

# Assessing the Green Behaviour of Generation Z: An Indonesia Case

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DOI: <https://dx.doi.org/10.47772/IJRISS.2024.803162>

Received: 28 February 2024; Revised: 12 March 2024; Accepted: 16 March 2024; Published: 19 April 2024

## ABSTRACT

This research further explores the relationship between endorsement for the New Ecological Paradigm (NEP) and its connection to the green behavior of Generation Z (Gen Z). Sociodemographic characteristics are assumed as antecedent variables influencing the correlation between ecological awareness and green behavior of Gen Z. This study involved 396 Gen Z individuals from various study programs, comprising 55.6% males and the rest females. The study used the NEP scale to measure the ecological awareness of participants. Researchers distributed questionnaires to students at a state university through Google Form facilities. From the computational results, 61.5% of Gen Z had a favorable view of statements on the NEP scale, although 19.9% tended to oppose statements on the NEP scale. Meanwhile, 53.7% of students behaved in an environmentally friendly manner compared to 22.7% of students who did not favor such behavior. This research found a significant relationship between the variables of residential area and age group with students' ecological awareness. However, no meaningful relationship was found between sociodemographic characteristics and environmentally friendly behavior in Gen Z. Based on the NEP scale constructs, there was no significant relationship between Anti-anthropocentrism and the Fragility of natural balance constructs with green behavior of Gen Z. The results of this study imply that Gen-Z has not fully internalized ecological awareness inherent in the NEP scale.

**Keywords:** ecological awareness; Generation Z; green behavior; Indonesia; New Ecological Paradigm.

## INTRODUCTION

Since its publication in 1987, the concept of sustainable development has attracted the attention of researchers and policymakers about the importance of incorporating environmental issues into development. The ongoing international discourse on the environment for sociological researchers, such as Dunlap and Van Liere (1978), believes that an ecologically oriented society continues to change along with the growing public awareness of environmental issues [1]. Therefore, they formulated the New Environmental Paradigm (NEP) to describe their point of view on environmental and development issues. This paradigm also opposes the Dominant Social Paradigm (DSP), which is known to the public as a reflection of the values and beliefs that underpin a free market economy, scientific and technological progress, and unlimited growth and progress. These values, in turn, have given rise to today's environmental problems. On the other hand, the NEP represents the belief that there are unavoidable limits to economic growth and that humans are not above nature but are highly dependent on the ecological balance for survival ([2], [1]).

Regarding NEP, Dunlap and Van Liere (1978) formulated an instrument with 12 statement items that represented a scale for understanding people's attitudes during the transition from DSP to NEP [1]. The

scale assesses the extent to which humans support this new paradigm. They ensure that the NEP scale is reliable, valid, and unidimensional. Since then, this scale has become a global indicator for measuring environmental concerns ([3]). Many studies have tested this NEP scale and found it reliable and accurate for measuring environmental value orientation. Several researchers have used the NEP scale and its original form ([4], [5]), used only part of the NEP scale or revised some statements to reflect the specific focus of their study ([6], [7]). However, contrary to Dunlap and Van Liere [1], most researchers believe the NEP scale could be more dimensional. In response to the criticisms and doubts of these researchers, Dunlap et al. (2000) revised the NEP model into the New Ecological Paradigm (NEP-R). They believed that NEP-R is more consistent and validated in measuring people's attitudes toward the environment[8].

Studies based on the original and revised NEP have documented various approaches to obtaining information about the characteristics of environmental viewpoints. For example, some researchers have applied the NEP scale based on cross-sectional analysis ([9], [10]). Others examine and characterize the distribution of the NEP scale in specific populations ([11], [7]). At the same time, the remainder compared NEP scales across countries or cultures ([6], [12], [13]) and gender ([14], [15], [16]). Previous research has often ruled out specific groups influencing green behavior, such as Generation Z. However, several researchers have examined the relationship between Gen Z and green behavior or pro-environmental behavior on a limited scale ([17], [18]).

The importance of studying green behavior among certain groups, such as Gen-Z or Digital Natives, is due to the large proportion of this generation occupying the world's population, around 32% ([19]). What distinguishes this generation from previous generations is their increasing desire to use environmentally friendly products and their intrinsic motivation to act ecologically friendly. Members of this generation are educated consumers who are well-versed in environmental issues and environmentally friendly products ([20]). Gen-Z is also known as "post-millennials" ([21]). Despite differences of opinion regarding this generational grouping ([22]), the fact is that members of Gen-Z cohorts have now entered secondary school and higher education as young adults ([23]).

The public assumes that Gen-Z will significantly impact environmental behavior, as they will face the most significant environmental challenges in the future. That is why it is so important to do research that considers specific generations. They are a technology-literate, innovative, creative, and educated generation. They are the first generation born in the digital world who live and socialize online ([24]). This community group relies on technology because they are digital natives who have had access to the internet since birth ([25]). Therefore, the internet largely shapes their pro-environmental behavior and fundamental social values. Gen-Z has yet to be considered a separate demographic in the research on pro-environmental behavior. Therefore, this study contributes to the existing research gap. Although foreign researchers ([17], [18]) have explored this area, we believe the determinants of young people's green behavior differ in Indonesia.

According to the 2020 Indonesian population census by the Central Bureau of Statistics (*Badan Pusat Statistik*, 2021), Gen-Z totals 74.9 million, or 27.9%. Gen-Z is currently estimated to be between 10 and 25 years old. In the next seven years, all Gen-Z will be of productive age. The next largest age group is Millennials (26-42 years), with 69.3 million or 25.9%, and Generation X (43-57 years), with 58.7 million or 21.9%. Considering the increasing number of Gen-Z consumers and the shifting trend towards environmentally friendly behavior in Indonesia, this study limits the sample to Gen-Z to answer the following questions:

RQ1: What is the level of Gen Z's endorsement of ecological awareness and Green behavior?

RQ2: Is there a significant association between sociodemographic characteristics and Gen Z's ecological

awareness?

RQ3: Is there a significant association between sociodemographic characteristics and Gen Z's green behavior?

RQ4: Is there a significant relationship between the NEP construct and Gen Z's green behavior?

## LITERATURE REVIEW

### • The New Ecological Paradigm

Critical researchers argue that the modes and relationships of industrial production, distribution, and consumption are responsible for the current environmental crisis (Wilson et al., 2008[26]). The environmental damage is associated with the Western world's tradition of anthropocentric views that spread to all parts of the world and affect how humans view their environment ([27]). According to the anthropocentric view, (i) humans are superior to nature; (ii) Natural resources are abundant and do not need to be conserved. Finally, (iii) Humans, because they have culture and technology, can adapt nature to human goals, not vice versa. Humans adapt to the natural environment ([28]). These beliefs and values reflect the Dominant Social Paradigm (DSP), which has the principle that: (i) belief in unlimited resources, sustainable progress, and the need for growth; (ii) firm belief in the ability of science and technology to solve environmental problems; and (iii) an intense emotional commitment to laissez-faire economics and respect for private property ([29]).

With the increasing sensitivity of society towards the environment, there has been a shift in view from DSP to a more ecocentric New Environmental Paradigm (NEP). The NEP perspective consists of norms and values: (i) high respect for nature; (ii) compassion for other species, fellow humans, and other generations; (iii) careful consideration of planning and actions to avoid risks to humans and nature; (iv) recognition that there are limits to growth within which humans must adapt to their environment; (v) creating a new society characterized by cooperation, openness and participation; and (vi) the emergence of a new consultative and participatory politics that emphasizes foresight and planning ([30]). The NEP, first described by Dunlap and Van Liere in 1978, intends to measure people's awareness of the environment using a survey instrument with 12 statement items. However, various shortcomings color the scale. Then Dunlop et al. (2000) revised the NEP scale by changing the term to the New Ecological Paradigm (NEP-R) by adding three statement items to respond to various criticisms of his thinking[31].

The new ecological paradigm (NEP), as a one-dimensional measure of environmental attitudes, was designed to measure the overall human-environment relationship ([31]). A high NEP score is also associated with a high ecocentric orientation. Thus, NEP represents the acceptance of a set of principles by humans towards nature ([2], [31]). The NEP focuses on five dimensions of people's environmental attitudes: (i) beliefs about humanity; (ii) the ability to disturb nature; (iii) there are limitations to human economic growth and development; (iv) human rights to control the whole nature; (v) rejection of anthropocentrism ([2], [31]). Previous studies have found that this adjustment to the concept of NEP is strongly associated with individual environmental problems ([32]). When discussing the New Ecological Paradigm (NEP) scale, various kinds of literature provide an overview of the variables in the NEP analysis, including applicability, dimensions or subscales, internal consistency, and the relationship of NEP with other variables ([33], 2019[34]). For example, Xiao and Buhrmann ([34]) frame a multifaceted point of view on the NEP concept from internal consistency and multidimensional aspects of scaling to an appreciation of measurable environmental values in focused samples. López-Bonilla and López-Bonilla ([35]) revealed that the revised NEP scale consists of two main directions: ecocentric and anthropocentric. A five-point Likert-type scale measures all items, which assesses reliability with Cronbach's alpha. However, in the literature, it is noted

that the NEP scale is somewhat unstable in various contexts and varies according to the socio- demographic variables of the respondents ([36]). Another controversial feature of the NEP Scale is its dimensions and variability concerning the reported socioeconomic status of the respondents [36].

In a multidimensional study of environmental attitudes in 14 countries, the revised NEP scale found that mean reliability varied among these countries based on ecological perspectives, showing an alpha coefficient between 0.47–0.81 with mean reliability of 0.70 ([33]). In this study, the average NEP Scale scores were reported to range between 3.67 (United States) and 4.11 (Canada), indicating that personal values such as universalism and tradition influence environmental attitudes ([33]). Testing the reliability of the NEP scale implies a Cronbach alpha value of 0.61 and the boundary between anthropocentric and pro-ecological worldviews. However, widespread use of various formats of the NEP scale – including 5-point, 7-point, 10-point, or 12-point Likert scale versions has not been done systematically ([33]). In this study, the format of the NEP scale uses a five-point scale that considers its dimensionality aspect of assessing Gen-Z's values, attitudes, and views on NEP based on gender, education, place of residents, and age.

The NEP scale is one of the most widely used scales to capture the degree of the ecological worldview of the respondents. According to its creator, it should have five subscales ([31]). However, the application of the NEP scale will vary depending on space, time, and group of people. We propose consistency, dimensionality, and applicability of the NEP scale in space (Indonesia), time (2022), and a group of people (Gen-Z). In addition, the NEP scale suffers from a variable reliability index (Cronbach's alpha) because it captures personality characteristics ([31]). Therefore, in this study, we propose developing factor analysis to verify the existence of the five subscales according to their creators ([31]).

### • Green Behavior

In simple terms, many people define *green behavior* as the tendency of consumers to adopt environmentally friendly consumption through consumer demographics and lifestyle. Therefore, consumers need sufficient information about environmental knowledge to help them evaluate green behavior and provide advice on action strategies ([37]). Thus, green behavior is consumer behavior as a manifestation of environmental protection attitudes and actions in the form of accountability for their consumption results to campaign for social and ecological change. A study from Ibtissem ([38]) proves an association exists between knowledge about the impact of altruism, egoism, anthropocentrism, and ecocentrism related to green behavior. Factors contributing to increasing green behavior include awareness of ecological and sustainability issues, increased environmental awareness, and the availability of environmentally friendly alternative energy ([38], [39]). Green behavior is pro-environmental behavior where each minimizes environmental hazards by reducing energy use, reducing waste, saving water, and refraining from buying goods that are considered harmful to the environment. Alias et al. (2013) propose measuring green behavior using knowledge, awareness, attitudes, subjective norms, control behavior, and intentions [40].

Various theorists propose indicators of green behavior from multiple points of view. The following is a summary of the different indicators: altruism, egoism, anthropocentrism, and ecocentrism ([38]); ecological and environmental awareness ([39]); knowledge, understanding, attitudes, subjective norms, behavioral control, and intentions ([40]); attitudes, subjective norms, and self-efficacy ([41]); environmental knowledge, altruism, environmental awareness, environmental awareness, availability of product information and product safety beliefs, views of effectiveness, collectivism, and transparency; and intentions, attention, motives and behavioral control ([42]).

In this study, we define green behavior as behavior in which individuals consciously seek to support environmental conservation efforts in three forms of behavior. First, supportive behavior reflects a willingness to contribute to institutions or individuals engaged in environmental conservation efforts.

Second, active behavior reflects behavior that minimizes the negative impact of their actions on the natural environment, such as avoiding purchasing products that damage the environment, recycling, using non-toxic substances, and reducing household waste. Third, lifestyle behavior manifests in saving and preventing using materials that harm the environment, such as saving electricity, reducing air conditioning, buying products that do not cause pollution, and buying energy-efficient goods.

• **Hypothesis formulation**

The age hypothesis states that younger people are more concerned about environmental damage than older people. Van Liere and Dunlap (1981) note that younger people are more likely to support action against ecological damage than older people. Previous studies evidenced that four of the six attitude scales negatively correlate with age ([43]). In the same conclusion, Arcury and Christianson (1990) proved this age hypothesis by using a modified NEP scale to investigate the rejection of critical environmental experiences (drought) on ecological problems[44]. In their cross-sectional study, Howell and Laska (1992) found that more young people expressed concern about environmental damage than older people [44]. In addition, technological advances have strengthened the notion that age impacts ecological awareness. Eagly and Kulesa (1997) have proven that persuasive calls for recycling through the media impact people’s attitudes and behavior, where young people are more affected than older people [45]. Research by Nord et al. (1998), for example, has recently shown a strong relationship between age and environmental concern [46].

Urban residents care more about the environment than rural residents. The residents are more vulnerable to issues of environmental damage, such as air pollution ([47]). Those living in metropolitan areas are significantly more concerned about the environment than those in provincial cities or the countryside [47]. Howell and Laska’s (1992) report supports this hypothesis, which finds that residential areas became increasingly important in the 1980s as a predictor of positive attitudes toward environmental protection [48].

The relationship between gender and environmental problems is rarely studied ([49]), so the assumption that the relationship between the two is still unclear. Van Liere and Dunlap (1981) note that previous research has yielded ambiguous consistency in the relationship between gender and environmental concern [43]. Arcury and Christianson (1990) found that men care more about the environment than women [44]. This conclusion supports the research of ([50], [51]) that women differ from men in that they express stronger intentions for pro-environmental actions and have stronger beliefs about the detrimental consequences of environmental degradation. Stern et al. (1995) indicated that the difference was primarily due to the difference in values between men and women [51].

Younger and more educated individuals living in urban areas are the most concerned with the environment. However, the formulation of these theoretical conclusions must be cautious. The relationship between socio-demographic factors and environmental problems is generally weak ([52]). There is a tendency for advances in information technology to have resulted in increased concern for the environment ([48]). This increased awareness weakens the link between socio-demographic factors and pro-environmental behavior. Considering that Gen-Z is an age group that has been in the digital world since an early age, we believe that they obtain environmental knowledge through access to information through digital platforms. As a result, demographic characteristics are not a determinant of their endorsement of the NEP and green behavior. Based on this theoretical framework, we propose the following hypotheses:

Hypothesis 1 (H1)	:	There is no significant association between socio-demographic characteristics and Gen-Z endorsement of the New Ecological Paradigm
Hypothesis 1.1 (H1.1)	:	There is no significant association between gender and Gen-Z endorsement of the new ecological paradigm

Hypothesis 1.2 (H1.2) :	There is no significant association between the area of residents and Gen-Z endorsement of the new ecological paradigm
Hypothesis 1.3 (H1.3) :	There is no significant association between age and Gen-Z endorsement of the new ecological paradigm
Hypothesis 1.4 (H1.4) :	There is no significant association between gender and Gen-Z green behavior
Hypothesis 1.5 (H1.5) :	There is no significant association between age and Gen-Z green behavior.
Hypothesis 1.6 (H1.6) :	There is no significant association between the area of the residents and Gen-Z green behavior.

In applying the principles of the NEP, Luo and Deng (2008) focused their research on how environmental attitudes according to the NEP Scale are associated with tourism motivation in the case of China. Respondents who support the notion of development boundaries and are more concerned with potential environmental crises tend to be close to nature and learn about nature [53]. The study of Grůnová et al. ([54]) shows the variance of responses to certain statement items caused by variations based on cultural features, religious viewpoints, perceptions of the human place in nature, and weak awareness of human impacts on natural resources.

Several studies have also examined pro-environmental attitudes based on the conceptualization and operation of the NEP. Taskin (2009), for example, investigates attitudes toward the environment of secondary school students in Turkey [55]. In a similar study, Putrawan (2015) suggests that there are two types of human attitudes toward the environment, namely the Dominance Social Paradigm (DSP) and the New Ecological Paradigm (NEP). According to the author, when humans acquire knowledge about ecosystems, it can change their attitudes toward the natural environment [56]. Putrawan (2015) emphasized that the NEP can be used for the concept of a “New Ecological Paradigm,” not a “New Environmental Paradigm,” because there is an increasing attitude toward the global environment of people moving from anti-ecological to medium-ecological and finally pro-environment [56]. Based on the theoretical framework that describes the relationship between endorsement of the NEP and green behavior, we propose the following hypothesis:

Hypothesis 2 (H2) :	The NEP positively influences Gen-Z green behavior
Hypothesis 2.1 (H2.1) :	The NEP positively influences the supportive behavior dimension of Gen-Z green behavior
Hypothesis 2.2 (H2.2) :	The NEP positively influences the active behavior dimension of Gen-Z green behavior
Hypothesis 2.3 (H2.3) :	The NEP positively influences the lifestyle behavior dimension of Gen-Z green behavior

## MATERIAL AND METHOD

### • Research Participants

The research population of this survey research consists of students from various universities and senior high school students in Bengkulu province, Indonesia, aged between 17-23 years (Table 1). They belong to Gen Z and are studying at university and senior high school. Table 1 illustrates the proportion of respondents based on socio-demographic characteristics, namely gender, age groups, study programs, and area of residents. The data collection method used was a questionnaire that operationalizes the New Ecological Paradigm (NEP) variables and green behavior (GB). Data collection used the Google Form facility involving five graduate students as enumerators and data collection controls from April to

September 2022. The responses were 412 questionnaires, but the current research analyzed 396 questionnaires according to the research objectives and population segments. This study involved 396 Gen-Z, 55.6% males and the rest females. Most of the research participants (61.6%) live in urban areas, and the rest live in rural areas.

Table 1. Characteristics Of Respondents (N: 396)

Characteristics	Category	Frequency	Percentage (%)
Gender	Male	220	55.6
	Female	176	44.4
Age	< 18 years old	82	20.7
	18-22 years old	266	67.2
	22 + years old	48	12,1
Departments	Social sciences	147	37.1
	Teacher’s Training and education	66	16.7
	Mathematics and Natural sciences	52	13.1
	Agriculture	38	9.6
	Engineering	37	9.3
	Economics	41	10.4
	Others <sup>a</sup>	15	3.8
Area of residents	Rural	152	38.4
	Urban	244	61.6

Source: Own work, 2022

Note: <sup>a</sup> including medical and nursing departments

• **Measurements**

This study used a revised NEP scale that included 15 statement items to assess the ecological awareness of Gen-Z. The scale is one of the most widely used and researched methods to measure value, attitudes, and environmental behavior. The current research used the average value of central tendency and frequency analysis to evaluate the distribution of weights. In addition to providing an overview of the percent proportion and average distribution for each item on the scale, this study also used summary indexes. The present study developed two types of summary indexes to obtain the average distribution of the 15 items: (1) Averaging the mean scores of the 15 items to calculate the index’s overall environmental orientation. (2) The frequency distribution index for each column is calculated by averaging the column scores. These summaries aim to provide (a) Gen-Z’s general central tendency score on the mean distribution of the 15 items and (b) general frequency distribution scores of each level 5 of the ordinal measurement scale.

The present study used the Cronbach alpha coefficient ( $\alpha$ ) to evaluate the reliability of the 15-item NEP scale (see Table 2). The reliability of each item should exceed the recommended 0.7 limit point (Hair et al., 2014). In other words, the coefficient measures the extent to which the NEP scale will produce an acceptable score level when given at different times (2022), locations (Indonesia), and populations (Gen-Z). This study used the reliability of the composite construct (CR) and the extracted mean value of variance (AVE) method to evaluate the multi-item scale (Gefen et al., 2000). The CR value must exceed the minimum requirement of 0.60, and the AVE value must exceed the recommended limit point of 0.50 (Hair et al., 2014).

Table 2 and Table 3 describe the items that make up the NEP and the green behavior scale—a scale ranging from 1 to 5 measures each item. Eight odd-numbered items indicate pro-environmental views for the NEP variable, and the rest indicate pro-DSP orientation. For statistical analysis purposes, the authors reversed the scores for these seven items. The score of responses is 5 = strongly agree (SA), 4 = mildly agree (MA), 3 = Unsure (UN), 2 = mildly disagree (MD), and 1 = strongly disagree (SD) both for the NEP and green behavior variables. For the green behavior variable, these 12 variable items refer to the construction of supportive, active, and lifestyle behaviors. Six odd numbers indicate environmentally friendly behavior; the remaining even numbers indicate environmentally unfriendly behavior. We also reversed the scores for these six non-environmentally friendly items for statistical analysis.

## RESULTS

### • Assessing Reliability and Validity

Table 2 and Table 3 illustrate the internal consistency of the NEP scale and green behavior constructs. The NEP’s alpha coefficient ( $\alpha$ ) is 0.778, and the Cronbach item alpha coefficient ranges from 0.743 to 0.814 (Table 3). Meanwhile, the green behavior variable’s Cronbach alpha coefficient ( $\alpha$ ) is 0.826, and the coefficients for each item range from 0.804 to 0.847 (Table 4). Thus, the reliability of each item is high because it exceeds the recommended cut-off point of 0.70. This study also used the composite construct (CR) reliability to evaluate the multi-item scale ([57]).

The current research found that the CR values for the NEP construct ranged from 0.631 to 0.776, and for the green behavior construct ranged from 0.590 to 0.783, exceeding the minimum requirement of 0.60. Meanwhile, all extracted variance average values (AVE) of the NEP constructs ranged between 0.589 and 0.732, and for the green behavior, they went from 0.510 to 0.686, exceeding the suggested cut-off point of 0.50.

Table 2. Reliability And Validity Testing Of The Nep Scale

Constructs	Items	Cronbach’s Alpha		CR <sup>a</sup>	AVE <sup>b</sup>	SD <sup>c</sup>	SE <sup>d</sup>
		Items	Constructs				
New Ecological Paradigm		.778					
<i>Reality to limits of growth</i>	1	.744				1.213	.061
	6	.742	.649	.748	.705	1.455	.073
	11	.743				1.290	.065
<i>Anti-anthropocentrism</i>	2	.760				1.269	.064
	7	.758	.709	.666	.632	1.208	.061
	12	.758				1.405	.071
<i>Fragility of nature’s balance</i>	3	.760				1.247	.063
	8	.782	.658	.631	.598	1.396	.070
	13	.758				1.196	.060
<i>Anti-exceptionalism</i>	4	.762				1.290	.065
	9	.756	.817	.776	.732	1.186	.060
	14	.762				1.060	.053
<i>Possibility of an eco-crisis</i>	5	.763				1.289	.065



	10	.783	.606	.653	.589	1.339	.067
	15	.760				1.398	.070

Note:

<sup>a</sup> Composite construction reliability

<sup>b</sup> Average Variance Extracted

<sup>c</sup> Std. Deviation

<sup>d</sup> Std.Error Mean

Table 3. Reliability And Validity Testing Of The Green Behaviour Scale

Constructs	Items	Cronbach's Alpha		CR <sup>a</sup>	AVE <sup>b</sup>	SD <sup>c</sup>	SE <sup>d</sup>
		Items	Constructs				
Green Behavior		.826					
<i>Supportive behavior</i>	1	.817	.634	.590	.510	1.130	.057
	2	.817				1.343	.067
	3	.837				1.309	.066
	4	.835				1.365	.069
<i>Active behavior</i>	5	.818	.845	.783	.686	1.110	.056
	6	.806				1.276	.064
	7	.804				1.199	.060
	8	.809				1.251	.063
<i>Lifestyle behavior</i>	9	.827	.684	.624	.530	1.284	.065
	10	.814				1.283	.064
	11	.805				1.197	.060
	12	.847				1.235	.062

Note:

<sup>a</sup> Composite construction reliability

<sup>b</sup> Average Variance Extracted

<sup>c</sup> Std. Deviation

<sup>d</sup> Std.Error Mean

• **Ecological Worldview of Gen-Z**

Table 4 describes the environmental view of Gen-Z in the form of scores and indexes of the NEP scores. We divided the direction of respondents' endorsements into two parts: the odd number of items (eight items) represented the pro-NEP view, and the remainder (seven items) belonged to the DSP direction. After being corrected, the average score for the eight pro-NEP items is 3.65 (out of a possible five). It indicates that overall student orientation falls in a middle rank if the score is categorized into three levels: Low (1.00 to 2.32), medium (2.33 to 3.66), and high (3.67 to 5.00). After being corrected, the average score for the seven

pro-DSP items is 3.38 (out of five possible) or in the middle category.

The frequency and mean distribution of the NEP scale items reflect three trends: negative, ambivalent, and positive directions. Overall, Table 4 illustrates that the majority of Gen-Z (61.5%) have pro-NEP views, even though there are still 19.9% who do not agree with these views, and the rest are ambivalent. On the other hand, 39.4% of this generation also have pro-DSP-oriented ideas to varying degrees (positive thoughts), while 43.0% have negative directions, and the rest are ambivalent. Furthermore, 18.6% of Gen-Z still respond ambivalently to the pro-NEP items, and 16.7% are uncertain to pro-DSP items. This figure shows that Gen-Z has not yet fully adopted the NEP. This generation approves of some of the NEP orientations while disapproving of other parts.

Table 4. Frequency And Mean Distribution Of The Nep Scale Items<sup>a</sup> (N= 396)

Items Statements	% distribution					M <sup>b</sup>
	SD	MD	UN	MA	SA	
1. We are approaching the limit of the number of people the earth can support.	4.5	13.4	16.4	26.5	39.1	3.82
2. The Earth has plenty of natural resources if we just learn how to develop them.	27.0	21.7	14.1	20.7	16.4	2.78
3. The Earth is like a spaceship with very limited room and resources.	8.3	14.4	21.2	24.7	31.3	3.56
4. Humans have the right to modify the natural environment to suit their needs.	30.6	26.3	17.4	5.8	19.9	3.43
5. Plants and animals have as much right as humans to exist.	5.3	13.4	22.0	26.8	32.6	3.68
6. Humans were meant to rule over the rest of nature.	29.7	25.3	13.1	15.2	16.7	2.67
7. When humans interfere with nature it often produces disastrous consequences.	5.3	15.2	16.9	25.8	36.9	3.74
8. The balance of nature is strong enough to cope with the impacts of modern industrial nations.	21.5	21.0	15.2	27.3	15.2	3.68
9. The balance of nature is very delicate and easily upset.	6.3	10.4	16.2	33.8	33.3	3.59
10. Human ingenuity will ensure that we do not make the earth unlivable.	7.8	21.5	16.4	28.5	25.8	3.55
11. Despite our special abilities, humans are still subject to the laws of nature.	7.6	11.6	18.4	38.6	23.7	3.59
12. Humans will eventually learn enough about how nature works to be able to control it.	3.8	8.3	23.2	37.4	27.3	3.76
13. Humans are severely abusing the environment.	8.6	11.1	20.5	25.0	34.8	3.66
14. The so-called "ecological crisis" facing humankind has been greatly exaggerated.	26.8	30.1	17.2	9.8	9.8	3.76
15. If things continue on their present course, we will soon experience a major ecological catastrophe.	14.1	9.6	16.9	26.3	33.1	3.55
NEP(Ecocentrism)	7.5	12.4	18.6	28.4	33.1	3.65

<sup>a</sup>SD = Strongly disagree, MD = Mildly disagree, UN = Unsure, MA = Mildly agree, SA = Strongly agree

<sup>b</sup>Mean Likert scores after adjustment for direction. Higher score indicates pro-NEP worldview

• **Green behaviour of Gen-Z**

The green behavior scale consists of supportive, active, and lifestyle behavior dimensions, which consist of 12 question items, where six odd-numbered items connote pro-green behavior, and the remaining six connote environmentally unfriendly behavior. For the needs of statistical analysis, even-numbered items are computed inversely with the direction of the response given by the respondent. The study divided the frequency and mean distribution of green behavior variables into three trends: positive (MA and SA), negative (SD and MD), and ambivalent (UN) directions for pro-green behavior. On the other hand, the response tendency for items that are not pro-environmentally friendly behaves in the opposite direction: positive (SD and MD), ambivalent (UN), and hostile directions (MA and SA). Table 5 illustrates Gen-Z’s frequency and mean distribution of green behavior.

Based on the average response to the scale items, 53.7% of Gen-Z tend to favor the statement of pro-green behavior, although 22.7% oppose it. However, 23.6% of respondents have an ambivalent position. Overall, individuals’ endorsement of green behavior among Gen-Z is at a reasonably good level, indicated by more than half of respondents’ pro-green behavior, with almost the same proportion also being hostile toward anti-green behavior

Table 5. Frequency And Mean Distribution Of The Green Behavior (N=396)

Items Statements	% distribution					M <sup>b</sup>
	SD	MD	UN	MA	SA	
<i>Supportive behavior</i>						
1. If I have extra money, I don’t hesitate to donate to environmental organizations.	4.3	3.5	31.3	32.1	28.8	3.77
2. I rarely get involved in environmental groups because I am not interested in environmental issues.	18.9	32.6	26.5	14.2	7.8	2.59
3. I often remind my colleagues about the consequences of ecological crises for future generations.	8.8	9.6	8.1	33.8	39.6	3.86
4. I prefer not to get involved in any issues related to the environment.	21.2	37.6	19.4	11.9	9.8	2.52
<i>Active behavior</i>						
5. If possible, I prefer to buy products in reusable packaging.	5.1	5.8	22.2	41.7	25.3	3.76
6. I find it challenging to switch from certain products even though I know they are not environmentally friendly.	26.3	26.0	25.8	5.8	16.2	2.60
7. Under challenging conditions, I try to support the environmental conservation activities of my colleagues.	5.8	10.9	15.9	32.3	35.1	3.80
8. I have convinced my family or friends not to get involved in environmental and development policy protests.	18.9	24.2	33.6	16.4	6.8	2.68
<i>Lifestyle behavior</i>						
9. I prefer to buy products packaged in paper rather than plastic.	17.7	12.6	6.80	21.0	41.9	3.57
10. I don’t think it’s necessary to replace a light bulb even though a new bulb is more energy efficient.	28.3	17.9	28.3	20.2	5.3	2.56
11. I provide separate organic and inorganic waste disposal containers.	5.3	18.9	34.1	19.9	21.7	3.34
12. I buy products without checking whether they are labeled as environmentally friendly or not.	45.5	25.0	7.8	16.9	4.8	2.11

<i>Overall pro-green behavior</i>	8.5	14.2	23.6	27.2	26.5	2.51
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Note:

<sup>a</sup>SD = Strongly disagree, MD = Mildly disagree, UN = Unsure, MA = Mildly agree, SA = Strongly agree;

<sup>b</sup>Mean Likert scores after adjustment for direction.

<sup>c</sup>Pro-Green behavior index for frequency distributions was calculated by allowing for the reversed direction of even-numbered items.

• **Testing hypotheses**

This study hypothesizes that there is no association between socio-demographic characteristics and endorsement of NEP among Gen-Z (Table 6). The socio-demographic characteristics include gender, area of residents (urban and rural), and age. The present study found no association between gender and endorsement of the NEP. However, the current research revealed an association between the area of residents and age with Gen-Z endorsement of the NEP. This result also rejects the research hypothesis.

Table 6. Association Between Socio-Demographic Characteristics And The Endorsement Of The Nep

Hyphoteses	X <sup>2</sup>	df	Asym.sig (2-side)*	Conclusions
1. There is no asossociation between gender and the endorsement of the NEP	54.398	53	.421	Supported
2. There is no asossociation between area of residents and the endorsement of the NEP	80.508	53	.009	Not supported
3. There is no asossociation between age and the endorsement of the NEP	143.612	106	.009	Not supported

Note: \*Significant with X<sup>2</sup> value < .05

Meanwhile, the computational results show no association between socio-demographic characteristics and Gen-Z green behavior (Table 7). These results also support the research hypothesis. This finding indicates that the green behavior of Gen-Z or digital natives is in a borderless world, where environmentally friendly behavior does not depend on the characteristics of the problem, such as gender, age, and area of the residents. Cyberspace has provided so much information regarding green behavior as a lifestyle for this generation. Individuals can access information without being limited by gender, age, or area of residence (rural and urban).

Table 7. Association Between Socio-Demographic Characteristics And Gen-Z Green Behavior

Hyphoteses	X <sup>2</sup>	df	Asym.sig (2-side)*	Conclusions
1. There is no significant association between gender and Gen-Z green behavior.	49.928	38	.093	Supported
2. There is no significant association between age and the Gen-Z green behavior.	91.719	76	.106	Supported

3. There is no significant association between area of the residents and Gen-Z green behavior.	51.052	38	.077	Supported
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Note: \*Significant with  $X^2$  value < .05

The recent study employed the Pearson correlation coefficient to examine the correlation between the dimensions of the NEP variable and green behavior (GB). The formulation of the hypothesis of this study is that there is a significant relationship between NEP and green behavior. The computational results showed that overall, there is a significant relationship between Gen-Z’s endorsement of the NEP and their green behavior ( $r = 0.314$ ) at a significance level of 0.01 (2-tailed). However, when we computed the inter-dimensional variables, some NEP dimensions were not significantly related to the green behavior dimension. For example, the dimensions of reality to limits of growth, anti-anthropocentrism, and fragility of nature’s balance were not significantly associated with the dimensions of supportive behavior (SB). The dimensions of Anti-anthropocentrism and the fragility of nature’s balance were not related to active behavior (AB). Likewise, the Anti-anthropocentrism and Fragility of nature’s balance dimensions did not correlate with lifestyle behavior (LB) and green behavior (GB) variables (Table 8). In other words, an individual’s endorsement of anti-anthropocentrism and the fragility of nature’s balance was not associated with the level of individual green behavior, either supportive, active, or lifestyle behaviors.

Table 8. Pearson Correlation Coefficient Between Nep Constructs And The Green Behavior (N= 396)

Constructs	RG	AA	AE	FB	PC	SB	AB	LB	NEP	GB
Reality to limits of growth (RG)	1									
Anti-anthropocentrism (AA)	.638**	1								
Anti-exceptionalism (AE)	.160**	.116*	1							
Fragility of nature’s balance (FB)	.373**	.101*	.120*	1						
Possibility of an eco-crisis (PC)	.190**	.059	.317**	.090	1					
Supportive Behavior (SB)	.078	.010	.256**	.049	.177**	1				
Active Behavior (AB)	.132**	.037	.392**	.061	.340**	.521**	1			
Lifestyle Behavior (LB)	.106*	.091	.250**	.027	.108*	.353**	.546**	1		
NEP	.711**	.416**	.589**	.316**	.611**	.214**	.346**	.197**	1	
GREEN BEHAVIOR (GB)	.132**	.059	.373**	.056	.259**	.750**	.861**	.803**	.314**	1

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).

## GENERAL DISCUSSION

The primary concerns in this study revolve around examining the reliability, dimensions, and applicability of the NEP to environmentally conscious behavior. Initially, we assessed potential common bias in our research variables using the common bias method (CMB). Results indicate that the variance extracted on the NEP scale is 18.3%, and for environmentally friendly behavior, it is 30.1%, which falls below Fuller's recommended threshold of 50%, indicating susceptibility to common bias. This proportion is lower than Fuller's (2016) recommendation value of 50%, which means this research is accessible from the issue of common bias [57]. To mitigate this, a quality control test was conducted on 10% of respondents through direct interviews to ensure response standards were met. Additionally, non-participatory observations were carried out on selected respondents to better understand their daily environmentally friendly behavior. Meanwhile, Cronbach's alpha coefficient ( $\alpha$ ) indicates a number exceeding the expected limit point of 0.70. Likewise, the composite reliability for evaluating multi-item scales exceeds the required value limit of 0.50 confirming the suitability of applying the NEP scale to Gen-Z's environmental awareness behavior.

Supporting the results of previous studies ([58], [59], [16]), the results of this study indicate that the majority of Gen-Z (63.5%) are pro-NEP, and 18.2% anti-NEP. On the other hand, 38.9% have pro-DSP views to varying degrees. However, about 17% of Gen-Z are ambivalent towards the NEP idea, and 14% are in the same position towards the DSP idea. These findings indicate that the diffusion of the NEP among Gen-Z is still relatively weak. The current study found that the NEP scale has more than one dimension, and the researchers must evaluate each dimension separately to assess pro-environmental behavior. The findings support previous studies ([60], [59], [15], [16]). Regarding the dimensionality aspect of NEP, the present study discovered four loading components in line with previous studies ([20], [59]). Component one can explain the dimensions of Reality to the limits of growth and Anti-anthropocentrism. Component two describes Anti-exceptionalism. The third component explains the Fragility of nature's balance, and the fourth component presents the Possibility of an eco-crisis.

The second issue of the present study is whether the socio-demographic characteristics of Gen-Z are associated with the endorsement of the NEP. The study shows no association between gender and the endorsement of the NEP among Gen-Z. This finding contradicts previous studies ([50],[51]) that there is an association between gender and environmental awareness. Women differ from men because they express stronger intentions for pro-environmental actions and have stronger beliefs about the detrimental consequences of environmental degradation. The present study found an association between age and the endorsement of the NEP. These findings support previous studies ([44], [45], [48], [46]). In addition, the present study also revealed an association between the area of residents and Gen-Z's endorsement of the NEP. The finding is in line with the work of Fransson and Garling (1999[47]), Arcury and Christianson ([44]), and Howell and Laska ([48]). However, there is no association between socio-demographic characteristics and Gen-Z green behavior. These findings align with the work of ([52], [61]) that the relationship between socio-demographic factors and environmental problems is generally weak. There is a tendency for advances in information technology to have resulted in increased concern for the environment ([48]).

The third issue of this study is whether Gen-Z's endorsement of the NEP is significantly associated with their green behavior. The present study discovered that endorsement of the NEP is positively and significantly associated with Gen-Z green behavior. The findings of this study are in line with several previous studies showing that NEP is significantly associated with behavioral intentions and various pro-environmental behaviors ([62],[63],[64],[16]). NEP significantly and positively influences pro-environmental behavior in general and green behavior in particular. The regression analysis has proven that the five dimensions of NEP simultaneously affect the green behavior variable. However, when the authors

analyze the correlation between constructs, the current study finds no association between Anti-exceptionalism and Fragility of nature's balance dimensions, both with green behavior variables and supportive, active, and lifestyle behaviors dimensions. Thus, these two dimensions may not be considered predictors to assess the context of Gen-Z's green behavior.

The fourth issue is whether demographic characteristics are associated with endorsing the NEP Gen-Z. From the computational results, we did not find any association between demographic characteristics such as gender, area of residence, education level, and age group with the level of endorsement of the NEP Gen-Z. This finding aligns with several previous studies that found that demographic characteristics tend to be unclearly related to endorsement of the NEP, even though some studies are weak ([52]). The current study's findings also contradict the results of Ntanos et al. ([33]), which found that respondents' high NEP scores correlated with their region of residence. This study's results align with the opinion that the NEP Scale is unstable in various contexts and varies regarding the socio-demographic variables of the respondents ([65]).

## CONCLUSION

In short, NEP represents high-level beliefs about human-environment relations and how humans build harmonious relationships with nature. NEP represents overarching beliefs about the world we live. Whether we call them higher-order or more basic ecological beliefs, the NEP dimension represents our perception of how humans should relate to nature. Ecological beliefs for Gen-Z may differ from other age groups due to their social environment. They are a technology-literate, innovative, creative, and educated generation. They are the first generation born in the digital world who live and socialize online and can access information resources related to environmental issues. Their world is a world without boundaries. Therefore, demographic barriers have little effect on their pro-environmental behavior.

Finally, this study has limitations, primarily related to applying the NEP scale to analyze Gen-Z's pro-environmental behavior (green behavior), considering that the intensity of the endorsement of the NEP is very complex. The variables influencing the decision to endorse someone are not limited to the NEP dimension. Environmental value orientation factors and environmental awareness will determine the decision to behave pro-environmentally. In addition, analyzing the influence of the touch of mass media becomes an essential factor that directly influences pro-environmental or anti-environment decisions. Therefore, future research should focus on analyzing the influence of mass media's touch on Gen-Z's environmental behavior. Meanwhile, researchers can rule out situational factors such as demographic characteristics.

## ACKNOWLEDGMENT

I thank the Dean of the Faculty of Social and Political Sciences, Bengkulu University, for his support in completing this research. Likewise, we would like to thank the Center for Research and Community Service Team for their review of the research proposal and results.

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