin, 2003). McAdams et al. (1993) found, when examining generativity features in a sample of elderly people from Illinois, a correlation of 0.35 between generative concern and satisfaction with life. More recently, Efklides et al. (2003), in a study of Greek elders, found particularly important for life satisfaction and perceived health to have good adaptation to old age and generativity towards one's children.

As it has been exposed, a great deal of research has been done on predictors of life satisfaction. However, few of them have taken into account the effect of predictors in a multivariate context. This study aims to test the predictive power of variables measuring three components of successful aging and generativity on this facet of well-being, in a multivariate structural equation model, offering transcultural evidence of a scarcely studied population, the Angolan elderly. The structural equation model simultaneously tests several hypotheses of interest:

Hypothesis 1: Perceived health will positively predict Angolan elderly's life satisfaction.

Hypothesis 2: Aging process variables will predict life satisfaction over and above the effect of perceived health status. This general hypothesis may be divided into several ones. Hypothesis 2a: Active engagement with others will have positive links with life satisfaction. Hypothesis 2b: Productivity will be positively related to life satisfaction, or alternatively dependency will be negatively related to life satisfaction. Hypothesis 2c: Generativity will positively predict life satisfaction.

Methods

Design, participants, and procedure

The research is a cross-sectional survey of elderly people living in the capital of Angola, Luanda. The sample was non-probabilistic, since neither a census of elderly living in Luanda nor a complete list of nursing homes and day-care centers were available. Participants were sampled from several old people's homes depending on Angola's Government, day care centers depending on religious institutions, and NGO assisting elderly living alone, all of them sited in the city of Luanda. Total sample comprised 1003 elderly people. The research had permission from the Ministry of Social Welfare. Elderly people were asked to complete a survey of about 30 minutes, which included scales on several constructs related to the aging processes. Most of these surveys were self-completed in nursing homes or in their own houses. However, interviewers were used whenever the elderly people's age and/or educational level made survey self-completion difficult. The interviewers were trained for the purposes of the study. The sample of elderly people either lived in nursing homes (76.3%), with their families (18.6%), or on their own (5.1%). Women were 65.4% of the sample. The mean age was 73.1 (SD = 8.8), ranging from 60 to 90 years old; 71.2% were widows or widowers, 16.3% singles, and 12.5% married.

Instruments

The dimensions included in the structural model were as follows:

(a) *Life satisfaction*, measured by the Satisfaction With Life Scale (SWLS; Diener et al., 1985).

Example items were 'In most ways my life is close to my ideal' or 'So far I have gotten the important things I want in my life'. The alpha was 0.92.

(b) *Perceived health*, measured by the Perceived Health Scale (Fernández-Ballesteros et al., 2001). An example item was 'In the last twelve months, your health has been...', scoring from *bad* (1) to *good* (3). The alpha was 0.77.

(c) *Active engagement with others*. This dimension has been measured with three indicators or observed variables: (1) A two-items indicator of perceived adequacy of social relationships adapted from the Aging Perception Scale (de Gracia, Garre, & Marcó, 1999). The two items were 'I have a good relationship with my closest relatives' and 'I think the relationship with my friends is good'. Alpha was 0.72. (2) The factor of emotional support from friends in the Emotional Support Scale (Shaw, Krause, Chatters, Connell, & Ingersoll-Dayton, 2004). An example item was 'How much do they understand the way you feel about things?' Alpha was 0.84. (3) Priority for social acceptance by Lang and Carstensen (2002), with items such as 'It is my priority to have good friends who accept me the way I am'. Alpha was 0.88.

(d) *Productivity*, measured by two indicators or observed variables (Cox, Green, Seo, Inaba, & Quillen, 2006): (1) Performance-related quality of life, with items like 'I can still do a number of things that I enjoyed all of my life' or 'I am able to contribute to my community'. Alpha was 0.92. (2) Dependency, with items like 'I feel like my freedom has been taken away'. Alpha was 0.91.

(e) *Generativity*, by Lang and Carstensen (2002), with items such as 'It is my priority to give my knowledge/experience on to others'. Alpha was 0.88.

All the scales, except the SWLS, were translated into Portuguese applying the standard back-translation procedure. The Portuguese version of the SWLS used was the author's translation (Diener, 2009).

Analyses

Confirmatory factor analysis and Multiple Indicators Multiple Causes (MIMIC) structural models were estimated using maximum likelihood with Satorra–Bentler robust corrections for the standard errors and fit indices, the recommended procedure implemented in EQS 6.1 program (Bentler, 2005) for ordinal and non-normal data such as the ones under study (Mardia's coefficient normalized estimate = 37.34; Finney & Di Stefano, 2006). Although other statistical procedures, such as multiple regression or path analyses, could have been used for the prediction of life satisfaction, MIMIC models were chosen to predict life satisfaction in a context: (a) free of error of measurement in the dependent variable and (b) allowing for consideration of unique relations with particular life satisfaction indicators (items). In order to assess model fit, several fit criteria have been used, as recommended in the literature (Hu & Bentler, 1999; Tanaka, 1993): (a) chi-squared statistic, with significant test statistic casting doubt on the model specification; (b) the comparative fit index (CFI; Bentler, 1990) of more than 0.90 (and, ideally, greater than 0.95; Hu & Bentler, 1999); (c) the root mean squared error of approximation (RMSEA; Steiger & Lind, 1980) of 0.05 or less; (d) the GFI, with values of more than 0.90 as indicative of adequate fit (Hoyle & Panter, 1995); (e) the standardized root mean squared residuals (SRMR) of 0.08 or less (Hu & Bentler, 1999). The most common of these indices is the chi-squared test. However, several problems arise with its use, in particular those due to the chi-squared test nature: it is based on restrictive assumptions, depends on sample size, and a model is an approximation to reality rather than an exact representation of the observed data. In particular, Tabachnick and Fidell (2007) stated that assessment of fit is not always as straightforward as the assessment of χ^2, because with large samples, the trivial differences between sample and estimated population covariance matrices become significant. This is indeed the case of this study. To overcome these problems with the chi-squared test, there is a broad consensus that no single measure of model overall fit should be relied on exclusively; therefore, researchers are advised to use a variety of different indices from different families of measures (Tanaka, 1993).

Results

A structural MIMIC model was hypothesized to relate the aforementioned variables to satisfaction with life while including the link between perceived health and life satisfaction. The model had a clear rationale; as literature has shown, several variables may predict elderly people's life satisfaction, and therefore may be potential predictors of successful aging. The variables included in the model were broadly measures of active engagement with others (perceived adequacy of social relationships, emotional support from friends, and priority for social support), productivity (performance-related quality of life and dependency), and generativity. All these variables were hypothesized to directly impact on well-being, as presented in Figure 1, together with perceived health. These variables were interrelated, which turned into estimated covariances in the structural model among all the exogenous variables with significant product–moment correlations. Correlations are given in Table 1.

This initial or theoretical model (Figure 1) fitted the data reasonably well: $\chi^2_{33} = 408.75$, $p < 0.001$,

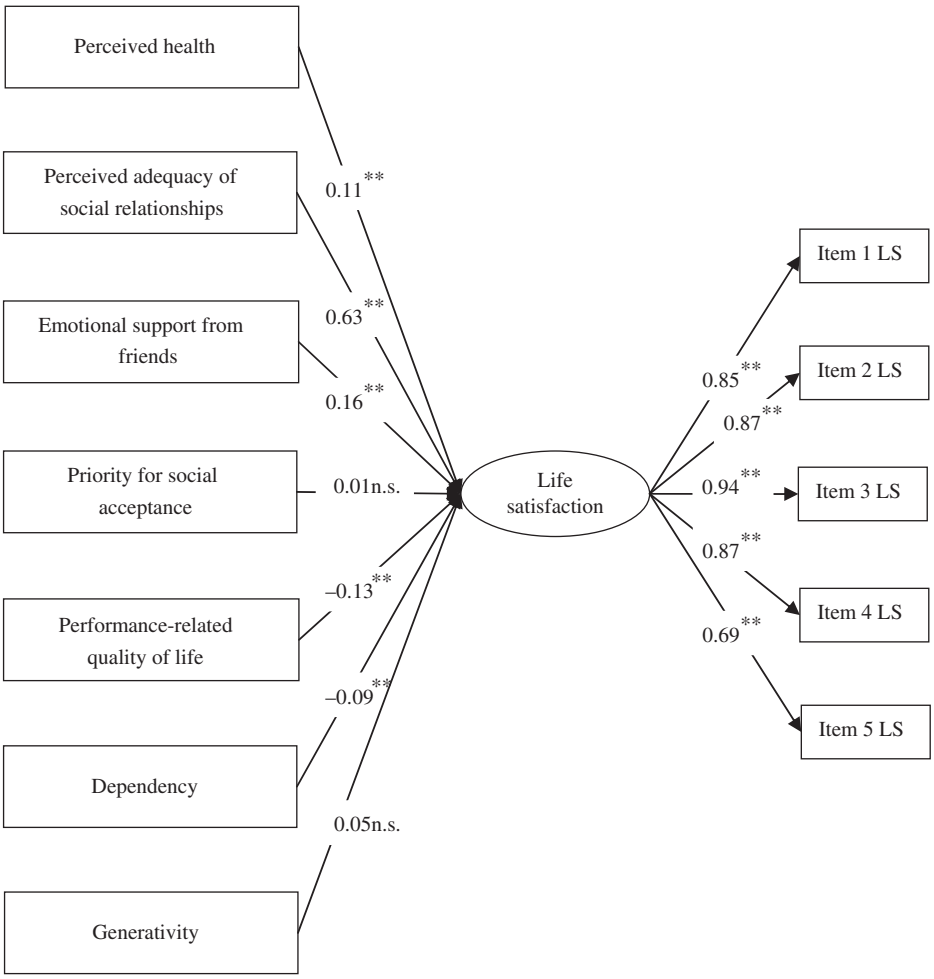

Figure 1. MIMIC model to predict satisfaction with life.
Note: $^{**}p < 0.01$.

Table 1. Correlations among predictors within the MIMIC model and product–moment correlations among life satisfaction and the predictors.

	LS	PH	SS	ESF	PSA	PRQL	D	PG
PH	0.326**	1	–	–	–	–	–	–
SS	0.696**	0.294**	1	–	–	–	–	–
ESF	0.416**	0.288**	0.382**	1	–	–	–	–
PSA	0.347**	0.378**	0.357**	0.529**	1	–	–	–
PRQL	0.210**	0.279**	0.346**	0.381**	0.243**	1	–	–
D	−0.172**	0.095**	−0.162**	−0.076*	0.132**	0.006	1	–
PG	0.244**	0.339**	0.233**	0.437**	0.614**	0.332**	0.272**	1

Notes: LS, Life satisfaction; PH, perceived health; SS, social support; ESF, emotional support from friends; PSA, priority for social acceptance; PRQL, performance-related quality of life; D, dependency; and PG, priority for generativity.
$^{*}p < 0.05$; $^{**}p < 0.01$.

CFI = 0.944, GFI = 0.922, SRMR = 0.031, and RMSEA = 0.107 (90% CI 0.097–0.116). Only RMSEA was not adequate. However, no *post-hoc* modifications were made, especially having into account that the structural model had no salient areas of strains in the new solution (e.g., large modification indices) and that the interpretability of parameter estimates was reasonably in accordance with previous empirical results (and hypothesis) and logical arguments. Accordingly, the model was retained as a sufficient representation of the data, and its standardized parameter estimates are presented in Figure 1.

The measurement part of the model showed a strong link between the indicators and their corresponding latent variable (life satisfaction), with factor loadings extremely large and reliable (starting with a

minimum of 0.69). In terms of life satisfaction prediction, the main predictor was perceived adequacy of social relationships (0.63, $p < 0.01$), although emotional support from friends also had a positive and important association (0.16, $p < 0.01$). Other effects were statistically significant but modest, such as the positive one of perceived health (0.11, $p < 0.01$), or the negative ones of both performance-related quality of life (-0.13, $p < 0.01$) and dependency (-0.09, $p < 0.01$). Two predictors were not statistically related to life satisfaction: generativity (0.05, $p > 0.05$) and priority of social acceptance (0.02, $p > 0.05$). Overall, the amount of variance of life satisfaction explained by all predictors in the model was large ($R^2 = 0.56$).

Discussion

The estimates of the structural MIMIC model simultaneously tested all the hypotheses in the study. These hypotheses will guide the discussion of results.

With respect to hypothesis 1, 'perceived health will positively predict Angolan elderly's life satisfaction', the results found a significant and positive effect of perceived health on life satisfaction. However, the magnitude of the effect was low. Thus, this effect agrees with the literature but do not represent the large effect found in studies in Western societies. Borg et al. (2006) found that self-reported health had the strongest explanatory power for life satisfaction in a sample of Swedish elderly. Kunzmann et al. (2000) and Smith et al. (2002), in successive studies of German elderly, also found that perceived health was a relevant predictor of life satisfaction. In another longitudinal German sample, Gwozdz and Sousa-Poza (2010) also found that perceived health was a major predictor of life satisfaction. Other studies are far less conclusive on the relationship between these variables. For example, Berg et al. (2006) found a positive univariate correlation between self-rated overall health and life satisfaction, but this correlation was larger for women than it was for men. Indeed, in a multivariate analysis (multiple stepwise regression) on the same data, health remained a significant predictor only in the subsample of women. Another process may well be operating here. According to Gwozdz and Sousa-Poza (2010), life satisfaction remains quite constant across the entire lifecycle, except for the oldest old, who have a rapid decline in life satisfaction. As Baltes and Smith (2003) pointed out, 'healthy and successful aging has its age limits' (in Gwozdz & Sousa-Poza, 2010, p. 398). This may not be the case for the young old. Therefore, the moderate effect found in our sample may be due to the wide range of years considered (60–90 years old).

Hypothesis 2a, 'active engagement with others will have positive links with life satisfaction', has been completely supported by the data. There were three indicators related to active engagement, and two of them significantly predicted life satisfaction. Specifically, perceived adequacy of social relationships with family and friends was the largest predictor in the whole model, with a positive and large standardized coefficient. Emotional support from friends was also positive and statistically significant, with a much lower impact, but nevertheless it was the second largest standardized coefficient to predict satisfaction with life. Relationships between familiar and social networks and well-being have long been documented (Bowling & Browne, 1991). Therefore, these results are in line with large amounts of scientific evidence that highlights the benefits of strong social networks and social support on well-being and life satisfaction in later life (Gow et al., 2007; Okabayashi et al., 2004; Theurer & Wister, 2010). A key point of the results still deserves consideration: there is a large distance among the predictive power of the overall indicator of perceived adequacy of social relationships and the specific on friends' emotional support. This result could be partially explained by the relative importance that family versus friends' support plays in the elderly. According to Lang and Carstensen (1998), well-being of the elderly mostly depends on the maintenance of close social ties, which they mostly have with family members. After a review of existing literature to date, Bowling and Browne (1991) pointed out that spouses and members of the immediate family provide the most support. Recent research abounds in the same idea. For example, Okabayashi et al. (2004) found larger effects for social support given by spouses and/or children than the one given by friends or other relatives. However, the indicators of active engagement with others in this study are coarse and general. Thus, this effect should be studied in depth, given that social networks and social support may be operationally defined in several dimensions such as size, composition (friends and relatives), geographic dispersion, or member homogeneity (Bowling & Browne, 1991). Additionally, the differential effects of instrumental versus emotional support provided by the social network should be investigated.

Hypothesis 2b, 'productivity will be positively related to life satisfaction, or alternatively dependency will be negatively related to life satisfaction', has not been fully supported by the data. On one hand, and as it was expected, dependency had a significant and negative effect on life satisfaction, a result that is in line with the literature. Several authors have found that activities have a positive effect on well-being, health status and successful aging (Everard, 1999; Rowe & Kahn, 1998). As dependency is negatively associated to activity, this confirms the results found. Meléndez et al. (2009) found a multivariate positive effect of autonomy on life satisfaction index, a result also in line with the negative effect of dependency found in this study. On the other hand, the negative effect of performance-related quality of life, an indicator of active aging, is a counterintuitive result, indicating that active elderly are less likely to be satisfied with their lives, when controlling for the other predictors in the model. Although it is not a large effect (-0.13), it is

nevertheless an awkward result. A bivariate correlation between performance-related quality of life and life satisfaction was therefore calculated, and it resulted in a positive zero-order correlation (0.24). However, the positive correlation turned into negative (−0.14) when it was partially out by the other predictors in the model. Therefore, this is an example of a net suppressor effect (Cohen, Cohen, West, & Aiken, 2003), in which X is positively correlated with Y, but has a negative regression coefficient. That is, within a multivariate context, the direction of the relationship changes. This effect clearly needs careful consideration, as it does not agree with the existing literature.

Finally, Hypothesis 2c, 'generativity will positively predict life satisfaction', has not been supported by the data. Recent literature on generativity discusses the importance of participating in social causes that advocate for peace, justice, and care of the environment for their well-being (Sorrell, 2011). Bianchi (2005) noted that having social purposes and goals was associated to well-being. Empirical evidence by Efklides et al. (2003) found a strong link (0.34) between generativity and life satisfaction in a Greek elderly sample. Similarly, McAdams et al. (1993) also found a correlation of similar amount (0.35) between generativity and satisfaction with life. These strong links are not supported by present results. However, it must be borne in mind that the aforementioned studies found a bivariate correlation, whereas our results were estimated in the context of a multivariate model, in which other aging processes were taken into account. Therefore, the salient effect expected for generativity was not supported in this context.

This study presents some strengths and also some limitations. Among the strengths, it studies an array of relationships in a multivariate context, including latent variables free of error. The structural MIMIC model has included a variety of measures and indicators of the aging processes, and these indicators have explained a significant portion of life satisfaction variance over and above the variance explained by perceived health. However, it must be borne in mind that the cross-sectional design makes difficult to establish causal links beyond what scientific logic, theories and previous results may help. Another strength is the relatively large sample. Finally, in our opinion, the main strength of the study is that estimates the model in an understudied African country, Angola. Although the aging process in Africa has been slower, its elderly population is estimated to reach 6% in 2025 and 11% in 2050, and it is therefore a collection of great interest. A limitation of the study is that when multiple variables and constructs are included in a model, it is always at the price of being specific, and so some quite specific processes may be obscured. Further studies including detailed indicators would surely be needed. This was clearly the case with social networks measures, and so, future researches in Angolan population should include better measures of this dimension. In particular, extended measures of social networks size, composition, etc., as well as the types of social support given by these networks, instrumental versus emotional, are needed. As a reviewer pointed out, a critical distinction in the elderly is between family and friends' support, and future studies should tapper this question. Additionally, longitudinal studies would help to establish causal effects among variables.

In order to better comprehend these results, African cultural, and Angolan socio-historical context, should be borne in mind. The elderly people in this sample have all lived the long 40-year period of wars in Angola, since the Independence war started in 1961. Together with this period of wars, Angola has had profound sociological and economical changes. Of particular importance for the elderly has been the change from rural to urban populations: the inhabitants of Luanda were around 600,000 when the Independence war started and are around eight millions nowadays. Most of this growth in urban population was due to forced relocation, also ultimately due to the war. All these changes have had, at least, two effects: (a) a decrease in the number and proximity of members of the social networks available to the elderly and (b) a shift in the traditional cultural African view according to which the elderly will be looked after by their offsprings (Unanka, 2002), and therefore the importance of family support. Additionally, the sample has a majority of elderly living in nursing homes, which could make them being less productive in the society. All these differences could explain the inconsistent findings with previous studies, especially the lack of association of life satisfaction with generativity and performance-related quality of life.

To sum up, the relations showed up in the structural model indicated that several processes together may predict life satisfaction in the elderly population of Angola, and that the variance accounted for it is large enough to be considered relevant, but to put the whole matter in a nutshell, the key factor associated to life satisfaction seems to be active engagement with others.

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