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Article

New environmental paradigm, environmental attitude, and proenvironmental behaviour as antecedents of environmental sustainability

New Environmental Paradigm, Environmental Attitude, and Proenvironmental Behaviour as Antecedents of Environmental Sustainability

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ABSTRACT

Environmental sustainability (ES) requires conducting business activities by causing the least harm to the environment. Care and caution must be exercised to see that natural resources are not depleted and that environmental assets are preserved for posterity. ES is a precondition for sustained economic growth, requiring integrated multi-disciplinary knowledge and decision-making. Using structural equation modelling (SEM), the study examined a few antecedents of ES. The antecedent variables examined include environmental attitude, new environmental paradigm, and pro-environmental behaviour. The data for the study was collected online from 453 gainfully employed samples from Saudi Arabia using three structured questionnaires. All the questionnaires had robust reliability and validity. SEM analysis revealed a significant positive relationship between the identified variables ad ES. The study has various theoretical and practical implications, which are discussed. It is expected that the present study will motivate social scientists to involve in further examinations of similar nature.

Keywords: Environmental Attitude, Environmental Austainability, New Environmental Paradigm, Pro-environmental Behaviour, Structural Equation Modelling
JEL Classifications: Q01, Q54, Q56, Q57

1. INTRODUCTION

Environmental concerns have evolved into a common survival dilemma for people globally in today's global ecological crises. As a result, sustainability and sustainable development are now the buzzwords. Therefore, understanding how people view the sustainability of natural ecology is necessary for protecting the environment. Promoting and measuring public pro-environmental behaviour (PB) is the stepping stone to attaining environmental sustainability (ES). This behavior is mainly derived from human altruistic values, which in some communities arise from traditional anthropogenic concerns. This trend toward environmentalism and pro-environmental attitude has compelled decision-makers and management professionals to adopt appropriate practices that help achieve sustainability (Hameed et al., 2021). Further, organizations are under enormous pressure to take significant measures to achieve sustainability by abiding by different international treaties and accords due to increased environmental awareness among many stakeholders (Chang et al., 2019). Hence, there is a definite need to examine how pro-environmental attitudes, behaviours, and culture influence environmental outcomes and achieve sustainability. With the world facing enormous challenges, proper PBs are the only remedy, as such attitudes and behaviors help deal with the adverse effects of pollution and ecological degradation.

Though examining such behaviours is essential across the population, it is all the more important in Asia, the world's most populous part (WEPA, 2018). The Middle East region, particularly, has experienced significant increases in pollution levels due to economic growth. Examining potential behaviorus that promote

pro-environmental attitudes can help identify ecological problems and provide remedies that could facilitate sustainability (Dunlap, 2008; Sulphey and Safeer, 2017; Sulphey, 2019). The present study highlights how certain behaviours could impact sustainability which is essential to maintain the ecological balance. Though various factors were found to influence sustainability, the psychological antecedents are still under-researched. The study, therefore, identifies the indispensability of certain behavours that could foster sustainability, which is critical for dealing with and solving ecological issues. Against this milieu, the study's objectives include identifying the relationship between a few attitudes that could be antecedents of sustainability. The attitudes examined in the study include the new environmental paradigm (NEP), Environmental attitude, and PB. The NEP provides direction for creating efficient environmental protection measures and adopting efficient environmental protection practices (Wang and Sun, 2021). The study's importance stems from the fact that, despite the wealth of literature on the causes of sustainability, it is unclear what drives this behavior. In addition, existing literature suggests a lack of studies identifying the antecedents of sustainability. Furthermore, no previous research in this fascinating field has been done in Saudi Arabia, where this study is being conducted. By identifying factors that explain the psychology of sustainability among the Saudi population, this study is anticipated to add to the body of literature.

2. LITERATURE REVIEW

The theoretical and empirical literature that has been gathered in the pertinent domains is reviewed in this section. The theoretical foundations are presented in the first section, followed by the empirical evidence about the identified variables.

2.1. Theoretical Underpinnings

Social scientists believe that a single or general theory of environmentalism may not address environmental behavioiur. Reviews suggest the need to have a multidimensional view to discuss environmental and sustainable behaviours (Jackson, 2005; Stern, 2000). Usually, environmental behaviours are studied against the backdrop of two types of attitudes, the Dominance Social Paradigm (DSP) and the NEP. DSP is identified as an anthropocentric approach, which proposes that the environment can be exploited as it could recover itself. DSP proposes that natural resources are infinite and can cover human needs (Putrawan, 2015). NEP, on the other hand, is opposite to DSP. According to NEP, human beings are inseparable from the ecosystem, and natural resources are limited and hence need to be utilized with control. Furthermore, all components of the ecosystems, including humans and other living beings, are interrelated. As such, destroying one ecosystem component could result in overall deterioration. As humans gain additional knowledge about ecosystems, there can be drastic changes in their attitude toward the environment.

The Value-Belief-Norm (VBN) Theory, which links and expands the Value-based theory (Stern and Dietz, 1994), the NEP perspective (Stern et al., 1995), and the Norm-activation theory (Schwartz, 1977), explains PB lucidly (Stern 2000). Tian and Liu (2022) opines that the theory presents the causal chain of

five variables contributing to the generation of environmentally favourable behaviors. They include values, the NEP, awareness of adverse consequences, the ascription of responsibility, and personal pro-environmental norms. Each variable impacts the next one or could directly impact other variables in the chain (Steg et al., 2005). Hence, many social scientists have applied the VBN theory (Stern, 2000; Tian and Liu, 2022; Whitley et al., 2016), and it is one of the most important theoretical foundations of pro-environmental behavior.

Though there are volumes of literature about sustainability, studies have overlooked the significant roles played by the identified variables. Despite the multiple advantages of implementing sustainability, organizations are often slow to respond (Yong et al., 2019). Further, there is a broad disparity between profitability and ES, which needs to be bridged. One of the theories that help address this gap is the Stakeholder theory (Freeman et al., 2018). The theory encourages constructive, mutually beneficial contact between various stakeholders, including the larger environment (Ranangen, 2015). It also underlines the necessity of giving the environment the respect it deserves, as all necessary resources are extracted, which causes adverse ecological issues, environmental problems, and consequential global warming (Barney and Harrison, 2020). Thus, stakeholder theory facilitates a shared vision and alignment of different organizational objectives with ES (Ogbeibu et al., 2020).

Kollmuss and Agyeman (2002) identified three factors that facilitate PBs. They are the demographics of the employee and internal and external factors. Demographic factors include age, gender, locale residency, and educational levels. Employee motivation, environmental consciousness, personal beliefs and attitudes, and locus of control are examples of internal influences. In addition, organizational structure and the broader economic, social, and cultural environment may be considered external variables. The discussion, aligning with Wilson and Chatterton (2011), proposes that environmental behaviour must be examined against multiple specialties and not a single theoretical model. Such multi-specialty strategies could facilitate environmental behavior activities at different organizational levels. Further, environmentally friendly and sustainable behavior could be promoted by implementing interventions like financial incentives, regulations, and community transformation.

2.2. New Ecological Paradigm (NEP)

The NEP is a measure of environmental attitudes that aids in examining how people and the environment interact (Dunlap et al., 2000). It is centered on the idea that human beings have the power to upset the natural order, the limits to human growth, and the humans right to dominate the rest of nature (Dunlap et al., 2000). The NEP conceptualization emerged based on literature from the late 1970s and early 1980s, which presented the dichotomy between the developing environmental and dominant social paradigms (Olsen et al., 1992). However, the earlier dominant social paradigm (DSP) has also contributed to the emergence of NEP (Dunlap et al., 2000).

NEP has applications across disciplines. For instance, political scientists identified NEP as the core element in any comprehensive

environmental belief system (Dalton et al., 1999; Hawcroft and Milfont, 2010). Xiao and Buhrmann (2017), under the broad framework of consistency and dimensionality, presented a comprehensive picture of NEP. According to their conceptualization, NEP involves the idea that certain economic factors constrain growth and that ecological balance has primacy over human power concerning nature. NEP reveals multiple ecological opinions and environmental objects to validate global environmental concerns and issues. Under the broad conceptualization of NEP, social scientists identified the determining role of ecocentrism and anthropocentrism on environmentalism (López-Bonilla and López-Bonilla, 2015). The ecocentric view assumes that individuals understand the intrinsic value of nature, its potential for the common good, and the necessity to protect it. On the other hand, the anthropocentric view is that humans can control nature and balance off the negative impacts caused by the human developmental process.

The joint theoretical framework of "VBN" and the "modified-norm-activation-model" describes NEP (Park et al., 2018). The intricate process of making environmental decisions aids in assessing behavioral control, personal norms, and pro-environmental behavioral intents. According to this theoretical framework, the elements that encourage environmental behaviors are proactivity, accountability, social and individual standards, and environmental prudence. In addition, a high score in NEP is related to a high level of ecocentric orientation (Dunlap et al., 2000). Furthermore, over and above the egoistically attributed advantages of social power and wealth, these intentions and behaviors get strengthened to generate strong biospheric and altruistic values based on ecological consciousness (Ntanos et al., 2019). Thus, this integrative model presents the high predictive power of NEP on pro-environmental intentions and behaviours. Based on this, it is hypothesized that NEP has a significant positive relationship with PB (H1).

2.3. Environmental Attitude (EnA)

Environmental attitude is a critical aspect of environmental psychology, as it directly relates to pro-environmental behaivour. According to Hawcroft and Milfont (2010), EnA is the evaluation of nature in the backdrop of favors or disfavors derived from the environment. There is no dearth of studies regarding understanding environmental attitudes and behaviors. The findings point out that though societal and environmental attitudes are reasonably well developed, most associated behaviors are influenced by economic concerns (Imandoust and Gadam, 2007; Chien and Shih, 2007). The influences of psychology and societal ideas and values on environmental attitudes and behaviors were studied by Steel (1996) and Dunlap et al. (2000).

Empirical evidence suggests that women's attitudes and behaviors toward environmental protection were more developed than men's. According to Robertson and Burdge (1998), urban dwellers are more concerned with environmental issues than those living in rural areas. Further, people living in rural areas are less concerned about environmental issues (Müderrisoglu and Altanlar, 2010). Cary (1993) identified that the attitudes and behaviors about environmental problems varied according to the distance from the issue. Tehrani et al. (2009, 2010) found that education changed environmental attitudes and behaviors.

2.4. PB

Humans are in constant interaction with the environment. Therefore, virtually all human interactions could be categorized as environmental behavior. In a restricted sense, environmental behavior, or "environmentally relevant behaviour" is any conduct that significantly impacts the environment. Such behaviour could be intentional or unintentional. For example, when individuals, out of their sensitivity, realizes the environmental impact of their action, it is known as intentional environmental behavior. Alternatively, when an individual does not realize the impact of their behavior, it is called unintentional. Based on the environmental impact of the behaviour, it can be identified as pro-environmental or otherwise.

PB is a complex behaviour investigated in Environmental Psychology since the 1960s (Hines et al., 1987), identified against a particular society as a protective method that can contribute towards a healthy environment. Mesmer-Magnus et al. (2012: p. 160) defined PB as:

> "individual behaviors contributing to ES (such as limiting energy consumption, avoiding waste, recycling, and environmental activism."

According to Sara (2014), PB involves behaviors promoting positive environmental changes and limiting the adverse effects of human negligence. It involves human conduct, like reducing wastage and saving energy and water, which leads to the preservation of the environment. It refers to all actions that lessen the negative environmental impact and alter the environment (Stern, 2000; Kollmuss and Agyeman, 2002). Increased PB would encourage the adoption of cleaner manufacturing techniques and reduce wastage. As a result, there would be resource and energy conservation, and the environment would not be negatively affected, preserving the environmental quality (Suganthi, 2019). PB entails a paradigm shift in behavior in favor of embracing environmentally friendly actions and forming optimistic attitudes that help promote and achieve sustainable development (Mtutu and Thondhlana, 2016). Multiple studies have empirically examined the relationship between EnA and PB (Bai et al., 2017; Kousar et al., 2022). They have evidenced a relationship between the two constructs. Another study by Si et al. (2022) found that EnA has a positive relationship with PB. Hence H2 is formulated as *There is a significant positive relationship between Environmental awareness and* PB.

2.5. ES

ES can be attained, and tangible gains accrued only through a shift in the fundamental attitudes towards sustainable development. ES is the conduct of business activities without causing harm to natural resources. It involves maintaining environmental assets and not depleting resources. The concept is still evolving, and social scientists have proposed definitions based on their respective areas of expertise. Patzelt and Shepherd (2011, p. 637) defined ES as:

> "the improvement of conditions of the natural environment – [which] is an important development goal in societies that are confronted with poor air quality and drinking

water, over exploited soil and aquatic habitats, declining forests, and other diminished natural resources."

It is also defined as the "condition of balance, resilience, and interconnectedness" that permits societies to satisfy the present needs while not exceeding the available ecosystem capacity and continue regenerating it in the future (Morelli, 2011, p. 5). Understanding and dealing with ES requires integrated multi-disciplinary knowledge and decision-making. Further, Goodland and Daly (1995) identified a strong linkage between economic and ES, which is also an essential precondition for sustained economic growth.

ES sustains global life-support systems, preserving natural resources and biodiversity for the future, and avoids any activity destabilizing the ecosystem (Goodland, 1995). It is a persistent social issue that helps develop economies within the limits of the natural environment (Ones et al., 2015), achievable by combining preventive and restorative actions. It helps to address various environmental challenges and issues. Individual PBs and actions play a vital role in achieving ES. Authors have identified ES to include Proactively and Passive ES. The first category includes those who lead proactive lives. Their consuming habits have less of an influence on the environment. The latter describes people who passively exhibit ES. These people lack the finances and mean to consume since they consume less and have less environmental impact. Studies have identified behaviours like environmental knowledge, pro-ecological attitudes, frugality, altruism, and equitability as antecedents of ES (Bamberg and Moser, 2007; Bragagnolo et al., 2016; Corral-Verdugo et al., 2009; Sulphey and Faisal, 2021). Based on the above discussions, the following hypotheses are formulated for the study:

- H3: New economic paradigm has a significant positive relationship with ES
- H4: Environmental awareness has a significant positive relationship with enivironmental sustainability
- H5: Proenvironmental behaviour has a significant positive relationship with ES.

Based on the five hypotheses formulated for the study, a model is proposed, which is presented in Figure 1.

3. DATA AND METHODOLOGY

The study used a quantitative, questionnaire-based survey to address the research questions. The respondents were assured confidentiality and anonymity of their responses. Further, the

Figure 1: Proposed model
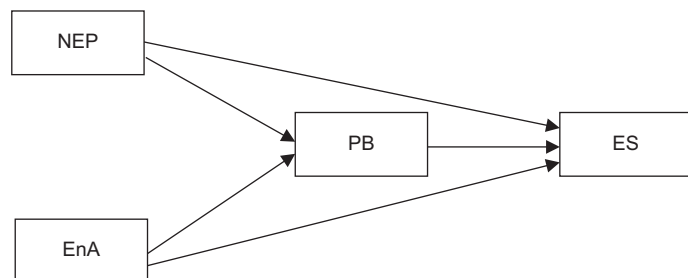
questionnaire had no identifying questions. Hence the ethical requirements for the study are met. As the independent and dependent variables were measured simultaneously, care had to be taken to avoid issues related to Common method variance (CMV) (Podsakoff et al., 2012). The study collected data in two stretches, with a time lag of 30 days. The data collection process consumed over 2 months. In addition, the items pertaining to different variables were shuffled, and a few dummy items were included. The study also used Harman's single-factor test, as Podsakoff et al. (2012) proposed. It was discovered that only 43.80% of the variance was attributed to a single factor, which is substantially less than the required figure of 50% (Podsakoff et al., 2012). These elements support the denial of CMV.

3.1. Scales Used
The study used the following standardized and validated scales to collect the required data.
(1) New Ecological paradigm (NEP): The eight-item scale developed by Dunlap et al. (2000) was used to measure NEP. This scale is the revised form of the NEP *Scale* developed by Dunlap and Van Liere in 1978. The revised version has improved the original version in several aspects, like tapping a more comprehensive range of ecological worldviews and avoiding outdated terminologies. This questionnaire is a widely and longitudinally used instrument, which is standardized and enjoys transparency (Dunlap et al., 2020). It has four factors (Ecological limits, Balance of nature, Human domination, and Ecological catastrophe) on a five-point scale. Sample items include "*We are approaching the limit of the number of people the earth can support*" and "*Humans are severely abusing the environment.*" This revised scale has a higher internal consistency (0.83) than the earlier version.
(2) Environmental attitude (EnA): The questionnaire developed and standardized by Müderrisoglu and Altanlar (2011) was used to measure Environmental attitude. The questionnaire has three factors – Ecocentric (six items), Technocentric (four items), and Dualcentric attitudes (four items). Ecocentric considers that the ecosystem is fragile and humans negatively impact it. The Technocentric attitude considers that technology can be used to solve environmental issues. Finally, the Dualcentric attitude identifies a symbiotic relationship between humans and beings. Sample items include "*Humans are severely abusing the environment*" and "*Plants and animals have as much right as humans to exist.*"
(3) PB: The PB is measured using the three-item questionnaire developed by Bissing-Olson et al. (2013). Employee pro-environmental behavior is "a broad set of environmentally responsible activities" (Graves et al. 2013, p. 81). A sample item includes "*I perform tasks that are expected of me in environmentally-friendly ways.*" The questionnaire enjoys a strong alpha of 0.96.
(4) ES: The seven-item questionnaire adapted by Saeed et al. (2018) was used to measure ES. They adapted the questionnaire from the developing country's perspective. This questionnaire was also further validated by Pinzone et al. (2019). A sample item includes "*Our organization emphasizes compliance with environmental standards.*"

Earlier studies have reported a high reliability of 0.963 (Wen et al., 2021).

The controlled variables used in the study included demographics like gender, age, profession, experience, and education level. These variables were identified based on the recommendation of Hameed et al. (2021).

All the questionnaires were on a five-point Likert scale that ranged between strongly agree and strongly disagree. The respondents were administered the English and Arabic versions of the questionnaire online. Online collection of data ensured maximum reach among the different classes of respondents. 453 responses were collected over 2 months, with informed consent from the respondents. Since all questionnaire items were made compulsory in the online platform, no response needed to be rejected. The respondents' demographics enjoyed wide diversity, the details of which are presented in Table 1.

3.2. Sampling Adequacy
Guidelines exist about the quantum of a sample that could be representative (Krejcie and Morgan, 1970). The guideline presented as a representative sample table, proposed by Krejcie and Morgan (1970), was revised by Bartlett et al. (2001). As per this guideline, a sample size of 384 is sufficient for a population above one million. According to them, as the population size increases, the "sample size increases at a diminishing rate and remains eventually constant at slightly more than 380 cases." Suskie (1996) also believes that a minimum sample of 364 is sufficient for a sampling error of 5%. Several earlier studies have been accepted and conducted based on this rule of thumb (Sulphey and Al Kahtani, 2017; Sandhya and Sulphey, 2019; 2021). Hence the 453 sample collected for the study is sufficient to conduct structural equation modelling (SEM). This sample size also confirms Barclay et al. (1995) and Hoyle's (1995) stipulations.

The age of respondents varied between 18 and 70 years, with the average age being 42.80. The overall experience of the sample ranged from less than a year to 46 years. The mean for the overall experience of the sample was 16.95 years, and the standard deviation 9.52.

Table 1: Demographics

Demographic details	Number	Percent
Citizenship		
Saudi	412	90.9
Expatriate	41	9.1
Gender		
Male	108	23.8
Female	345	76.2
Qualification		
High school	53	11.7
Undergraduate	45	9.9
Graduate	197	43.5
Post graduate	64	14.1
Doctroate	94	20.8
Occupation sector		
Government	52	11.5
Education	173	38.2
Manufacturing	204	45.0
Others	25	5.3

N=453

4. RESULTS

As an initial analysis, Factor analysis (both EFA and CFA) was done to validate the measurement model and test the formulated hypothesis. EFA facilitates content validity assessment as the extracted factors accurately reflect the dimensions they are measuring (Floyd and Widaman, 1995). CFA evaluates whether the data support the theoretical model of relationships (Brown, 2006). The EFA loadings are above the stipulated 0.7, and the standardized factor loadings are over 0.5 (Kline, 2015). The results of the factor analysis and item-to-total correlation are presented in Table 2.

4.1. Construct Validity
Construct validity is how a particular scale measures a construct (Aiken, 1980). Examination of construct validity is a complex process and is demonstrated through content analysis, correlation, and FA. In addition, construct validity involves convergent (Campbell and Fiske 1959) and discriminant validities (Hulland, 1999). Construct Reliability (CR) and Average Variance Extracted (AVE) are used to examine convergent validity. Hair et al. (2009) proposed that convergent validity is assumed when the CR is higher than the AVE. Further, AVE needs to be over 0.50. The values presented in Table 3 meet the stipulations Hair et al. (2009) proposed, confirming the constructs' internal consistency. In the instant case, the AVE ranged between 0.666 and 0.856, and the CR value ranged between 0.901 and 0.966. According to Hair et al. (2014), the stipulation for CR is 0.70. Therefore, it can be found that both AVE and CR meet the rule of thumb. Thus, the scales are valid and reliable.

Table 2: Results of factor analysis

Items	EFA	Item to total correlation	CFA	Cronbach alpha
NEP1	0.876	0.772	0.754	0.897
NEP2	0.987	0.907	0.897	
NEP3	0.908	0.977	0.806	
NEP4	0.785	0.885	0.911	
NEP5	0.784	0.806	0.945	
NEP6	0.773	0.813	0.884	
NEP7	0.907	0.833	0.865	
NEP8	0.884	0.923	0.977	
EA1	0.854	0.766	0.776	0.811
EA2	0.811	0.741	0.811	
EA3	0.813	0.766	0.805	
EA4	0.724	0.704	0.855	
EA5	0.738	0.933	0.833	
EA6	0.704	0.807	0.814	
TA1	0.748	0.866	0.842	0.894
TA2	0.804	0.744	0.844	
TA3	0.895	0.834	0.833	
TA4	0.954	0.817	0.813	
DA1	0.932	0.826	0.832	0.872
DA2	0.845	0.825	0.855	
DA3	0.744	0.803	0.822	
DA4	0.732	0.814	0.916	
PB1	0.724	0.866	0.782	0.843
PB2	0.966	0.874	0.992	
PB3	0.778	0.832	0.854	
ES1	0.733	0.834	0.744	0.823
ES2	0.722	0.883	0.854	
ES3	0.726	0.754	0.903	
ES4	0.722	0.955	0.847	
ES5	0.737	0.833	0.884	
ES6	0.932	0.816	0.883	

Table 3: Convergent validity

Items	Estimate	Item reliability	Error (delta)	AVE	Sum of Estimate	Sum of error (delta)	CR
NEP1	0.754	0.569	0.431	0.779	7.039	1.770	0.966
NEP2	0.897	0.805	0.195				
NEP3	0.806	0.650	0.350				
NEP4	0.911	0.830	0.170				
NEP5	0.945	0.893	0.107				
NEP6	0.884	0.781	0.219				
NEP7	0.865	0.748	0.252				
NEP8	0.977	0.955	0.045				
EA1	0.776	0.602	0.398	0.666	4.894	2.005	0.923
EA2	0.811	0.658	0.342				
EA3	0.805	0.648	0.352				
EA4	0.855	0.731	0.269				
EA5	0.833	0.694	0.306				
EA6	0.814	0.663	0.337				
TA1	0.842	0.709	0.291	0.694	3.332	1.224	0.901
TA2	0.844	0.712	0.288				
TA3	0.833	0.694	0.306				
TA4	0.813	0.661	0.339				
DA1	0.832	0.692	0.308	0.856	3.425	1.062	0.917
DA2	0.855	0.731	0.269				
DA3	0.822	0.676	0.324				
DA4	0.916	0.839	0.161				
PB1	0.782	0.612	0.388	0.775	2.628	0.675	0.911
PB2	0.992	0.984	0.016				
PB3	0.854	0.729	0.271				
ES1	0.744	0.554	0.446	0.729	5.115	1.623	0.942
ES2	0.854	0.729	0.271				
ES3	0.903	0.815	0.185				
ES4	0.847	0.717	0.283				
ES5	0.884	0.781	0.219				
ES6	0.883	0.780	0.220				

Table 4: Fit index

Fit index	Final Model value	Cutoff for good fit
Chi-square $\chi^2//df$ (Chi-square probability)	8.14	<5
Root mean square error of approximation (RMSEA)	0.031	<0.07
Comparative fit index (CFI)	0.924	>0.90
Normed fit index (NFI)	0.911	>0.80
Root mean square residual (RMSR)	0.033	<0.05
Parsimony goodness of fit index (PGFI)	0.647	No limit near 0.50
Tucker Lewis index (TLI)	0.971	>0.95
Coefficient alpha	0.889 to 0.913	>0.7

Table 5: Discriminant validity

	NEP	EnA	PB	FS
NEP	0.86			
EnA	0.05	0.77		
PB	0.13	0.21	0.81	
FS	0.23	0.17	0.14	0.74

The square root of AVE is presented in the diagonal

Table 6: Results of correlation analysis

	NEP	EnA	PB	ES
NEP	1	0.727**	0.162**	0.144**
EnA		1	0.217**	0.127**
PB			1	0.491**
PS				1

**Significant at 0.01 level. N=453

4.2. Fit Index

The particulars of the fit index presented in Table 4 show that the model proposed for the study is plausible and parsimonious. For a robust model fit, RMSEA and RMR need to be <0.08. CFI, TLI, and GFI should be above 0.90 (Hair et al., 2013; Hu and Bentler, 1999). The model fit in Table 4 shows that all values are acceptable, exhibiting robust fit. This shows that the model is ideal for the conduct of SEM.

4.3. Discriminant Validity

The results of the discriminant validity analysis are presented in Table 5. According to Hair et al. (2013), discriminant validity examines the constructs' variances and uniqueness. The correlation must be relatively low to exhibit discriminant validity (Bagozzi and Kimmel, 1995). The r-values presented in Table 5 do not exceed the stipulated 0.70 (Anderson and Gerbing, 1988). In addition, the r values are less than AVE's square roots (Fornell and Larcker, 1981).

5. RESULTS

5.1. Correlation

Correlation analysis showed that the r value for all four variables was significant at 0.01 level. This denotes that all four variables have a positive relationship among themselves. The results of the correlation analysis are presented in Table 6.

Table 7: SEM results

Hypothesis		Path coefficient	Standard deviation	t-statistics	P values	Results
H1	NEP --> PB	0.41	0.07	4.67	<0.05	Supported
H2	EnA --> PB	0.38	0.02	4.92	<0.05	Supported
H3	NEP --> FS	0.37	0.06	3.98	<0.05	Supported
H4	EnA --> FS	0.44	0.04	5.01	<0.05	Supported
H5	PB --> FS	0.42	0.08	4.69	<0.05	Supported

SEM: Structural equation modelling

After that, SEM analysis was conducted, and the results are presented in the following sections.

5.2. SEM Results

SEM was carried out using Python software after the measurement model had been validated using statistical approaches such as EFA and CFA. The results of the SEM analysis are presented in Table 7. In addition, SEM was used as it tests concurrently and comprehensively all the hypothesized relationships (Hair et al., 2013; Tabachnick and Fidell, 2007). It also enables the assessment of predictive validity (Becker et al., 2013). Further, SEM is appropriate as the study examined the relationship between multiple variables. The hypotheses formulated for the study were examined with path analysis. The SEM analysis results are presented in Table 7 and Figure 2.

Table 7 shows that all five hypotheses proposed for the investigation are supported at 0.01 (Hair et al., 2014). The comparison of the β values aids in determining the path coefficient of the latent variables. A high β value suggests that the predictor variable greatly influences the dependent variable (Aibinu and Al-Lawati, 2010; Lleras, 2005). Further, robust t-values confirm the strength of the significance level of β (Hair et al., 2014) and substantiate the relationship between the variables.

6. DISCUSSION

In today's increasingly prominent global ecological crisis, environmental issues have become a common survival challenge for people worldwide. Protecting the world's ecological environment requires understanding how humans conceptualize the viability of natural ecology. Environmental concerns have evolved into a survival dilemma in the context of global ecological crises. Protecting the ecological environment requires understanding how humans conceptualize the viability of natural ecology and understanding the thought pattern about sustainability. The study results extend insights into Stakeholder Theory's and VBN Theory's assumptions by identifying robust relationships between the identified variables and ES. Furthermore, the study findings can be used to help bolster ES, which is consistent with the identified theories (Amabile and Mueller, 2008; Junsheng et al., 2020; Tian and Liu, 2022).

The study findings are also in congruence with the extant literature (Bai et al., 2017; Dunlap et al., 2000; Kousar et al., 2022). In addition, Si et al. (2022) found EnA to have a positive relationship with PB. Further, several studies have found that PB could reduce environmental footprint and boost green performance (Saifulina et al., 2022). The current study has substantiated these findings.

Figure 2: Measurement model
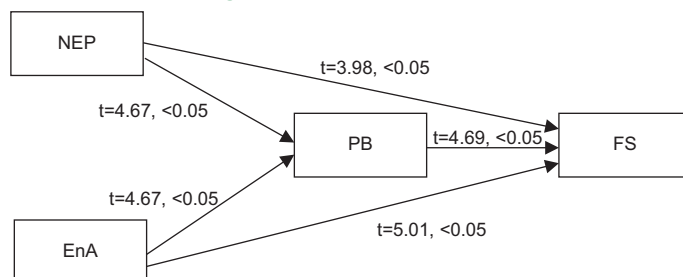
Similarly, studies by Bragagnolo et al. (2016), Sulphey and Faisal (2021), and Corral-Verdugo et al. (2009) have identified that behaviours like environmental knowledge, pro-environmental attitudes, frugality, altruism, and equitability are antecedents of sustainability, which is also a finding of the present study. Thus, the current study substantiates several earlier studies. The uniqueness of this study is that it has found the identified complex, comprehensive, and concurrent relationship between all four identified variables. No previous study has attempted to examine this relationship. Further, this is the first study conducted with samples from Saudi Arabia. The study has thus opened a window into the green behaviour of Saudi citizens. Future studies could examine the complex relationships between environmental values, attitudes, motivations, participation, and environmentally friendly behaviors. Attempts could also be made to examine the attitude of samples from the Gulf Cooperation Council and Middle East and North African counties, as these groups of counties are identified to have similar cultures. The study's findings have theoretical and practical implications, which are presented in the following sections.

7. CONCLUSION

Various international environmental protocols, accords, and agreements like the Kyoto Protocol and Paris Agreement have inculcated among the public and administrators the paramount importance and need to turn green to attain sustainability. This has highlighted the need to innovate and consider manufacturing green and environment-friendly products and services. However, there is a need for attitudinal and behavioural change among the general public and policymakers as a forerunner to this. Though there are several studies about ES, a study in Saudi Arabia about its antecedents is scarce. This paper investigates a few factors that could promote environmentally sustainable behaviour. The study has developed empirical insights into the distinct roles played by NEP, EnA, and PB in developing ES. It has also succeeded in offering a complex model that presents the relationships between the identified variables, which was not examined earlier. Finally,

this study's findings could be used for critical organizational policymaking implications concerning ES, highlighting the importance of NEP, EnA, and PB. Overall, the findings challenge conceptualizing the factors influencing ES, advancing the literature on environmental behaviours. We encourage researchers to expand the scope of sustainability behaviour research further.

7.1. Implications

This current work provides both theoretical and practical implications. The following sections present a few implications. Theoretically, it contributes to the ever-increasing green and sustainable literature and the complex relationship between the identified variables. In addition, the findings provide further insights into aspects regarding green behaviours, advancing the VBN, the NEP perspective (Stern et al., 1995), and the Norm-activation theory (Schwartz, 1977).

The study has also succeeded in having an integrated conceptual framework of the proposed theories. Finally, by demonstrating the positive relationship and the influence on NEP, EnA, PB, and ES, the study advances established and contemporary behavioural insights into environmental psychology. The key practical implication of this study is the realization that green attitudes and behaviours have significant positive relationships with ES. Further identifying environmental awareness and various related behaviours precisely could help policymakers and managers realign environmental education and training in line with local and national priorities. This would help to improve environmental awareness, knowledge, and behaviours so that ES could be achieved with elan and ease. Attaining ES is now the need of the hour as the ecosystem is nearing a tipping point.

7.2. Limitations

Literature is scarce about ES, and its antecedents in Saudi Arabia. By empirically examining the relationship of NEP, EnA, PB, and ES, this study has opened opportunities for further discussions about the concepts. The current study, which focuses on the behavioural antecedents of ES, was carried out at the individual level of analysis, mostly the educated and employed class. As a result, implications for the other sections of the population cannot be inferred. In addition, further investigations could be attempted with a broader range of other related variables. Future studies could also be attempted by controlling various demographic factors influencing environmental attitude and sustainability.

The current study was quantitative in nature. Future studies could also be undertaken by including qualitative methodologies to understand the concepts further. In addition, the data for the study was collected in two stretches. Therefore, future studies could be conducted based on a cross-sectional sample with further time lags. In addition, future comparative studies could be attempted with a longitudinal design, with cross-cultural–national samples. The moderating effect of demographic factors on the variables studied is another plausible area for further investigation. Finally, caution has to be exercised in generalizing the study findings since the sample for this study was limited to Saudi Arabia, which has a unique culture (Faridi and Sulphey, 2019). Future comparative empirical examinations with samples from other developed and developing nations could expand the study's and draw assumptions that could be further generalized.

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