Climate Change Risk Perceptions in a VBN Model to Predict Intentions to Buy Cosmetics and Detergents Containing Recycled CO2

Abstract

The modified by Risk Perception theoretical model of VBN was found to reveal 57.1% of the variance in Consumption Intentions regarding cosmetics and detergents that are going to contain chemical ingredients made by recycled CO_2. Just Biospheric Values were found to influence Risk Perception. Risk Perception contributed to the examination significantly as its impact on Awareness of Consequences was found to be the strongest of all in the sequential chain of the VBN relationships. Media Influence and Scepticism failed to moderate the relationship between Personal Norms and Consumption Intentions. Nonetheless, Media Influence was found able to moderate the relationship between Biospheric Values and Risk Perception increasing to 62.1% the variance explained. Scepticism was found to moderate both the relationships between Awareness of Consequences to Ascription of Responsibility and Ascription of Responsibility to Personal Norms increasing the variance explained to 69.3%.

Keywords: values-beliefs- norms, cosmetics, detergents, recycled CO_2

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1. Introduction

The importance of climate changes (CC) is considered to be crucially important (UNEP, 2019). In European Union, responsible environmentally friendly research projects are encouraged to benefit from the European Green Deal regarding the reduction of carbon gas emissions (European Commission, 2019). Public concerns are constantly raising (Prakash and Pathak, 2017; ElHaffar et al., 2020). However, research on consumers' attitudes and behaviour have remained rather scant, so far (Jones et al., 2017; Delistavrou et al., 2023).

This study focuses on two categories of Consumer-Packaged Goods (CPGs) namely personal and house care products. Under a Horizon project, a reactor is being designed that is going to capture and recycle CO_2 (https://suncochem.eu/). The recycled CO_2 is going to be used in the production of three chemicals, namely glycolic acid, n-valeraldheyde, and limoxalTM, which can be embedded in fragrances or flavours used in cosmetics and household cleaning products.

A consumer survey was implemented in Greek consumers aiming to test the power of a modified by Risk Perception (Leiserowitz's, 2006) Values-Beliefs-Norms (VBN) model (Stern et al., 1999; Stern, 2000) to predict the consumers' intentions to buy cosmetics and detergents that are going to contain innovative, green ingredients made from recycled CO_2, instead of the usual chemicals. Nonetheless, as any application of consumer behaviour theories leaves a considerable portion of unexplained variance in the dependent variable, review papers indicate that mediation or moderation techniques are useful in order to reveal any further understanding that additional variables might provide (ElHaffar et al., 2020). In this study, two variables were selected, namely Media Influence and Scepticism as they had both provided previous indications of effect on pro-environmental behaviours (Sama, 2019; Mishra and Maity, 2021 about media influence) and (Leonidou and Skarmeas, 2017; Luo et al., 2020 about scepticism).

2. Background and hypotheses

Stern et al. (1995) based on Schwartz (1977) initiated the VBN theory suggesting the formulation of personal norms that lead to movements, actions and several behaviours as a sequence of the New Environmental Paradigm/NEP (Dunlap and Van Liere,1978; Dunlap et al., 2000) and beliefs regarding consequences and responsibilities that challenge a person's values towards himself, other people and the biosphere in overall (Stern et al., 1999; Stern, 2000).

The framework of this study incorporates the three types of personal values (Egoistic/EV, Altruistic/AV and Biospheric Values/BV), Risk Perception/RP (Leiserowitz, 2006) replacing NEP (Dunlap et al., 2000), Awareness of Consequences/AC and Ascription of Responsibility/AR, leading to Personal Norms/PN that are assumed able to predict Consumption Intentions/ CI towards cosmetics and detergents that are going to contain ingredients made by recycled CO2 (Figure 1). When a VBN framework is empirically tested, each variable, in a sequential chain, should be causally related to the next one (Stern, 2000).

All three of the values constructs have been previously found to influence all types of beliefs customarily positively in the cases of altruistic and biospheric values and negatively in the case of egoistic values (Zhang et al., 2022; Awais et al., 2022). Therefore, the following hypotheses were set:

H_1: Egoistic Values are significantly and negatively related to CC Risk Perception.

H_2: Altruistic Values are significantly and positively related to CC Risk Perception.

H_3: Biospheric values are significantly and positively related to CC Risk Perception.

The Leiserowitz's (2006) RP Index seemed promising for this study, as it concerns specifically risks and threats due to climate change. There are three sub-measures in the construct, which have been previously found to be related to some pro-environmental behaviours (Lacroix and Gifford, 2018; Lee et al., 2018; Wang et al., 2021). In this study, just the first sub-measure of RP was employed as it is the most concise including holistic concern, seriousness of threat for non-humans, and seriousness of current impacts around the world (Leiserowitz, 2006). AC reflects essentially a person's acknowledgement that human activities impact on negative conditions in the natural environment (Stern et al., 1999). In this study it concerns global warming and climate change. Therefore, the following hypothesis was set:

H_4: Awareness of Consequences is significantly and positively influenced by Risk Perception.

Further, according to the VBN theory a person's understanding about ecological consequences will affect the ascription of his own responsibility for the related phenomena (Steg et al., 2005). Therefore, the following hypothesis was set:

H_5: Ascription of Responsibility is significantly and positively influenced by Awareness of Consequences

Personal norms (PN) are customarily viewed as an individual's feelings of moral obligations to perform a specific action (Chen, 2020). In this study, the question under examination is whether a consumer's sense of responsibility - regarding specifically the

increase of CO_2 - impacts on his moral obligations to buy CPGs containing ingredients, made by recycled CO_2. Therefore, the following hypothesis was set.

H_6: Personal Norms are significantly and positively influenced by Ascription Responsibility.

It is to be noted that several applications of VBN confirmed Stern's (2000) argument that PN should be viewed as the most appropriate predisposition to pro-environmental behaviours (Quoquab et al., 2020; Hein, 2022; Zhang et al., 2022). Intentions are examined in this study, since the innovative, green CPGs are still in the early stages of production. Therefore, the following hypothesis was set:

H_7: Consumption Intentions are significantly and positively influenced by Personal Norms.

There have been previous suggestions that media are able to strengthen ecological concerns due to relevant information delivering (Trivedi et al. 2018). There have been, nonetheless, opposite implications that due to consumers' scepticism, advertisements do not play a significant role in increasing consumers' pro-environmental attitudes and behaviour (Luo et al., 2020). Therefore, the following hypothesis was set:

H_8: Media Influence moderates the relationship between Personal Norms and Intentions

Mohr et al. (1998) were the first to suggest that when consumers come in contact with eco-labels or advertisements of ecological products, they do not automatically believe them; they may feel sceptical about the quality and the efficacy of eco-products and thus less motivated to buy green. Leonidou and Skarmeas (2017) found that scepticism is capable of leading to lower assessments of eco-products. There have been indications that scepticism either impacted directly and negatively to green purchase intentions (Goh and Balaji, 2016; Luo et al., 2020) or mediated the negative relationship between greenwash and green purchase intentions (Nguyen et al., 2019). Hence, the following hypothesis was set:

H9: Scepticism moderates the relationship between Personal Norms and Consumption Intentions

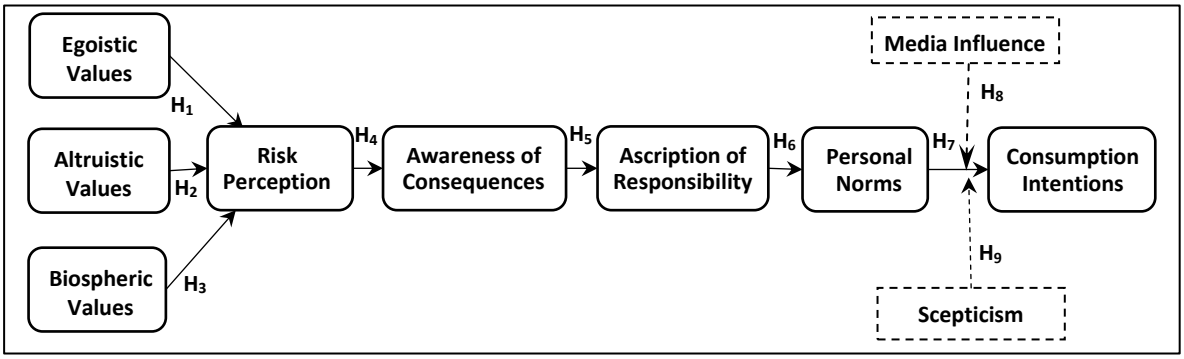

Figure 1: Theoretical Model

3. Methodology

Gender and age served as strata of the stratified sampling method employed (Churchill and Iacobucci, 2005). The electronic interviews with Greek consumers were undertaken by a research agency and resulted in 307 sample size. A structured questionnaire included the following variables: Egoistic Values (EV), Altruistic Values (AV) and Biospheric Values (BV) with 4 items each, all adopted from Steg et al. (2005) and measured on a 6-point (no midpoint) importance scale. The first sub-measure of Leiserowitz's (2006) scale CC Risk Perception, namely global warming concern (RiskPer1) with 3 items, measured on a 6-point rating scale. Awareness of Consequences (AC) with 5 items, Ascription of Responsibility (AR) with 4 items, and Personal Norms (PN) with 7 items, all based on Steg's et al. (2005) measures and tailored to the subject of this study (Table 1). Consumption Intentions (CI) including 4 items, was originally developed for this study. Media Influence (MI) by Bearden, et al., (1989) consisting of 5 items as well as Mohr et al.'s (1998) Scepticism (Sc) consisting of 6 items were added in the questionnaire. All items of the latter 6 variables were measured on a 6-point (no midpoint) Likert scale.

4. Results

4.1. Measurement and Structural Models

Common method variance was established with the employment of Harman's single factor test resulted in 43% (<50%), variance explained from the first factor when all measured items were entered in an exploratory factor analysis (Podsakoff et al., 2003).

The initial Measurement Model analysis resulted in the exclusion of 2 items (CI1, CI2) due to low (<0.50) factor loadings (Hair et al., 2010). The final measurement model obtained acceptable goodness of fit (GOF) values (χ^2=1016.378, df=464, χ^2/df=2.190, TLI=0.929, CFI=0.938, RMSEA=0.62), indicating that it fits the data well. Unidimensionality, convergent, discriminant and nomological validity of all constructs were assessed (Table 1).

Thresholds: factor loadings >0.50, AVE >0.50, CR>0.80	
Egoistic Values (EV) *Range 4-24, Mean =14.279, a=0.827, CR=0.833, AVE= 0.534*	**Factor loadings**
Ego1 Authority: the right to lead or command	0.867
Ego2 Social power: control over others, dominance	0.875
Ego3 Wealth: material possessions, money	0.547
Ego4 Influential: having an impact on people and events	0.566
Altruistic Values (AV) *Range 4-24, Mean = 20.344, a=0.886, CR=0.891, AVE=0.673*	
Alt1 Social justice: correcting injustice, care for the weak	0.834
Alt2 Helpful: working for the welfare of others	0.753
Alt3 Equality: equal opportunity for all	0.871
Alt4 A world at peace: free of war and conflict	0.819
Biospheric Values (BV) *Range 4-24, Mean =20.646, a=0.954, CR=0.957, AVE=0.848*	
Bio1 Protecting the environment: preserving nature	0.946
Bio2 Preventing pollution	0.939
Bio3 Respecting the earth: live in harmony with other species	0.921
Bio4 Unity with nature: fitting into nature	0.875
Risk Perception 1 (RiskPer1) *Range 3-18, Mean =14.515, a=0.938, CR=0.939, AVE=0.836*	
RP1 How concerned are you about global warming?	0.893

RP2	How serious of a threat do you believe global warming is to non-human nature?	0.940
RP3	How serious are the current impacts of global warming around the world?	0.909
Awareness of Consequences (AC) *Range 5-30, Mean=22.698, a=0.859, CR=0.841, AVE=0.519*		
AC1	Global warming has consequences for society	0.772
AC2	Green chemical ingredients in CPGs help reduce global warming	0.831
AC3	The exhaustion of fossil fuels is a problem	0.590
AC4	The exhaustion of energy sources is a problem	0.580
AC5	Environmental quality will improve if we use green chemical ingredients in CPGs	0.791
Ascription of Responsibility (AR) *Range 4-24, Mean =15.906, a=0.878, CR=0.884, AVE=0.660*		
AR1	I am jointly responsible for CO_2 emissions	0.849
AR2	I feel jointly responsible for the exhaustion of energy sources	0.880
AR3	I feel jointly responsible for global warming	0.862
AR4	Not only the government and industry are responsible for high levels of CO_2 emissions, but me too	0.633
Personal Norms (PN) *Range 7-42, Mean=28.244, a=0.942, CR=0.942, AVE=0.701*		
PN1	I feel personally obliged to buy CPGs containing green chemical ingredients	0.872
PN2	Regardless of what others do, I feel morally obliged to buy CPGs containing green chemical ingredients	0.845
PN3	I feel guilty when I do not buy CPGs containing green chemical ingredients	0.815
PN4	I feel morally obliged to use ecological products instead of regular products	0.853
PN5	When I buy a new CPG, I feel a moral obligation to prefer one that contains green chemical ingredients	0.891
PN6	People like me should do everything they can to buy CPGs containing green chemical ingredients	0.856
PN7	I would be a better person if I consumed CPGs containing green chemical ingredients	0.718
Consumption Intentions (CI) *Range 2-12, Mean=8.362, a=0.835, CR=0.844, AVE=0.732*		
CI3	I am seriously thinking to buy CPGs containing environmentally friendlier ingredients as soon as I run out of the products I am currently using	0.766
CI4	I will definitely switch to a brand of a CPG that contains green chemical ingredients	0.937

Correlations (HTMT ratios <0.90)

	EV	***AV***	***BV***	***RiskPer1***	***AC***	***AR***	***PN***
EV							
AV	0.150(0.144)						
BV	0.158(0.138)	0.876(0.878)					
RiskPer1	0.191(0.167)	0.559(0.567)	0.696(0.696)				
AC	0.195(0.206)	0.642(0.651)	0.689(0.662)	0.749(0.719)			
AR	0.241(0.211)	0.411(0.426)	0.386(0.387)	0.569(0.571)	0.642(0.618)		
PN	0.193(0.168)	0.454(0.470)	0.508(0.506)	0.615(0.612)	0.796(0.762)	0.692(0.691)	
CI	0.196(0.172)	0.427(0.444)	0.536(0.539)	0.606(0.542)	0.698(0.674)	0.514(0.518)	0.766(0.766)

α: Cronbach's alpha, CR: Construct Reliability, AVE: Average Variance Extracted, HTMT: Heterotrait-Monotrait

Table 1: Measurement model results

GOF values (Table 2) of the Structural Model indicated that the model fits the data very well. The hypothesised consecutive relationships between BV, RiskPer1, AC, AR, PN and CI were found to be statistically significant and positive. However, the hypothesised paths from EV and AV to RiskPer1 were found to be statistically non-significant (Table 2). These results led to the rejection of H1 and H2 and the acceptance of H3, H4, H5, H6 and H7. The R^2 indicated that the VBN model explains 57.1% of the variance in CI.

4.2. Moderation of Media Influence and Scepticism

Multi-group moderation analysis was conducted to test the hypothesised moderating role of MI and Sc on the structural relationship between PN and CI. The sample was divided into two groups (below and above the Mean scores) in both moderators (MI and Sc). In the moderation analyses EV and AV were excluded. Firstly, measurement invariance was assessed; however, the results were omitted due to paper length constraints. Then, the structural models were run and provided acceptable GOF values (Table 2) indicating that the moderated models fit the data well. The critical ratios were within the interval (±1.96) in both analyses indicating that neither MI nor Sc moderates the impact of PN on CI. However, the

examination of the other critical ratios indicated that MI moderates the relationship between BV and RiskPer1 (higher regression weight in the group of below the Mean in MI) while Sc moderates the relationships between AC and AR as well as AR and PN (higher regression weights in the group of above the Mean in Sc).

The moderated VBN model is able to explain the higher portion of the variance in consumers' intentions in the groups of respondents who obtained scores below the Mean in MI (62.1%) and above the Mean scores in Sc (69.3%).

	Structural Model		**Moderation**					
			Media Influence			**Scepticism**		
χ^2	1,105.847***		1,084.250***			1,127.522***		
df	481		534			534		
χ^2/ df	2.299		2.030			2.111		
CFI	0.930		0.922			0.919		
TLI	0.923		0.912			0.909		
RMSEA	0.065		0.058			0.060		
			Below the Mean	*Above the Mean*		*Below the Mean*	*Above the Mean*	
	β	**Hypotheses**	*β*	*β*	**Hypotheses**	*β*	*β*	**Hypotheses**
EV→RiskPer1	0.089 n.s.	H_1: Rejected						
AV→RiskPer1	-0.107 n.s.	H_2: Rejected						
BV→RiskPer1	0.862***	H_3: Accepted	0.759***	0.647***		0.810***	0.543***	
Critical ratio (±1.96)			***-2.232***			*-1.253*		
RiskPer1→AC	0.866***	H_4: Accepted	0.884***	0.833***		0.863***	0.879***	
Critical ratio (±1.96)			*-0.725*			*-1.762*		
AC→AR	0.687***	H_5: Accepted	0.726***	0.602***		0.610***	0.764***	
Critical ratio (±1.96)			*-0.163*			***2.590***		
AR→PN	0.726***	H_6: Accepted	0.711***	0.716***		0.662***	0.767***	
Critical ratio (±1.96)			*-0.690*			***1.999***		
PN→CI	0.756***	H_7: Accepted	0.788***	0.663***	H_8: Rejected	0.683***	0.832***	H_9: Rejected
Critical ratio (±1.96)			*-0.798*			*0.107*		
R^2 (CI)	0.571		0.621	0.439		0.466	0.693	

**** p<0.001, (β)=standardized regression weights, n.s.: non-significant*

Table 2: Structural Model, Moderation and Hypotheses testing

5. Discussion and Conclusions

VBN theory was found powerful to extract 57.1% of the variance in Consumption Intentions regarding cosmetics and detergents that are going to contain green ingredients made from recycled CO_2. It is to be discussed that the items about price and quality in were excluded when running SEM indicating consumers' intentions to buy cosmetics and detergents alleged to mitigate climate change without any prerequisites. With regards to values, just biospheric values were found able to contribute to the model, in contrast with other studies, in which altruistic values have been found to play a significant role (Awais et al., 2022; Hein, 2022) and (Quoquoab et al., 2020) specifically with regards to cosmetics. The choice to replace NEP with Risk Perception is considered to be successful. While NEP had recently provided rather weak results (Chen, 2020; Zhang et al., 2022), risk perception provided the strongest indications in the chain of the relationships in the model, either as being affected by biospheric values or by affecting awareness of CO_2 emissions'

consequences. It is to be noted that the weakest of all regression weight was indicated in the causal relationship between consequences and responsibility. This probably illustrates the difficult step between awareness to responsibility undertaking.

Although neither media influence nor scepticism were found to moderate the relationship between norms and intentions, some unexpected findings are perhaps worthy to be discussed. It seems that nature associated values impact more strongly on perceptions about global warming in those people that are not influenced by advertisement. It also seems that in those people who doubt the eco-labels, the awareness of severe environmental deterioration influences more strongly their ascription of responsibility as well as the ascription of responsibility impacts their personal norms more strongly.

6. Implications

The main contribution of this study is the suggestion that risk perception about global warming can successfully expand a VBN model relevant to sustainability and neutrality. The effects of both biospheric values and risk perception imply that we had better apply a VBN model with as closer to the topic under investigation variables as possible.

With regards to managerial implications, marketing executives should effectively build their communication strategies on consumers' values and beliefs that specifically regard global warming and climate change. The main request regards a convincing presentation of the new products' ability to contribute to the global effort of climate change mitigation. Productive use of the findings concerning media influence and scepticism may end up fruitful. Messages challenging conventional overconsumption trends in media as well as honest labelling and promotional tools that expunge scepticism may be found valuable in leveraging consumption intentions and hopefully actual behavioural choices in the future.

7. Limitations and Future Research Suggestions

Although bias metrics in the Measurement Model have been satisfactory, it is to be acknowledged that there is always a certain social desirability effect in pro-environmental consumer behaviour studies. Further, any VBN study is criticised as it does not include examination of any attitudinal construct. Recent literature study implies that combined models of both VBN and TPB should be examined in order to encompass both values and attitudes (Chen, 2020) in a non-stop effort to understand better both moral and practical antecedents of pro-environmental intentions and behaviours.

Of course, some of the items' phrasing may be judged as limiting measurement accuracy and hence in future efforts they should be further edited. Another limitation is that the results

of this study concern just one country while it would be interesting to duplicate this research in several other European and non-European countries.

References

Awais, M., Fatima, T., & Awan, T. M. (2022). Assessing behavioral intentions of solar energy usage through value-belief-norm theory. *Management of Environmental Quality, 33(6),* 1329-1343. https://doi.org/10.1108/MEQ-09-2021-0227.

Bearden, W. O., Netemeyer, R. G., & Teel, J. E. (1989). Measurement of Consumer Susceptibility to Interpersonal Influence. *Journal of Consumer Research, 15(4),* 473–481. http://www.jstor.org/stable/2489543

Chen, M. F. (2020). Selecting environmental psychology theories to predict people's consumption intention of locally produced organic foods. *International Journal of Consumer Studies, 44(5),* 455-468. https://doi.org/10.1111/ijcs.12578

Churchill, G. A. Jr., & Iacobucci, D. (2005). *Marketing Research: Methodological Foundations* (9th ed.). Thomson South-Western Publishers, Orlando.

Delistavrou, A., Tilikidou, I., & Papaioannou, E. (2023). Climate change risk perception and intentions to buy consumer packaged goods with chemicals containing recycled CO2. *Journal of Cleaner Production, 382*, Article e135215. https://doi.org/10.1016/j.jclepro.2022.135215.

Dunlap, R. E., & Van Liere, K. D. (1978). The "new environmental paradigm": a proposed measuring instrument and preliminary results. *Journal of Environmental Education, 9,* 10–19. https://doi.org/10.1080/00958964.1978.10801875.

Dunlap, R. E., Van Liere, K. D., & Mertig, A. G., Jones, R. E. (2000). New trends in measuring environmental attitudes: measuring endorsement of the new ecological paradigm: a revised NEP scale. *Journal of Social Issues, 56(3),* 425-442. https://doi.org/10.1111/0022-4537.00176.

ElHaffar, G., Durif, F., & Dubé, L. (2020). Towards closing the attitude-intention-behavior gap in green consumption: a narrative review of the literature and an overview of future research directions. *Journal of Cleaner Production, 275,* Article e122556. https://doi.org/10.1016/j.jclepro.2020.122556.

European Commission (2019). *Communication from the commission: the European green deal*, Brussels, European Commission. Retrieved from: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52019DC0640. Accessed November 23, 2021.

GFANZ (2021). *Glasgow Financial Alliance for Net Zero*. United Nations. Retrieved from: https://www.gfanzero.com/. Accessed March 7, 2022.

Goh, S. K., & Balaji, M. S. (2016). Linking green skepticism to green purchase behavior. *Journal of Cleaner Production, 131,* 629-638. https://doi.org/10.1016/j.jclepro.2016.04.122.

Hair, J. F., Black, W. C., Balin, B. J., & Anderson, R. E. (2010). *Multivariate Data Analysis*. Maxwell Macmillan International Editions.

Hein, N. (2022). Factors influencing the purchase intention for recycled products: integrating perceived risk into Value-Belief-Norm theory. *Sustainability, 14*, Article ε3877. https://doi.org/10.3390/su14073877.

Hwang, J., Kim, W., & Kim, J. J. (2020). Application of the value belief norm model to environmentally friendly drone food delivery services. *International Journal of Contemporary Hospitality Management, 5,* 1775-1794. https://doi.org/10.1108/IJCHM-08-2019-0710.

Jones, C.R., Olfe-Kräutlein, B., Naims, H., & Armstrong, K. (2017). The social acceptance of carbon dioxide utilization: a review and research agenda. *Frontiers in Energy Resources 5,* Article e11. https://doi.org/10.3389/fenrg.2017.00011.

Lacroix, K., & Gifford, R. (2018). Psychological barriers to energy conservation behavior: the role of worldviews and climate change risk perception. *Environment and Behavior, 50(7),* 749–780. https://doi.org/10.1177/001391651 7715296.

Lee, P.-S., Sung, Y.-H., Wu, C.-C., Ho, L.-C., & Chiou, W.-B. (2018). Using episodic future thinking to pre-experience climate change increases pro-environmental behavior. *Environment and Behavior, 52(1),* 60–81. https://doi.org/10.1177/001391 6518790590.

Leiserowitz, A. (2006). Climate change risk perception and policy preferences: the role of affect, imagery, and values. *Climatic Change, 77,* 45-72. https://doi.org/10.1007/s10584-006-9059-9.

Leonidou, C. N., & Skarmeas, D. (2017). Gray shades of green: causes and consequences of green skepticism. *Journal Business Ethics, 144,* 401–415. https://doi.org/10.1007/s10551-015-2829-4
Luo, B., Sun, Y., Shen, J., & Xia, L. (2020). How does green advertising skepticism on social media affect consumer intention to purchase green products? *Journal of Consumer Behaviour, 19(4),* 371–381. https://doi.org/10.1002/cb.1818.
Mishra A, & Maity M. (2021). Influence of parents, peers, and media on adolescents' consumer knowledge, attitudes, and purchase behavior: A meta-analysis. *Journal of Consumer Behaviour, 20,* 1675–1689. https://doi.org/10.1002/cb.1946
Mohr, L. A., Eroğlu, D., & Ellen, P. S. (1998). The development and testing of a measure of skepticism toward environmental claims in marketers' communications. *Journal of Consumer Affairs, 32(1),* 30–55. https://doi.org/10.1111/j.1745-6606.1998.tb00399.x
Nguyen, T. T. H., Yang, Z., Nguyen, N., Johnson, L. W., & Cao, T. K. (2019). Greenwash and green purchase intention: the mediating role of green skepticism. *Sustainability, 11(9),* Article e2653. http://dx.doi.org/10.3390/su11092653
Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: a critical review of the literature and recommended remedies. *Journal of Applied Psychology, 88(5),* 879–903. https://doi.org/10.1037/0021-9010.88.5.879.
Prakash, G., & Pathak, P. (2017). Intention to buy eco-friendly packaged products among young consumers of India: a study on developing nation. *Journal of Cleaner Production, 141,* 385-393. https://doi.org/10.1016/j.jclepro.2016.09.116.
Quoquab F., Jaini A., & Mohammad J. (2020). Does it matter who exhibits more green purchase behavior of cosmetic products in Asian culture? A multi-group analysis approach. *International Journal of Environmental Research and Public Health, 17(14),* Article e5258. https://doi.org/10.3390/ijerph17145258.
Sama, R. (2019). Impact of media advertisements on consumer behaviour. *Journal of Creative Communications, 14(1),* 54–68. https://doi.org/10.1177/0973258618822624
Schwartz, S. H. (1977). Normative influences on altruism. In L., Berkowitz, (Ed.), *Advances in Experimental Social Psychology* (pp. 221–279). Academic Press, San Diego, CA,
Steg, L., Dreijerink, L., & Abrahamse, W. (2005). Factors influencing the acceptability of energy policies: a test of VBN theory. *Journal of Environmental Psychology, 25(4),* 415– 425. https://doi.org/10.1016/j.jenvp.2005.08.003.
Stern, P. C. (1992). What psychology knows about energy conservation. *American Psychologist, 47(10),* 1224–1232. https://doi.org/10.1037/0003-066X.47.10.1224
Stern, P. C., Dietz, T., Abel, T., Guagnano, G. A., & Kalof, L. (1999). A value belief norm theory of support for social movements: the case of environmental concern. *Human Ecology Review, 6,* 81–97. http://www.jstor.org/stable/24707060.
Stern, P. (2000). Toward a coherent theory of environmentally significant behavior. *Journal of Social Issues, 56(3),* 407– 424. https://doi.org/10.1111/0022-4537.00175.
Stern, P., Dietz, T., Kalof, L., & Guagnano, G. A. (1995). Values, beliefs and pro-environmental action: attitude formation toward emergent attitude objects. *Journal of Applied Social Psychology, 25,* 1611– 1636. https://doi.org/10.1111/j.1559-1816.1995.tb02636.x.
Trivedi, R. H., Patel, J. D., & Acharya, N. (2018). Causality analysis of media influence on environmental attitude, intention and behaviors leading to green purchasing. *Journal of Cleaner Production, 196,* 11-22. https://doi.org/10.1016/j.jclepro.2018.06.024.
UNEP (2019). *The UN Environment Programme and Climate Emergency*. UNEP, New York. Retrieved from: https://www.unep.org/unga/our-position/unep-and-climate-emergency. Accessed February 27, 2023.
Wang, C., Geng, L., & Rodríguez-Casallas, J. D. (2021). How and when higher climate change risk perception promotes less climate change inaction. *Journal of Cleaner Production, 321,* Article e128952. https://doi.org/10.1016/j.jclepro.2021.128952.
Zhang, W., Mas'od, A. & Sulaiman, Z. (2022). Moderating effect of collectivism on Chinese consumers' intention to adopt electric vehicles—an adoption of VBN framework. *Sustainability, 14(19),* Article e12398. https://doi.org/10.3390/su141912398.