A paradigm shift: Nano-sensory nudges stimulating consumer's purchase behaviour for green products driving towards environmental sustainability

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ABSTRACT

Sensory nudge has been creating a significant impact in the field of market research with implementation of methods used in neuro marketing. These methods help in understanding the impact of sensory nudge on consumer purchase behavior. This research paper focuses on the impact of different sensory nudges due to the packaging, promotional activities, design and other motivational that influences the purchase behavior for green product. This sensory nudge stimulates the environmental consciousness of the consumers and their preference for green products over conventional products. This research work has been started with an introduction to the research topic followed by an extensive review of literature related to the subject matter. Then the conceptual framework for the study was developed followed by research hypotheses. The testing of hypotheses was carried by using specified research methodology with the help of a structured questionnaire for conducting the survey. The results from data analysis were interpreted. The major challenge in this context is to know the impact of sensory nudge derived from marketing activities that modulate consumer's perception, attitude, and behaviour towards purchasing of green products that builds environmental sustainability. Based on the extensive review of the literature, this study addresses the causes that restrict consumers' from using green products. This study also scrutinizes the environmental consciousness of the respondents. The research work includes analyzing the awareness level of green products and perception about the term green.
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1. Introduction

The term environmentalism has rapidly turned out to be a global phenomenon. The impact of environmental challenges has been accepted as an opportunity by marketing organizations. This opportunity is converted to profitability by implementing green marketing strategies. Social challenges coming up due to environmental problems have now been transferred to marketing problems. Sustainability is societal objective, once attained will practically transform everyone's behaviour [1]. The positivity of marketing green products is increasing among Indian consumers.

Therefore, the concept of green marketing is not new to the business organization. Several companies have acknowledged their

accountability and responsibility towards protecting the environment. The conception of "go green" has been introduced by companies by producing green products and adapting production process that adds towards minimising pollution and built profitability at the same time. The activities executed by companies that are addressing the environmental problems and satisfying consumer need by delivering green are termed as green marketing [2]. It is noticeable that there is a class of consumer who are more concern towards matter related to the environment and they implement this in their purchase decision [3]. The fast-moving consumer goods sector, electronic products, and solar energy sector are among the growing markets that have revealed green marketing practises. However, a better understanding of consumer's purchase behaviour towards the green product is an important task. The main purpose of the study is to identify the factors involved in green marketing which drives purchase intention of consumers towards green

product and to analyse their purchase behaviour. Sensory Nudge has an impact towards moulding the consumers' perception, attitude, purchase intention and other parameters influencing the consumption pattern [4]. Nudges are considered to small contextual signals transmitted that are aimed at creating an impact on the consumer's judgment towards a product acceptance that creates a positive effect on their health, society, environment and sustainability. Consumer acceptability of product is the major concern and this issue can be resolved by application of sensory nudge that enable to understand the consumer acceptability of a product prior to introduction of the product in the market. There are several medium of sensory stimuli that are transmitted in the consumers that includes packaging, background sound of advertisement, temperature level, fragrance, labelling data and many more. The impact of the nudges has been used by the market researchers to manipulate the environmental related variables with the sensory impact.

2. Literature review

With this extensive literature review, it can be derived that the success of green products is determined by the psychology of consumer's and their purchase behaviour. Many factors play an important role in influencing the decision process of the consumer, but one of the major roles has been played by awareness towards the green product. The studies based on analysing the behavioural pattern of the consumer reveal that the green consumer is puzzled. The puzzled behaviour of the consumer is the outcome of low awareness and little environmental knowledge about the green product and also the lack of effort by marketers in providing the right kind of information about green products. In developing countries like India, the purchase of these products is low and one of the factors that contribute for this is need for green certification and eco-labels. Therefore, cataloguing and advertisements play a vital responsibility in eradicating the knowledge barrier. The spending towards the purchase of the green product is more of consumers' having strong knowledge about environmental issues [5–8]. The major role is played by consumption value that influences consumer choice behaviour towards the green product. Few of the study suggest that in comparing the effect of consumption values the role of price and quality does not matter. The distinguishing features of a green product such as recycling potential, low pollution and economy of resources may possibly persuade consumers to purchase this type of product. In the study of literature, it shows that green behaviour of the consumer may also be affected by peer pressure or personal factors. Consumer behaviour is also influenced by collectivism and study proposed that the collectivist people are friendlier towards their environment. The purchase intention, of green, also varies on the basis of personal factors. Even though consumers purchase recycled products they consider price and quality of these products should match with other conventional product. There are a number of people who are willing to pay a premium price for the green product. With reference to the intensive literature review, it was found that the influence of subjective norm and reference group creates an impact on an individual's purchase intention and thereafter purchase behaviour. It is found that there exists a positive correlation with the purchase intention and actual purchase of green product [9–11]. There are studies which have found a negative impact of subjective norm on purchase intention and purchase behaviour. There other variables that have an impact on purchase intention of consumer's is perceived behavioural control [12]. It refers to the ability of an individual to act in a given manner. In case of literature study, it has been found that intention and actual purchase of the green product is positively correlated with perceived behavioural control [13–14]. However, another study reported that

there exists no relationship between perceived behavioural control and consumer green purchase intention. The most studied variable is environmental knowledge about the benefit of using green products environment. The literature study reveals that knowledge has a positive influence on consumers purchase intention and purchase behaviour. Several other reports highlight that knowledge about organic food creates a positive attitude towards these products. Environmental knowledge plays a mediating role between consumer ecological behaviour and ecological attitude. Studies reported that restricted accessibility of a product has a negative impact on the consumers' purchase intention and purchase behaviour. However, on the hand, it is evident that availability of green has a positive correlation with the purchase intention and purchase behaviour [15]. Consumers generally don't encourage themselves in spending more time in finding the green product. Therefore, they purchase other alternative product that is easily accessible. Thus, it can be said that control on product availability plays a major role in affecting purchase intention and purchase behaviour towards consumption of the green product. The major role played by sensory nudge to stimulate the purchase behaviour for green product needs to be tapped by marketers [16–18].

3. Nudging of Sensory-Related contextual cues

3.1. Chromatic signals

The most popular visual cues that stimulates the sensory organ are colours, dimensions, figures and the pattern of display that modulates the consumer purchase intention and behaviour in the context of purchasing green products. There is different impact of various colour of lights for example yellow lighting creates increase in carving, whereas research suggest that blue or red light has the reverse impact on appetite. Similarly packaging of the product creates an impact on the consumer perception of accepting the product [19]. The visual image on the package or information about the content of the product and also the labelling creates an impact on purchase intention for green product. The display of the product in the retail outlet also influences product evaluation. These study suggest that marketers, packaging designers and sensory researchers need to consider visual cues as one of the vital factor that influences consumers to try for green products [20].

3.2. Aural cues

It has been observed by researcher that sound played in background, noise or conversations can significantly impact the perception, attitude and liking towards a product. A study was conducted by Lin et al. [21] with an aim of identifying the factors that impact the consumer intention, perception and sentimental response towards consumption of chocolate gelato based on the ambience with different sound encountered by the consumers created an impact on their consumption pattern. This showed that different flavour of gelato was consumed based on different pleasant and unpleasant sound associated with consumer. Therefore, it is essential for the marketers to understand which place and the type of ambience they shall choose to pitch their product.

3.3. Touch cues

In case of consumable product studies have basically dealt with touch cues that focus on the taste buds. The oral feels decide the consumers' perception and acceptance of the product. There are other studies where consumers purchase intention is decided based on the hands or the touch feeling may be at the point-of-sales, usage of the product, sample testing of the product. These factors have

deep influence on the consumer perception, attitude, and acceptance of the green product [22].

This research article focuses on the impact of Nano-sensory cues stimulating the consumer's perception, attitude, subjective norm, acceptability and purchase behaviour towards products that are consumable and green products. It vital for today's marketers to understand these factors both for online and offline purchase of products. The conceptual framework for the research work is mentioned in Fig. 1.

4. Significance of study

Ever since the report was issued by the United Nations, industry practice has cuddled the concept that sustainability originated from focusing on the triple bottom line. A triple bottom line is a holistic approach for attaining sustainability through the incorporation of three dimensions that are environment, society, and economy as depicted in Fig. 2. The Triple Bottom Line focuses on creating three values which are economic, environmental and social for constructing a sustainable organization. In order to live on, in this competitive world, it is essential to generate an acceptable level of economic performance by an organization. Simultaneously a sustainable organization should also nurture societal values by interacting with customers, suppliers, consumers and other groups linked to them. Another aspect of achieving sustainability is to achieve an acceptable level of environmental performance throughout their supply chain starting from procurement of raw material to production of the final product till post-consumption disposal. Therefore, sustainability is viewed as a practice in which businesses struggle for continuous enhancement headed for the three dimensions of the Triple Bottom Line [23]. Hence, green marketing is imperative for achieving their organizational goals. Additionally, environmental issues and health problems from governmental and societal sectors have imposed constraints on the organizations to adopt a method that shall minimize environmental pollution. Consumers' knowledge, environmental concern, positive belief towards eco-friendliness, safe and green products and desire to protect the environment are other factors that triggered the growth of green marketing [24]. Thus, the study provides insight into green purchase behaviour and facilitates purchase intention of green products based on the stimuli provided by the sensory nudges.

5. Research hypotheses

5.1. Hypotheses

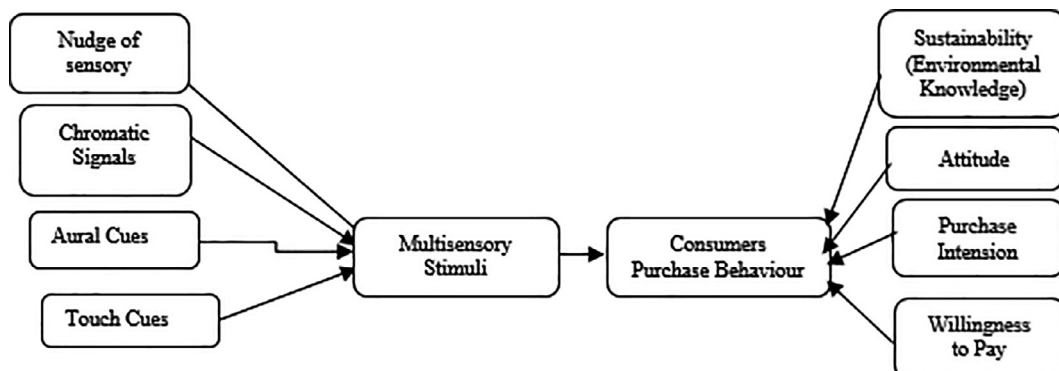- H1: There is a significant relationship between Multisensory stimuli and Consumers Purchase Behavior.
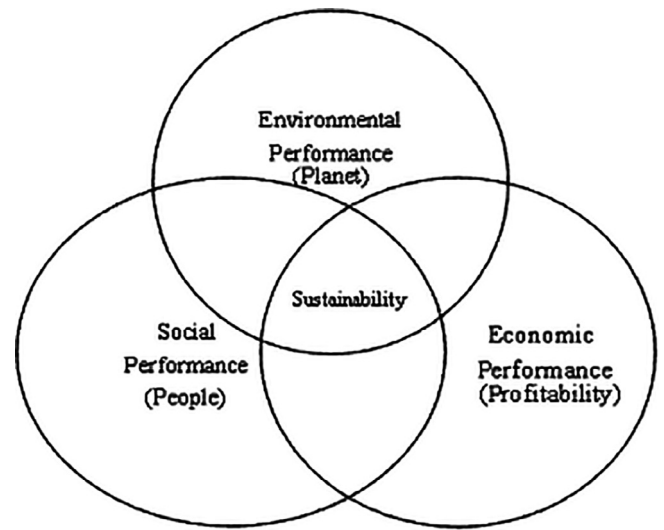

Fig. 2. Dimensions of Sustainability.

- H2: There is a significant relationship between Consumers Purchase Behavior and Sustainability.
- H3: There is a significant relationship between Consumers Purchase Behavior and Purchase Intension.
- H4: There is a significant relationship between Consumers Purchase Behavior and Willingness to pay.
- H5: There is a significant relationship between Consumers Purchase Behavior and Attitude.

6. Research methodology

The detailed procedure of conducting research methodology for the present study has been reviewed. It covers the research design, types of data sources, sampling techniques, data collection process, statistical tools, coverage and the procedure of analysing the data in detail. The section initiates with the outline of the research, research philosophy, strategy and the paradigms considered for conducting the study. Thereafter data analysis process is reviewed in brief.

6.1. Research type

The study comes under exploratory research type, as it is an introductory study of an unknown difficulty about which the researcher has limited knowledge and wants to generate new information. Exploratory research was found to be more appropriate for this study to explore the perspective and challenges of

Fig. 1. Conceptual Framework.

green marketing approach on consumer purchase behaviour towards green products.

6.2. Research approach

The research approach illustrates the relationship between theory and research work. There is two types of research approach: deductive and inductive approach. It is the techniques used by the researcher to gather the data and respond to the research problem. In case of a deductive approach, the whole process of data collection is guided after the development of research hypothesis of the existing theories. The developed hypothesis is thereby accepted or rejected built on the data analysis. On the other hand, another form of research advance is the inductive approach. The researcher concludes the hypothesis by means of the inferences and results of the study. In this research, we have started our study by means of the existing literature and research work carried out in this area. Review of the selected literature guided in identifying the factors that influence the purchase behaviour of consumers' for using the green product base on the nudges stimulated by different sensory methods. This study also enlightens us about various green marketing strategies formulated by companies and marketers for attracting consumers to motive their purchase intention towards the green product by changing the consumer perception through multisensory nudges. The quantitative method has been utilized and the null hypothesis was developed for evaluation. The data collected is required to be analyzed by using Statistical Package for the Social Sciences (SPSS) 20. This developed hypothesis will enable us to evaluate the correlation between the factors considered and purchase intention and behaviour of consumers for green products.

6.3. Population

Bhubaneswar city was selected as the population for the research work due to several reasons. First and foremost, Bhubaneswar, being a capital city is the hub for industry and education in Odisha. Bhubaneswar is the centre of business intended for big and small retailers and is a hub for the availability of various categories of green products. In addition to it, Bhubaneswar has excellent connectivity through air, rail, and road. Therefore, conducting research in this location was of major benefit and provided useful insights in to analyse the purchase behavior and perception of the consumer for green products by multisensory stimuli. The study was conducted by using quota sampling method and was employed to select 650 respondents, from Bhubaneswar city. The respondents were considered based on the age groups mentioned in the questionnaire. The respondents were students; housewives; professional; business; services. A Survey method was employed and a structured questionnaire was developed to measure demographic variables (age, gender, education etc.), attitude and purchasing behaviour of the respondents. Both open ended and closed ended questions were employed for eliciting desired information from respondents. The survey was carried for a period of 3 months during the last quarter of 2020. The population of Bhubaneswar was considered from the census report and based on the above formula the sample size was calculated to be 398.The desired sample size was calculated based on the below mention formula [25]:

$$n = \frac{NZ^2 X 0.25}{d^2 X[N-1] + [Z^2 X 0.25]}$$

7. Data analysis

The Table 1 interpretation is illustrated in terms of percentage, approximately 52.4% are male and 47.6% are female. For distribution of the respondents on the basis of age groups, it can be inferred that 65 numbers of respondents which consist 16.3% of total respondents belonged to an age group of 18–24 yr, 108 numbers of respondents consisting 27.1% belong to the age group of 25–34 yr, 111 respondents consisting of 27.8% belong to the age group of 35–44 yr, 84 respondents consisting of (21.1%) belong to the age group of 45–54 yr and 31 respondents consisting of (7.8%) belong to the above 55 yr age group of the total 399 respondents. It can be concluded that majority of the respondents belonged to the age group between 25 and 34 yr and 35–44 yr. The distribution in terms of educational qualification of the respondents shows that 70 numbers of respondents which consists 17.5% of total respondents are undergraduates, 171 numbers of respondents consisting 42.9% are graduates, 138 numbers of respondents consisting 34.6% are from post graduates and 20 numbers of respondents consisting 5% are from higher qualifications. Hence, predominantly respondents are graduates in terms of qualification. On the basis of the marital status of the respondents, it can be deduced that overall 218 numbers of respondents which consist 54.6% of total respondents are married and 95 numbers of respondents consisting 45.4% are unmarried.

7.1. Regression

Consumer purchase behaviour towards green product as the consequences of independent factors like Environmental Knowledge, Sustainability, Attitude, Multisensory Stimuli, Willingness to pay. The influence of these factors on consumer perception can be measured by using regression model. The below mentioned regression table summarizes the model performance through linear regression analysis. It was used to test if the consumer perception towards the green product is predicted by factors such as; environmental knowledge, sustainability, attitude, multisensory stimuli, willingness to pay.

7.2. Regression co-efficient of purchase behaviour

Table 2

Here, R is the multiple correlation coefficients that measure the strength and direction of a relationship between the variables. It varies from −1 to +1. R value reflects the score of 0.632, which states that the total extent of consumer purchase behaviour has a positive relationship with independent variables such as; environmental knowledge, sustainability, attitude, multisensory stimuli, willingness to pay. R square expresses the proportion of the variation in the dependent variable that is attributable to variation in the independent variables. The range of coefficient of determination lies between 0 and 1. Since R square value is 0.399, it reflects that 40% of the variation in the extent of consumer purchase behaviour is explained by environmental knowledge, sustainability, attitude, multisensory stimuli, willingness to pay (Table 3).

From the above ANOVA table for purchase behaviour, F value is significant at less than 0.05 and it reflects that the model is reliable as dependent variable is significantly impacted by independent variables (Table 4).

The multiple regression was calculated to predict purchase behaviour based on environmental knowledge, sustainability, attitude, multisensory stimuli, willingness to pay. It was found that

Table 1

Demographic Profile of the Respondents.

Sl. No.	Demographics	Category	Number	Percentage (%)
1	Gender	Male	209	52.4
		Female	190	47.6
2	Age	18–24	65	16.3
		25–34	108	27.1
		35–44	111	27.8
		45–54	84	21.1
		>55	31	7.8
3	Educational Qualification	Undergraduate	70	17.5
		Graduate	171	42.9
		Post graduate	138	34.6
		Higher Qualification	20	5.0
4	Marital Status	Married	218	54.6
		Unmarried	181	45.4
5	Occupation	Student	67	16.8
		Employed	215	53.9
		Unemployed	5	1.3
		Housewives	65	16.3
		Business	39	9.8
		Others	8	2.0
6	Monthly Household Income Rs.	<25,000	34	8.5
		25,001–50,000	102	25.6
		50,001–75,000	89	22.3
		75,001–100,000	61	15.3
		100,001–125,000	64	16.0
		125,001–150,000	24	6.0
		>150,000	25	6.3

Table 2

Model Summary for Purchase Behaviour.

Model Summary				
Model	R	R2	Adjusted R2	σest
1	.632a	0.399	0.412	2.488

a. Predictors: (Constant), Environmental Knowledge, Sustainability, Attitude, Multisensory Stimuli, Willingness to pay.
b. Dependent variable: Consumer Purchase Behaviour.
Where, σest = Standard Error of the Estimate.

Table 3

ANOVA for Purchase Intention.

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6.210	4	1.552	1.142	0.025**
	Residual	531.336	391	1.359		
	Total	537.545	395			

Note: **Significant at 5 percent level of significance

Table 4

Co-efficient Result and Regression Equation Co-efficient for Consumer Purchase Behaviour.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Acceptance of Hypothesis
		B	Std. Error	Beta (β)			
1	(Constant)	0.994	1.013		1.982	0.000**	
	Environmental Knowledge	0.031	0.038	0.032	0.826	0.409	Rejected
	Attitude	0.312	0.043	0.339	7.243	0.000**	Accepted
	Willingness to Pay	0.029	0.035	0.034	0.842	0.400	Rejected
	Purchase Intention	0.358	0.037	0.350	9.753	0.000**	Accepted
	Multisensory Stimuli	0.023	0.036	0.341	5.673	0.000**	Accepted

Note: **Significant at 5 percent level of significance.

purchase behaviour is predicted by attitude for using green product (β = 0.339, p < .001), purchase intention (β = 0.350, p < .000) and multisensory stimuli (β = 0.341, p < .000).

The alternate hypothesis is accepted after removing the variables environmental knowledge and willingness to pay from the statement. The new statement shall be; Purchase Behaviour for

the green product is predicted by attitude, purchase intention and multisensory stimuli.

8. Conclusion

The key findings of this research work reflect that manufacturers these days have started giving importance to environmental protection and have strong notion that green marketing will definitely act as a tool for getting hold of competitive and sustainable growth. There are small companies that have started implementing the practices of green marketing as a part of their corporate social responsibility. Green marketing should be seen as just one more way to sustainable marketing. With this view, many organizations have become aware that it is very difficult to survive in this competitive era without adapting green in the core of their strategy. The awareness level about the benefit of implementing green marketing strategy is moderate in the manufacturing companies. The implementation of green marketing practises can be in any form such as product design, modification in the production process, packaging changes, which are less harmful to the environment. The research has revelled various factors that can be monitored for reducing environmental pollution in case of a production process. These factors were using renewable resources, process starting from procurement of raw material till disposal of waste product. This research has shown that due to numerous rationale such as; regulatory pressures from government, competitive forces, industrial expansion, influences the action of other firms to make certain that they are going green in new product development. Being eco-friendly provides the firm a USP (Unique Selling Proposition), which rivals may stumble on to contest. Hence, being eco-friendly creates a firm to be economical and customer responsive. Managers must instigate to distinguish the significance of environment as a financial and competitive prospect, not as an infuriating cost or a foreseeable threat. The research has tried to justify its research objective defined for execution of this study on analysing the purchase behaviour of consumers towards green product.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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