

Discriminating market segments using preferential green shift: a conjoint approach

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Abstract

Purpose – *This paper aims to explore surprising facets of consumer delight behavior. The study is the empirical juncture of three studies based on consumer survey on the Indian television market. Study 1 traces the existence of greenies in India among brownies prevailing around the globe by using the surprise-delight model. Study 2 is a pre-intervention research design confirming greenies preferences to television attributes such as screen technology, annual energy cost saving, screen resolution, screen size and free gifts. Study 3 signifies a price intervention design by allowing customers to include their preference by replacing the annual energy cost saving with price.*

Design/methodology/approach – *This paper is a harvest of studies based on discriminant analysis for identifying green and brown customers and a two-level conjoint analysis for identifying attributes contributing to green behavior.*

Findings – *The empirical generalization of a study comes out with unique findings of the greenies and brownies and their preference and attitude toward green attribution and substitution. A “preferential green shift” appeared as a vital output owing to knowledge–attitude–practice from these consecutive studies. This gap exists because of the price factor. The authors suggest the measures for improvement in product offering by targeting and positioning green products from the findings and the preferential green shift.*

Research limitations/implications – *Future research may focus on other segments of products such as automobiles, i.e. cars. Despite the availability of the non-probabilistic sampling technique, the probabilistic sampling technique can be used. Finally, a larger sample size could have given a better generalization of results.*

Originality/value – *The gap in knowledge–attitude–practice was evident. This gap was caused by the presence of “price” concern. The study revealed that heavy consumer durable buyers are aware of the benefit of green, but the reality of price cannot be ignored and finally make a purchasing decision on the basis of price criteria. Hence price is recommended as another criterion to be considered in the technology acceptance models.*

Keywords *Conjoint analysis, Green, Price, Discriminant analysis, Knowledge–attitude–practice*

Paper type *Research paper*

1. Introduction

Earth, a planet of life in the “Milky Way”, is facing severe climatic changes, adversely affecting the environment and endangering species. Various activists, environmentalists and conservatives have voiced their concern from time to time alerting to this danger in the near future. Brooks (2015), an American conservative, political and cultural commentator in *The New York Times* editorial regarding green tech solution on December 1, 2015, said:

[.] a vast majority of Republican politicians can't publicly say what they know about the truth of climate change because they're afraid the thought police will knock on their door and drag them off to an AM radio interrogation.

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The issue of climate change is distress to everyone. Previous researchers have emphasized on the growing concern for protecting the environment and urging companies to increasingly opt for “green” (Banerjee *et al.*, 2003; Maignan and Ferrell, 2004; Hult, 2011). However, it is tough to hold green concern, as customers are compelled to substitute necessary attributes like price, performance and quality in comparison to “brown” alternative. This attribute swapping or shifting explains gap in knowledge–attitude–practice (KAP) between consumers’ green friendly attitude and their rare pro-green behavior (Bamberg, 2003; Rogers, 2003; Barr, 2006; Rokka and Uusitalo, 2008). From the pro-environmental standpoint, the gap in KAP is filled by saying “no” to brown alternative substitution available across the market and no to products having any adverse effect on the environment (Barr, 2006; Kollmuss and Agyeman, 2002; Pujari *et al.*, 2003; Pujari, 2006).

Several giant economies have taken the initiative to spread green awareness; however, very few empirical researches have addressed the attributes’ substitution and consumer shift. Researchers such as Khare (2014) have suggested that the reason behind the fewer green product adoptions by Indian consumers must be explored, and if such explorations are made, it will allow the green products to cover a higher market share (Peattie, 1999; Rokka and Uusitalo, 2008; Young *et al.*, 2010). The paper aims to predict the behavioral and attitudinal impact of green attributes’ substitutions by one that is majorly purchased and is an environmental antagonist product, i.e. television (Hauser *et al.*, 2013; Honkanen *et al.*, 2006; Tarkiainen and Sundqvist, 2009; Pino *et al.*, 2012; Zhou *et al.*, 2013).

2. Background

“Going green” has become the compulsory route for the marketers who want to protect the environment (Hult, 2011; Maignan and Ferrell, 2004; Banerjee *et al.*, 2003) and also cultivate profit. An improvement is also seen in the number of consumers shifting their focus from “brown” to “green” (Kotler, 2011; Luchs *et al.*, 2010). Corporates and consumers have understood the significance of designing and executing activities in a less harmful environment (Dahlstrom, 2011; Kotler, 2011; Menguc and Ozanne, 2005). The market provides a bundle of surprising offers, appreciated by the customers mostly owing to the positive effect of green and environment-friendly products. Although, being concerned about environment does not necessarily translate to a consumer purchasing green products (Newell *et al.*, 1998). Approximately two decades ago, a 32-inch television was considered to be large enough (Nicholson, 2016). Sharp launched its 3-inch color LCD TV in 1987, whereas Hitachi launched a 5-inch LCD in the same year (Cho and Daim, 2016). In the past decade, the average TV screen size has grown up to 77 inches (Cho and Daim, 2016), where a 32-inch TV and a 65-inch TV approximately consume \$9.76 and 81.22 worth of energy cost per year, respectively (Katzmaier, 2013). The demand for high specification and screen (type and size, both) of a TV has almost nullified the considerable improvement in efficiency during the recent decade (Davis, 2008).

These market unexpected and mis-expected product and service offerings create surprises (Vanhamme, 2000). Surprises are cognitive divergences in a framework or schema by market stimuli (Schutzwohl, 1998; Vanhamme, 2000). On the contrary, a small portion of “dark-green” consumers represent the pro-green behavior (Connolly and Prothero, 2003; Ginsberg and Bloom, 2004; Peattie and Peattie, 2009). Therefore, marketers and environmental activists need to purge the gap in KAP and inflate the ration of dark-green consumers. The efforts should be made to make green-attributed products more visible and preferred by consumers through various marketing strategies and to relate the high price of green products with status and uniqueness (Burroughs, 2010; Kilbourne and Carlson, 2008; Sheth *et al.*, 2011). In this regard, marketing tools such as gifts, coupons, entertainment, publicity stunts, pioneer marketing, product design, product add-ons features, contests and advertisements are capable of creating green surprises

(Alden *et al.*, 2000; Ludden *et al.*, 2012; Dubey *et al.*, 2016). The purchasing pattern of Indian consumers shows the need of better marketing and other initiatives to increase the size of well-informed and “green” motivated consumers. Customers’ or clients’ knowledge is the know-how of intrinsic factors such as need, want and desires patterns and extrinsic factors such as market environment, peers, family and friends (Bergeron and Roy, 2008). Marketing surprises such as price-offs create differences in schema leads to positive effects. On the other hand, a firm’s expertise or competency to add or green feature the product as a solution to customer needs, problems or green concern in an unexpected or surprising manner creates prosperity for customers and businesses (Bergeron and Roy, 2008). In addition, well-informed and environment-concerned consumers are more prone to be affected by the green surprise aspect (Schuhwerk and Lefkoff-Hagius, 1995).

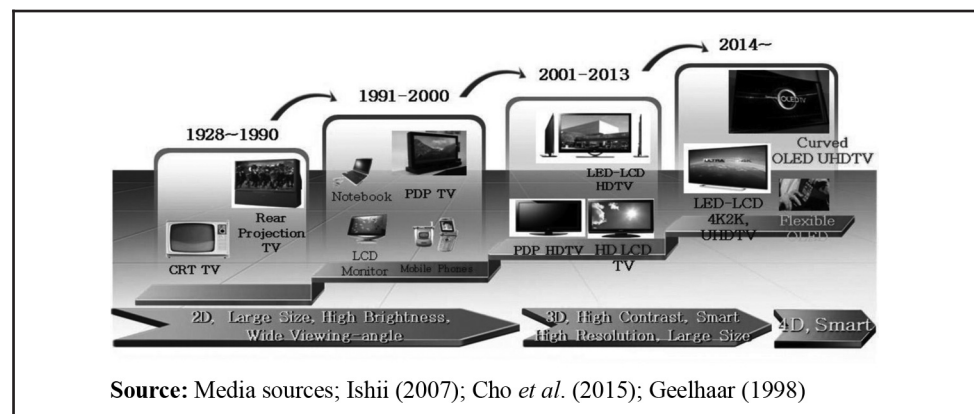
Pertaining to the context, this study seeks to explore the impact of technology, price and free gifts on consumer “green” behavior.

3. Literature review

Technology is an integral part of business and society at large, but the full benefit of technology is not realized as shown in Figure 1 (Boden *et al.*, 1998; Curran and Meuter, 2005). In the dynamic and diversified environment, enterprises need to develop innovative technology for exploring internationalization and R&D (Gemba and Kodama, 2001; Koch, 2011). In extension, Kozmetsky (1996) states that technology and adaptability are the prime concern factors over other factors for better engagement the of management and decision-makers (Assimacopoulos, 2013). The European Commission (2010, p. 2) states that technology is not only benefitting the corporates but also changing the lives of people (elderly) populations (Saritas and Keenan, 2004). It facilitates quality of life, safety, health, connectivity, participation, contribution and control across different age groups, especially elder people (Delbreil and Zvobgo, 2013).

Several research studies conducted on technology and its related dimensions such as the theory of reasoned action (TRA) (Fishbein and Ajzen, 1975) inspired Davis (1989) to study the technology acceptance model (TAM) that covers the jurisdiction of acceptance of technology by organizations, which later provides an explanation of technology-based products and services acceptance. Further, diffusion of innovation covered various disciplines such as education, sociology, agriculture, communication, marketing and information technology (Rogers, 1995; Karahanna *et al.*, 1999; Agarwal *et al.*, 2000). As per Rogers (1995, p. 11), an innovation is “an idea, practice, or object that is perceived as new by an individual or another unit of adoption”. Diffusion, conversely, is “the process by which an innovation is communicated through certain channels over time among the members of

Figure 1 Television market trends



a social system” (Rogers, 1995, p. 5). Diffusion of innovation (DOI) theory includes five significant factors that are responsible for dissemination of technology, i.e. relative advantage, compatibility, complexity, trialability and observability. *Relative advantage* is the degree to which users or consumers consider an innovation to be better than the previous idea it tends to replace. *Compatibility* is the degree to which innovation is able to address the needs of potential end-users. *Complexity* is the end-users’ perceived level of difficulty in understanding innovations and their ease of use. *Trialability* refers to the degree to which innovations can be tested on a limited basis. *Observability* is the degree to which the results of innovations can be visible to other people. These characteristics explain end-user adoption of innovations and the decision-making process (Rogers, 1995). Thus, the diffusion of the innovation theory argues, “potential users make decisions to adopt or reject an innovation based on beliefs that they form about the innovation” (Agarwal, 2000, p. 90).

In the present study, television screen technology, screen resolution and screen size (closely associated with technology) are considered under the technology domain. Modern consumers are inclined toward latest technologies, higher-end features and its utilities. However, the price concern is omnipresent and acts as a decisive factor for manufacturers (Kulshreshtha *et al.*, 2017) and marketing managers (Monroe, 1995) and influences consumer behavior (Damay *et al.*, 2011). Price helps consumers in evaluating and drawing subjective inferences from the product options offered to them about quality (Gabor and Granger, 1964; Erickson and Johansson, 1985; Monroe and Lee, 1999). Subsequent research work validates that consumers evaluate a product on the basis of the expected price (Chandrashekar and Jagpal, 1995; Kalwani and Yim, 1992; Mazumdar *et al.*, 2005; Thaler, 1985; Urbany *et al.*, 1997) and fair price (Bolton *et al.*, 2003; Campbell, 1999; Grewal *et al.*, 1998; Monroe, 1973; Xia *et al.*, 2004). Where, the expected price is a reference price based on “[. . .] consumers’ memory or contextual information” (Mazumdar *et al.*, 2005, p. 98). Fair price is the payoff seems acceptable, reasonable and just to consumers (Bearden *et al.*, 1992; Mazumdar *et al.*, 2005; Bolton *et al.*, 2003; Campbell, 1999; Xia *et al.*, 2004). Therefore, the truth of price dominance cannot be ignored.

A single attribute of a product does not stimulate a consumer and make it tough for companies to attract and retain customers. In this endeavor, companies are constantly envisioning some monetary promotional tactics, e.g. discounts, coupons, etc., to fulfill short-term objectives, but, in the process, creating a suspicion of quality, price and brand equity in the consumers’ mind (Ataman *et al.*, 2010; Mela *et al.*, 1998; Yoo *et al.*, 2000). Therefore, to accrue for long-term benefits, marketing managers progressively use non-monetary promotions such as free gifts (Palazón and Delgado, 2009; Raghbir, 2004). Gifts, are offered free in return for the purchase of one or more products or services (d’Astous and Landreville, 2003), is the most captivating factor for consumers’ overall assessment, especially when it possesses attractiveness (Buil *et al.*, 2013).

For understanding consumer fascination, conjoint analysis technique will certainly be useful. In the early 1970s, introduction of conjoint analysis made its way in research and marketing (Green and Rao, 1971; Green and Wind, 1973; Green *et al.*, 2001). A significant quantum of this technique was noted in medicine, transportation research and environmental studies (Louviere *et al.*, 2000), though little interest has been shown by the researchers for discovering and implementing findings in behavioral decision research within the context of conjoint analysis (Bradlow, 2005; Swait and Adamowicz, 2001).

A study conducted on Australian consumers’ purchase decision, taking hedonistic, functional and ethical (environmental) attributes of denim jeans into consideration, successfully applied the conjoint analysis (Jegethesan *et al.*, 2012). The rationale behind using this technique is its capability of providing a realistic decision model, by facilitating respondents to evaluate products as a whole and simulate real-life purchase scenarios (Bajaj, 1999). It calculates the importance score of different products’ attributes (Churchill

and Iacobucci, 2002). Luzio and Lemke (2013) investigated Portuguese consumers' perception of green products by product demands and consumption pattern. However, this study was unable to evaluate complex trade-off situations for green consumers, and the influence of the understudy factors on consumer decision remained unclear. Therefore, application of the conjoint analysis in future research has been suggested (Luzio and Lemke, 2013). Researchers used much ink in endorsing conjoint analysis as an effective technique for evaluating the combined impact of bundle of attributes on consumers' preferences (Hobbs, 1996). Further, it was clear that the use of full-profile conjoint design provides a realistic description and requires respondents to make fewer judgments (Green and Srinivasan, 1978). Kauppinen-Raisanen *et al.* (2012) used the conjoint analysis on consumers of Finland, USA and Ghana, owing to the applicability of this technique in evaluating the impact of various attributes used in the study. In the words of Gustafsson *et al.* (1999), conjoint by orthogonal design, fractionated the stimuli, which means that the impact of one attribute is measured independently of the other attributes. Thus, based on the aforementioned ground, the motivation of researchers to apply conjoint analysis in the current research is justified.

We may see that related research on green has garnered worldwide attention. There are several ways to address green and related issues such as Moser (2015) who took the theory of planned behavior (TPB) framework as the basis of his research by applying the two-step structural equation modeling approach and found willingness to pay (WTP) as a strong predictor for green purchasing behavior of Germans, followed by personal norms. In the IT domain, Molla *et al.* (2014) is inspired by belief-action-outcome (BAO) framework, and has applied structural equation modeling (SEM) and explored the positive behavior toward green. Similar studies were conducted on green using SEM (Cleveland *et al.*, 2005). Simula *et al.* (2009), by way of literature review, explored green marketing dimensions and the need of communicating in a logical and truthful way for the same. Tilikidou and Delistavrou (2014), in Greece, applied one-way ANOVA, Pearson's parametric correlations, multiple-regression analysis (stepwise method) and K-means cluster analysis for exploring green, and endorses that conservation behavior, i.e. pro-environment behavior, is largely driven by financial motives rather than by environmental concerns. Mohd Suki (2016), by using partial least squares, found that green brand knowledge is the most important determinant and emphasized that building an outstanding green brand identity by Malaysian firms should be differentiated. Park and Ha (2012) investigated green product buyers and non-buyers of USA by using confirmatory factor analysis, multiple regression analysis and MANOVA. Green product consumers display significantly higher levels of cognitive and affective attitude, social and personal norms and recycling intention.

In Asian countries such as Bangkok and Thailand, Sony and Ferguson (2017) studied Thai consumers to exhibit environment consciousness owing to egoistic- and biospheric-based values, and, in London, Pickett-Baker and Ozaki (2008) explored different marketing and branding techniques that can help set up green brands and motivate the people of London to go green. Kumar (2017) uncovered four types of intents of green advertisements, i.e. intent to communicate, intent to develop believability toward environmental claims, intent to inform consumers and intent to engage consumers of India. Onel and Mukherjee (2016) identified the relationship between knowledge and psychological factors to persuade consumers to go pro-environment. The result obtained from this study indicates that positive attitude for science leads to knowledge and people are inclined toward environmental concern. Flagg and Bates (2016), in the USA, attempted to answer whether faculty and student apply their environment-concerned behavior to reduce campus waste. The findings suggest that concern for "green" and knowledge about specific "green" guidelines, e.g. campus recycling guideline, are two different aspects. In addition, echo boomers of China and India are inclined toward "green life" but fail in their action. It is suggested that instead of giving importance to social media, social networks should also address the issue in depth (Muralidharan and Xue, 2016).

3.1 Greenie brownie attributes' substitution

As per Rogers's innovation diffusion theory, innovations that offer more advantages, compared with less-advantaged current products, are rewarded by business (Rogers, 1995; Janssen and Jager, 2002). The aforementioned theory that has been adopted and confirmed in several studies led to the development of our thought of existence of brownies and greenies. The brownies believe in identifying pleasure from any product irrespective of any green attribute, whereas greenies have the tendency to explore joy and happiness in environment-friendly products. There are the situations where the buying behavior shows that green products are compromised over conventional or brown products; this may be because of the absence of marketing creativity such as *humor* in appeal creating joy and pleasure by using an incongruent approach from originality helps in developing green knowledge (Dubey *et al.*, 2016). Price bonuses and discounts through *unexpected coupons* such as electronic shelf coupons that create pleasant surprises are necessary for the development of the green attitude (Heilman *et al.*, 2002). Marketing practices such as *advertisements* create incongruity through personal presentation of products, creating an emotional outcome that may lack in creating green attention and attitude (Alden *et al.*, 2000; Teixeira *et al.*, 2012). Green products are superior to brown products on various generic attributes such as quality, performance, price and presents a "win-win" situation (Ginsberg and Bloom, 2004) and hence most likely to be preferred by buyers. It is also expected that customers feel surprised owing to different information such as green, environment friendliness and energy saving. The *product design* Flat TV, LED, LCD, HD, HD-Ready, etc. and *add-on features* such as energy-saving modes of consumer durables like televisions, mobiles, etc. create green concern and positive surprises (Bertini *et al.*, 2009; Ludden *et al.*, 2012; Saranya and Santhi, 2016; Dubey *et al.*, 2016).

As every person has self-developed schema owing to varied past experiences, whenever it gets distort by market offerings such as prices, offers, discounts, it creates surprises and this positive affect leads to delight. Similarly, store environment; collaboration of persons, systems or processes; products or services; and aesthetics create greater pleasure, joy and surprises (Kaltcheva and Weitz, 2006; Teixeira *et al.*, 2012). However, in most studies, consumers' green behavior is positively projected, but some situations like efforts for green information search, effective information processing, preference or choice development are neither considered negatively nor analyzed with negatively correlated attributes for any product. Consequently, to understand the reason behind consumer taste and preference to go for brown products over green, it is imperative for examining the existence of green and brown attitudes and the trade-offs of green attribute products (Peattie, 1999).

There are research studies that have examined the relationship of products with green attributes, i.e. greenie and conventional attribute, i.e. brownie. As per the available literature review, none of the empirical studies has examined the existence of green category of customer and their characteristics such as joy/pleasures from green products and the impact of negatively correlated attributes on green products perception (Young *et al.*, 2010). Consumers cannot "have it all" (Newman, 1977; Olson and Widing, 2002), that is why consumer may choose the compromised alternatives (Simonson, 1993; Widing and Talarzyk, 1993). Consumers want to choose the best combination and companies do not allow one to "have it all"; therefore, it is assumed that consumers prefer the green attributed products in the absence of tradeoff, and on the contrary, opt for "less-green" products when trade-offs are considered.

4. Research questions and hypotheses

For understanding the concept in depth, the issue related to green attitude, researchers formulated some research questions. Research questions pertaining to the nature of

customer perception and preference sets about green attributes of product are identified and are as follows:

- RQ1.* Green and brown consumers exist and feel surprised with diverse delight tendency.
- RQ2.* Consumer preference will be higher for green featured product, when trade-offs are not considered.
- RQ3.* Consumer preference will be higher for brown featured products, when trade-offs are considered.
- RQ4.* Green buyers will demonstrate more interest for green-attributed product with trade-off, when some lucrative options like free gifts are offered.
- RQ5.* Price is of prime concern for consumers while making the purchase decision.
- RQ6.* There is gap in knowledge–attitude–practice of an Indian consumer during purchase.
- RQ7.* Higher-end attributes are preferred more, irrespective of the concern of the impact of environment.

To address and explore the aforementioned research questions, a set hypothesis has been developed. To answer *RQ1*, hypothesis was formulated to explore the existences of brownies and greenies. To assess the concept in depth, we adapted the surprise-delight model of [Dubey et al. \(2016\)](#). The following hypotheses have been framed based on the adapted model as follows:

- HA.* Client knowledge of green attribute significantly differentiates surprise positive effect in the brownie delight (Category 1) and greenie delight (Category 2).
- HB.* Perceived firm expertise green attribute significantly differentiates surprise positive effect in brownie delight (Category 1) and greenie delight (Category 2).
- HC.* Customer participation for green attribute significantly differentiates surprise positive effect in brownie delight (Category 1) and greenie delight (Category 2).
- HD.* Customer humor about green attribute significantly differentiates surprise positive effect in brownie delight (Category 1) and greenie delight (Category 2).
- HE.* Unexpected coupons for green attribute significantly differentiates surprise positive effect in brownie delight (Category 1) and greenie delight (Category 2).
- HF.* Advertisement of green attribute significantly differentiates surprise positive effect in brownie delight (Category 1) and greenie delight (Category 2).
- HG.* Green add-on features significantly differentiates surprise positive effect in brownie delight (Category 1) and greenie delight (Category 2).
- HH.* Product appearance having green attribute significantly differentiates surprise positive effect in brownie delight (Category 1) and greenie delight (Category 2).
- HI.* Schema discrepancy due to green attribute significantly differentiates surprise positive effect in brownie delight (Category 1) and greenie delight (Category 2).
- HJ.* Store environment significantly differentiates surprises from product green attribute in positive effect in brownie delight (Category 1) and greenie delight (Category 2).

We framed the following propositions for green surprise predictors like customer knowledge, perceived firm expertise, customer participation, humor, unexpected coupons, advertisement, add-on features, product appearance, schema discrepancy and store environment from *HA* to *HJ*. At last, an additional hypothesis *HK* describing discrimination in greenies and brownies owing to green surprises is as follows:

- HK.* Green surprise function D having 10 predictors significantly differentiates between brownie delight (Category 1) and greenie delight (Category 2).

5. Methodology

For research populace, when forecasting an unfolding event, there is a consistent need of simple frameworks based on underlying propositions (Fisher and Pry, 1971). Most of the empirical studies in management sciences deal with survey method. To respond to the research questions and developed the hypotheses, three studies are conducted consecutively as observed in previous studies by Schweitzer and den Hende (2016). We explored some exclusive insights from the three studies as discussed below with purpose, methods and results.

5.1 Study 1: purpose

The *raison d'être* of this qualitative study is to identify whether green customers exist. The green customers have an environment-friendly approach as surprise or attitude towards life and livings concerned. The existence of green customers will revolutionize the idea of existence of a separate market segment in India and Asia Pacific at large.

5.1.1 Method. India is a country with rapidly increasing purchasing power. It is also a test market for Asian countries, is the research area (Majestic MRSS, 2016). The overall study is done with convenience sampling from mid-July 2016 to December 2016. Primary survey of 212 respondents is conducted by adapting the surprise-delight scale of Dubey *et al.* (2016), measured by a five-point interval scale for identifying the surprising effect of green attributes delineating customer preferences of being green or brown. To check the effect on preferences, Preference 1: low, i.e. brownies, and 2: high, i.e. greenies, is developed. The brownies are people who feel surprised with television or product irrespective of green attributes and greenies are surprised by green attributes.

5.1.2 Results and discussion. First, the reliability of scale is calculated as 0.853, affirming soundness and internal consistency of data collection. The number of respondents in two different categories is identified as Category 1: 127 brownies and Category 2: 85 greenies. On primary observation of data, we discover the differences in means of categories. Table I is an ANOVA table or a test of equality of predictor means among Category 1 and Category 2. We find that the alternative hypotheses H_A-H_J are accepted at p -value 0.001. The Wilks' lambda value and F -value are on the higher side on observation.

To segregate the green delight in categories, an analysis of canonical discriminant function, shown in Table II, is conducted; the canonical function 1 separates the customer delight significantly with 100 per cent of variance; hence, we accept the proposition H_K at p -value < 0.001 (level of significance). Function 1 has supreme chi-square value of 146.574, eigenvalue 1.044, confirming the superior segregation of a delight categories. The value of Wilks' lambda of 0.489 signifies that a large number of predictor variables contribute in the discrimination of green delight category by function.

Table I Tests of equality of group means

Hypothesis	Predictors	Wilks' lambda	F	df1	df2	Significance
HA	Client knowledge	0.821	45.780	1	210	0.000
HB	Perceived firm expertise	0.675	100.89	1	210	0.000
HC	Customer participation	0.912	20.276	1	210	0.000
HD	Humor	0.824	44.880	1	210	0.000
HE	Unexpected coupons	0.717	82.880	1	210	0.000
HF	Advertisement	0.785	57.545	1	210	0.000
HG	Add-on features	0.795	54.194	1	210	0.000
HH	Product appearance	0.777	60.102	1	210	0.000
HI	Schema discrepancy	0.702	89.110	1	210	0.000
HJ	Store environment	0.819	46.409	1	210	0.000

Note: At p -value 0.001

Table II Analysis of discriminant function

Function	Eigenvalue	% of variance	Cumulative %	Canonical correlation
1	1.044	100	100	0.715
Test of function(s)	Wilks' Lambda	Chi-square	df	Significance
1	0.489	146.574	10	0.000

Note: At p -value 0.001

The analysis of discriminant function in Table III exhibits the largest absolute correlation at 0.715 between each predictor in the discriminant function, contributing toward classification of brownies and greenies. The perceived firm expertise and schema discrepancy appears to have the largest correlation value at 0.678 and 0.637, respectively (Table IV). The firm's competency is creating surprises by positioning the green product features in a positive and different manner, as a solution for existing problem or need is necessary to create joy and delight (Bergeron and Roy, 2008). Further, it is also confirmed by the schema discrepancy that an idea which firms experience in creating new products, developing and enhancing television from CTV to LCD, LCD to LED, LED to HD and LED to OLED is appreciated by customers owing to energy saving and technology as conceptualized by Fisher and Pry's (1971) simple substitution model. The new, distinct and add-on offerings like environment-friendly, green technology, screen technology, etc. create great surprises for customers as confirmed by study of OLED TV by Cho and Daim (2016).

The canonical discriminant function coefficients in Table III reveal the discriminating power of each predictor variables contributing toward segregating brownies and greenies. The brownies are distinct from greenies customers on the basis of each predictor variable.

Table III Contribution of predictors variables in classification

Predictors	Structure matrix	Canonical discriminant function coefficients (Unstandardized)
Client knowledge	0.457	0.074
Perceived firm expertise	0.678	0.334
Customer participation	0.304	0.084
Humor	0.452	0.144
Unexpected coupons	0.615	0.261
Advertisement	0.512	0.083
Add-on features	0.497	0.284
Product appearance	0.524	0.114
Schema discrepancy	0.637	0.273
Store environment	0.460	0.159
(Constant)	–	–7.094

Table IV Attributes and levels

Attributes	First conjoint analysis Model description Without price attribute		Second conjoint analysis Model description With price attribute	
	No. of levels	Relation to ranks or scores	Attributes	Relation to ranks or scores
Screen technology	3	Discrete	Screen technology	Discrete
Annual energy cost saving	3	Discrete	Price	Discrete
Screen resolution	3	Discrete	Screen resolution	Discrete
Screen size	3	Discrete	Screen size	Discrete
Free gift	3	Discrete	Free gift	Discrete
All factors are orthogonal			All factors are orthogonal	

Customers are classified mostly by surprise predictors of delight, i.e. perceived firm expertise, schema discrepancy and unexpected coupons, as exhibited in Table III by corresponding correlation value and discriminant coefficients. These coefficients are measures of discriminating power of surprise predictors in classifying greenies' and brownies' delight. The discriminant model function D appears by arranging the discriminant coefficient value in the manner shown below that is responsible for classifying brownies from greenies:

$$D = (0.074) \textit{Client Knowledge} + (0.334) \textit{Perceived Firm Expertise} \\ + (0.084) \textit{Customer Participation} + (0.144) \textit{Humor} \\ + (0.261) \textit{Unexpected Coupons} + (0.083) \textit{Advertisement} \\ + (0.284) \textit{Add - on features} + (0.114) \textit{Product Appearance} \\ + (0.273) \textit{Schema Discrepancy} + (0.159) \textit{Store Environment} - 7.094$$

The discriminant approach to check the RQ1 is viable in answering that greenies and brownies exist distinctly. Greenies have distinct thought over brownies as far as delight is concerned against surprises felt. Greenies feel joy and pleasure with green product and green attributes. They are different from brownies mostly with regard to firm's expertise in offering product, creating discrepancy in schema and add-on features like energy-saving modes, auto power cut, yearly saving, etc. (Bergeron and Roy, 2008; Bertini et al., 2009; Ludden et al., 2012; Saranya and Santhi, 2016; Dubey et al., 2016). The identified results appreciate the presence of greenies in India as Fisher and Pry's (1971) simple substitution model suggests that superior technology overcomes inferior ones, and like Cho and Daim's (2016) study on OLED TV, having screen-bending phenomena create positive surprises like delight, compelling consumers toward attribute admiration and substitution as well. For reaching a precise conclusion, a separate study in two parts is conducted to understand green attribution impact on customers.

5.2 Study 2: purpose

The before-treatment experiment study 2 has a precise investigation objective about green customer. As greenies are identified, we are interested in knowing their preferences for environment-friendly approach toward a specific product. The viability of the existence of green customers through a consecutive experiment will demand an insignia and characterize them as greenies.

5.2.1 Method. On the basis of convenience, people are contacted on online and offline bases with a structured questionnaire on television attributes with existing combination and substitution. Initial screening eliminated 27 per cent questionnaires, as they had not and were not even considering purchasing a TV in the near future, leaving us with 323 filled-in questionnaires. There were 44 and 66 per cent valid responses from male and female respondents, respectively, belonging to the age group of 24 to 63 years with a median annual income of Rs 600,000 per annum. Conjoint analysis is increasingly being used to determine the attribute importance level that motivates the decision-making including attribute trade-offs (Green and Wind, 1975; Green and Srinivasan, 1978; Vriens, 1994; Hair et al., 1998, 2006; Green et al., 2001; Stremersch et al., 2003; Wuyts et al., 2009; Jervis et al., 2012; Dauda and Lee, 2016). The attributes and levels were calculated after a discussion with industry experts, keeping the focus also on "real-world" negatively correlated attributes. The outcome of this exercise resulted in five attributes \times three levels (Table IV), but these led to $(3 \times 3 \times 3 \times 3 \times 3)$ levels which becomes 243 combinations. Therefore, using an orthogonal design, the number has been reduced to 16 statistically significant product combinations.

Simultaneously, it was felt that consumers may not be able to interpret the electricity consumption rating. For that reason, electricity ratings were converted in the form of saving of rupees per year. To avoid the strong and omnipresent impact of brands, products were not allotted any brand name as one of the attribute with its levels; instead, respondents were told to assume the brand and the brand name of their choice for all combinations that were offered

to them. Simultaneously, to demonstrate the impact of trade-off, especially when price is considered in contrast to other green attributes, a separate conjoint analysis was conducted. Using orthogonal design, 16 product combinations were generated, and respondents were asked to rate those on a scale of 1 to 7, where 1 stands for highly unacceptable and 7 stands for highly acceptable product combination.

5.2.2 Result and analysis. SPSS v 20 was used to conduct the conjoint analysis. Based on part-worth utility, the analysis computes the relative importance of each attribute for each level. The individual scores were averaged for getting the part-worth utilities and the relative importance. Actual and predicted correlations were calculated and tested for statistical significance. In this regard, the Pearson's *R* values, i.e. correlation, were 0.984 and 0.990 and Kendall's tau values were 0.879 and 0.946 for the first and second conjoint analyses, respectively, indicating a good fit (Hair *et al.*, 2006). Table IV shows the attributes and the number of levels included for the conjoint analysis for products, i.e. a TV with and without the price attribute. It is worth mentioning here that two different conjoint profiling analyses were conducted, first without the price factor and second after including the price.

5.2.2.1 Conjoint analysis with no price trade-off. Table V shows the utility score for every attribute and its levels for two different products combinations, i.e. with and without price attributes. The positive value of part-worth/utility score shows that the particular attribute level is preferred over other levels. Based on the result (Table V), people preferred higher-end attribute levels, i.e. for screen technology, annual energy costs, etc. When the product was offered to the respondent in the form of bundle of attributes, LED was the most preferred level in screen technology category with a () score of 0.049, followed by an LCD score of 0.046 and a Plasma score of -0.095 in the decreasing order, supporting RQ2, which states that consumer will prefer environment-friendly green attributes when trade-off is not considered. At this point, another observation is made about attributes such as screen technology, screen resolution and screen size which are the attributes that possess relative advantage compatibility, low complexity perception, high chance of trialability and positive outcomes of these features, i.e. observability. The annual energy cost saving and the possibility of receiving a gift hold features under the observability head (Rogers, 1995). Moreover, this may be another important reason for (diffusion of innovation, i.e. DOI) respondents' choice. RQ1 is also addressed in Study 2 that add-on features and firm expertise in offering the bundle of variety attributes create surprises as the primary emotion and delight as the secondary emotion. The annual energy cost, which is also a pro-green attribute, was rated high for Rs 150 per year

Table V Utility estimate

Attributes	First conjoint analysis			Second conjoint analysis			
	Utilities			Utilities			
	Without price			With price			
Levels	Utility estimate	Standard error	Attributes	Levels	Utility estimate	Standard error	
Screen technology	LCD	0.046	0.031	Screen technology	LCD	0.173	0.030
	PLASMA	-0.095	0.036		PLASMA	-0.151	0.030
	LED	0.049	0.036		LED	-0.022	0.025
Annual energy cost saving	100	0.006	0.031	Price	60,000	-0.061	0.030
	150	0.033	0.036		50,000	0.345	0.030
	50	-0.039	0.036		70,000	-0.284	0.025
Screen resolution	HD READY	-0.037	0.031	Screen resolution	HD READY	0.002	0.025
	HD	-0.012	0.036		HD	0.083	0.030
	FULL HD	0.049	0.036		FULL HD	-0.084	0.030
Screen size	49	0.129	0.031	Screen size	49	-0.019	0.030
	43	-0.032	0.036		43	0.033	0.025
	40	-0.097	0.036		40	-0.014	0.030
Free gift	Unique	-0.254	0.031	Free gift	Unique	-0.036	0.025
	Material	-0.127	0.036		Material	0.115	0.030
	Experiential	0.381	0.036		Experiential	-0.079	0.030
(Constant)		4.835	0.029	(Constant)		4.596	0.024

saving with (0.033) score, followed by Rs 100 per year saving and Rs 50 per year saving with a score of 0.006 and -0.039 , respectively, again supporting *RQ2* and *RQ1*. It is important to know that technology is important and yet of no use if not accepted and used by the target customers (Oye *et al.*, 2012). The rationale behind the acceptance of technology including perceived usefulness, perceived ease of use and influence of external variables (Davis, 1989), is also apparent here. Study 2 authenticates that the availability of energy-saving features in television is delightfully appreciated as observed in Study 1 by both green and brown consumers both. For the third attribute, i.e. screen resolution, consumers had a preference for Full HD resolution with a score of 0.049, with -0.012 and -0.037 scores being in the decreasing order for HD and HD Ready resolutions, rejecting *RQ2* and supporting *RQ7* that consumers prefer higher-end attributes irrespective of the concern for any environmental impact. The next attribute, i.e. screen size, which includes 49 inches, 43 inches and 40 inches sizes with utility scores of 0.129, -0.032 and -0.097 , rejecting *RQ2* and supporting *RQ6*. The last attribute, i.e. free gift while purchasing a TV, had three different levels, i.e. unique gifts, material gifts and experiential gifts receiving utility scores of -0.254 , -0.127 and 0.381, respectively, supporting *RQ4* that consumers will display more interest for green-attributed products with trade-offs when some lucrative options like free gifts are offered, supporting Study 1 and approving *HE* about unexpected coupons. Although this conjoint run did not hold a trade-off, the output for free gift strongly appeared, affirming the discriminating power of predictor variable unexpected coupon to classify customer surprises in green and brown delight categories. The customers appreciate the green attribution most without a price trade-off. The Greenies and Brownies identified in study 1 through discriminant run prefer conjoint green substitutions in television attributes offered like free gifts, screen type, screen size and screen technology, thus confirming the research question 1 by this study 2. In the next part of the study, we tried to confirm this preference perception and attitude toward green products.

5.3 Study 3: purpose

Study 3 is an after-treatment experiment, which has a specific examination objective about customer substitution against price trade-off. The precisely explored Indian greenies in previous study 2 are reevaluated here for their specific choice configuration by using following methodology.

5.3.1 Method. In the same sample of 323 respondents, an after-treatment experiment is performed by replacing the existing attribute, i.e. annual energy cost saving per year attribute, with the price attribute. We replaced energy saving or annual cost saving attribute with price, as annual energy cost saving per year was the least preferred attribute in comparison with others with a score of 16.563 (the least score) obtained on the basis of importance score in the first conjoint run. The reframed questionnaire is used for collecting responses for preference toward television after three months of Study 2. The following differences are identified in the preference set and attitude.

5.3.2 Result and analysis: price trade-off. In the second conjoint run, the screen technology preference level shifted from LED (-0.022) to LCD (0.173) with Plasma (-0.151) scoring the least, thus rejecting both *RQ2* and *RQ3*. When the price factor was included in product profiling, the preference of the consumer shifted from FULL HD (-0.084) to HD (0.83) followed by HD Ready (0.002), again rejecting both *RQ2* and *RQ3*. The impact can also be seen on screen size that screen size of 43 inches (0.033) was the preferred over that of 40 inches (-0.014) and 49 inches (-0.019) (Table V), contrary to conjoint analysis without price, not supporting *RQ2* and *RQ3*. When consumers were forced to choose the trade-off product, material gift scored (0.115), both unique gift and experiential gift had preference scores of -0.036 and -0.079 , respectively, supporting *RQ4* similar to that seen in Study 1 for predictor unexpected coupon discriminant power valuing 0.261 in Table III.

5.3.2.1 Relative importance. Relative importance score is another output generated by conjoint analysis for each attribute by SPSS, which is computed by taking the utility range for each attribute separately and dividing it by the sum of the utility ranges for all attributes. Therefore, the percentages sum up to 100. In the first conjoint analysis (without price), free gift was rated as the highest preferred attribute with an importance score of 24.015, followed by a screen size score of 21.637, screen resolution score of 18.982 and screen technology score of 18.804 (Table VI). Annual energy cost saving (16.563) was the least preferred attribute. On the other hand, in the second conjoint analysis (with price as one of the factor for consideration) showed price attribute to have a relative importance at first with a score of 22.997. It supports RQ5 and highlights the limitation of green surprise delight in study 1, with a screen technology score of 22.606, supporting RQ7, followed by the relative importance scores of 18.490 for free gift, 18.463 for screen resolution and 17.445 for screen size.

6. Discussion and conclusion

There is imperative need of green and environment-friendly products for nullifying the disaster of mankind by brown products. Diverse business houses around the globe delve into creating, innovating and distributing green products by redefining the standards for limited use of hazardous elements. The present Study 1 comes out with greenies and brownies delight responses, acknowledging such affects by surprise predictors such as perceived firm expertise, schema discrepancy and unexpected coupons. A country such as Taiwan has a high level of consumer awareness and regulations; still there is a need of top management support, compliance statement, product testing report, green purchasing and environmental audit (Hu and Hsu, 2010). Similarly, Study 2 confirms the global endeavor for green product attribution acceptance in developing countries such as India, Brazil, etc. As per Shantz and Adam (1999), the expansion of green is clearly visible in "green syndicalism" which talks about "greening" by way of abolition.

Findings like greenies, expectation of greenies and shifting in green attribution owing to the price attribute suggest using the business formats for multinationals as observed in Italy, i.e. re-active, anticipatory and innovation-based patterns to deal with "green" for large and diversified markets such as India and Canada (Azzone and Noci, 1998). Bundling the product with green attributes and green product image can also bring financial leverage to company by convincing the customer to pay more for the green product (D'Souza, 2004) in contrast of non-green products available in Finland (Lansiluoto and Jarvenpaa, 2008; Ginsberg and Bloom, 2004). In a similar research on green conducted under a comparative study of regulations among Japan, European Union and USA, it was observed that consumers expect from companies to manufacture products that enhance their quality of life beyond the value of the product or service (Ciocci and Pecht, 2006). However, their willingness to pay is affected by the price range offered. In the Italian context, the study states the benefit of "green labeling" in building material (Blengini and Shields, 2010).

The result of the current studies offer insight for consumer surprises and delight preference for electronic consumer durable, i.e. TV in India, which is probably a fair representation of entire Asia. The buying capacity of people is expanding rapidly. The results obtained from

Table VI Importance score and ranking

First conjoint analysis Without price			Second conjoint analysis With price			Difference in importance (%)
Importance values		Ranking	Importance values		Ranking	
Screen technology	18.804	4	Screen technology	22.606	2	3.802
Annual energy cost saving	16.563	5	Price	22.997	1	6.434
Screen resolution	18.982	3	Screen resolution	18.463	4	-0.519
Screen size	21.637	2	Screen size	17.445	5	4.192
Free gift	24.015	1	Free gift	18.490	3	5.525

three studies have provided vital findings for the role of “green” and “price” building consumers’ preferences. The three consecutive studies recommend several segments of consumer market for television. The two segments based on surprise and delight levels were classified as brownies and greenies. The product positioning containing a surprise element strengthens the customer delight and marketing efforts. The greenies segment of market identified in present study due to the preferential green shift are brownies prior, as justified by Fisher and Pry’s (1971) substitution model also suggesting replacement of technology. The replacement of technology is a shift in customer’s preference. The surprise predictors of delight responsible for such phenomena is customer knowledge of new technology, schema discrepancy created due to new and distinct product and product appearance, i.e. upgradation in LCD–LED–OLED television designs (Venkatesh and Davis, 2000; Cho and Daim, 2016). The other two separate segments of product attributes, i.e. with and without price, suggested that people give high preference to “price”. When a product is offered to respondents without the price factor, under the screen technology category, then LED was preferred over LCD and Plasma technologies. The reason behind this may be the younger generation’s fondness for latest technology (Harris *et al.*, 2016). Though the negative relationship exist between increase in age and probability in technology adoption (Chung *et al.*, 2010; Czaja and Sharit, 1993; Kolodinsky *et al.*, 2004; Lam and Lee, 2006; Morris and Venkatesh, 2000; Sharit and Czaja, 1994; Yao and Murphy, 2007). Higher saving option of annual energy cost was also chosen by respondents, and the probable reason behind this is the “green”-oriented behavior or the concern for efficient use of the product (Chen, 2010; McIntosh, 1991).

The people, being early-movers for technology, preferred full HD option for the screen resolution attribute, although full HD consumes more energy. The biggest screen size, i.e. 49 inches, was preferred; again, the reason could have been the want of owning latest technology. Lastly, respondents prefer unique gifts more than other types of gifts. However, all the aforementioned findings have been derived in absence of the “price” factor.

To check and validate the findings, the second conjoint analysis was conducted after the gap of three months in the same respondents, but this time “price” was included. The gap in studies was to reduce the influence of the first conjoint profiling test. The findings of the second conjoint analysis gave a result that proved to be a revelation for all stakeholders. Preference for product design shifted from LED to LCD, screen resolution from shifted from full HD to HD screen size preference reduced from 49 to 43 inches; however, preference for “free gift” remained the same, i.e. unique gifts. Finally, medium price was chosen, which had already been introduced in the second conjoint analysis. Several research studies have endorsed that today’s consumer is inclined more toward “green” but has failed to eliminate the impact of brand and price. The respondents were asked to assume a brand of their choice, and were instructed to assume the same brand for both product attributes and conjoint analyses. For assessing the impact of “price” on consumers and “green”, respondents were given a price option too, resulting in a changed outcome. It was noticed that people, when the price element is introduced, adjust their preferences based on an affordable price range. This shift in behavior, if remained unnoticed and not interpreted carefully, can mislead that the Indian consumer is inclining toward “green”, which is not the case. In fact, even today, the Indian consumer is concerned about the price more than any other attribute, which has also been confirmed by the importance score for price, i.e. a score of 22.997. On combining the findings of three separate studies, we identified some interesting segments, such as brownies and greenies as defined previously, some like price greenies, ready to pay for green product and shifting-greenies, that measures preference and price trade-off. A further inference that can be drawn is that the Indian consumer is concerned about green and environmental issues, but when purchase decision is taken, consumers counter trade-off situation by shifting their choice to “price” from “green”. From an economic viewpoint, we acknowledge this shift as a “preferential green shift” phenomenon that is responsible for the existence of consumer categories that

are creating new market segments. The preferential green shift occurs when consumers trade-off their green preferences for more admiring and most differential factors such as price, supporting *RQ6*. The preferential green shift is apparent upwardly for advance technology owing to attribution and in the downward direction because of price inclusion. The perceived usefulness (PU) and perceived ease of use (PEOU) owing to television green attributes, make customers shift to environment-friendly advanced technology as identified by the substitution model of [Fisher and Pry \(1971\)](#) and the TAM of [Bagozzi et al. \(1992\)](#). The aforementioned findings help us in comparing current results with previously established theories. First, the TPB ([Ajzen, 1991](#)) a, much discussed model, envisaged attitude toward behavior, subjective norms and perceived behavioral control as resultants of variation in behavior. Second, Task-Technology Fit (TTF) model suggests that a technology is easily acceptable, having a positive impact on performance of individual if user finds it fit and facilitating in completion of the given assignment ([Goodhue and Thompon, 1995](#)). TTF includes quality, locatability, authorization, compatibility, ease of use, production timeliness, systems' reliability and relationship with users. Third, expectation disconfirmation theory (EDT) elucidates that users like change with the passage of time. A possible explanation is given through four factors including expectations, performance, disconfirmation and satisfaction ([Oliver, 1980](#)). Forth, [Bandura's \(1986\)](#) social cognitive theory (SCT) emphasizes the role of social pressure, cognitive and personal factors, personality and demographic features in shaping behavior ([Losh, 2004](#); [Colley and Comber, 2003](#); [Venkatesh and Davis, 2000](#)). Fifth, technology acceptance model (TAM2) by [Venkatesh and Davis \(2000\)](#) made the theoretical extension of the TAM theory. TAM2 portrays that perceived ease of use, subjective norms, image, job relevance, output quality and result demonstrability, influence the users' acceptance significantly.

However, none of the abovementioned studies have endorsed "price" as an important criterion while adopting any technology. On the contrary, the novel finding of Study 3 in the present paper acknowledges that customers shift their preference downward due to perceived price of the TV. Therefore, the current study that suggests "price" as an essential factor during technology acceptance by individuals can be termed as a price-oriented technology acceptance model (POTAM), a possible extension of TAM.

7. Limitation and future research

Although TV is the source of greenhouse gas emission and natural resource use, future research may focus on other segment of products like automobiles, i.e. cars. Another limitation of the present research is the sample included only Indian region, which is the representation of a single country from the Asian region. In addition, two or more countries can be examined for the difference of consumer preference. Next, instead of the non-probabilistic sampling, probabilistic sampling techniques can be used. At last, the sample size could have been larger for better generalization of the results.

8. Managerial and public policy implication

Results from the present study for green products show that people prefer products that have the latest technology and products with higher-end features but at lower price. The gap in knowledge–attitude–practice is reflected by the "price" concern. This study reveals that consumer durable buyers are aware about the benefit of green, but they cannot ignore the reality of price ([Berends et al., 2000](#); [Brío and Junquera, 2003](#); [Binkley and Bejnarowicz, 2003](#); [Magi and Julander, 2005](#)). It is observed that customers sometimes wait until the preferred product becomes affordable or low priced. Therefore, the established theories of technology adoption emphasizing on various necessary factors while technology adoption must include "price" too. The initial two studies solidify the fact that Indian consumer have positive attitude towards purchase of green products. The attempt of technology adaptation by best possible green attribution can be promoted at the national level through

corporate participation for upward preferential green shift as the last Study 3 signifies. The products must be offered at concessional or optimal price by the government of developing countries like India, Brazil, etc., supporting business through subsidies and business promotion activities (Kalish and Lilien, 1983). A comprehensive innovative endeavor of creating green products is performed by motivating scientific communities at the firm and national levels. The ultimate attempt of this study reveals that the price perception of consumers heavily affects the green product. The downward preferential green shift should be altered by public policy, assisting businesses for creating more greenies. The application of soft and hard judicial norms on the environment affecting public products, such as TVs, automotive, air-conditioner, etc., can be applied by nations for creating product acceptance (Blamey, 1998; Skjærseth et al., 2006). The promotion of green mixed consumer durables by offering hassle-free licensing, approvals, incentives and tax relaxation to firms will be an innovative step to adjust price ratios for public green attribute products, namely, television and plug-in electric vehicles (Zhou et al., 2015). TV, a necessity and a civic product for information, knowledge and entertainment with high-end attribution, compensates the higher price band of the product, but only up to an extent (Blamey, 1998). Thus, managerial and practical implications of the study advocate for a reduction in trade-off by reversing the preferential green shift for offering more value to consumers, i.e. reduced or subsidized price, for green-attributed product (Kalish and Lilien, 1983). The product promotion by emotional appeal also works well in the green milieu. The present study connotes that the attempt to market green product as an exclusive and premium category will not work in developing countries. Hence, the role of a manufacturer along with support from government is requisite for providing green products at low price. Consequently, to reduce the gap of KAP in purchase decisions, scientists, designers and manufactures must develop such green products that can purge the unattractive attribute tradeoffs and attract more buyers toward green in the long run. Simultaneously, marketers need to formulate a marketing mix in such a way that can convince skeptical consumers for going green.

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