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FACTORIAL COMPOSITION OF THE SCALE OF ATTITUDES TOWARD THE ELDERLY BY KOGAN IN MEXICAN UNIVERSITY STUDENTS

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ABSTRACT
The present study aims to investigate whether the psychometric results proposed by Sampén, Varela Diaz, Tello and Ortiz (2012) for the Spanish version of the scale of attitudes toward the elderly by Kogan (KAOP) are replicated. The total sample was of 1702 Mexican university students, with an average age of 20.70 years (SD = 1.93). The factorial structure of the questionnaire was analyzed through exploratory and confirmatory fac tor analysis. The three-factor structure (personal sphere, social sphere and emotional sphere), based on statistical and substantive criteria, has shown adequate adjustment indicators of reliability and validity. However, the model does not match the obtained raised by Sampén et al. (2012). Future research should replicate these findings in larger samples.

Keywords
Instrumental Study, Factor Structure, Construct Validation, Attitudes

Resumen
El presente estudio pretende investigar si se replican los resultados psicométricos propuestos por Sampén, Varela Díaz, Tello y Ortiz (2012) para la versión española de la escala de actitudes hacia los ancianos por Kogan (KAOP). La muestra total fue de 1702 estudiantes universitarios mexicanos, con una edad promedio de 20,70 años (DE = 1,93). La estructura factorial del cuestionario se analizó mediante análisis factorial exploratorio y confirmatorio. La estructura de tres factores (esfera personal, esfera social y esfera emocional), basada en criterios estadísticos y sustantivos, ha mostrado adecuados indicadores de ajuste de fiabilidad y validez. Sin embargo, el modelo no coincide con el obtenido por Sampén et al. (2012). La investigación futura debe replicar estos hallazgos en muestras más grandes.

Palabras clave
Estudio Instrumental, Estructura Factorial, Validación de constructo, Actitudes

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COMPOSICIÓN FACTORIAL DE LA ESCALA DE ACTITUDES HACIA EL ADULTO MAYOR DE KOGAN EN UNIVERSITARIOS MEXICANOS

In our society dominated by economic factors, in which be productive is a key element, too often the value of people is dependent on their ability to produce; this originates that the elderly have a marginal role being excluded from the social dynamics. The contributions that the elderly make to society are ignored; and often they are represented as isolated, weak and frail persons; emphasizing in the decadence, linking old age with negative stereotypes (Shenkin et al., 2014).

Levy (2003) review, shows how in younger individuals stereotypes about aging are internalized, and then, when individuals reach the old age become self-stereotypes. Therefore, discriminatory attitudes impact negatively in self-perception, health and wellness of the people (Franco, Villarreal, Vargas, Martínez, & Galicia, 2010; Kotter-Grühn & Hess, 2012).

It is a reality that aging is accompanied by a series of biological, psychological and social changes that actually affect the level of independence and productivity of senior citizens; but it is also true that the perception we have of it by young people is full of beliefs and stereotypes, which often do not correspond with reality. This social perception can be originated by a tendency to emphasize the negative aspects associated with old age, understand it in a pessimistic manner and as a progressive decline of life (Latorre & Montañes, 2004).

Many investigations, as highlighted by the meta-analysis by Meisner (2012), indicate how stereotypes, both positive and negative, associated with age plays an important role in health, disease and disability in the elderly. Investigations related to positive attitudes about aging were associated with higher levels of satisfaction with life and low physical and emotional discomfort (Bryant et al, 2012; Castellano, 2014); improvements in self-perception on physical and mental health and lower levels of anxiety and depression (Bryant et al., 2014). Authors like Stephan, Chalabaev, Kotter-Grühn and Jaconelli (2012) relate positive attitudes towards aging as indicators for a successful aging, reflected in aspects such as better physical functioning, better health and quality of life.

On the contrary, negative attitudes are consistent with the negative stereotypes of aging, and reflect the beliefs about old age as a time of physical and mental deterioration, such as decreased memory processing (Hughes, Geraci & De Forrest, 2013), while self-perceptions and self-image are associated with poorer health status (Levy, 2003). In general, negative age stereotypes seem to harm the well-being, exacerbate disease and disability; having a greater negative influence on behavior; while positive age stereotypes seem to support health and prevent deterioration (Meisner, 2012). Having a positive attitude towards aging contributes to physical and mental health results. Overcoming the negative aging stereotypes through changes to social and individual levels can help promote successful aging (Bryant et al., 2012).

Nowadays many instruments have been developed to measure beliefs, attitudes and stereotypes about the elderly and aging which include a series of questions grouped in areas or domains; authors as Fraboni, Saltstone, and Hughes (1990); Kafer, Rokowski, Lachman, and Hickey (1980); Kogan (1961); Lasher and Faulkender (1993); Rosencranz and McNevin (1969) and Tuckman and Lorge (1953); have developed main instruments to measure attitudes and stereotypes about the elderly and aging.

Most of these instruments exhibit good psychometric properties of validity and reliability; however it is important to note that such questionnaires are adapted and validated in different cultures and times, so its psychometric performance is more than questionable for a reliable and valid measure when used in our own culture.

In this context, our interest is to study the scale of attitudes toward the elderly of Kogan (1961), which presents certain characteristics that favor their choice; as its ease of administration and economy of time, its extensive use as a reference for the construction and validation of other instruments, and to evaluate attitudes about the elderly across different groups as college students, seniors, medical students, nursing students and other health professionals, as well as its good psychometric properties regarding content validity, construct validity, internal consistency and test-retest reliability, showing structural stability of its dimensions.

Therefore the present instrumental study (Montero & León, 2005) has been directed to provide empirical support for the factorial division of the Spanish version of the scale attitudes toward the elderly by Kogan (KAOP) proposed by Sampén et al. (2012); which it is justified by the importance of checking the factorial structure of the instrument and the psychometric equivalence of it in different groups; since in the context of intergroup comparison, it is essential to consider the need to conduct the adaptation of an instrument of psychological measurement that meets all criteria of equivalence, but above all, consider whether the same factorial structure is applicable to different groups of subjects or, more generically, to different populations (Abalo, Levy, Rial, & Varela, 2006).

Method

Participants

Were 1702 participants in the study, 878 women and 824 men, all university students of Mexico. The subjects' age ranged between 18 and 28 years, with an average of 20.70 and a standard deviation of 1.93 years.

The sample was randomly divided into two parts using the Statistical Package for Social Sciences (SPSS) version 18.0; in order to perform parallel studies to corroborate and verify the obtained results (cross validation).

The first half (subsample 1) was composed of 819 subjects; 423 women and 396 men. The ages range between 18 and 28 years, with an average of 20.79 and a standard deviation of 1.94 years.

The second half (subsample 2) was composed of 883 subjects; 455 women and 428 men. The ages range between 18 and 28 years, with an average of 20.62 and a standard deviation of 1.92 years.

Instrument

Spanish version of Sampén et al. (2012) of the scale of attitudes toward the elderly by Kogan (KAOP), consists of 34 statements relating to the elderly, 17 of them have positive statements and 17 negative statements. The scale is designed based on a Likert questionnaire with five response categories ranging from "strongly disagree" to "strongly agree". To study the factor structure of the scale, in the present study, only the 17 positive statements were used.

For our study, three adaptations to the original version of Sampén were made (2012):

First adaptation, in the original scale is scored with five response options: (1) strongly disagree, (2) disagree, (3) neither agree nor disagree and (5) totally agree; in the version used in this research the subject chooses from 11 possible answers. We combine the original with our version to make it as follows: strongly disagree (0) disagree (1, 2 and 3), neither agree nor disagree (4, 5 and 6), agree (7, 8 and 9) and strongly agree (10). This first adaptation is justified because the subjects as students are used to the scale of 0 to 10, since like that they have been evaluated by the education system in our country (Mexico).

The second adaptation was to change some terms used in the items of the original version in order to use a language appropriate to the context of the Mexican culture.

The third adaptation was to apply the instrument through a computer (Figure 1); this in order to allow the storage of data without prior encoding stages, with greater precision and speed.

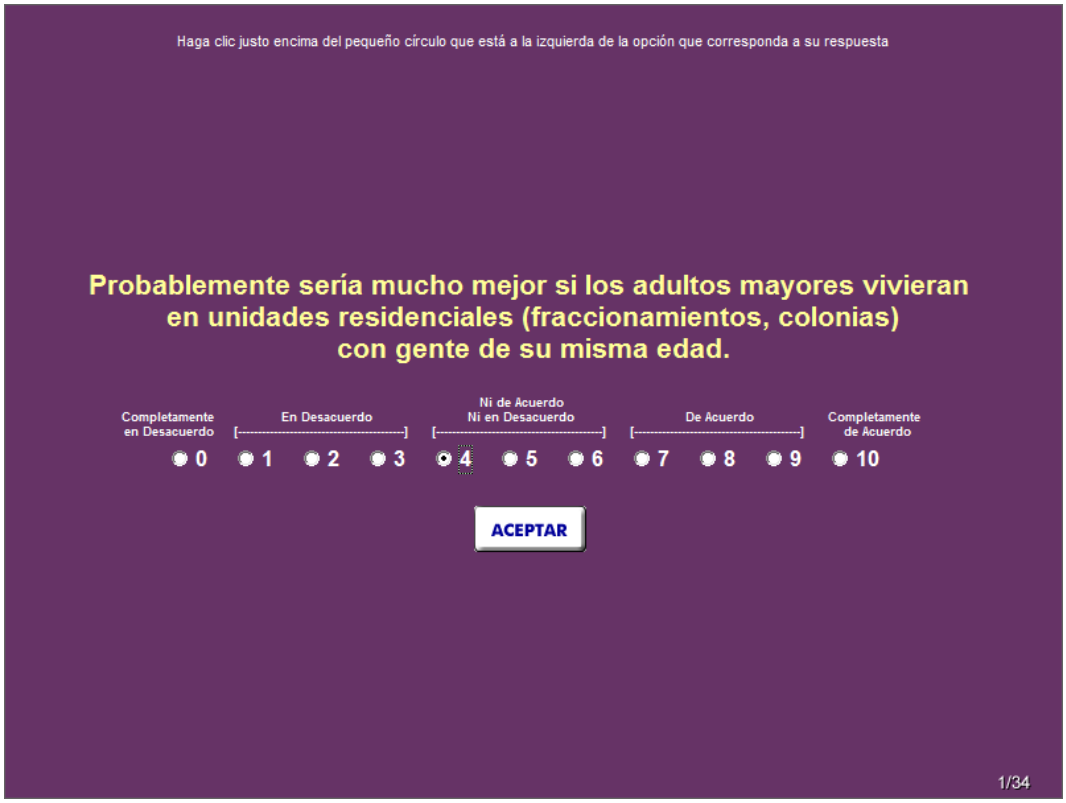

Figure 1. Answer sample to the questionnaire items.

Procedure

Students of the degrees offered at the Faculty of Physical Culture Sciences (FCCF) of the Autonomous University of Chihuahua were invited to participate. Those who agreed to participate signed the voluntary consent. Then, the instrument described above was applied using a personal computer (administrator module of the instrument of the scales editor of typical execution), in a session of about 30 minutes in the computer labs of the FCCF. At the beginning of each session students were given a brief introduction on the importance of the study and how to access the instrument; they were asked the utmost sincerity and they were guaranteed the confidentiality of the data obtained. Instructions on how to respond were in the first screens; before the first instrument item. At the end of the session they were thanked for their participation.

Once the instrument was applied, data was collected by the results generator module of scales editor, version 2.0 (Blanco et al., 2013).

Finally the results obtained ware analyzed using SPSS 18.0 and AMOS 21.0.

Data analysis

The psychometric analysis was conducted in two stages: 1) Exploratory factor analysis and 2) confirmatory factor analysis and factorial invariance; in order to obtain proof that presents the best properties for the conformation of the scores in the scale of attitudes toward the elderly by Kogan.

Classic Analysis of the Psychometric properties of the scale. The first step in analyzing the psychometric properties of the questionnaire was to calculate the mean, standard deviation, skewness, kurtosis and discrimination indexes of each item. Then remove of the scale those who obtain a kurtosis or extreme asymmetry, or a discrimination index below 0.30.

Then, to determine the minimum number of common factors capable of reproducing, in a satisfactory way, the observed correlations between the instrument items (with good discrimination), an

exploratory factor analysis with the total sample was made, from the method of maximum verisimilitude, based on the criterion of Kaiser-Guttman, plus to ensure an adequate representation of variables (items), only those whose initial communality was higher than .30 were kept; after a varimax rotation (Costello & Osborne, 2005).

Subsequently, the reliability of each of the factors of the models obtained was calculated through the Cronbach's alpha coefficient (Elosua & Zumbo, 2008; Nunnally & Bernstein, 1995) and the Omega coefficient (Revelle & Zinbarg, 2009; Sijtsma, 2009).

Confirmatory factor analysis and factorial invariance.

Were submitted to comparison two measurement models: Model 1 (M1), model of a factor according to the original distribution of the items in the questionnaire and Model 2 (M2) that corresponds to a three-factor model according to the results of exploratory factor analysis, removing the items that were not sufficiently well explained and /or obtained an index of low discrimination.

To conduct the confirmatory factorial analysis, the AMOS 21 software was used (Arbuckle 2012), variances in terms of error were specified as free parameters, in each latent variable (factor) a structural coefficient was set associated to one, so that scale was equal to one of the observable variables (items). The estimated method used was the maximum credibility; following the recommendation of Thompson (2004), so when the confirmatory factorial analysis is used, it is necessary to verify not only the fit of the theoretical model but it is recommended to compare the fit indexes of some alternative models to select the best.

To evaluate the adjustment model, statistical chi-squared, the Goodness-of-fit index (GFI), the standardized root mean square residual (SRMR) and the root mean square error of approximation (RMSEA) were used as absolute adjustment measures. Adjusted goodness of fit index (AGFI) the Tucker-Lewis Index (TLI), the comparative fit index (CFI) as measures of increasing adjustment. The chi-squared divided by degrees of freedom (CMIN/GL) and the Akaike Information Criterion (AIC) as adjusting measures of Parsimony (Byrne, 2010; Gelabert et al., 2011).

Subsequently, following the recommendations of Abalo et al. (2006), an analysis of the factorial invariance of the questionnaire for the subsamples was made, taking as a base the best measurement model obtained in the previous stage.

Finally the reliability of each of the dimensions was calculated, of the measurement models obtained in each subsample, through Cronbach's alpha (Elosua & Zumbo, 2008; Nunnally & Bernstein, 1995) and Omega coefficient (Revelle & Zinbarg, 2009; Sijtsma, 2009).

Results

Exploratory factor analysis (first and second factorial solutions).

In Table 1 are summarized the results of the descriptive analysis and the discrimination indexes (total-item correlation corrected) of each of the 17 items on the questionnaire in the total sample. The responses to all items reflect mean scores that oscillate between 2.47 and 6.96, and the standard deviation provides, in all cases, values higher than 2.00 (within a response range between 0 and 10). All values of skewness and kurtosis are within the range ± 3.00; it´s inferred that the variables are reasonably fit a normal distribution. As for the discrimination indexes, with the exception of items 3, 5, 6, 7, 16 and 17, all items satisfactorily discriminate with indexes above 0.30 (Brzoska & Razum, 2010).

The significance of the Test of Bartlett (5243.344, $p < 0.001$) and the KMO measure of sampling adequacy (0.896) showed a very good correlation between items and a very good sampling adequacy respectively, demonstrating the relevance of a factor analysis. The exploratory factor analysis of the total sample, after varimax rotation (Costello & Osborne, 2005), eliminating 5 of the 17 items analyzed that were not sufficiently well explained and/or with low rates of discrimination, revealed a three-factor structure, personal sphere (items 15, 17, 19, 21, 23, 27 and 29), social sphere (items 1, 3 and 7) and emotional sphere (items 31 and 33). The set of retained factors explained the 55.53% of the variance (Tables 2 and 3).

Table 1.
Descriptive Analysis and discrimination indixes of the questionnaire items "attitudes toward the elderly by Kogan". Total sample

Ítem	M	DE	AS	CU	$r_{i\text{-}total}$
Item 1	4.85	3.00	.27	-.96	.32
Item 2	4.32	2.29	.50	-.02	.44
Item 3	2.47	2.08	.93	.75	.10
Item 4	5.21	2.59	.12	-.63	.49
Item 5	6.09	2.78	-.21	-.91	.28
Item 6	6.02	3.23	-.29	-1.11	.28
Item 7	5.21	2.16	.32	.06	.29
Item 8	6.86	2.53	-.35	-.81	.60
Item 9	6.50	2.66	-.29	-.82	.51
Item 10	5.57	2.64	.04	-.69	.55
Item 11	6.36	2.75	-.15	-1.00	.62
Item 12	6.96	2.73	-.46	-.84	.55
Item 13	4.42	2.48	.54	-.18	.32
Item 14	6.11	2.55	-.09	-.77	.56
Item 15	6.35	2.48	-.10	-.76	.62
Item 16	3.26	2.16	.59	.39	.30
Item 17	4.13	2.16	.28	.31	.30

Note: M = mean; SD = standard deviation; AS = asymmetry; CU = kurtosis; ri-Total = total-item correlation corrected.

Table 2.
Eigenvalues and percentage of variance explained by each of the retained factors.
Exploratory Factorial Analysis total sample. Rotated Solution

Factors	Eigenvalues	% of the variance	% accumulated
Personal sphere	3.66	30.50	30.50
Social sphere	1.68	14.00	44.50
Emotional sphere	1.32	11.03	55.53

Table 3.
Items grouped by factor. Rotated solution. Exploratory Factorial Analysis total sample

Item	F1	F2	F3
15 Most older adults make you feel uncomfortable	.72		
17 Most old people make persons get bored by insisting that they want to talk about the "old days"	.72		
19 Most of the elderly people spend much time getting into the business of others and giving advice to those who did not ask	.68		
21 If the Elderly want to be liked by others, their first step should be to get rid of their irritating defects	.75		
23 In order to have a pleasant residential neighborhood, it would be better not to have many elderly people living there	.67		
27 Most of the Elderly should worry more about their personal appearance; they are very messy	.66		
29 Most of the Elderly are irritable, grumpy and unpleasant	.72		
1 It would probably be better if older adults live in residential units (subdivisions, neighborhoods) with people of their own age		.80	
3 There is something different about the elderly; It is difficult to know what bothers them so much		.73	
7 Most of the Elderly prefer to retire as soon as their pensions or their children can maintain them		.56	
31 Most of the Elderly constantly complain about the behavior of the youth			.79
33 Most of the Elderly make excessive demands for love and security more than any other persons			.74

Note: F1 = Personal sphere, *F2* = Social sphere, *F3 = E*motional sphere

Reliability of the subscales (internal consistency).

The subscales (factors) resulting in the exploratory factor analysis have, mostly, internal consistency values above 0.70 in both samples demonstrating adequate internal consistency for these type of subscales, particularly when you consider the reduced number of items (Table 4).

Table 4.
Coefficient alpha and omega for the factors obtained in the exploratory factor analysis total Sample

Factor	Ω	□
Personal sphere	.873	.849
Social sphere	.743	.570
Emotional sphere	.739	.396

Confirmatory factor analysis for subsamples 1 and 2

The overall results of the confirmatory factor analysis in the subsample 1 (GFI 0.916; RMSEA 0.067; CFI .866) and the subsample 2 (GFI 0.927; RMSEA 0.063; CFI 0.871) for the M1 model which corresponds to the original distribution of the items of the questionnaire of attitudes toward the elderly by Kogan, they indicate that the measurement model, in both subsamples can be considered as not acceptable (Table 5).

Table 5
Absolute, incremental and Parsimony fit indexes for the generated models. Subsamples 1 and 2.

	Absolute indexes				Incremental Indexes			Parsimony Idexes	
Model	χ^2	GFI	RMSEA	SRMR	AGFI	TLI	CFI	CMIN/DF	AIC
First factor solution (subsample 1)									
M1	555.957*	.916	.067	.057	.892	.847	.866	4.672	818.032
M3	104.386*	.978	.038	.030	.965	.970	.978	2.175	164.386
Second factor solution (subsample 2)									
M1	538.279*	.927	.063	.052	.906	.852	.871	4.523	606.279
M3	98.620*	.982	.035	.027	.971	.973	.981	2.055	158.620

Note: * $p < .05$; GFI = goodness of fit index; RMSEA = root mean square error of approximation; SRMR = Standardized Root Mean Square Residual; AGFI = adjusted goodness of fit index; TLI = Tucker-Lewis index; CFI = comparative fit index; CMIN/DF = chi-squared fit index divided by degrees of freedom; AIC = Akaike information criterion

The factors of the model M1 explain approximately 29.67% of the variance in the first subsample and 28.52% of the variance in the second subsample. Furthermore according to the results in Table 6; 10 of the 17 items, in both subsamples, saturates below .60 in its intended dimension.

The overall results of the confirmatory factor analysis in the first (GFI 0.978; RMSEA 0.038; CFI 0.978) and second subsample (GFI 0.982; RMSEA 0.035; CFI 0.981), the second model tested (M3) that corresponds to a three-dimensional structure according to the results of the exploratory factor analysis, indicate that this measurement model is better than the previous model and its setting is optimal (Table 5). The three factors of this model explain altogether, in both subsamples approximately 55% of the variance.

Furthermore according to the results of Table 7; only three items, in both subsamples, saturates below 0.60 in its intended dimension. Also observed moderate intercorrelations among the factors demonstrating adequate discriminant validity between them.

Table 6
Standardized solutions confirmatory factor analysis for the Model M1. Subsamples 1 and 2.

Item	Attitudes toward the elderly	
	Subsample 1	Subsample 2
1 It would probably be better if older adults live in residential units (subdivisions, neighborhoods) with people of their own age	.36	.29
3 There is something different about the elderly; It is difficult to know what bothers them so much	.43	.43
5 Most older adults have established so much their way of being and/or act that it is difficult for them to change	.07	.07
7 Most of the Elderly prefer to retire as soon as their pensions or their children can maintain them	.49	.51
9 Most older adults tend to have their homes in a seedy appearance and unattractive	.49	.56
11 It is foolish to think that wisdom comes with age	.36	.30
13 Older persons have a lot of power in business and politics	.34	.32
15 Most older adults make you feel uncomfortable	.69	.68
17 Most old people make persons get bored by insisting that they want to talk about the "old days"	.61	.63
19 Most of the elderly people spend much time getting into the business of others and giving advice to those who did not ask	.63	.62
21 If the Elderly want to be liked by others, their first step should be to get rid of their irritating defects	.76	.69
23 In order to have a pleasant residential neighborhood, it would be better not to have many elderly people living there	.61	.68
25 There are some exceptions; but in general most of the elderly are very similar	.32	.31
27 Most of the Elderly should worry more about their personal appearance; they are very messy	.65	.63
29 Most of the Elderly are irritable, grumpy and unpleasant	.73	.68
31 Most of the Elderly constantly complain about the behavior of the youth	.25	.20
33 Most of the Elderly make excessive demands for love and security more than any other persons	.22	.13

Table 7
Standardized Solutions confirmatory factor analysis for the M3 model. Subsamples 1 and 2.

	Subsample 1			Subsample 2		
Item	F1	F2	F3	F1	F2	F3
Factor weights						
15 Most older adults make you feel uncomfortable	.68			.65		
17 Most old people make persons get bored by insisting that they want to talk about the "old days"	.61			.61		
19 Most of the elderly people spend much time getting into the business of others and giving advice to those who did not ask	.62			.63		
21 If the Elderly want to be liked by others, their first step should be to get rid of their irritating defects	.78			.71		
23 In order to have a pleasant residential neighborhood, it would be better not to have many elderly people living there	.62			.69		
27 Most of the Elderly should worry more about their personal appearance; they are very messy	.65			.63		
29 Most of the Elderly are irritable, grumpy and unpleasant	.74			.69		
1 It would probably be better if older adults live in residential units (subdivisions, neighborhoods) with people of their own age		.53			.40	
3 There is something different about the elderly; It is difficult to know what bothers them so much		.60			.60	
7 Most of the Elderly prefer to retire as soon as their pensions or their children can maintain them		.60			.64	
31 Most of the Elderly constantly complain about the behavior of the youth			.45			.59
33 Most of the Elderly make excessive demands for love and security more than any other persons			.50			.43
Correlations between factors						
F1	-			-		
F2	.69	-		.67	-	
F3	.38	.47	-	.22	.38	-

Note: F1 = Personal sphere, *F2 =* Social sphere, *F3 = E*motional sphere

Invariance of the factor structure between subsamples

The fit indexes obtained (Table 8) allow to accept the equivalence of the basic measuring models between the two subsamples. Although the value of Chi-squared exceeds to that required to accept the hypothesis of invariance, the CFI=0.980, CFI=0.979, RMSEA=0.026 y AIC=323.006 indexes contradict this conclusion allowing us to accept the base model invariance (unrestricted model).

Table 8
Goodness of fit indexes of each of the models tested in the factorial invariance.

Model	Fit Indexes						
	χ^2	gl	GFI	NFI	CFI	RMSEA	AIC
Model without restrictions	203.006*	96	.980	.962	.979	.026	323.006
Metric Invariance	220.915*	105	.978	.959	.978	.025	322.915
Strong factor invariance	224.859*	111	.978	.958	.978	.025	314.859

Note: * $p < .05$; GFI = goodness of fit index; NFI = normed fit index; CFI = comparative fit index; RMSEA = root mean square error of approximation; AIC = Akaike information criterion

Adding to the base model restrictions on factorial loads the metric invariance was characterized. The values shown in Table 8 allow to accept this level of invariance. The goodness of fit index (GFI 0.978) and root mean square error of approximation (RMSEA 0.025) continue to provide convergent information in this direction. Also, the Akaike Information Criterion (AIC 322.915) and Bentler comparative fit index (CFI 0.978) do not suffer large variations over the previous model. Using the criteria for the evaluation of the nested models proposed by Cheung and Rensvold (2002), who suggest that if the calculation of the difference of the CFI of both nested models diminish in 0.01 or less, the restricted model is taken for granted therefore the compliance of the factorial invariance; the difference of the CFIs obtained allows to accept the metrical invariance model. We can conclude up to this point that factorial charges are equivalent in the two subsamples.

Having demonstrated the metric invariance between the subsamples, we evaluate the equivalence between intercepts (strong factorial invariance). The Indices (Table 8) show a good adjustment of this model, evaluated independent as well as analyzed toward nesting with the metric invariance model. The difference between the two comparative indices of Bentler is less than 0.001; and the general adjustment index is 0.978 and the root mean square error of approximation is 0.025. Accepted then the strong invariance, the two evaluated models are equivalent toward the factorial coefficients and the intercepts.

The factors obtained in the confirmatory factor analysis reach, mostly internal consistency values below 0.75 in both subsamples showing a low internal consistency (Table 9).

Table 9
Coefficient omega and alpha for the factors obtained in confirmatory factor analysis subsamples 1 and 2.

	Subsample 1		Subsample 2	
Factor	Ω	□	Ω	□
Personal sphere	.853	.853	.843	.845
Social sphere	.600	.589	.565	.551
Emotional sphere	.368	.393	.415	.398

Discussion and Conclusions

The main objective of the study was to investigate whether or not are replicated the psychometric results proposed by Sampén et al. (2012) for the scale of attitudes toward the elderly by Kogan through a sample of university students using exploratory factor analysis (EFA) and Confirmatory (CFA). The Exploratory factor analysis with the total sample and confirmatory factor analyzes performed on each subsample separately support a factorial structure of three factors: personal sphere, social sphere and emotional sphere, where the factors thus obtained generally have appropriate standardized factor saturations, suggesting besides the existence of strong evidence of cross-validation of the mean and therefore the stability of the structure until proven otherwise. However the internal consistency of each of the factors is low, probably due to the small number of items in each.

On the other hand the obtained model does not match the proposed by Sampén et al. (2012) as to achieve a better fit and greater discrimination capacity it was necessary to eliminate 5 of the 17 items analyzed and change the original saturation of some items; this based on the modification indexes and its theoretical justification.

The discrepancies observed between the model proposed by Sampén et al. (2012) and the one here suggested, can be attributed to social or cultural differences of the participants; such as being college students in the area of physical activity. In any case, the validation of a questionnaire is a slow and continuous process, so that future research should compare these findings in larger samples (Holgado, Soriano, & Navas, 2009).

In summary, the analysis of the psychometric properties of the scale of attitudes toward the elderly by Kogan (1961), has shown that a three-factor structure is viable and appropriate in accordance with established psychometric requirements. The structure of three factors, except for the low internal consistency of its factors, based on statistical and substantive criteria, has shown adequate indicators of adjustment and validity

However, the scope of these results is limited and therefore it is necessary that future research will confirm the obtained structure increasing the number of items per factor, which will allow for more robust evidence for the factorial structure of the scale. Specifically, it must be demonstrated if the invariance of the structure of the scale is accomplished by gender, age, between students of different degrees, among others; so it is considered that further studies are necessary in order to corroborate or refute the data obtained in the investigations carried out so far.

It is also essential to check if the scale is useful to study the relationship between the attitudes toward the elderly, the satisfaction of life and perceived psychological well-being.

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