

A NEURAL NETWORK APPROACH FOR PREDICTING SUSTAINABLE CONSUMPTION BEHAVIOUR OF SNS USERS' BY INTEGRATING PERSONALITY TRAITS AND E-MAVENISM

Viral Bhatt, Gujarat Technological University

Twinkle Trivedi, Gujarat Technological University

Ritesh Patel, Sanjivani College of Engineering, Savitribai Phule Pune University

Harsha Jariwala, Indian Institute of Management Jammu

Sujo Thomas, Amrut Mody School of Management, Ahmedabad University

ABSTRACT

Sustainable consumption behavior is diversely viewed by various researchers who either consider it as an act of voluntary simplicity or consider it as adoption of green practices. The consumption decision takes place increasingly in digital environments which makes it a complex phenomenon. Many scholars and practitioners have expressed their concern regarding the change in sustainable consumption behavior in social networking sites (SNS). It becomes imperative to investigate an individual's personality traits to comprehend the consumer mind-set and attitude in the digital environment, while attempting to realize what drives sustainable consumption behavior. Past studies have acknowledged the decisive role of e-mavens and accordingly, e-mavenism has been associated with gathering information from social networks and influencing others in their decision making process. This study investigates the role of big five personality traits and e-mavenism to predict sustainable consumption behaviour from SNS perspective. Primary data has been collected from 480 SNS users and analysed by adopting the deep neural network architecture based on the innovative dual-stage PLS-SEM and ANN method to predict and rank the factors influencing the sustainable consumption behavior in SNS. The results revealed the normalized importance of the factors and found that agreeableness was the strongest predictor of sustainable consumption behavior followed by e-mavenism, openness, extraversion, and conscientiousness. The results of our study provides ample opportunities for non-profit marketers and public policy makers to leverage and gain valuable insights on the pivotal role of big-five personality traits and e-mavenism in predicting the sustainable consumption behavior of SNS users.

Keywords: Sustainable Consumption Behaviour, Social Networking Sites, E-Mavenism, Big Five Personality Traits, and Artificial Neural Network.

INTRODUCTION

Sustainable consumption behaviour is diversely viewed by various researchers who either consider it as an act of voluntary simplicity Black (2010) or consider it as adoption of green practices (Gilg et al., 2005). Abdolmohammadi & Baker (2008) state that it is crucial to understand how and why sustainable consumption takes place which would eventually provide

valuable information for non-profit organizations and public policy to more confidently impact positive behavioural change. The consumption decision in the present world takes place increasingly in digital environments which makes it a complex phenomenon. Social networking sites (SNS) have percolated our daily lives and how it has become an integral internet-based platform by allowing interaction and creation of user-generated content. Boyd & Ellison (2007) suggests that the change in consumption behaviour is the underlying reason for academicians and scholars paying close attention to SNS. Based on the recommendations of Voronoff (2005), our study stresses on sustainable consumption behaviour by SNS users in their mundane lives. Understanding the sustainable consumption behaviour in the context of an SNS user is remarkably important as both community as well as business sustainability transpires at a 'human scale' and within social networks on a mundane basis (Rex et al., 2015).

Some non-profit marketers and public policy makers have highlighted the need to nurture environment-friendly behaviour among consumers whereas others have called for research studies to empirically investigate the role of personality traits in shaping sustainable consumption behaviour, Goldsmith & Flynn (2015). Moreover, as mentioned earlier, there has been a considerable change in the extent of internet usage by consumers along with the change in their personalities and beliefs, thereby indicating that the overall consumption behaviour has transformed as life moved online (Pew Research, 2021). Liu & Campbell (2017) assert that examining the influence of personality traits is a significant way of comprehending the SNS user's psychology. Thus, it becomes imperative to investigate an individual's personality traits to comprehend the consumer mind-set and attitude in the online context Awais et al. (2020) while trying to investigate what drives sustainable consumption behaviour in SNS.

Feick & Price (1987) originated the idea of mavenism and e-mavens are individuals who use electronic platforms to acquire and spread information. Barnes & Pressey (2016) assert that mavenism is linked to learned and intensive utilization of web platforms. SNSs such as Facebook, Instagram, Twitter, and YouTube enable users worldwide to link with each other, unite with their friends and share messages with each other Boyd & Ellison (2007) and such networking platforms permit people to exchange information about various brands, products and services as well as various stores selling such products. In addition, Barnes & Pressey (2016) observe that such platforms are ideal for 'mavens' who facilitate social interactions and disseminate market information. Prior research suggests that market e-mavens are concerned with developing connections with individuals who are on same wave length in the online world Barnes & Pressey (2016) and e-mavens are considered to be reliable by friends and family for gathering information from online marketplace and may influence others in their decision making process Belch et al. (2005). Recently Aljukhadar et al. (2020) suggests that the nature of information flow demarcates a salient disparity between market mavenism and e-mavenism. Furthermore, Goldring & Azab (2021) noted that 'e-mavens' are a valuable segment of consumers who are worth focussing due to their personality traits and accelerating positive word of mouth. On the contrary, past research reveals that the transferability of physical maven to digital platforms depends on whether shoppers have adequate e-shopping depth Darley & Lim (2018). The important question for our study, therefore, is whether e-mavenism would mediate the relationship between personality traits and sustainable consumption behaviour, thereby predicting relevant factors influencing SNS users' sustainable consumption behaviour Bove et al. (2009).

The existent literature in the public domain is ambiguous in resolving this query, especially in the emerging market context. Till date, we have found only one study that has attempted to establish the above relationship in the Chinese context Awais et al. (2020). However, our study

extends the prior research by adopting methodologically superior technique constituting deep neural network architecture based on the innovative dual-stage PLS-SEM and ANN method to predict and rank the factors influencing sustainable consumption behaviour in the Indian context. Therefore, the current study adds to the existing literature by providing empirical evidence on the role of personality traits (grounded on big-five personality theory) in moulding the sustainable consumption behaviour of SNS users, as mediated by e-mavenism. The results of our study would provide ample opportunities for non-profit marketers and public policy makers to leverage and gain valuable insights on the pivotal role of big-five personality traits and e-mavenism in predicting the sustainable consumption behaviour from SNS user's perspective.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Personality Traits and E-Mavenism

The consumers respond to the environment differently because of their distinct psychological personality characteristics and such traits give them a separate identity Friedman & Schustack (1999). Among myriad of personality trait vocabularies that are result of factor analysis, the five fundamental psychological traits have been consistently studied by researchers and these traits are universally constant. Past studies have linked personality traits with market mavens who are highly knowledgeable and inclined to share the knowledge of products and services with others Goldring & Azab (2021). Likewise, Goldsmith & Flynn (2015) have specifically associated mavenism with big-five personality traits. However, e-mavenism is different from market mavenism as it involves virtually discovering and disseminating of information through online market/products. In the digital environment, consumers attain numerous opportunities during purchases with diverse products/services and it is critical to drive consumers towards embracing environmentally-friendly or green products and promoting sustainable consumption Song et al. (2019). Past research observes that 'e-mavens' need to be valued as a consumer segment and worth concentrating due to their personality traits Goldring & Azab (2021). Contrastingly, other research reveals that the physical maven's transferability to online platforms is contingent on the adequacy of e-shopping depth Darley & Lim (2018). Additionally, recent study warrants the need to deep dive into understanding the relationship between personality traits and e-mavenism which would guide marketers who may have intentions to target e-mavenism to acquire their communal influence Awais et al. (2020). In this study, we have adopted the big-five personality traits developed under 'trait theory of personality' Goldberg (1993). Thus, big-five traits constitutes agreeableness, conscientiousness, extraversion, openness, and neuroticism. Based on the above premise, we have thereby formulated the following hypothesis:

H₁: There is positive relationship between big-five personality traits (agreeableness, conscientiousness, extraversion, openness, neuroticism) and e-mavenism in the context of SNS users.

E-MAVENISM AND SUSTAINABLE CONSUMPTION BEHAVIOUR

In an online environment, consumers increasingly use SNSs to connect and build social relations with others as they have similar interest and it also provides them to extend their connectivity and keep in touch with their friends who are geographically dispersed. E-mavenism is of interest because individuals who are e-mavens often act as intermediaries between marketers

and consumers, conveying knowledge and influence to the latter. Marketing managers want to learn more about such individuals in order to assess their impact on other consumers' buying behaviour and consider them prime segments due to their influence on other consumers. Such individuals are regarded as prime influencers and are noteworthy in inspiring others due to their ability to influence and specific personality traits Vazifehdoost et al. (2012).

Recent research focused on e-mavens followed similar methodology and suggested that market mavens only constituted 5 per cent or less of consumers whereas e-mavens on a healthy network would constitute a higher percentage Aljukhadar et al. (2020). Aljukhadar et al. (2020) assert that market mavenism theory emphasizes the affinity between possessing marketplace knowledge and the vigorous dissemination of this knowledge. The sustainable behaviour suggests that consumers' approach of consumption should be future generation oriented and it should consider economic, societal and ecological consequences of their actions. Prior studies have found e-mavens to undertake activities on social network platforms which do not benefit them directly but others as well as the e-mavenism encompasses knowledge dispersion actions as a consequence of facilitating behaviours Aljukhadar et al. (2020). Based on this premise we propose, positive relationship between e-mavenism and sustainable consumption behaviour of SNS users. As per network theory, a consumer is considered an influencer on a network if the portfolio of relationship is dense which makes the e-mavens context specific and action driven. Based on network theory, we propose that mediating relationship of e-mavenism wherein e-mavens could be designated tasks based on their personality and thereby their decisive behaviour (sustainable consumption) could be nurtured Aljukhadar et al. (2020). The mediating role of e-mavenism between the big-five personality traits and sustainable consumption behaviour has been investigated in prior research Awais et al. (2020) but our study wants to extend the model to predict and rank the factors to determine the predictors of sustainable consumer behaviour. Therefore, the following research hypotheses are proposed Figure 1-5:

- H₂: There is positive relationship between e-mavenism and sustainable consumption behaviour of SNS users.*
- H₃: There is a mediating effect of e-mavenism on the association between big-five personality traits (agreeableness, conscientiousness, extraversion, openness, neuroticism) and sustainable consumption behaviour of SNS users.*

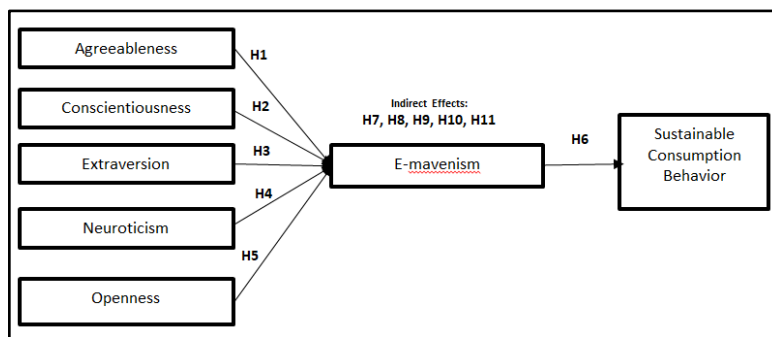


FIGURE 1
CONCEPTUAL FRAMEWORK

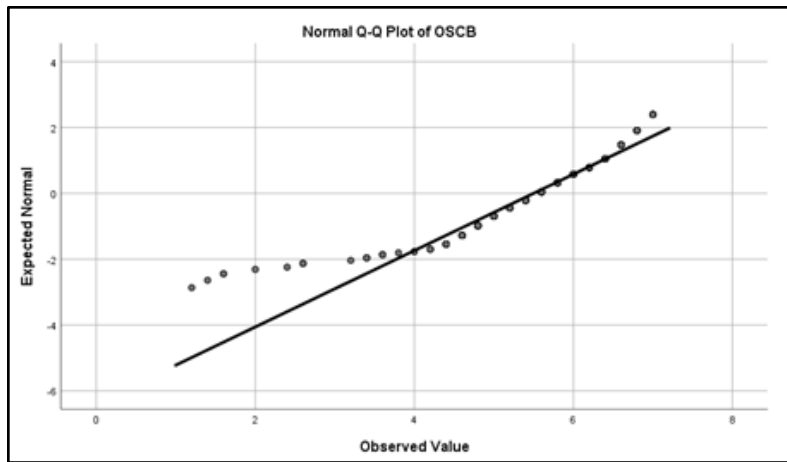


FIGURE 2
NORMAL Q-Q PLOT OF OBSERVED VS EXPECTED (SCB)

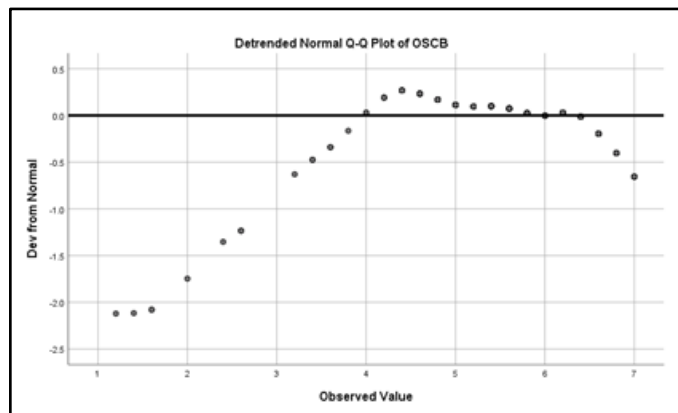


FIGURE 3
DETRENDED NORMAL Q-Q PLOT (SCB)

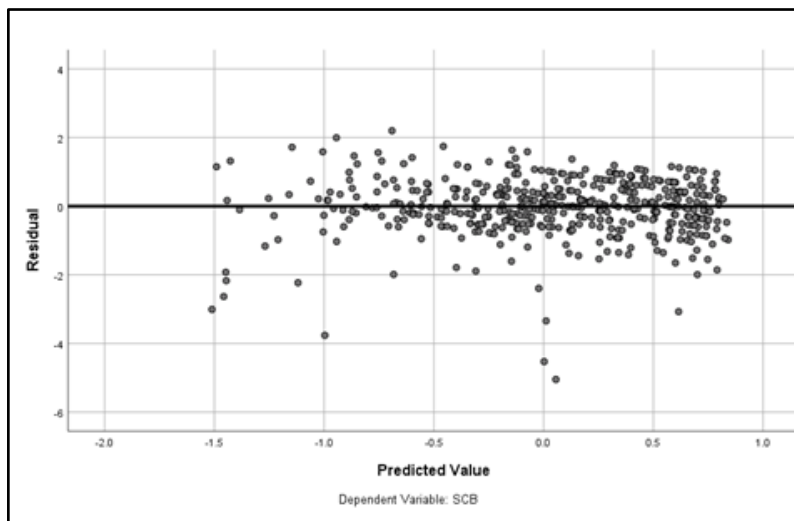


FIGURE 4
PREDICTED VS. RESIDUAL (SCB)

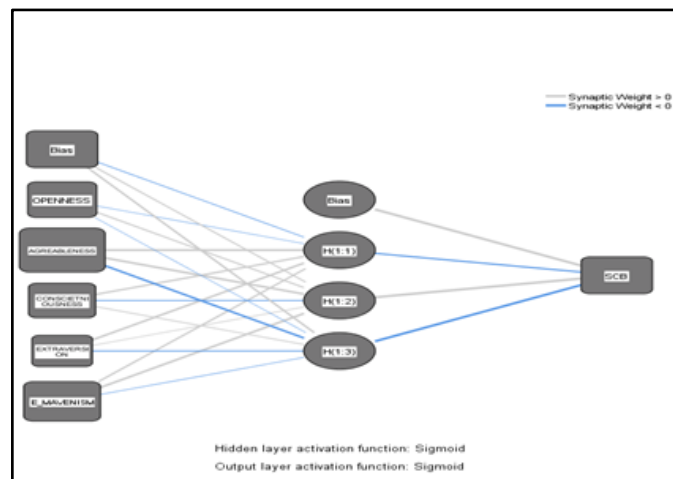


FIGURE 5
ANN MODEL (SCB)

METHODOLOGY

Data Collection Process

To reach the goal of the aforementioned hypothesis, this study focused on SNS users who were high-level internet users and accessed it at least once per month. The data was collected from 512 respondents with the support of a private reputed data collection agency. We followed recommendations of Kees et al. (2017) and aptly employed a private data collection agency, because it substitutes a convenience sample by heterogeneous respondents and it surpasses student samples. All the participants who responded were Facebook users, 87 percent were You-Tube users, 78 per cent were Instagram users, 65 per cent were LinkedIn users, 52 per cent were Twitter users and 38 per cent were Tinder users. This study adopted a non-probability convenience sampling for the collection of the data. The structured questionnaires were reviewed initially by a team of three senior academicians to ensure the content and face validity of items. All suggestions related with structure, layout, formulations of statements and their orders were incorporated. In the pilot testing, 46 respondents were approached and their responses were not included in the final sample. The outcomes of analysis indicated that Cronbach-alpha of all pre-identified constructs exceeded to its minimum threshold (0.70). Moreover, these values indicate that assumptions of internal consistency were not violated and reliability of instruments was ensured for all the constructs Chou & Bentler (1995).

The final survey was carried out after minor revisions based on the findings of pilot testing. The data was collected from 512 respondents, out of which, 32 partially completed questionnaires were removed before constructing the final dataset. The usable sample size of 480 was arrived which was sufficiently large to meet the minimum requirement of SEM analysis. The sample size was found to be ten times larger than the number of statements formulated in the structured questionnaire, which clearly indicates that current study sample size for survey (20:1) is more than

benchmark value Chou & Bentler (1995). In addition, we fulfilled the criteria for performing variance-based SEM analysis, wherein the number of respondents must be ten times more than whichever construct would possess higher number of statements.

The demographic profile of the respondents' indicate that 59.40 percent were male respondents and remaining 40.6 percent were female respondents. Participants belonged to three different age groups: 18-30 years (37.5 percent), 31-40 years (36.9 percent), and 40 years and above (25.6 percent). While considering the level of education, majority of the respondents were graduates (54 percent), and the remaining were post-graduates (46 percent). While considering other socio-demographic structure of the sample profile, 14.6 percent respondents belonged to the family income group of lower middle class. While, 35.6 percent belongs to middle class category, higher middle class (37.5 percent) respondents outnumbers all other categories; the remaining 12.3 percent respondents were from upper class income group.

Measurement of Variables

The research model constituted seven variables and the opinion of the respondents were collected using a seven-point Likert scale. The seven-point scale provides a wider opportunity to the respondent regarding expression of their opinion. The big-five personality traits were measured using a pre-established scale from Goldsmith & Flynn (2015). E-mavenism scale was adopted and modified using five-items from Belch et al. (2005). Finally, sustainable consumption behavior was assessed using a five-item scale adapted and modified from Figueroa-García et al. (2018) and Quoquab et al. (2019). For our study, we have adopted the definition put forward by Rex et al. (2015) who define sustainable consumption behaviour as “*impact on the environment and the systems in place in society as a consequence of what is done in consumers' daily lives*”.

Statistical Results

This study inspected the existence of common method biasness (CMB) and prior plus post statistical techniques were applied based on the recommendations of Hew & Kadir (2016) to ensure the absence of CMB. In order to avoid any response bias, all the respondents were made aware that there are no correct or incorrect answers and that confidentiality would be maintained Leong et al. (2019). In this study, various scales were applied to collect information from respondents. The demographic variables, like gender and education, were measured on a two point nominal scale, whereas, age, and income were measured using a three and four point ordinal scales respectively. Researches also employed statistical methods to analyze the non-existence of common method biasness in the research design. Statistically, the Harman's single factor suggested overall 34.99 per cent variance, which is sufficiently lesser than the recommended threshold of 50 per cent. It further indicated that common method bias was negligible in the collected data. Additionally, common method bias was evaluated through evaluating VIF (variance inflation factor) values in line with the recommendations of Kock (2015). Next, a full collinearity test was performed and the resulted vertical collinearity test found that all inner VIF values are less than the threshold of 3.3. Further, all exogenous and endogenous variables were connected to a dummy variable to evaluate a model-wide VIF. The model-wide VIF values for each construct were recorded to be lesser than 3.3 which indicates that CMB is not a significant issue in our study. Cook's distance was also carried out to detect existence of any potential influential outlier. Using SPSS 25, a multiple regression analysis was performed and the longest cook's distance value was found to be at 0.26, which is less than the recommended threshold of

0.50. Therefore, the non-existence of influential outliers was confirmed for the current study.

Assumptions of Multivariate Normality

Before performing the multivariate analysis, multivariate assumptions were verified. To test the normality of data, Shapiro Wilk's test, K-S test and QQ plots were performed (Fig. 2, and Fig. 3). The Shapiro Wilk's is considered a robust test to evaluate the normality of data when size of sample is less than 2000. The test results indicates that all variables' p values are less than 0.05, which further validates that the key variables applied in this study were not normally distributed. While addressing multi-collinearity concerns, VIF and tolerance values were ascertained. The tolerance values for each statement lies between 0.45 - 0.72. This exceeds the recommended threshold of 0.20 Hew & Kadir (2016). The VIF values for each statement, which lies between 1.37 - 2.22 and that is sufficiently below the recommended threshold value of 5.0. Further, VIF and tolerance results confirmed that there is no issue of multi-collinearity in the current data. Additionally, researchers have analyzed the intra-construct correlations amongst variables, wherein the highest correlation coefficient is between sustainable consumer behavior and agreeableness at 0.585, which is less than the recommended threshold of 0.90. Hence, it was ensured that multi-collinearity assumption was not violated. Homoscedasticity was performed through scatter plot of regression predicted value of sustainable consumption behavior against the standardized residual (see Fig. 4), which was found to have homoscedastic distribution. Here, not all the required multivariate assumptions are fulfilled. Hence, Partial Least Square (PLS) was used because it was robust toward the non-normal distributions.

Assessment of Measurement Model

For multivariate data analysis, artificial neural network (ANN) and variance based SEM (PLS) was compared. IBM SPSS V25 was used for multivariate assumption and ANN prediction, while PLS-3 was performed to validate the measurement model and structural model (see Table 1). The internal consistency of each variable was tested through α (alpha) and rho techniques. In all endogenous and exogenous variables, the value of α (alpha) exceeded threshold value i.e. 0.70 Hair et al. (2017). Therefore, it was confirmed that all the reliability related criteria meets its recommended requirements. The measurement model (refer Table 1) has been verified for its soundness considering the benchmark's value decided by Hair et al. (2017) who recommended that the factor loadings and composite reliability should be greater than 0.70, and AVE must be at least 0.50. In this study, we confirmed whether the measurement model meets all the necessary thresholds. One statement from e-mavenism and conscientiousness each was removed in the final data analysis due to lower factor loadings. While considering the model validity challenges, the composite reliability (CR) should be greater than 0.70 and AVE should be above 0.50 and for each construct respective CR must be greater than AVE. In the reliability and validity analysis, researcher ensure that convergent validity for each constructs is under threshold level. Discriminant validity was evaluated using Fornell-Larcker's criterion. The positive square root of AVE exceeds the value of intra-construct correlations (Lowery & Gaskin, 2014). In addition, criterion of HTMT (Hetero-Trait-Mono-Trait Ratio) was applied, which was sufficiently below the recommended levels of 0.85. Considering the aforementioned tests, on the basis of which statistically discriminant validity was confirmed, it is safe to state that all the latent constructs are significantly different from each other.

Structural Model

In this study, the effects of agreeableness, neuroticism, conscientiousness, extraversion, openness and mediating effect of e-mavenism on sustainable consumption behavior was tested. To evaluate the effects and achieve the objective, PLS-SEM was performed with 5000 bootstrapping re-sample without sign change. The path analysis showed that four out of five exogenous variable have statistically significant impact on e-mavenism. Bootstrapping analysis indicates agreeableness ($\beta=0.334$, $p=0.00$), conscientiousness ($\beta=0.132$, $p=0.013$), extraversion ($\beta=0.180$, $p=0.004$), openness ($\beta=0.136$, $p=0.011$) has significant impact on e-mavenism. However, neuroticism ($\beta=0.010$, $p=0.114$) has an insignificant impact on e-mavenism. Finally, the mediating variable e-mavenism ($\beta=0.485$, $p=0.000$) has statistically significant impact on outcome variable sustainable consumption behavior. It is observed that e-mavenism has statistically significant mediating effect on four personality traits, agreeableness ($\beta=0.162$, $p=0.000$), conscientiousness ($\beta=0.064$, $p=0.025$), extraversion ($\beta=0.088$, $p=0.016$), and openness ($\beta=0.066$, $p=0.008$) that indirectly predicts the criterion variable (SCB). However, e-mavenism has failed to have any significant mediating effect on the relationship between neuroticism ($\beta=0.004$, $p=0.116$) and SCB. The existing research model is able to explain 43.90% of variance (R^2) in predicting the SCB. The goodness of fit of bootstrapping estimated model was ascertained and the values of SRMR, dULS, and dG discrepancies of estimated models were 0.047, 0.620, and 0.349 respectively. Notably, all the values were below their respective 95%-quartile of the bootstrap confidence intervals at 0.057, 0.757 and 0.650. In addition to that, the value of NFI at 0.927 exceeded the value of its threshold at 0.90. The above results indicate that the model is better with respect to goodness of fit index and is reliable for further analysis.

ANN Analysis

ANN is a modern and widely used robust techniques for prediction. This method is very effective in predicting complex relationships amongst inputs and outputs. ANN has higher level of prediction ability than traditional statistical tools like multiple regression, binary logistic regression, SEM, and multiple discriminant analysis Leong et al. (2019). In this study, we applied hybrid SEM-ANN because ANN is robust to handle linear and non-linear relationships with its non-compensatory model Chan & Chong (2012). ANN method is capable of working like human brain that includes neuron, synapse, and axon, which is able to learn through the iterative process and develop its knowledge. Multilayer perception (MLP) was carried out which comprises three layers (input, hidden and output), which is regarded as very efficient and robust method by adopting weight coefficient and delivering input output mappings Chong (2013).

Validation of ANN

The ANN analysis was performed by IBM-SPSS V25. In the final ANN model, all the significant personality traits identified during the primary analysis of PLS-SEM have been taken as the input layer for predicting the output variable (SCB). Moreover, as continuous function can easily be explained by a single hidden layer Sharma et al. (2018), the current study has employed single hidden layer. In addition, to increase the effectiveness of training, all inputs parameters were standardized in the range of 0 to 1. In this study, sigmoid function was performed in both hidden layer and output layers Liu & Campbell (2017). To restrict the over fitting challenges, standard practice of K-fold (10) cross-validation technique was applied. In this research, 90 per

cent of the data set was considered for training purpose while remaining 10 per cent of the data set was employed for testing purpose Leong et al. (2019). Here the sample size is 480, which is sufficient for ANN study, because this number is greater than 10 times of the synaptic weights in the current ANN model. The five significant exogenous constructs including mediating variable was used for the second-stage ANN technique to predict SCB. The variables openness, agreeableness, extraversion, conscientiousness and e-mavenism were used as input layers and sustainable consumption behavior was employed as output layer. The mean value of RMSE of training and testing (0.0885 and 0.0861) low values validates that mathematical relationship between predictors and output variables as highly accurate and fit the data appropriately. Further, a technique called sensitivity analysis, was performed to analyze the contribution of each predictor in the incremental values of predicting the output variable. As per the results of K-fold (10) cross validation ANN showed that agreeableness is the most influencer predictor with average normalized importance at 0.3174 followed by e-mavenism (0.2942). Next, openness (0.1799) and extraversion (0.1296) contribute moderately in the middle while predicting the SCB. Lastly, conscientiousness was the lowest contributor in predicting SCB. Furthermore, goodness of fit index was calculated which is comparable to multiple regression analysis R^2 using a formula $R^2 = 1 - \frac{RMSE}{Sy^2}$, where Sy^2 is the mean variance of SSE of the ten-fold testing ANN model. The result (refer Table 1) shows that the current ANN model with its given personality traits and e-mavenism can predict total 77.36 per cent $[1 - (0.0861 / 0.3803)]$ of variance while predicting sustainable consumption behaviour Chen, & Shi (2009) Table 1.

Table 1					
SUMMARY OF RESULTS					
Path Analysis (5000 re-sample bootstrapping)					
Hypothesis	Structural Path	Coefficients (β)	T - Statistics	P -Values	Results
Direct Effects:					
H1	Agreeableness -> e-mavenism	0.334	4.688	0.000**	Supported
H2	Conscientiousness -> e-mavenism	0.132	2.498	0.013*	Supported
H3	Extraversion -> e-mavenism	0.180	2.889	0.004**	Supported
H4	Neuroticism -> e-mavenism	0.010	1.086	.114 ^{n.s.}	Not Supported
H5	Openness -> e-mavenism	0.136	2.896	.011*	Supported
H6	e-Mavenism -> Sustainable consumption behaviour	0.485	8.649	0.000**	Supported
Mediating Effects (Indirect Effects) of e-Mavenism:					
H7	Agreeableness -> e-mavenism -> Sustainable consumption behaviour	0.162	3.812	0.000**	Supported
H8	Conscientiousness -> e-mavenism -> Sustainable consumption behaviour	0.064	2.247	0.025*	Supported
H9	Extraversion -> e-mavenism -> Sustainable consumption behaviour	0.088	2.776	0.016*	Supported
H10	Neuroticism -> e-mavenism -> Sustainable consumption behaviour	0.004	1.120	0.116 ^{n.s.}	Not Supported
H11	Openness -> e-mavenism -> Sustainable consumption behaviour	0.066	2.478	0.008**	Supported
Construct	Agreeableness	E-mavenism	Openness	Extraversion	Conscientiousness
Reliability / Convergent Validity Statistics:					
A.V.E.	0.758	0.710	0.713	0.704	0.667
C.R.	0.9047	0.907	0.882	0.905	0.857
rho_A	0.847	0.865	0.805	0.861	0.780
C.A.	0.841	0.864	0.799	0.860	0.755
Discriminant Validity:					
Agreeableness	[0.871]	{0.682}	{0.449}	{0.724}	{0.403}
E-mavenism	(0.583)	[0.843]	{0.480}	{0.610}	{0.462}
Openness	(0.368)	(0.400)	[0.844]	{0.515}	{355}
Extraversion	(0.617)	(0.527)	(0.430)	[0.839]	{0.403}
Conscientiousness	(0.323)	(0.368)	(0.277)	(0.327)	[0.817]
ANN Results (Sensitivity Analysis) :					
Rank#	#01	#02	#03	#04	#05
A.N.I.	0.3174	0.2942	0.1799	0.1296	0.0789

DISCUSSION AND CONCLUSION

Although numerous commercial and non-profit organizations such as energy, environment, agriculture, construction and community development have embraced the concept of sustainability (Rex et al., 2015), the adoption of sustainable products/services and implementation of ethical practices remain dismally low Sharma & Jha (2017). One of the major barriers faced by non-profit organizations and public sector marketers in their mission en route for attaining sustainable future is the disinclination by consumers towards adoption of sustainable measures in their mundane lives (Rex et al., 2015). In this direction, our study has examined the impact of big-five personality traits and e-mavenism on sustainable consumption behaviour from SNS perspective. We have identified the ranks of the factors ultimately leading to the prediction of sustainable consumption behaviour of SNS users. Henceforth, this study discovers new frontiers for progression in the field of sustainable consumption behaviour of SNS users and on a similar level deepens the knowledge of human psychology behind participating in such behaviours. Theoretical contributions and managerial implications have been discussed further.

Theoretical Contributions

This research work has provided fresh theoretical contributions. Using big five personality trait theory as a theoretical framework, our research study intended to examine the association of personality traits and e-mavenism in predicting sustainable consumption behaviour. Additionally, we have used real SNS users providing value to researchers and scholar who might possibly extend our study in different settings. However, we found that not all constructs of big five personality have significant relationship with e-mavenism and sustainable consumption behaviour.

We found agreeableness to be the strongest predictor of sustainable consumption behaviour in the context of SNS. This is in line with the findings of Awais et al. (2020) and Goldsmith & Flynn (2015) but in different context. This might have happened because individuals who are high on agreeableness care about others and are more sympathetic, kind and affectionate McCrae & John (1992) thus, emulating sustainable consumption behaviour. This finding is unique as it represents the predictive power of the construct, thereby augmenting the existing literature in the domain of sustainable consumption.

The second strongest predictor of sustainable consumption behaviour was found to be e-mavenism. Although the past literature has established the relationship between personality traits and e-mavenism on sustainable consumption, our research has extended the literature by providing a new paradigm in predicting sustainable consumption behaviour by providing the predictive power and ranking of such factors. Our study established the positive effect of e-mavenism and the inclusion of e-mavenism as mediator as well as predictor in the model provides us with new theoretical standpoint. On one hand, this study provides empirical evidence on the mediating effect of e-mavenism between personality traits and sustainable consumption behaviour Awais et al. (2020) while on the other hand, it validates the predictive power of e-mavenism on sustainable consumption. This innovative discovery would be a starting tip for researchers and scholar to further explore the impact of e-mavenism in the SNS domain or another context, thereby contributing the prevailing literature on sustainable consumption behaviour Reinecke Flynn & Goldsmith (2017).

Next, one of the thought provoking outcomes we established was the predictive power of

openness on sustainable consumption behaviour, since such outcome has been empirically validated for the first time in the SNS domain. It indicates that SNS users who are high on openness quotient hold greater strength of mavenism and therefore, are precious and very proactive in dispersing or sharing information, specifically related to sustainable products and services McClain et al. (2021).

The next strong predictor of sustainable consumption behaviour were extraversion followed by conscientiousness, from SNS perspective. Prior literature has indicated the positive relationship of both extraversion and conscientiousness with e-mavenism and sustainable consumption behaviour Vazifehdoost et al. (2012); Awais et al. (2020). On one hand, conscientiousness is regarded as the propensity of an individual to be trustworthy, organized and responsible whereas on the other hand, extraversion is broadly a positive social trait which is linked to the disposition to seek out social interactions.

Remarkably, there is no significant association between neuroticism on e-mavenism and sustainable consumption behaviour in the context of SNS. This is a surprising result found by our study that contradicts the findings by Goldsmith & Flynn (2015). This might have happened because the individuals who are high on neuroticism are considered emotionally insecure and least sociable persons who are hard to get along with during social interactions. This is a novel theoretical contribution that could be verified by future researchers in similar or other contexts. Therefore, it enriches the current literature on e-mavenism and sustainable consumption behaviour. Lastly, we have augmented the extant literature by using a relatively innovative hybrid approach of 'predictive analytic PLS-SEM-ANN' to discover significant linear relationship between e-mavenism and personality traits on sustainable consumption behaviour. Additionally, this study theoretically adds to the prevailing literature by adopting neural network approach to successfully verify and rank the normalized importance of the significant determinants of sustainable consumption behaviour in the context of SNS.

Managerial Implications

Today's the biggest challenge of non-profit marketers and public policy makers is to bring the change in unsustainable habits and consumption behaviours of consumers who appear concerned about the state of environment, but fail to change their consumption practices Sharma & Jha (2017). The findings of the study provides comprehensive interpretations for non-profit marketers who seek to raise the incidence of adoption of sustainable practices. This study has provided valuable insights regarding sustainable consumption behaviour in the SNS domain by integrating the relationship between personality traits and e-mavenism. The results of our study provides ample opportunities for non-profit marketers and practitioners to leverage and gain valuable insights on the pivotal role of big five personality traits and e-mavenism in predicting the sustainable consumption behaviour. This study has established that personality traits (agreeableness, openness, extraversion and conscientiousness) and e-mavenism were able to successfully predict the sustainable consumption behaviour in the context of SNS. E-mavenism is associated with individuals having exemplary knowledge regarding the product/services and play a significant role of influencers on SNSs. The findings of our study would guide the sustainable marketers to concentrate on e-mavenism phenomenon and promote sustainable products and services by taking into consideration the personality traits of a typical SNS user. The integration of personality traits with e-mavenism would help marketers to design/spread promotional campaigns by recruiting and capitalizing on e-mavens high on specific personality traits such as agreeableness and openness to disseminate and positively influence other SNS users on

sustainable consumption. Likewise, our research indicates that marketers should target individuals who are extraverts and try to engage them towards sustainable consumption. Although conscientiousness personality driven individuals were found to have least predictive power, marketers could definitely target such individuals to promote sustainable products or services.

Additionally, public policy makers and non-profit marketers could selectively and consciously appeal only certain individuals seeking sustainable behaviour by taking their personality characteristics into consideration. For instance, our findings suggests that individuals high on neuroticism would provide less returns on sustainable marketing efforts. Therefore, our study through in-depth investigation has provided guidance to managers to effectively target e-mavens with specific personality characteristics, to share and spread their message on sustainable consumption. For instance, marketers could launch social marketing campaigns which can emphasize consumers to believe that adoption of sustainable measures is a part of their personality and therefore, make the consumers feel that it is ethical obligation to engage in sustainable practices. Likewise, online marketers could identify and recruit e-mavens to drive sustainability and persuade consumers to behave sustainably in their mundane lives to have a healthy planet long into the future. Yet again, policy makers in India need to design effective online marketing and communication programs that may promote sustainable consumption behaviour by making the programs more relevant for the targeted segment thereby relating it to personality traits of SNS users. Henceforth, the comprehensive understanding of the normalized importance of personality traits and e-mavenism of SNS users could be utilized to effectively promote consumer welfare through sustainable product/services.

LIMITATIONS AND FUTURE DIRECTIONS

This study is also not free from limitations and being a cross-sectional study, the outcomes of our research is limited to a definite time period. Therefore, longitudinal studies by future researchers may provide additional insights on sustainable consumption behaviour. One of the limitations of this study is that we have not considered the effect of demographic variables such as age, gender, income or education which could be incorporated by future researchers. Moreover, future studies could also conduct studies in different context. Our study provided insights in the emerging market context as it was conducted in India. Future studies could utilize other demographics and also extend the study in other emerging markets. In future, cross cultural studies would give a broader perspective of sustainable consumption behaviour. Furthermore, employing other relevant theories such as social network theory in our model could provide new perspectives to researchers and gather empirical evidence by assessing the predictive power the model.

FINAL CONCLUSION

This research would pave way for future research that reflects less of organizational viewpoint and more of consumer perspective. Our research deep dives into comprehending what stimulates consumers towards adoption of sustainable consumption behaviour in SNS context which would guide public policy decision makers and non-profit organizations to identify and proactively target the right consumer towards sustainable consumption. Our study employed the deep neural network architecture based on the innovative dual-stage PLS-SEM and ANN method and successfully predicted and ranked the factors influencing the sustainable consumption behaviour. Our study highlights the importance of personality traits and e-mavenism in predicting

sustainable consumption behaviour in the context of SNS. The results revealed the normalized importance of personality traits and found that agreeableness was the strongest predictor of sustainable consumption behaviour in the SNS domain followed by e-mavenism, openness, extraversion, and conscientiousness. The outcomes and relationships identified between the variables under consideration ultimately provide unforeseen insights for scholars and future research. Our ANN model was able to predict sustainable consumption behaviour with an accuracy of 77.36 per cent.

REFERENCES

- Abdolmohammadi, M.J., & Baker, C.R. (2008). Moral reasoning and questionable behavior. *The CPA Journal*, 78(11), 58-60.
- Aljukhadar, M., Senecal, S., & Bériault Poirier, A. (2020). Social media mavenism: Toward an action-based metric for knowledge dissemination on social networks. *Journal of Marketing Communications*, 26(6), 636-665.
- Awais, M., Samin, T., Gulzar, M. A., Hwang, J., & Zubair, M. (2020). Unfolding the association between the big five, frugality, e-mavenism, and sustainable consumption behavior. *Sustainability*, 12(2), 490.
- Barnes, S.J., & Pressey, A.D. (2016). Cyber-mavens and online flow experiences: Evidence from virtual worlds. *Technological Forecasting and Social Change*, 111, 285-296.
- Belch, M.A., Krentler, K.A., & Willis-Flurry, L. A. (2005). Teen internet mavens: influence in family decision making. *Journal of Business Research*, 58(5), 569-575.
- Black, I. (2010). Sustainability through anti-consumption. *Journal of Consumer Behaviour*, 9(6), 403-411.
- Bove, L.L., Nagpal, A., & Dorsett, A.D.S. (2009). Exploring the determinants of the frugal shopper. *Journal of Retailing and Consumer Services*, 16(4), 291-297.
- Boyd, D.M., & Ellison, N.B. (2007). Social network sites: Definition, history, and scholarship. *Journal of computer-mediated Communication*, 13(1), 210-230.
- Chan, F.T., & Chong, A.Y. (2012). A SEM–neural network approach for understanding determinants of interorganizational system standard adoption and performances. *Decision Support Systems*, 54(1), 621-630.
- Chen, X., & Shi, S. (2009). A literature review of privacy research on social network sites. In *2009 International Conference on Multimedia Information Networking and Security* (Vol. 1, pp. 93-97). IEEE.
- Chong, A.Y.L. (2013). A two-staged SEM-neural network approach for understanding and predicting the determinants of m-commerce adoption. *Expert Systems with Applications*, 40(4), 1240-1247.
- Chou, C.P., & Bentler, P.M. (1995). Estimates and tests in structural equation modeling.
- Darley, W., & Lim, J.S. (2018). Mavenism and e-maven propensity: antecedents, mediators and transferability. *Journal of Research in Interactive Marketing*.
- Feick, L.F., & Price, L.L. (1987). The market maven: A diffuser of marketplace information. *Journal of marketing*, 51(1), 83-97.
- Figuroa-García, E.C., García-Machado, J.J., & Perez-Bustamante Yabar, D.C. (2018). Modeling the social factors that determine sustainable consumption behavior in the community of Madrid. *Sustainability*, 10(8), 2811.
- Friedman, H.S., & Schustack, M.W. (1999). *Personality: Classic theories and modern research* (p. 576). Boston, MA: Allyn and Bacon.
- Goldberg, L.R. (1993). The structure of phenotypic personality traits. *American psychologist*, 48(1), 26.
- Goldring, D., & Azab, C. (2021). New rules of social media shopping: Personality differences of US Gen Z versus Gen X market mavens. *Journal of Consumer Behaviour*, 20(4), 884-897.
- Goldsmith, R.E., & Flynn, L.R. (2015). The etiology of frugal spending: A partial replication and extension. *Comprehensive Psychology*, 4, 09-20.
- Hair, J., Hollingsworth, C.L., Randolph, A.B., & Chong, A.Y.L. (2017). An updated and expanded assessment of PLS-SEM in information systems research. *Industrial management & data systems*.
- Hew, T.S., & Kadir, S.L.S.A. (2016). Understanding cloud-based VLE from the SDT and CET perspectives: Development and validation of a measurement instrument. *Computers & Education*, 101, 132-149.
- Kees, J., Berry, C., Burton, S., & Sheehan, K. (2017). An analysis of data quality: Professional panels, student subject pools, and Amazon's Mechanical Turk. *Journal of Advertising*, 46(1), 141-155.
- Kock, N. (2015). Common method bias in PLS-SEM: A full collinearity assessment approach. *International Journal of e-Collaboration (ijec)*, 11(4), 1-10.
- Leong, L.Y., Hew, T.S., Ooi, K.B., Lee, V.H., & Hew, J.J. (2019). A hybrid SEM-neural network analysis of social

- media addiction. *Expert Systems with Applications*, 133, 296-316.
- Liu, D., & Campbell, W.K. (2017). The Big Five personality traits, Big Two metatraits and social media: A meta-analysis. *Journal of Research in Personality*, 70, 229-240.
- McClain, C., Vogels, E.A., Perrin, A., Sechopoulos, S., & Rainie, L. (2021). The Internet and the pandemic.
- McCrae, R.R., & John, O.P. (1992). An introduction to the five-factor model and its applications. *Journal of personality*, 60(2), 175-215.
- Quoquab, F., Mohammad, J., & Sukari, N.N. (2019). A multiple-item scale for measuring “sustainable consumption behaviour” construct: Development and psychometric evaluation. *Asia Pacific Journal of Marketing and Logistics*.
- Reinecke Flynn, L., & Goldsmith, R.E. (2017). Filling some gaps in market mavenism research. *Journal of Consumer Behaviour*, 16(2), 121-129.
- Sharma, R., & Jha, M. (2017). Values influencing sustainable consumption behaviour: Exploring the contextual relationship. *Journal of Business Research*, 76, 77-88.
- Sharma, S.K., Al-Badi, A., Rana, N.P., & Al-Azizi, L. (2018). Mobile applications in government services (mG-App) from user's perspectives: A predictive modelling approach. *Government Information Quarterly*, 35(4), 557-568.
- Song, L., Lim, Y., Chang, P., Guo, Y., Zhang, M., Wang, X., ... & Cai, H. (2019). Ecolabel's role in informing sustainable consumption: A naturalistic decision making study using eye tracking glasses. *Journal of cleaner production*, 218, 685-695.
- Vazifehdoost, H., Akbari, M., & Charsted, P. (2012). The role of psychological traits in market mavenism using big five model. *International Journal of Management and Business Research*, 2(3), 243-252.
- Voronoff, D. (2005). Community sustainability: A review of what works and how it is practiced in Victoria. *Environment Victoria: Melbourne, Australia*.

Received: 14-Jul-2022, Manuscript No. AMSJ-22-12327; **Editor assigned:** 18-Jul-2022, PreQC No. AMSJ-22-12327(PQ); **Reviewed:** 05-Aug-2022, QC No. AMSJ-22-12327; **Revised:** 25-Aug-2022, Manuscript No. AMSJ-22-12327(R); **Published:** 16-Sep-2022