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# Measurement of Proecological Attitudes Within New Ecological Paradigm in Polish Current Settings

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**Supplementary Materials:** Data, Materials [see Index of Supplementary Materials]

## Abstract

The NEP (New Ecological Paradigm) scale is an internationally used measure of environmental attitudes and a predictor of pro-ecological behaviours (Dunlap, Van Liere, Merting, & Jones, 2000). In the current study we investigate the factor structure of the scale in order to state if it fits the theoretical model concerning the Polish population. We use the GEB (General Ecological Behaviour) scale as a test of the convergent validity of NEP scale results. The online study made use of a convenience sample of people aged 17–68 years, N = 305. Our study revealed that the theoretical concept of the NEP scale, including its five-factorial solution proposed by the authors of the scale, does not fit our results. After having conducted the exploratory structural equation modelling (ESEM) we found a two-factorial structure to be more appropriate, but the newly revealed solution was still not completely satisfactory according to the obtained psychometric parameters. Convergent validity of NEP was confirmed. However, socio-demographic characteristics of participants in the study were not related to the frequency of pro-ecological behaviours in general.

## Keywords

NEP, GEB, environmental attitudes, pro-ecological behaviour, exploratory structural equation modelling

Environmental and social psychologists have been studying human attitudes towards the environment for many years. With the emergence and growth of the ecological crisis, there is a need for change in the way people think about and treat the environment. In

the scientific world there is no doubt that climate change and its consequences affect millions of Earth's inhabitants (Intergovernmental Panel on Climate Change [IPCC], 1990, 1995, 2001, 2007, 2014).

In many studies, environmental psychologists have investigated environmental attitudes and pro-environmental behaviour from various theoretical perspectives. Different measures have been applied for diagnosing environmental attitudes and behaviours; for example, the New Ecological Paradigm (NEP) and General Ecological Behaviour (GEB) scales: they both consider attitudes, but from different psychometrical assumptions (Dunlap et al., 2000; Kaiser, Byrka, & Hartig, 2010).

While environmental attitudes have been investigated in a broad, socio-demographical context, conclusions vary depending on the study. In Poland, studies of pro-environmental attitudes have been few. In many cases, attitudes towards the environment have been included only to serve as an additional factor that may or may not be conceptually important. We therefore decided to conduct research that aimed to investigate the structure of the most widely used scale for measuring environmental attitudes—the NEP scale—for the first time using a Polish sample as a target, but also to examine the possible influence of participants' socio-demographic characteristics. Studying proecological attitudes in Poland might also be scientifically interesting because of Poland's geopolitical location and recent history with major socio-economic changes after 1989. Communist past and its consequences might affect various areas of life (Prusik & Lewicka, 2016) and might be an important factor shaping attitudes towards the environment as well (Nawrotzki, 2012).

## Growing Environmental Concern

Global environmental change caused by human activity is rooted in the industrial revolution and the geographical discoveries that offered the old World unlimited natural resources (Catton & Dunlap, 1980). For centuries our planet has been forced to compensate for the impact of human activity that has regularly and constantly sought to profit from its natural resources, causing pollution, producing waste and introducing changes to the soil, water and atmosphere. Western culture has an anthropocentric tradition, which places the accumulation of knowledge and power of technology above all environmental issues (Catton & Dunlap, 1980). It was in the 1960s that the first alarming publication prompted an increase in awareness of the drama of the environmental situation (Cordano, Welcomer, & Scherer, 2003). In the late '70s we were confronted with the global ecological crisis announced by international organisations. Ecological awareness was continually growing, forcing many individuals not only to think about environmental protection but to demand more action from local and global authorities—what could be called an emerging ecological culture (La Trobe & Acott, 2000).

Today, society has shown interest in bringing about global environmental change, demanding improvements irrespective of the costs (Denis & Pereira, 2014). Public opin-

ion exhorts pro-environmental action in political programmes and activities, because the environmental threat is no longer an abstract notion. Even those citizens who are not particularly interested in environmental issues are noticing the warnings that scientists have been sending for decades now (Noe & Snow, 1990). The key issue for environmental psychology and research on attitudes towards the environment is to describe the perspective of human-environment relations especially that this perspective prejudges about pro-environmental decisions taken by millions every day. This can be ascertained from the various points of view that have contributed to the paradigms in which this relation is described, as well as the construction of social theories that consider it a central point of interest (Arcury, Johnson, & Scollay, 1986).

## Unecological Concepts of the Human Relationship With Nature

Thinking about the environment is deeply anchored in a western culture, ideology and tradition that are fundamentally unecological (Pierce, Lovrich, Tsurutani, & Abe, 1987). The anthropocentric worldview is a legacy of the history of western civilisation (Erdogan, 2009). It is built on a belief in constant and unlimited progress that requires more and more resources, where nature is treated as a supplier of cheap and abundant resources (Dunlap, 2008). Energy demands require fossil fuels, water and biological deposits of raw materials. Nevertheless, it cannot be ignored that nowhere else in the world has there been so much investigation and discussion as well as steps taken for change in the treatment of the environment and building awareness of the importance of environmental protection (Bissing-Olson, Fielding, & Iyer, 2016; Kidwell, Farmer, & Hardesty, 2013).

One of the paradigms that took root back in the "exuberant era" was Black's Dominant Western Worldview (DWW) (Catton & Dunlap, 1980). It assumes that humans are different from other creatures and have a dominant position. People can achieve any goal they desire because the world provides unlimited opportunities for humans and there is a solution, thanks to constant progress, for every problem (Catton & Dunlap, 1980). Constant development will rescue humans from natural catastrophes as well as those created by themselves (Arcury et al., 1986). As has been stated in many papers, the endorsement of NEP can vary due to cultural and socioeconomic background (Denis & Pereira, 2014; Erdogan, 2009; Pierce et al., 1987), therefore it is interesting to investigate the NEP's structure on a Polish sample, as an example of Central European culture.

The Human Exemptionalism Paradigm (HEP) takes a similar approach but focuses more on human uniqueness. It proposes that humans are unlike other species because of their culture; that culture and technology are the major factors behind humans' supremacy; that social and cultural background is much more important for humanity than the biophysical environment; and finally that continuous cultural and technological evolution assures our unlimited progress (Catton & Dunlap, 1980).

The Dominant Social Paradigm (DSP) proposed by Pirages and Ehrlich in 1974 claims that nature is treated in an unecological and possessive way (Dunlap, 2008; Dunlap & Van Liere, 1978). It alleges that humans trump nature, resources are unlimited, culture and technology are apt to adapt nature to human needs and social sciences are exempt from ecological constraint (Erdogan, 2009). There is also a strong emotional commitment to a laissez-faire economy and private property rights (Lueck, 2003). Moreover, DSP's adherents tend to think of the environment as an unlimited source providing resources for abundant economic growth, and of science and technology as the antidote to environmental issues (Dunlap, 2008; Dunlap & Van Liere, 1978). The acceptance of growing demand implying the use of more and more resources for economic benefit is the crucial factor of DSP (Pierce et al., 1987). Also important to this approach is the separation of humans from nature (Arcury et al., 1986). Although Pirages and Ehrlich recognised its limitations, they did not come up with an alternative proposal. There was, however, a belief that a new ecological view of the environment could contribute to the preservation and conservation of nature by means of a holistic approach to environmental protection (La Trobe & Acott, 2000). The anthropocentric approach represented by the DSP, with its human uniqueness taking precedence over nature (Geller & Lasley, 1985) contrasts with the New Environmental/Ecological Paradigm, which reflects ecological consciousness (Lalonde & Jackson, 2002), the integration of man with nature (Geller & Lasley, 1985), the relationship between humans and nature and "environmental concern" (Dunlap et al., 2000).

## New Environmental Paradigm

The New Environmental Paradigm was created and developed by Dunlap and Van Liere at the beginning of the '70s (Amburgey & Thoman, 2012). Hence, the concept is not new; nevertheless, its main concepts seem to be applicable, constituting an opposing approach to that presented by former such un-ecological world views as HEP, DWW and DSP. The theoretical underpinnings of DSP were questionable because they did not assure human survival, leading to the conclusion that such an approach was unsustainable. Moreover, it was no longer useful for describing social reality in the environmental context or the way in which humans treat nature (Dunlap, 2008).

The NEP presented a challenge to unecological paradigms because it considered human technology, faith in science and progress to be limited and insufficient for "governing" the world (Pierce et al., 1987). The NEP shifts from perceiving the environment as an unlimited source dominated by humans, to perceiving it as limited and fragile (Cordano et al., 2003). It is based on a high valuation of nature, compassion toward other species, the avoidance of environmental risks and respect for the limits of nature and growth. The crucial aspect is co-operation and the open participation of societies and politics in planning on the basis of long-term forecasts (Erdogan, 2009). Instead of

demonstrating human dominance over nature, the NEP puts forward the concept of a human-nature relation in which neither side is dominant.

This approach promotes equality between humans and nature, and submits the former to environmental cycles and processes. Superiority is not the point here; the fundamental order in which nature functions is—and any attempt to change it is considered a deviation from the perennial and entitled way in which nature works. Humans are no longer considered removed from nature; they are equal members and part of the natural environment (Arcury et al., 1986). As a consequence of this approach—to treating and understanding the environment as it is—Dunlap and Van Liere developed the NEP scale in the latter half of the '70s (Amburgey & Thoman, 2012), revising it at the beginning of '90s (Dunlap, 2008). The NEP scale was designed to measure attitudes towards the environment (Catton & Dunlap, 1980; Lundmark, 2007). So, we can investigate how people see the environment and what they think and feel about it, because the NEP is a measure of the cognitive aspects of environmental attitudes.

## Objectives of the Study

Because the NEP scale is widely and internationally used by many researchers to measure attitudes towards the environment (Amburgey & Thoman, 2012; Dunlap et al., 2000; Lalonde & Jackson, 2002), we wanted to investigate its structure in a Polish sample as well as attempt to introduce an official translation of the scale to Polish. The scale is not very popular among Polish researchers. When it is used it is translated each time, resulting in various parallel but not necessarily consistent versions of the scale. Nevertheless, there are almost no other scales for measuring attitudes toward the environment. Hence, there is a considerable need for an official Polish translation and Polish validation of the scale, including a structural analysis, the results of which could inform those willing to use it in future research. There is currently no monographic Polish study of the scale's statistical properties.

Our goal is, therefore, first, to confirm whether the Polish sample reflects the structural factors/facets of the scale as proposed initially by its authors and subsequently investigated in a number of studies (Denis & Pereira, 2014; Dunlap, 2008; Dunlap et al., 2000; Vikan, Camino, Biaggio, & Nordvik, 2007). The unstable factor structure of the NEP scale has been reported by many studies (Dunlap, 2008) and the literature in general is rather inconclusive on the NEP's structure. As the five-factor structure proposed by Dunlap and Liere was hardly confirmed, we hypothesise that its original structure might also not be confirmed in our Polish sample (Amburgey & Thoman, 2012). Therefore, we plan to conduct an exploratory analysis of the scale in a Polish sample if the scale does not meet the requirements of confirmatory factor analysis (CFA) for the original five-factor structure proposed by NEP's authors. On the basis of these results, we will attempt to uncover the underlying structure of the NEP scale in a Polish sample—whether it is unidimensional or multidimensional, and if it is multidimensional how many dimensions

describe pro-ecological behaviours in the most fitting way. We will also use the GEB scale, which has been investigated using a Polish sample (Byrka, 2015), as a reference point for the outcomes of our research and a means of convergence validation. We will also investigate the role of socio-demographics to answer the question of why people do or do not treat the place in which they live in a pro-ecological manner.

# Method

## Participants

The study was conducted on a convenience sample of 381 people who agreed to fill in the questionnaire via an Internet site. The sample was not randomised—we published our survey on different internet sites and social media. The questionnaire was completed by 305 people aged 17–68 years ($M$ = 32.71, $SD$ = 9.33). According to the results of a $\chi^2$ goodness of fit test, the gender distribution of the sample was slightly disproportionate (56.7% females), $\chi^2(1) = 5.37$, $p = .020$. Participants were characterised by the following levels of education: 0.3%—basic educational level (primary school and junior high school); 28.2%—high school education; 62.6%—university education (bachelor's or MA degree); 8.8%—PhD. In addition, 8.5% lived in the countryside, 11.9% in small towns and 79.5% in large cities.

## Materials

### The New Ecological Paradigm Scale

The NEP scale was created by Dunlap and Van Liere in 1978, and revised by Dunlap et al. in 2000. The scale evaluates people's relationship with the environment and pro-ecological attitudes on a 1 to 5 Likert scale (1—strongly agree, 2—mildly agree, 3—unsure, 4—mildly disagree, 5—strongly disagree). The scale we used in the study was the version revised by Dunlap and colleagues in 2000. The Polish version of the scale was subjected to a back translation process. After preparation of the Polish version, the scale was back translated into its original language, then the two English versions of the scale were compared in order to find differences, and then the differences were addressed. At the end, a final Polish version was prepared (in the Appendix in the Supplementary Materials).

In its original iteration, the scale was distributed over five facets describing different aspects of perceptions of the natural environment: 1) "the reality of limits to growth" (e.g., "*We are approaching the limit of the number of people that Earth can support*"), 2) "anti-anthropocentrism" (e.g., "*Plants and animals have as much right as humans to exist*"), 3) "the fragility of nature's balance" (e.g., "*The balance of nature is very delicate and easily upset*"), 4) "rejection of exemptionalism" (e.g., "*Despite our special abilities,*

*humans are still subject to the laws of nature*") and 5) "the possibility of eco-crisis" (e.g., "*Humans are seriously abusing the environment*").

In the revised NEP scale, Dunlap and colleagues corrected the uneven distribution between pro- and anti-ecological statements items, establishing a ratio of 8:7; added two new facets (anti-exemptionalism and eco-crisis); replaced the obsolete term "mankind"; and grounded the scale in relevant socio-psychological theory, describing it as a measure of essential beliefs about the relationship between human beings and the environment (Cordano et al., 2003; Dunlap, 2008; Dunlap et al., 2000). The factor structure of the revised scale was tested by Dunlap and colleagues. Although three- and four-factor models achieved some statistical validation during testing, the authors opted to consider the NEP revised scale as a unidimensional measure of endorsement of the NEP. The scale showed high reliability at the level of Cronbach's $\alpha = .83$ with all items loading heavily on one factor, which was sufficient to treat the scale as a unidimensional measure and which was accepted by many researchers (Dunlap, 2008). There are, however, numerous studies that describe the NEP scale as being dimensional, with one to five factors (Amburgey & Thoman, 2012; Dunlap, 2008; Erdogan, 2009). The application of the NEP scale was and is very widespread. It is used for diagnosing environmental attitudes (Dunlap et al., 2000; Stern, Dietz, & Guagnano, 1995).

### The General Ecological Behaviour Scale

For the current study we used the GEB scale, which was created by Kaiser in 1998 and translated into Polish and adapted by Byrka (2015). The scale measures general ecological attitude by posing a set of pro-ecological statements. The number of declared pro-environmental action in day-to-day tasks is a measure of general ecological attitude manifested through pro-ecological behaviour (Kaiser & Byrka, 2015). The GEB scale is described as a unidimensional measure (Kaiser & Wilson, 2000); however, recently it has been noted in the literature that pro-environmental behaviour should be regarded as a complex phenomenon that consists of several distinct types of behaviours (Stern, 2000). If the measure of pro-ecological behaviour is treated as a unidimensional measure, GEB is calculated either by adding up the number of declared pro-ecological activities or in a more sophisticated and recommended way with usage of Item Response Theory techniques and with reference to the Campbell Paradigm (Campbell, 1963; Kaiser, Frick, & Stoll-Kleemann, 2001; Kaiser, Woelfing, & Fuhrer, 1999). The latter approach and its advantages were widely discussed by Kaiser, Byrka, and Wilson (Byrka, 2015; Kaiser & Byrka, 2015; Kaiser & Wilson, 2019). However, this novel approach requires several steps. First, negatively worded GEB items should be reversed (the number of negatively worded items depends on the GEB version). Secondly, the items' scales of response have to be unified since some items are followed by five-point Likert scales, while others have a dichotomous form of yes and no. After all items are dichotomised, so the scale is uniform, the general one-parameter Rasch model (with varying difficulty parameter) is adopted.

Then, the general GEB score is presented and interpreted in the form of logits. Various statistical software (e.g., Mplus, IRTpro, or R with "ltm" package) could be used in order to calculate the GEB general score based on the Rasch model. When GEB is treated as more complex, several subscales are used: energy conservation, mobility transportation, waste avoidance, consumerism, recycling, and vicarious social behaviours (Kaiser et al., 2001). The more complex approach was used in the presented research. The version used in the current study contains 50 items: 18 with an answer scale: "yes," "no" and "not applicable" counted as a missing answer (e.g., "*I use renewable energy sources*"); and 32 questions on a Likert scale: 1—never, 2—seldom, 3—occasionally, 4—often, 5—always and again "not applicable" as a missing answer (e.g., "*I wash dirty clothes without pre-washing*") (Kaiser & Byrka, 2015; Kaiser & Wilson, 2004). As in the previous approach (based on the Rasch model), all negatively worded items were reversed, then all the Likert scale items were dichotomised (1—never, 2—seldom, and 3—occasionally, are recoded into zero; 4—often and 5—always, are recoded into one), at the end the sum of all positive answers for six subscales was summed up as representation of scores.

We decided to use a multidimensional GEB approach over application of the Rasch model, even though we calculated logit scores. There were several reasons behind it. We wanted to examine convergence validity between NEP and GEB in a unified way. Applying the Rasch model to one of the measurements and employing the traditional approach with the other might not really be justified in our opinion. However, we have reconsidered the application of the Rasch model to GEB measurement and graded response model to NEP. Secondly, treating GEB in a multidimensional way gives better insight into dependencies between NEP and GEB (co-dependency between particular subscales of both instruments). Thirdly, we are not really convinced that GEB measurement is really unidimensional. The additional on-site analysis revealed that the unidimensional GEB model was characterised by much worse performance than the model based on parallel analysis,—$\Delta\chi^2(243) = 1329.91$, $p < .001$. As much as it is interesting, the GEB multidimensionality versus unidimensionality matter is not the subject of the present paper and it should be left here due to the limited frames of this paper.

In general, we decided to use the GEB scale because it had been tested and evaluated on a Polish sample even though reliability was not very high and at the level of Cronbach's $\alpha = .67$ (Byrka, 2015). The reason for it was also that there is lack of measures of that type in Polish current settings. Both GEB and NEP are measures of environmental attitudes, but what distinguishes them is the behavioural and cognitive approach to the environmental attitude measurement. NEP measurement is more concentrated on proecological beliefs, while GEB is more focused on undertaken behaviours or behavioural intentions. At the end of the day both approaches constitute measurement of attitudes but with a different emphasis on the particular attitude component (cognitive versus behavioural). In both measures the affective component is not really present. From general psychological knowledge, we are entitled to assume that these behavioural and cognitive

approaches are correlated. At least, according to the classical approach (Rosenberg & Hovland, 1960), there are sufficient empirical data to assume that proecological beliefs should be significantly related to behavioural acts or behavioural intentions. Therefore, we can use the GEB as a convergence criterion for our NEP validation study. In the original validation survey, the GEB scale showed high reliability at the level of Cronbach's $\alpha = .81$ (Kaiser et al., 2001). The GEB scale in this study served as a test of the convergent validity of our NEP scale results.

## Procedure

The study was conducted via the Internet in an internet survey format on a convenience sample. We asked volunteers, participants of university courses and Facebook group members to fill in the survey and send it to their friends. The survey was conducted in Poland with the participation of Polish citizens between April 2016 and March 2017. It consisted of the NEP scale, the GEB scale and questions concerning sex, age, place of residence and education. Participants were not remunerated and the study was anonymous.

# Results

## Confirmatory Factor Analysis

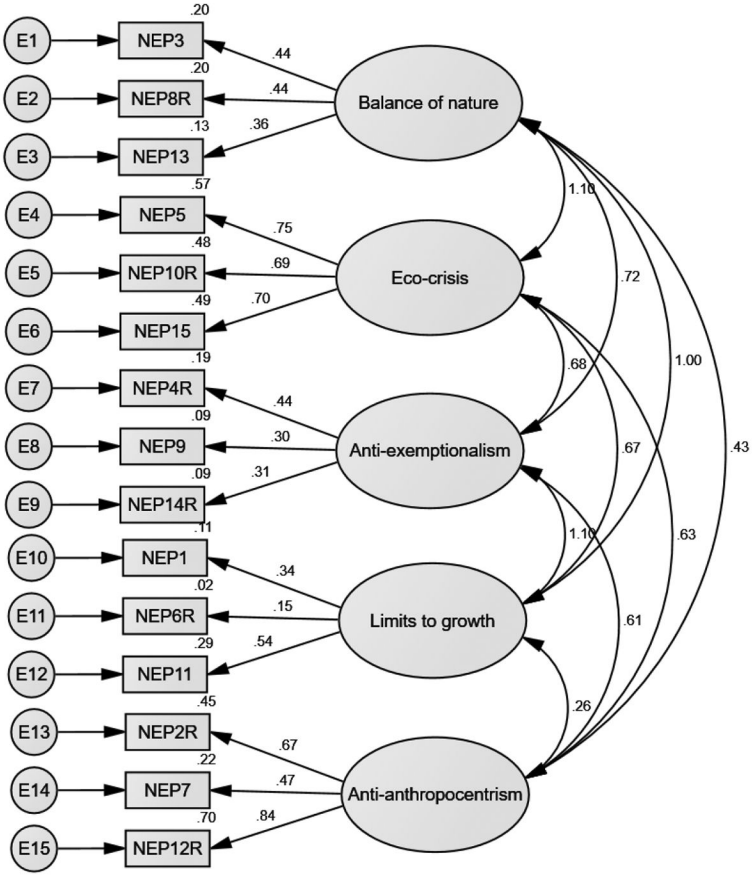
In order to check whether the structure (number and nature of factors) of the NEP Scale proposed by its original authors had five facets or dimensions (as described in the literature), we conducted a CFA. CFA is a widely used statistical technique that allows the latent structure underlying theoretical concepts, usually tested in the form of structural equation modelling, to be examined (e.g., Brown & Moore, 2012; Field, 2009; Tabachnick & Fidell, 2007). Before running the CFA using AMOS v. 25, we examined the variables to check whether all crucial assumptions were met (sufficient sample size, missing data, multivariate normality, linearity, outlying cases, lack of singularity and multicollinearity): the sample size was good ($N > 300$) (see Tabachnick & Fidell, 2007); linearity was examined by inspecting random pairs of scatterplots; multivariate normality was assumed based on normality tests, kurtosis and skewness values (fitting into the range of −1 and 1); univariate outliers were examined using the criterion of standardised values fitting the range −3.29 to 3.29; and, multivariate outliers were analysed using Mahalanobis distance coefficients. The amount of missing data was marginal—six data points out of 4,575—but we decided to replace them since it is not possible to calculate modification indices with missing data present. They were replaced using series means. More sophisticated techniques of replacing missing data (e.g., Expectation-Maximisation) were not required given how few data points were involved. However, before replacing the data we checked the randomness of their distribution. According to the Little's test

of Missing Completely at Random (MCAR), the missing data were distributed randomly, $\chi^2(9) = 3.38$, $p = .948$.

In general, no serious departures from assumptions were found. Hence, we could proceed with the CFA. The results are presented in Figure 1 and Table 1.

**Figure 1**

*Confirmatory Factor Analysis of the New Ecological Paradigm Scale (Model 1)*




*Note.* Error terms were omitted for the clarity.

**Table 1**

*Model Adequacy and Goodness of Fit Indices of the Final Models for the NEP Scale Model Adequacy and Goodness of Fit Indices of the Final Models for the NEP Scale*

| Model | $\chi^2$ | *df* | *p* | $\chi^2/df$ | RMSEA | LO | HI | PCLOSE | SRMR | IFI | CFI | TLI | AIC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Model 1—Simple CFA | 231.94 | 80 | < .001 | 2.90 | .08 | .07 | .10 | .000 | .06 | .84 | .83 | .78 | 311.94 |
| Model 2—CFA with modification indices | 218.69 | 78 | < .001 | 2.80 | .08 | .07 | .09 | .000 | .06 | .85 | .85 | .79 | 302.69 |
| Model 3—EFA in CFA with modification indices | 64.14 | 40 | .009 | 1.60 | .05 | .02 | .06 | .652 | .03 | .98 | .97 | .93 | 224.14 |

*Note.* LO = low RMSEA; HI = high RMSEA; EFA = exploratory factor analysis; CFA = confirmatory factor analysis; RMSEA = root mean square error of approximation; PCLOSE = *p* of close fit; SRMR = standardised root mean square residual; IFI = incremental fit index; CFI = comparative fit index; TLI = Tucker Lewis index; AIC = Akaike information criterion. The re-specifications of models were based on error covariance modification indices.

We started with a simple model (without making any modifications based on error covariances; Model 1), then we introduced some changes based on error covariances modification indices (Model 2). We then examined the data within the framework of exploratory factor analysis (EFA) in the CFA technique (Model 3). EFA within the CFA framework is an increasingly popular procedure that combines EFA and CFA (see, Brown, 2014; Ender, 2012), with the solution being closer to the EFA results but still including the advantages of CFA (e.g., the ability to calculate fit indices).

According to the results, Model 1's chi square was significant, $\chi^2(80, N = 305) = 231.94$, $p < .001$. This would normally suggest a poor fit of the model. However, various studies have suggested that it is very difficult to achieve a non-significant $\chi^2$ value because of its sensitivity to sample size when conducting CFA analyses, and thus it should not be considered the main criterion when judging the quality of a model (Schermelleh-Engel, Moosbrugger, & Müller, 2003; Vandenberg, 2006). The ratio of $\chi^2$ to degrees of freedom was within the desired interval of 2 and 3, which is good (Schreiber, Nora, Stage, Barlow, & King, 2006). The root mean square error of approximation (RMSEA) value was acceptable (according to the criterion of root mean square error of approximation (RMSA) below .08 or at least below .10), while the root mean square residual (RMR) was below .08 as recommended, and the Incremental Fit Index (IFI) was lower than the recommended .95. Comparative Fit Index (CFI) was below the required .90 and Tucker Lewis Index (TLI) was below the required .95. Unfortunately, the *p* of close fit (PCLOSE) was less than .05.

For the two other models (Model 2 and Model 3), the $\chi^2$ was significant but the ratio of $\chi^2$ to degrees of freedom was quite good (close or within the range of 2 and 3). The RMSEA values were very acceptable (in both cases below .08), the IFI value slightly

improved (Model 2) or excellent (Model 3) and the RMR very good for both models (below .08 as recommended). CFI improved as well and, for Model 3, was more than acceptable. TLI improved but still did not reach a value of .95. The PCLOSE was significant for Model 3 but not for Model 2. It was clear that the addition of the re-specifications based on error covariances (Model 2), as well EFA in CFA framework (Model 3), improved the models, which was confirmed through the additional analysis. Model 2 improved on Model 1, $\Delta\chi^2(2) = 13.25$, $p < .01$, and Model 3 improved on Model 2, $\Delta\chi^2(38) = 153.55$, $p < .001$. Furthermore, descending Akaike information criterion values (AIC) suggested that Model 3 was better than Model 2 and Model 1, and that Model 2 was better than Model 1.

Looking at just the modification indices, we could probably accept each of the models and claim that the structure of NEP originally proposed (Dunlap et al., 2000) has empirical support. However, the values of the other indices suggest that the five-dimensional structure is not in fact well supported by our data. We encountered three problematic aspects. First of all, the regression weights, as much as they were all significant, were also quite low, or at least some of them were (a value of .15 and a few of .30 for Model 1, and the same for Models 2 and 3; Figure 1). Secondly, the high values of correlations (exceeded .8–.9) between some factors (e.g., Balance of nature & Limits to growth; Balance of nature & Eco-crises; Anti-exemptionalism & Limits to growth) in Model 1 suggest serious problems of discriminative validity. The same applies for Models 2 and 3. Thirdly, Cronbach's alphas and Omegas coefficients for the extracted dimensions had in some cases unacceptable values ($\alpha = .38$ and $\omega = .38$ for Balance of nature, $\alpha = .30$ and $\omega = .29$ for Anti-exemptionalism, $\alpha = .26$ and $\omega = .29$ for Limits to growth); Cronbach's alpha and Omega's values for Eco-crisis ($\alpha = .75$ and $\omega = .75$), Anti-anthropocentrism/Human domination ($\alpha = .67$ and $\omega = .71$), and the overall reliability of the scale ($\alpha = .77$ and $\omega = .80$) were sufficiently high.

Taking into account the low regression weights (Figure 1), low reliability values for some subscales and evidently low discriminative validity combined, as well previous empirical work (Denis & Pereira, 2014), all of which cast doubt on the five-dimensional structure, we decided that the fit was not acceptable and that further analytical work [EFA and exploratory structural equation modelling (ESEM)] was required in order to reveal a more adequate factorial structure.

## Exploratory Structural Equation Modelling

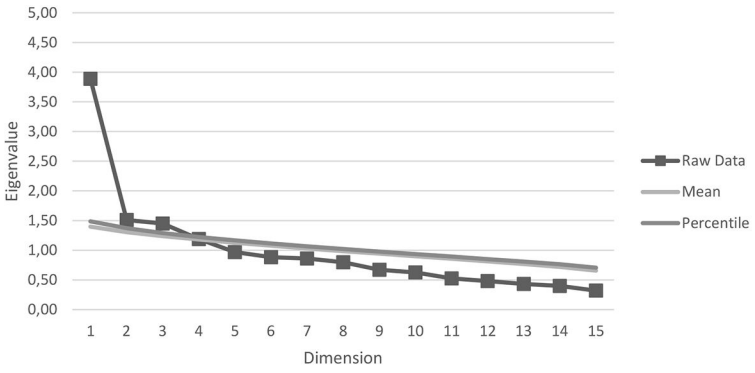
In order to propose a new structure of NEP we decided to use both ESEM and EFA. The ESEM technique is a combination of EFA and CFA (Asparouhov & Muthén, 2009), which has some advantages over classical EFA since it offers, for example, model fit indices. Model indices could then be used to compare newly revealed structures with dimensions revealed using CFA. On the other hand, ESEM conducted in Mplus does not offer easily accessible reliability parameters, the possibility to use certain types of rotations and factor extraction (e.g., principal axis factoring), as well ease of testing for an adequate

number of factors. Due to this, we also decided to use SPSS (ver. 25) and R software in order to calculate additional parameters.

We started by examining the preconditions for using EFA, also required in ESEM. The Kaiser-Meyer-Olkin measure of sampling adequacy was .78 (as recommended, above .60); the Bartlett's test of sphericity was significant, $\chi^2(105) = 1001.087$, $p < .001$ and the diagonal values of the anti-image matrix were all above 0.50. Other important assumptions (e.g., normal distribution, linear relationship between variables checked on randomly chosen pairs and univariate and multivariate outliers) had already been checked prior to the CFA. The data were evidently factorable. An initial run of EFA (principal component analysis (PCA) method with Varimax rotation) was used not only to check the factorability of the data but also to establish the correct number of factors. Besides Cattell's scree test and Kaiser's eigenvalue criterion, we also conducted a parallel test (Figure 2). According to Kaiser's eigenvalue criterion, we should have extracted four factors, while the results of Cattell's scree test were inconclusive and suggested between two and four factors. However, the results of the parallel analysis (Horn, 1965)—considered one of the most reliable criteria (Zwick & Velicer, 1986)—pointed to a three-factorial solution as being the most adequate (Figure 2).

**Figure 2**

*Parallel Analysis of the NEP*




*Note.* *N* Datasets = 1,000; *N* Variables = 15. Principal Components and Random Normal Data Generation.

We examined various solutions (with number of factors between two and four, with different methods of extraction as well different type of rotations). In general, regardless of the type of extraction and rotation, the factorial structure was quite rigid along tested solutions—the same items were part of the same factors. However, the most promising solutions were three-factorial and two-factorial ones. We decided to run ESEM analysis

in order to get model fit indices, allowing us to compare the performance of selected models. We decided to test three-factorial solution with all items included and two-factorial solution with all items included, as well as an additional two-factorial solution with 12 items (after removal of three negatively worded items which were forming a separate factor while examining initial procedure runs). Model fit indices obtained during the ESEM procedure are presented in Table 2.

**Table 2**

*Model Adequacy and Goodness of Fit Indices of the Final Models for the NEP Scale*

| Models | $\chi^2$ | *df* | *p* | $\chi^2/df$ | RMSEA | LO | HI | PCLOSE | SRMR | CFI | TLI | AIC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Three-factorial model | 148.63 | 63 | < .001 | 2.36 | .07 | .05 | .08 | .024 | .05 | .91 | .85 | 11,336.50 |
| Two-factorial model (all 15 items) | 225.42 | 76 | < .001 | 2.97 | .08 | .07 | .09 | .000 | .06 | .84 | .78 | 11,387.29 |
| Two-factorial model (12 items) | 108.85 | 43 | < .001 | 2.53 | .07 | .05 | .09 | .020 | .05 | .91 | .87 | 9,256.76 |

*Note.* LO = low RMSEA; HI = high RMSEA; RMSEA = root mean square error of approximation; PCLOSE = *p* of close fit; SRMR = standardised root mean square residual; CFI = comparative fit index; TLI = Tucker Lewis index; AIC = Akaike information criterion.

Indeed, the ESEM procedure helped us to select the most adequate number of factors and to compare all models, including comparisons to the original five-factorial model.

According to the results, a simple CFA model for a three-factorial solution performed significantly better in comparison to a simple CFA model for a two-factorial solution with all 15 items—$\Delta\chi^2(13) = -76.79$, $p < .001$. However, a CFA model for a two-factorial solution with 12 items was significantly better than a simple CFA model for a three-factorial solution—$\Delta\chi^2(20) = 39.76$, $p < .01$ and a simple CFA model for a two-factorial solution with 15 items—$\Delta\chi^2(33) = 116.57$, $p < .001$. The two-factorial model also showed slightly better performance in comparison to the two other models (Table 2) in terms of values of AIC and TLI.

In comparison to the initial five-factorial solution, a simple CFA model for a two-factorial solution (12 items version) showed significantly better performance even without any modifications based on error covariances included—$\Delta\chi^2(37) = 123.09$, $p < .001$.

Overall, a two-factorial model with 12 items showed the best performance in comparison to all tested models (initial five-factorial solution vs. models with new potential structures based on ESEM analysis). We eventually decided to settle upon the solution with two factors (in accordance with the parallel test results, Figure 2), also bearing in mind the meaningfulness of each dimension revealed and problems with the three-factorial solution. For the final EFA run, PCA was used as a method of extraction with Varimax rotation. The reason for using Varimax rotation was that the correlation

coefficients for the revealed dimensions were not highly correlated (did not exceed .32 in the previous run with oblique rotation; Tabachnick & Fidell, 2007), but we were also looking for a maximally distinctive set of dimensions. The factor loadings for the final two-factorial model with 12 items are presented in Table 3.

**Table 3**

*Summary of Items and Factor Loadings for Varimax Orthogonal Two-Factor Solution With PCA Extraction for the NEP*

| | Factor Loading | | |
|---|---|---|---|
| **Item** | **1** | **2** | $h^2$ |
| **Factor 1: Human Power (α = .72, ω = .73)** | | | |
| 12r. Humans were meant to rule over the rest of nature. | **.83** | −.03 | .68 |
| 2r. Humans have the right to modify the natural environment to suit their needs. | **.74** | .03 | .55 |
| 7. Plants and animals have as much right as humans to exist. | **−.56** | .13 | .34 |
| 15. If things continue on their present course, we will soon experience a major ecological catastrophe. | **−.56**[a] | .50 | .56 |
| 10r. The so-called "ecological crisis" facing humankind has been greatly exaggerated. | **.50**[a] | −.47 | .47 |
| 14r. Humans will eventually learn enough about how nature works to be able to control it. | **.43** | −.01 | .19 |
| **Factor 2: Limits of Nature (α = .60, ω = .63)** | | | |
| 11. Earth is like a spaceship, with very limited room and resources. | .12 | **.67** | .46 |
| 3. When humans interfere with nature it often produces disastrous consequences. | .12 | **.67** | .37 |
| 5. Humans are severely abusing the environment. | −.15 | **.59** | .62 |
| 13. The balance of nature is very delicate and easily upset. | −.53[a] | **.58** | .32 |
| 9. Despite our special abilities, humans are still subject to the laws of nature. | −.11 | **.56** | .29 |
| 1. We are approaching the limit of the number of people that Earth can support. | .09 | **.53** | .21 |
| % of total variance (42.13%) | 29.63 | 12.50 | – |

*Note.* PCA = principal component analysis; NEP = New Ecological Paradigm. The letter "r" stands for the reversed statement. The coefficients in bold indicate membership of particular item to the factor.
[a]cross-loadings. By cross-loadings we consider values overlapping at least by the value of 0.200.

Overall, the new NEP structure performed better than the five-dimension solution proposed by the scale's authors, not only taking into consideration the test of chi-square difference but also other measures. The reliability coefficients were comparatively better than those in the five-dimension solution (as low as 0.26). There was also an improvement according to all the other calculated indices like: the minimum discrepancy (CMIN), RMSEA, PCLOSE, CFI and TLI. However, the new structure still remains debatable: Cronbach's alphas and McDonald's omegas were still relatively low (especially for Factor 2); factor loadings were acceptable but not very high, especially for Factor 2, and there were some cross loadings.

Since the two-dimensional structure was not characterised by perfect coefficients of reliability, our recommendation is to treat the NEP scale with some caution. In our opinion, some of the factors are misspecified (judging by cross-loadings) or under-represented (judging by reliability criteria) in terms of the number of questions. During analytical

work we also tested a three-dimension solution which had a third factor of low reliability and this third factor consisted only of negatively worded-statements. Negatively worded questions are well known to be confusing for respondents (Van Sonderen, Sanderman, & Coyne, 2013) and can cause plenty of potential problems. Reduction of the factorial structure to two-dimensional resolved a problem temporarily. However, we recommend that perhaps future research make all NEP sentences positively oriented in order to test how the NEP scale will act in terms of psychometric characteristics with only positively worded items. It would also be worth re-examining the item-pool, as it was indicated by our study that dropping some items improved the final model significantly. Perhaps a new scale should be created which will be more up-to-date and for which construction will be more theoretically based.

Since in the current situation the two-dimension solution was the best, the additional analytical work is presented, including the newly revealed two-dimensional structure, but also for purely comparative purposes, with the five-dimensional structure proposed in the original study included.

## Convergent Validity

In order to test the convergent validity of the NEP Scale we chose another measure of pro-ecological behaviours, the GEB Scale. We assumed that both measures should be related theoretically. Indices representing the subscales of the NEP were based on a newly revealed structure and had a form of factorial scores. However, we also decided to show how the original five-dimensional structure of NEP would correlate with GEB measures. Pearson's coefficients ($r$) are presented in Table 4.

**Table 4**

*Pearson's r Correlation Coefficients for NEP and GEB Scales (N = 305)*

| | GEB Measure | | | | | |
|---|---|---|---|---|---|---|
| Subscale | Energy Conservation | Mobility Transportation | Waste Avoidance | Consumerism | Recycling | Vicarious Social Behaviours |
| 1) Balance of nature | **.13**$^{*}$ | **.13**$^{*}$ | **.27**$^{***}$ | **.12**$^{*}$ | **.18**$^{**}$ | **.17**$^{**}$ |
| 2) Eco-crisis | **.23**$^{***}$ | .10 | **.25**$^{***}$ | **.23**$^{***}$ | **.28**$^{***}$ | **.34**$^{***}$ |
| 3) Anti-exemptionalism | .08 | .01 | .11 | **.14**$^{*}$ | .07 | **.16**$^{**}$ |
| 4) Limits to growth | .04 | .10 | **.13**$^{*}$ | **.17**$^{**}$ | .09 | **.18**$^{**}$ |
| 5) Anti-anthropocentrism/Human domination | **.21**$^{***}$ | **.18**$^{**}$ | **.17**$^{**}$ | **.20**$^{***}$ | **.13**$^{*}$ | **.30**$^{***}$ |
| Factor 1: "Human power" | **−.18**$^{**}$ | **−.13**$^{*}$ | **−.18**$^{**}$ | **−.20**$^{***}$ | **−.15**$^{**}$ | **−.32**$^{***}$ |
| Factor 2: "Limits of nature" | **.17**$^{**}$ | .10 | **.20**$^{**}$ | **.17**$^{**}$ | **.18**$^{**}$ | **.21**$^{***}$ |

*Note.* NEP = the New Ecological Paradigm Scale; GEB = the General Ecological Behaviour Scale. Significant correlational coefficients are in bold.

$^{*}p < .05$. $^{**}p < .01$. $^{***}p < .001$.

The correlational coefficients for newly revealed two subscales of NEP were not high; however, they were significant across all the subscales of GEB except for the relationship between "Limits of nature" and "Mobility transportation," suggesting that both NEP scales overlap to some degree with GEB subscales and that convergence validity could then be confirmed to a certain degree, since the correlation coefficients are low, but on the other hand there is a steady correlational pattern between measures. According to the five indices of NEP from the original study, we can see that while three (Balance of nature, Eco-crisis, Anti-anthropocentrism/Human domination) overlap significantly with the GEB subscales, the other two (Anti-exemptionalism, Limits to growth) show no significant relationship or are only marginally related to the GEB subscales. These two NEP subscales (Anti-exemptionalism, Limits to growth) also turned out to be problematic (e.g., low reliability values, low loadings and high correlation with other factors) in our CFA analysis.

## Socio-Demographics

The relationship between basic sociodemographic characteristics and pro-ecological behaviours as measured using the NEP and GEB were analysed using Pearson's correlational coefficients (Table 5).

**Table 5**

*Pearson's r Correlation Coefficients for NEP and GEB and Sociodemographic Variables (N = 305)*

| Study construct | Gender (1-F) | Age | Education | Size of Locality |
|---|---|---|---|---|
| GEB—Energy Conservation | −.02 | −.03 | **.14*** | .00 |
| GEB—Mobility Transportation | .03 | .08 | **.17**** | .00 |
| GEB—Waste Avoidance | **.14*** | .02 | **.18**** | .06 |
| GEB—Consumerism | .10 | .05 | **.27***** | .11 |
| GEB—Recycling | **.12*** | .07 | **.27***** | .02 |
| GEB—Vicarious Social Behaviours | .04 | **.13*** | **.15**** | .06 |
| 1) Balance of nature | .10 | .03 | .00 | .01 |
| 2) Eco-crisis | **.15*** | .06 | .08 | .08 |
| 3) Anti-exemptionalism | **.12*** | .06 | **.13*** | .02 |
| 4) Limits to growth | .06 | .03 | .04 | .06 |
| 5) Anti-anthropocentrism/Human domination | **.14*** | .00 | −.05 | −.07 |
| Factor 1: "Human power" | **−.19**** | −.09 | .05 | .02 |
| Factor 2: "Limits of nature" | .02 | .03 | .11 | .06 |

*Note.* NEP = New Ecological Paradigm Scale; GEB = The General Ecological Behaviour Scale. Significant correlational coefficients are in bold.
*$p < .05$. **$p < .01$. ***$p < .001$.

In general, the correlation coefficients were quite low. There were not many significant dependencies between pro-ecological behaviours (measured by GEB and NEP) and socio-

demographic indices. In comparison with the NEP scale, the GEB scale showed a steady pattern of relationships with education. Higher education allied with more pro-ecological behaviours. Size of locality and age were unrelated to the frequency of pro-ecological behaviours (except for Vicarious Social Behaviours). The role of gender was inconclusive. Only some of the NEP and GEB subscales were correlated with gender: women presented a higher prevalence of Waste Avoidance and Recycling and scored higher on some of the NEP subscales, such as Eco-crisis, Anti-exemptionalism and Anti-anthropocentrism/Human domination. For the newly revealed two-dimensional structure, the only significant outcome was related to men scoring higher on Factor 1: "Human power." Neither scale appeared to significantly differentiate pro-ecological behaviours by socio-demographic characteristics, which may be a surprising result.

## Discussion

The goal of our study was to confirm the factorial structure of the NEP Scale and its fit with the theoretical model proposed by Dunlap and Van Liere (1978), in the context of Poland today. From the beginning, Dunlap and Van Liere claimed that their scale was unifactorial (Dunlap et al., 2000), but built it on five so-called facets that were subsequently tested as the NEP's factors. Our study revealed that the theoretical concept of the NEP scale, including its five-factorial solution, does not fit with our results. We found a two-factorial structure to be more appropriate, but still not perfect (relatively low reliability coefficients). Our results pointed to two strong factors—one, the presumption that humans have a dominant role over nature and that nature itself is strong; the other, an opposing factor, encompassing items declaring the fragility of nature. The ratio of items was 6:6 for the final solution, suggesting that the scale is perfectly balanced. However, it has only two, opposing dimensions that could be considered original "facets" from Dunlap and Van Liere's (1978) theory of the NEP.

The results of our study are consistent with the results obtained by other researchers. Testing the scale's structure, Amburgey and Thoman (2012) found that neither a unifactorial nor a five-factorial (based of the five facets originally proposed by Dunlap and Van Liere) solution met the satisfactory psychometric parameters. The unstable factor structure of the NEP scale has been reported by many other studies. For this reason, it is recommended that confirmatory or exploratory analysis be conducted each time the structure is investigated. In our study, the NEP scale appeared to have two dimensions which describe, as Dunlap (2008) calls them, different conceptualisations of environmental attitudes. He argues that in Eastern Europe, people tend to have a different understanding of the NEP items to that of Western European nations or US citizens (Dunlap, 2008). As Polish people tend to accept solutions for general welfare than a particular interest, they may opt more frequently for actions that are not ecological, arguing that they are however in favour of a superior goal. The acceptance of an eventual

high cost is more likely possible as well and the consequences are put aside and are considered as future and distant problem. What counts in situations of decision making is the instant result of the action. As revealed in a number of studies (Cordano et al., 2003; Denis & Pereira, 2014; Erdogan, 2009; Lueck, 2003), the NEP scale's factor structure could be described as unstable. However, it can be used successfully to measure differences in environmental attitudes between various countries. It can also be helpful in investigating differences between perceptions of the environment in different economic, cultural and national environments, as well as in cross-national studies investigating the similar social groups, that is, having the same levels of higher education, living in big cities or in rural areas. The concept that we propose also reflects the theoretical basis of Dunlap and Van Liere's NEP. Starting from the proposed unifactorial scale with five facets, we discovered that a two-factorial model had the best statistical parameters, and that only two facets emerged as a dominant way of perceiving nature.

The differences between the original and our structure of the scale can be caused by a different approach to the cultural issues between Western and Central Europe. In Poland, for example, the authorities can be easily questioned (Kolman, Noorderhaven, Hofstede, & Dienes, 2003), which comes directly from the communist heritage when authority and power were associated with violence and were, at least internally, denied and refused. A two-factorial solution can be a good explanation here. On the one hand, Polish people are used to having power held over them and situations in which rules can simply be imposed against the common will, but on the other hand they are very sensitive and particular in terms of common rights and respect towards values and principles of coexistence. Another difference is the level of individualism and collectivism in both cultures. In Poland, people are far more collectivist than in, for example, The Netherlands (Oppenheimer, 2004). Moreover, in central European countries, the short-term perspective is far more present than in western ones. The Netherlands manifested long-term planning and taking into account distant consequences (Kolman et al., 2003), which can be a strong differentiating factor for our NEP structural solution. We consider that concerning the cultural differences, the NEP scale is a measure of environmental attitudes, but focused on beliefs and values rather than emotions and behavioural intentions, but it still has limitations.

Differences between the west and Polish endorsement of the NEP may also be a consequence of differences in gross domestic product per capita (Dunlap, 2008). The fast economic development of central European countries, of which Poland is a leader, requires resources and nature is an obvious source of these. That is probably the reason why people see the role of humans as being dominant over nature and consider nature to be powerful while at the same time recognising its limits. Our Polish sample showed that the environment is seen as the possession of human beings, but also that it is seen on the other hand as a fragile system that can be destroyed by humans. This result can be explained as, on one hand, recognising the need to use nature for human

purposes in situations where economic development needs resources and where it is therefore acceptable to abuse the environment in order to grow more quickly; while on the other hand, people are highly aware of the dangers caused by extensively abusing and polluting the environment. This reflects the Polish climate situation, where extreme air pollution is very often present throughout the year. In comparison to many other countries, Poland is in an especially dramatic situation. Polish citizens have relatively low purchasing power so they are forced to use low-quality coal to heat their homes during the winter, knowing perfectly well that the smog is killing them by causing extreme air pollution for approximately half the year. This may explain the strong belief in Polish society regarding the power of nature and that nature should be able to cope with air pollution itself. Despite burning coal being highly harmful for the environment, coal is a natural product and that can also be a way to rationalise its widespread use. Polish citizens also need to use cars because public transport outside of the big cities is poor; however, they do not have enough money to buy cars with low exhaust emission, even though they are aware that pollution caused by cars increases smog levels.

Our results showed that, if there were any, there were very low correlations between either the NEP or the GEB and socio-demographic characteristics. The role of gender has been found to be the most significant in previous studies, although even this is inconclusive (see, e.g., Denis & Pereira, 2014; Müderrisoglu & Altanlar, 2011). In our study, only weak correlations were observed, which might be explained by the dominant role of economic factors influencing Polish society's ways of viewing nature. A marginal correlation between NEP and GEB scores with age and level of education is perhaps surprising. Although in the literature this correlation is also inconclusive (see, e.g., Dunlap et al., 2000; Hawcroft & Milfont, 2010), we might expect that better educated people would display more pro-environmental attitudes compared with the rest of the sample. This result might be explained by the low tolerance of environmental issues among young and educated people despite their knowledge of the environment, a finding that was previously observed by Leiserowitz (2005).

## Limitations

The abovementioned results should be treated with a high level of prudence as our sample is one of convenience, and this is a limitation of our study. To confirm our findings, the additional study should be conducted for our assumptions. Future studies could gather more diverse socio-demographic data; for example, the economic status or political views that could give significant input to future analyses, as well as social value orientations.

Another limitation of our research is that only one study was conducted. When we analysed the two-factorial solution, there was a need to test a shortened version of a scale, as proposed and done by many researchers before (see, e.g., Cordano et al., 2003; Johnson, Bowker, & Cordell, 2004). Another possible solution for the improvement of the

scale would be reformulating the original NEP's items that do not meet the psychometric criteria or proposing new items that would fit better contemporary environmental issues. Obviously, the way the scale was translated might affect its psychometric properties. These are strong arguments for introducing major changes to the NEP Sale and testing them for a general revision of the scale in future research.

It is recommended to randomise the sample and repeat the research after some time to check if the scale's parameters are stable, as the results can vary across the population (Dunlap et al., 2000). A longitudinal study would help to check whether dependencies between constructs are stable over time, but also to test whether the translation of the items (performance of the items in time) was sufficient enough. The NEP scale should also be examined in future analytical work using item response theory techniques, including a graded response model, in order to identify malfunctioning items in a more detailed way.

The concept of the NEP may be outdated, in that posing very general questions can lead to misunderstandings and open interpretation of the items. The goal of the NEP's authors was to create a universal measure that could be used worldwide (Dunlap et al., 2000). As many studies have shown, the scale was not free from cultural influence (Caron, 1989; Vikan et al., 2007). Moreover, its scoring and structure depends on pro-environmental concepts operating in different countries (Johnson et al., 2004). Therefore, we cannot treat it as a universal measure of environmental attitudes. From our research, we can see that the NEP's structure depends on the actual environmental situation in Poland. Although we are well educated about environmental dangers, we tend to treat the environment rather ambivalently because of our economic situation while at the same time recognising the limits of its durability. That is why the results of our study show a bi-polar structure.

## Final Comments

The NEP as a polemic response to DSP which establish a dichotomous approach to the environment is obsolete nowadays, because we construct our knowledge about the environment not on a denial of the anthropocentric approach but more progressively on the basis of respect, thriftiness and sustainability (Lundmark, 2007). This is another perspective, which is seen as a social demand for a clean and safe environment. The subsequent impact on politicians derives from the high status accorded to the environmental situation as well the direct consequences of environmental damage that adversely affects many people (Noe & Snow, 1990; Nygren & Rikoon, 2008). The key issue is to shift the environmental concern from discussion to action. Therefore, we are about to elaborate a novel approach to environmental attitudes. In the meantime, in the absence of an environmental attitudes measure, we opt to apply the NEP scale as a two-factorial measure of attitudes towards the environment; we are aware that the NEP scale as a general

environmental attitude measure is not satisfactory when it comes to investigating the concept of pro-environmental behaviours.

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**Competing Interests:** The authors have declared that no competing interests exist.

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**Data Availability:** For this article, a dataset is freely available (Dyr & Prusik, 2020).

## Supplementary Materials

The supplementary materials include a dataset, codebook, and appendix (for access see Index of Supplementary Materials below).

### Index of Supplementary Materials

Dyr, W., & Prusik, M. (2020). *Supplementary materials to "Measurement of proecological attitudes within new ecological paradigm in Polish current settings"* [Dataset, codebook, and appendix]. PsychOpen. https://doi.org/10.23668/psycharchives.4233

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