Validating the Structure of the New Ecological Paradigm Scale among Argentine Citizens through Different Approaches[1]

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Abstract

Objective. This study assessed the psychometric properties of the New Ecological Paradigm – R scale, in a sample of adult people from Córdoba, Argentina. This scale assesses attitudes, beliefs, values, and worldviews regarding the environment. Previous studies have found differences in the dimensionality, while the consistency has shown to be acceptable. **Method.** The structure of the instrument was explored using an exploratory factor analysis and also an exploratory structural equation modeling. **Results.** Both techniques have shown that the bifactor model comprising 11 items yielded the best fit to the data compared to other models. Internal consistency was adequate. While gender differences were not observed, a high educational level was associated with a more ecological view, and age was inversely related to it. **Conclusion.** Even though good psychometric properties were observed, there is a need for further studies in order to obtain evidence of the predictive value of the scale in the Argentinian context.
Keywords. Psychometrics, ecological and environmental phenomena, reproducibility of results.

Validez estructural de la Escala del Nuevo Paradigma Ecológico en ciudadanos argentinos utilizando diferentes abordajes

Resumen

Objetivo. Este estudio evaluó las propiedades psicométricas de la escala del Nuevo Paradigma Ecológico – R, en una muestra de personas adultas de Córdoba, Argentina. Esta escala evalúa actitudes, creencias, valores y visiones del mundo con respecto al ambiente. Estudios previos han encontrado diferentes estructuras factoriales subyacentes, en tanto que la evidencia de consistencia interna es aceptable. **Método.** Se analizó la estructura del instrumento por medio de análisis factorial exploratorio y también con un modelo de ecuaciones

estructurales exploratorio. **Resultados.** Ambas técnicas mostraron que el modelo bifactorial que comprende 11 ítems produjo el mejor ajuste a los datos en relación con otros modelos. La consistencia interna fue adecuada. No se observaron diferencias de género, en tanto que un nivel educativo mayor se asoció con una visión más ecológica y la edad se relacionó de manera inversa. **Conclusión.** Aunque se observaron adecuadas propiedades psicométricas, se resalta la necesidad de realizar futuros estudios para obtener evidencia del valor predictivo de la NEP-R en el contexto argentino.
Palabras clave. Psychometría, fenómenos ecológicos y ambientales, reproducibilidad de resultados.

Validade estrutural da Escada do Novo Paradigma Ecológico em cidadãos argentinos usando diferentes abordagens

Resumo

Escopo. Em este estudo, foram avaliadas as propriedades psicométricas da escalaa do Novo Paradigma Ecológico - R, em uma amostra de pessoas adultas da cidade de Córdoba, Argentina. Esta escala avalia atitudes, crenças, valores e visões de mundo sobre o médio ambiente. Estudos prévios têm achado diferentes estruturas fatoriais subjacentes, em tanto que a evidencia de consistência interna é aceitável. **Metodologia.** A estrutura do instrumento foi explorada por médio de uma análise fatorial exploratória e também com um modelo de equações estruturais exploratório. **Resultados.** Ambas técnicas mostraram que o modelo bi-fatorial composto por 11 itens produziu o melhor ajuste aos dados em relação a outros modelos. A consistência interna foi adequada. Não foram observadas diferencias de gênero, enquanto um nível educativo maior foi associado com uma visão mais ecológica e a idade foi relacionada de jeito inverso. **Conclusão.** Embora não foram observadas boas propriedades psicométricas, remarcamos a necessidade de futuros estudos para obter evidencia de valor preditiva da NEP-R em nosso contexto.
Palavras-chave. Psicometria, fenômenos ecológicos e ambientais, reprodutibiladade dos resultados.

Introduction

The first signs of a society more concerned about environmental problems emerged in 1970 when the Dominant Social Paradigm (DSP) went through a crisis. The DSP began in the context of the Industrial Revolution, aiming to exploit nature in order to improve people's quality of life. Unfortunately, this paradigm produced the opposite effect, causing the depletion of resources and consequently an inability to cover the growing needs of people. Particularly, based on ecocentric beliefs, the New Ecology Paradigm (NEP) understands a more harmonic relationship between human beings and other species and sustainability in relation to the use of natural resources. Both paradigms have points in common, but also differences. For example, both paradigms postulate that humans are exceptional species, but the NEP also points out that they should be viewed as one among many others. Moreover, both recognize that human life is deeply influenced by social and cultural forces but the NEP also postulates that human life is influenced by the biophysical environment, often as a reaction to human action (Catton & Dunlap, 1980). Contrary to the DSP, the NEP paradigm has a critical position about the way political decisions are made, supporting active citizen participation (Milbrath & Fisher, 1984).

In this context of greater environmental awareness, Dunlap and Van Liere (1978) developed the New Ecological Paradigm scale (NEP) which assesses attitudes, beliefs, values and worldviews that people have in relation to the environment (Dunlap et al., 2000). According to several studies, people can show environmental concerns just to project environmental friendliness, but this does not necessarily imply specific actions (Gomera, Villamandos, & Vaquero, 2013; Moyano & Palomo, 2014). While there are several scales that measure the same psychological construct (e. g., the Ecology Scale by Maloney & Ward, 1973; or the Environmental

Concern Scale by Weigel & Weigel, 1978), the NEP scale is the most frequently used. Its repeated use has led to Hawcroft and Milfont (2010) to perform a meta-analysis using 139 different samples to which the scale was applied. Nevertheless, the ecological worldview has expanded more slowly in our society (Dunlap, 2008).

Dunlap and Van Liere (1978) proposed three dimensions to evaluate environmental beliefs: limit to growth, anti-anthropocentrism, and fragility of the balance of nature. The first refers to the possibilities of humankind to keep growing in numbers or not, taking into account the limited resources in the world. The second is based on beliefs of people about their place in the world, their rights, their qualities and their relationships with other species. Finally, the last includes ideas about the capacity of nature to resist and regenerate the modifications and abuses human beings exert upon it (Amburgey & Thoman, 2012; Dunlap & Van Liere, 1978).

Later, in order to correct validity problems, researchers added two more dimensions: rejection of exceptionalism, which involves the belief that human beings are exempt from nature's laws and knowledge can revert any environmental situation; and the ecocrisis, which focuses on the idea that environmental disasters are caused by human intervention (Dunlap, 2008; Dunlap et al., 2000). These two dimensions allowed the authors to construct a new version of the scale entitled NEP-R, which will be the focus of the current study.

The psychometric properties of the NEP-R have been studied in many countries and it has been translated into several languages (English, Spanish, and Portuguese, among others). In terms of construct validity, most factor analyses show problems in relation to the scale dimensionality. Dunlap et al. (2000) using a principal component analysis with Varimax rotation obtained four components with a total explained variance of 56.5%, while other studies using the same method reported different results: structures of five components (Denis & Pereira, 2014; Ogunbode, 2013), four components (Erdoğan, 2009; Harraway, Broughton, Deaker, Jowett, & Shephard, 2012; Noblet, Anderson, & Teisl, 2013), three components (Gomera et al., 2013; Halkos & Matsiori, 2015); and two components (Moyano & Palomo, 2014; Nistor, 2012).

To assess the internal consistency, most authors use Cronbach´s alpha index. Once again, there are differences regarding the results. On the one hand, some studies report acceptable values for the different dimensions ranging between 0.73 and 0.86 (Dunlap et al., 2000; Gomera et al., 2013; Harraway et al., 2012; Moyano & Palomo, 2014; Noblet et al., 2013); while other studies register low values that fluctuate between 0.47 and 0.61 (Denis & Pereira, 2014; Erdoğan, 2009; Nistor, 2012; Ogunbode, 2013). In cases where the internal consistency is below the acceptable values, researchers mentioned difficulties regarding the understanding and interpretation of the questions, due to the sensitivity of NEP-R to sociocultural characteristics.

The NEP-R scale has been used with different samples: university students (Cordano, Welcomer, & Scherer; 2003; Dunlap et al., 2000; Erdoğan, 2009; Gomera et al., 2013; Harraway et al., 2012; Ogunbode, 2013), general population (Denis & Pereira, 2014; Halkos & Matsiori, 2015; Moyano & Palomo, 2014; Pienaar, Lew, & Wallmo, 2015; Vozmediano & Guillén, 2005), and to a lesser extent, specific groups of the population as scientists or stakeholders (Noblet et al., 2013).

In addition, the NEP-R has been related to different socio-demographic variables such as gender, age, and educational level. With regard to gender, Halkos and Matsiori (2015) found that women scored higher than men in the anti-anthropocentric dimension, while Harraway et al. (2012) observed that women scored higher on the pro-ecological factor, and in other studies, no statistically significant differences were observed (Denis & Pereira, 2014; Ogunbode, 2013). In terms of age, the elderly showed lower levels of environmental awareness and concern while young adults maintained higher levels of environmental awareness (Moyano & Palomo, 2014; Nistor, 2012; Vozmediano & Guillén, 2005). Finally, in terms of education, Noblet et al. (2013) reported that university students showed more pro-ecological scores in comparison with the rest of the population. Specifically, students in Biology, Zoology, and Botany, as well as majors that are related to the ecological process, showed higher scores on the scale than students enrolled in the Humanities (Harraway et al., 2012; Ogunbode, 2013).

The advances of Environmental Psychology throughout Latin America have not been uniform (Corral & Pinheiro, 2009; Wiesenfeld & Zara, 2012). Particularly in Argentina, the progresses in this line are scarce and have occurred mainly in the last 10-

15 years. The NEP-R has shown to predict different pro-environmental behaviors. Hence, having an adapted version of the scale in Argentina is of great importance to advance in the explanation of citizen's environmental behavior. Thus, in this study we offer new evidence of validity and reliability of the NEP-R with a sample of adult people from the city of Cordoba, Argentina. Specifically, we explore its structure using two methods: exploratory factor analysis, and exploratory structural equation modelling. Moreover, we assessed the internal consistency and relations with socio-demographic variables.

Method

Participants

A convenience sample was used, which was comprised of 480 participants from 18 to 65 years of age ($M = 33.36$, $SD = 12$) of both genders (55.8% women, 44.2% men) residing in the city of Cordoba, Argentina (at least one year of residence). The sample included people with different educational background: 2.5% elementary school, 22.9% high school, 19% tertiary, 53.1% university, and 2.5% post-graduated.

Instruments

The New Ecological Paradigm Scale proposed by Dunlap et al. (2000) was analyzed. The scale comprised 15 items that are scored on a 5 point Likert scale (1 = *strongly disagree*, 5 = *strongly agree*). Dunlap et al. (2000) reported a four-component structure but they concluded this using a single dimension. Regarding the reliability, the authors reported a Cronbach's alpha of 0.83. A version of the scale translated into Spanish was used (see procedure section). Also, some information on socio-demographic data was collected through a questionnaire developed *ad hoc*. Specifically, information about gender, age, and educational level was recollected.

Procedure

The English version of the scale was previously tested in a pilot study taking into account the guidelines collected by Muñiz, Elosua and Hambleton (2013): (a) direct translation from English into Spanish by three specialists in the English language (native Spanish speakers) and comparison of the differences was carried out jointly by specialists in psychological assessment; (b) pilot study with 12 adults to assess cultural appropriateness, semantic clarity, and grammatical aspects of the items and instructions; and (c) discussion within the research group on the results of the pilot study.

This study is part of a larger project on energy performance (see source of evaluation and financing). The ethical guidelines for research with humans recommended by the American Psychological Association (APA, 2002) were respected. Participants received oral and written information about the objectives of the study. Participation was voluntary, the data were handled under conditions of confidentiality and anonymity, and the participants were told that the results would only be used for research purposes.

Data collection was conducted in public places and was carried out by qualified researchers and research assistants previously trained in homogeneous administration criteria. Questionnaires were always completed individually.

Data analysis

First, preliminary analyses of variables and cases were performed. Cases with $Z \pm 3.29$ were considered univariate outliers; and multivariate outliers at a level $p < .001$ (Tabachnick & Fidell, 2007). Values of skewness and kurtosis in the range ± 1.5 were considered acceptable (George & Mallery, 2001). Second, an exploratory factor analysis was performed based on Pearson correlations by applying the maximum likelihood extraction method using the FACTOR 10.3 program (Lorenzo & Ferrando, 2006). Initially, a Promin rotation was used because the factors were assumed to be correlated. The parallel analysis results (Timmerman & Lorenzo, 2011), the KMO, the Root Mean Square Error of Approximation (RMSEA) and the Goodness of Fit Index (GFI) were taken into account to define the dimensionality. Several analyses were repeated in order to achieve a structure with factor loadings above 0.30. After exploring the structure, reliability was computed based on Cronbach's Alpha. Third, an ESEM with ML estimation method was conducted. While several methods of rotation are available, the choice of one or another is a question currently being researched, so it was decided to use the geomin

rotation method (Marsh et al., 2009) available in the software used to carry out this analysis (MPlus 7.11; Muthén & Muthén, 1998-2012). In this case, different indicators were considered for the assessment of the adjustment (Byrne, 2010; Kline, 2011): χ^2 ; χ^2/gl, with values below three being indicative of a good fit; standardized root mean square residual (SRMR), values near 0.08 were considered acceptable and values of 0.05 indicate a very good fit; Tucker-Lewis index (TLI) and comparative fit index (CFI), values below 0.90 indicate the need to re-specify the model, and values higher than 0.95 indicate a good fit; and root mean square error of approximation (RMSEA), values lower than 0.05 indicate a good fit, and between 0.05 and 0.08, that the fit is acceptable. Additionally, the Akaike Information Criterion (AIC) and the Bayesian Information Criterion (BIC) were considered, lower values in those indices show a better fit of a model to data in relation to a model with higher values. After that, standardized regression coefficients were interpreted. Finally, taking into account the previous results, the score on NEP-R scale was related to gender, age and educational level using group comparison or correlational analysis.

Results

Preliminary analysis of cases and variables

Before proceeding with the analyses, the score of even items was reversed as suggested in the original scale. Preliminary analysis showed that no variable had more than 5% of missing data, so it was decided not to replace them. A total of 24 cases were found to be univariate outliers while three resulted in multivariate outliers. Regarding skewness (S) and kurtosis (K), excellent or acceptable values were observed (Table 1). Only one item showed a value of kurtosis around two (item 7: "plants and animals have as much right as humans to exist"). That was taken into account in the following analysis.

Table 1
Descriptive statistics of the New Ecological Paradigm items

Scale items	N	M	SD	Skewness	Kurtosis
1. We are approaching the limit of the number of people the earth can support	454	3.09	1.06	-0.16	-0.50
2. (R) Humans have the right to modify the natural environment to suit their needs	454	3.38	1.10	-0.31	-0.77
3. When humans interfere with nature it often produces disastrous consequences	456	4.09	0.89	-1.30	2.23
4. (R) Human ingenuity will insure that we do not make the earth unlivable	451	2.63	1.01	0.29	-0.47
5. Humans are severely abusing the environment	449	4.29	0.69	-0.90	1.30
6. (R) The earth has plenty of natural resources if we just learn how to develop them	455	1.92	0.86	0.77	0.04
7. Plants and animals have as much right as humans to exist	455	4.49	0.70	-1.43	2.17
8. (R) The balance of nature is strong enough to cope with the impacts of modern industrial nations	452	3.71	1.02	-0.66	-0.07
9. Despite our special abilities humans are still subject to the laws of nature	452	3.84	0.95	-0.82	0.35
10. (R) The so-called 'ecological crisis' facing humankind has been greatly exaggerated	453	3.55	0.98	-0.61	-0.08
11. The earth is like a spaceship with very limited room and resources	454	3.19	1.04	-0.12	-0.65
12. (R) Humans were meant to rule over the rest of nature	452	3.42	1.14	-0.26	-0.90
13. The balance of nature is very delicate and easily upset	455	3.89	0.78	-0.60	0.28
14. (R) Humans will eventually learn enough about how nature works to be able to control it	452	3.02	0.98	0.07	-0.61
15. If things continue on their present course, we will soon experience a major ecological catastrophe	456	3.90	0.91	-0.89	0.78

Note. R = punctuation is reversed.
Source: own elaboration.

Exploratory factor analysis

The initial Kaiser-Mayer-Olkin (KMO) measure of sampling adequacy was 0.77. The Horn's parallel analysis suggested retaining one factor taking into account the 95% of random samples, and two factors taking into account the mean of random samples (Figure 1). Consequently, solutions from one to two factors were analyzed, looking for the most parsimoniously and theoretically relevant structure. The one-factor structure showed an inadequate adjustment (RMSEA = 0.080, p = 0.000, GFI = 0.94). The bi-factor structure showed a better adjustment (RMSEA = 0.058, p = 0.108, GFI = 0.97). However, some items presented factor loading lower than 0.30 (items 1, 6, 9, 11), so it was decided to delete them and repeat the analysis. In the final analysis the following statistics were obtained: KMO = 0.789, RMSEA = 0.053, p = 0.351, GFI = 0.96. Factor 1 explained 27.68% of the variance and included five items about the ecological crisis and the damage that humans are causing to nature, while factor 2 explained 13.38% of the variance and comprised six items with an anthropocentric vision. Almost all items presented factor loading higher than 0.40. Three items presented factor loadings between 0.30 and 0.40 in one of the factors, and a difference higher than 0.10 in relation to the other factor (Table 2).
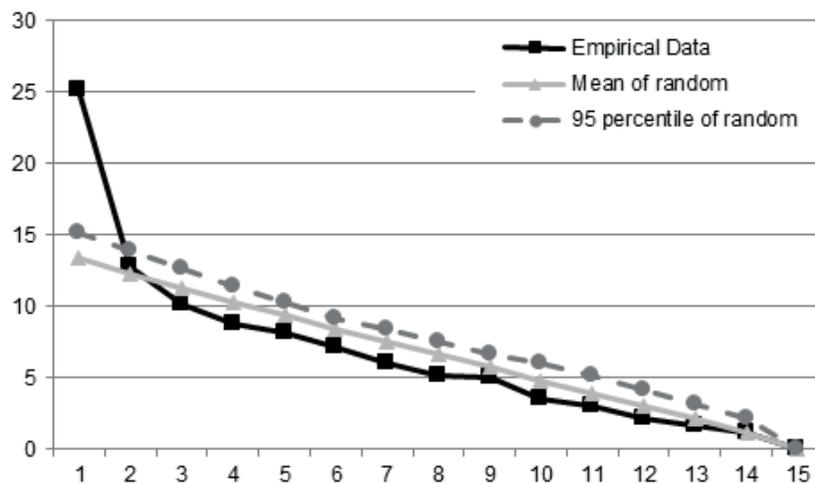
Figure 1. Horn's parallel analysis of the New Ecological Paradigm items.
Source: own elaboration.

Table 2
Factor solution of the final EFA and the ESEM of the New Ecological Paradigm Scale items

Scale items	EFA		ESEM – All items		ESEM – Reduced model	
	F1	F2	F1	F2	F1	F2
1. We are approaching the limit of the number of people the earth can support			0.27	0.032		
2. (R) Humans have the right to modify the natural environment to suit their needs	0.197	0.357***	0.212**	0.338***	0.203*	0.35***
3. When humans interfere with nature it often produces disastrous consequences	0.439***	-0.107	0.346***	0.015	0.367***	-0.014
4. (R) Human ingenuity will ensure that we do NOT make the earth unlivable	-0.242	0.388***	-0.272***	0.394***	-0.264**	0.375***
5. Humans are severely abusing the environment	0.736***	-0.019	0.727***	0	0.72***	0.003
6. (R) The earth has plenty of natural resources if we just learn how to develop them			-0.359***	0.222**		
7. Plants and animals have as much right as humans to exist	0.516***	0.084	0.524***	0.08	0.523***	0.084
8. (R) The balance of nature is strong enough to cope with the impacts of modern industrial nations	0.071	0.54***	0.066	0.549***	0.063	0.561***
9. Despite our special abilities humans are still subject to the laws of nature			0.134	0.085		
10. (R) The so-called 'ecological crisis' facing humankind has been greatly exaggerated	-0.014	0.675***	-0.01	0.667***	-0.039	0.692***
11. The earth is like a spaceship with very limited room and resources			0.282	-0.081		
12. (R) Humans were meant to rule over the rest of nature	0.092	0.511***	0.122	0.479***	0.102	0.486***
13. The balance of nature is very delicate and easily upset	0.523***	-0.16	0.461***	-0.081	0.509***	-0.119
14. (R) Humans will eventually learn enough about how nature works to be able to control it	0.046	0.396***	0.007	0.448***	0.02	0.416***
15. If things continue on their present course, we will soon experience a major ecological catastrophe	0.461***	0.119	0.457***	0.133	0.421***	0.139

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.
Source: own elaboration.

Internal consistency

With regard to reliability, internal consistency was evaluated by means of Cronbach's alpha (α). Indices between 0.70 and 0.80 were considered good reliability estimates (Kaplan & Sacuzzo, 2006), whereas a lower value is acceptable (around 0.60) on scales that meet certain criteria (Loewenthal, 2001). In that sense, the full scale ($\alpha = 0.74$, 11 items) and factor 1 showed a good index ($\alpha = 0.72$,

5 items), while for factor 2 the index was acceptable and nearing good (α = 0.69, 6 items).

Exploratory structural equation modeling

As shown in Table 3, the data that fit a model of one factor using ESEM techniques was acceptable according to some indices (χ^2/df; SRMR) but non-acceptable according to others (CFI, TLI, RMSEA). Similarly, a bi-factor model presented a good fit of the data to the model according to some indices (χ^2/df; SRMR; RMSEA) but not according to others (CFI, TLI). This model showed clearly a better fit than the previous one, however, some factor loadings were lower than 0.30 (items 1, 6, 9, 11). Hence, it was decided to evaluate a new bi-factor model without considering those items. That reduced model

showed a good fit according to all considered indexes. The factor structure was similar to the one observed using exploratory factor analysis but, as expected, more complex. Items about ecological crisis and the damage caused by humans on nature presented significant and generally high loads on the first factor (items 3, 5, 7, 13, 15); while items about an anthropocentric vision showed significant and high loads on the second factor (items 2, 4, 8, 10, 12, 14). At the same time, item 2 ("humans have the right to modify the natural environment to suit their needs") also presented a significant and positive load on the first factor, but it was lower than the load on the second factor. The relation between both factors was statistically significant (r = 0.50, p < 0.000).

Table 3
Adjustment indices of ESEM models

	χ^2	df	χ^2/df	SRMR	CFI	TLI	RMSEA [90% CI]	AIC	BIC
All items – 1 factor	356.18	90	3.96	0.07	0.69	0.64	0.08 (0.07-0.09)	17771.01	17956.52
All items – 2 factors	206.62	76	2.72	0.05	0.85	0.79	0.06 (0.05-0.07)	17649.45	17892.68
Reduced model – 2 factors	84.93	34	2.50	0.04	0.93	0.88	0.06 (0.04-0.07)	12660.40	12837.67

Source: own elaboration.

Relation between NEP-R and gender, age and educational level

Based on the results of the previous analysis, the mean scores for each factor and a total score were computed, given the high correlation between factors (the items of the second factor were reversed). First, the relationship between those scores, gender, and educational level were examined. Multivariate analysis indicated that there were statistically significant differences in the mean vector constituted by the factor one and the factor two of the NEP-R scale, according to educational level (Wilks' Lambda = 0.92; $F(6,894)$ = 6.05, p< 0.000, n^2_p = 0.04), but not according to gender or interaction between gender and educational level. Univariate analyses show that there were only

significant differences according to educational level in factor two ($F(3,448)$ = 9.85, p < 0.000, n^2_p = 0.06), and in the total score of the scale NEP-R (F (3,448) = 5, p < 0.002, n^2_p = 0.03). In factor two, posteriori comparisons (Bonferroni) showed that people with university or higher education level (N = 254, M = 3.40, SD = 0.60) showed higher scores than those with primary (N = 12, M = 2.89, SD = 0.67) and high-school education level (N = 104, M = 3.05, DS = 0.64), with no differences in relation to people with tertiary education (N = 86, M = 3.27, DS = 0.57). Specifically, people with university education level showed a more ecological vision (less anthropocentric) than people with primary and high-school education level. Similar results were obtained when considering the total score of the NEP. In this case, significant differences between

university ($N = 254$, $M = 3.73$, $SD = 0.48$) and high-school students ($N = 104$, $M = 3.53$, $SD = 0.48$) were observed, the former showed a greater tendency to ecological considerations.

Then, the relationship between age of participants and factor scores and the total score of the NEP-R was evaluated. In this case, a significant and negative relationship between age and factor two ($r = -0.19$, $p < 0.000$) and with the total score ($r = -0.17$, $p < 0.000$) was observed. The scatter plots showed that the relationship between the variables can be characterized as linear. Thus, these results showed that among older people a more anthropocentric and less ecological view prevails.

Discussion

In this study, the psychometric properties of the NEP-R (Dunlap et al., 2000) in a sample of adult people from Cordoba, Argentina, were examined. Specifically, the factor structure was explored and the internal consistency of the scale was evaluated, along with the analysis of the relation between the NEP-R score and socio-demographic variables.

The exploratory factorial analysis (EFA) performed with the15 items showed inadequate fit indices for one factor, while better indices were obtained for two factors. However, given that some items showed factor loadings lower than 0.30 (1, 6, 9, 11) a new EFA with two factors deleting those items was carried out, and better indexes of fit were found. The first factor comprised five items (3, 5, 7, 13, 15), and the second factor six items (2, 4, 8, 10, 12, 14). Additionally, the results obtained through the exploratory structural equation modeling (ESEM) also showed the best fit for the bi-factor structure. Similar to the EFA, when all the 15 items were included the fit was not good. Hence, a subsequent analysis was performed discarding the items with factor loadings lower than 0.30 (1, 6, 9, 11). This latest model resulted in better-fit indices and a similar factor structure to the one observed in the latest EFA.

Through the EFA and ESEM analysis, a bi-dimensional structure of the NEP-R was observed, as several authors from different countries have reported, like Romania (Nistor, 2012), Chile (Moyano & Palomo, 2014), and Spain (Vozmediano & Guillén, 2005). Similar to other studies (Moyano & Palomo, 2014; Nistor, 2012), the local adaptation of the scale was finally comprised of 11 items. However, the items composing each factor are different to those previously observed. For instance, item 8 ("the balance of nature is strong enough to cope with the impacts of modern industrial nations") was loaded on the factor comprising items about anthropocentrism, while in the study of Moyano and Palomo (2014) was loaded in the factor about ecocrisis.

Despite the bifactor structure observed and the fact that it showed a better adjustment than the unifactorial structure, a detailed analysis of the items shows inconsistencies regarding the theoretical dimensions. This is because the observed factors were constituted by items from different dimensions of the original scale (Dunlap & Van Liere, 1978). Specifically, the first factor was composed by items from the following original dimensions: fragility of the balance of nature (3, 13), ecocrisis (5, 15) and anti-anthropocentrism (7), while the second factor was formed with items from the original dimensions anti-anthropocentrism (2, 12), rejection of exceptionalism (4, 14), fragility of the balance of nature (8) and ecocrisis (10). Additionally, it is important to note that in the current study, a full dimension from the original scale was removed (1, 6, 11). Based on the proposal of some authors (e. g., Moyano & Palomo, 2014; Nistor, 2012; Vozmediano & Guillén, 2005), it is possible to consider the first factor as concerning to the ecocrisis dimension. That factor has only one item referring to a different dimension from the original dimensions proposed in the original NEP-R and the fragility of the balance of nature and ecocrisis refer to the perception of environmental problems and risks. However, the second factor contains an almost equal number of items from the four dimensions considered in the current adaptation. Based on that, it seems adequate to consider the scale from the total score, as reflecting the perception and general attitude towards environmental issues. These results also shed light to the apparent difficulty of representing the ecological view people have. The inconsistencies on the dimensionality of the NEP-R between studies that explore this scale can be considered as a call for a deeper revision of the construct. Although the NEP-R can provide a general view of the attitudes and beliefs regarding the environment, the specific views and psychological variables implied are yet to be understood.

Regarding the internal consistency of the scale, Cronbach's alpha coefficients obtained in the local sample were adequate both for the first (0.72) and the second factor (0.69), as well as for the full scale (0.74). These results are consistent with those observed in studies conducted in Latin America, for example, in the Chilean sample the value for the full scale was 0.76. On the other hand, Dunlap et al. (2000) reported a Cronbach's alpha value of 0.83 for the full scale, and other researchers have observed high values of internal consistency (Harraway et al., 2012; Noblet et al., 2013).

In regard to the relation between the NEP-R and socio-demographical variables, no differences for gender were observed, nor interaction between gender and educational level, which is in line with previous studies (Denis & Pereira, 2014; Ogunbode, 2013). But differences by educational level were indeed found. Specifically, people with tertiary and university education levels got higher scores in the NEP-R and showed a more ecological view than those with lower levels. Nevertheless, the result should be considered with caution due to the differences in sample sizes. Also, older people got higher scores in anthropocentrism, which may means that age is related to a lesser ecological view. The correlation between age and a higher knowledge and interest in the environment may also be an indicator of different generational-related worldview. Those results match previous studies (Moyano & Palomo, 2014; Nistor, 2012; Vozmediano & Guillén, 2005). These results, along with previous findings, shed light on the importance of considering socio-demographic variables for the study of environmental attitudes and beliefs.

Although the objectives of this study were achieved, it is important to highlight that the sampling method was not probabilistic, which made it difficult to generalize the results to the reference population. The accidental sampling method was due to the availability of human resources for data collection and economic issues.

In summary, there was obtained evidence about the psychometric properties of the NEP-R in the local context of Argentina, generating a valid, reliable and reduced version to be used in research contexts. This instrument is essential to move forward in the study of the attitudes and beliefs related to the protection of the environment. In this vein, it would be useful to obtain evidence about

the predictive validity of the NEP-R in relation to constructs such as pro-environmental behavior, because it is not enough to have a favorable attitude towards a behavior in order to predict its execution (Ajzen, 2011).

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