Consumer Innovativeness : The Mediating Role of Leading Edge Status (LES) on Adoption of Innovative Products in Indian Rural Markets

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Abstract

Consumer innovativeness has recently caught the attention of Indian marketing academics due to rapid adoption of high tech products and services like laptop computers, tablets, DVDs, mobile phones, and cable TV providers. Companies are spending heavily on brand promotion and advertising to attract new customers. This research paper studied consumer innovativeness and lead user status (LUS) in adopting new products and services in Indian rural markets. Lead users are defined as customers at the leading edge of the market and who have a high incentive to adopt a new innovation. In earlier research studies, a construct like 'lead user status' was developed as a bimodal and discrete variable. This paper advanced the idea of lead user through redefining and validating the construct as a leading edge status (LES) and adapting the same to the Indian rural market context as a continuous variable. This helped in comparing LES with other behavioural adoption traits like individual dispositional innovativeness (IDI) and time of adoption (TOA) from the seminal work of Rogers (1962). This paper also studied the mediating effect of LES with the traditional measures like IDI, TOA, and other general characteristics by application of route path analysis in LISREL. A pairwise correlation also revealed interesting patterns among LES, IDI, and TOA and with demographic and psychographic consumer traits. The study validated a continuous construct of LES and further established that LES assumed a mediating role in explaining consumer innovativeness and adoption behaviour.

Keywords : **innovativeness, rural, lead user, leading edge status, mediating, AMOS**

Paper Submission Date : July 2, 2018 ; Paper sent back for Revision : April 14, 2019 ; Paper Acceptance Date : May 14, 2019

The Indian market is changing in multiple ways. While there is a large demographic shift happening due to rapid urbanization and increase in per capita income in India, deeper distribution of technology has enabled products like mobile phones and other gadgets to change the technology adoption behaviour in Indian rural markets. Increase in per capita income can be attributed to various factors, which can be seasonal like fairly good monsoon to state intervention due to various developmental and welfare schemes. Furthermore, both above and below the line media are abuzz with advertising and promotion of these new generation products, which includes laptops, tablets, mobile phones, DVD players, and cable services, among others. An exponential increase in the use of these mass media for advertising and promotion of these technology products indicates that these products have crossed the minimum threshold level of adoption. These products are being used by early adopters as per diffusion based market segmentation (Rogers, 1962). Subsequent reductions in prices of these products and services over the past few years have made them affordable and accessible to a larger part of Indian society, including the rural heartland.

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DOI : 10.17010/ijom/2019/v49/i6/144696

According to von Hippel (1986), the concept of 'lead users' has two distinct characteristics - they face a need for a product or service that in general will be in the market place, but face this need months and years before a majority of the market encounters the same product or service and secondly, they are positioned to benefit significantly by obtaining a solution to these needs. As a result, the lead users are more likely to innovate (than others) when the product they needed is not available in the marketplace, which has been discussed in extant literature by previous researchers (Franke & Shah, 2001; Morrison, Roberts, & von Hippel, 2000 ; Urban & von Hippel, 1988). Researchers, thus far, have identified three criteria that define the characteristics of lead users, namely, (a) staying ahead of the market in terms of identifying and adopting innovations, (b) having clear perceptions of expected benefits from the innovations introduced in the market, and (c) understanding about the levels of innovations vis-a-vis their usability & adoption (Schreier & Prügl, 2008 ; von Hippel, 1986). Treatment to the construct "lead user" as a binary variable is evident in many earlier research works (Herstatt & von Hippel, 1992 ; Urban & von Hippel, 1988). However, the same term is used as a continuous variable in the context of industrial marketing (Morrison, Roberts, & Midgley, 2002). These authors introduced a new construct called 'leading edge status' (LES), which is defined as the degree to which organizations use and apply technology and innovation in new and different ways to solve problems faced by the organization and the degree to which they perceive the benefits of new products earlier than the rest of the market place (Morrison et al., 2002). Similar behaviour is also seen among individual customers. Therefore, the current study has redefined the construct of leading edge status in the context of business-to-customer (B2C) segment as the degree to which individuals use and apply technology and innovation in new and different ways to solve individual consumption problems faced by them and the degree to which these customers perceive the benefit of these innovative products earlier than the rest of other consumers in the market. People showing higher degree of LES are treated as lead users. The idea of using 'degree to which' refers LES as a continuous variable than the earlier bipolar classification as a discrete variable.

This research paper focuses on technology enabled products and services adoption and rural consumer's innovativeness in accepting these products and services. There is a severe dearth of literature available among Indian academia on this aspect of consumer behaviour. Although there is a fair amount of research conducted in the context of developed nations on consumer adoption of new products and how an innovation spreads in a broader societal context, there still exists a dearth of literature on this aspect of consumer behaviour in the Indian context. The current research aims to shed some light on this important, but sparsely discussed issue. This research further also explores the correlation among three variables, namely, being ahead of the market, level of expected benefit, and level of innovation. It has been observed that only when the aforementioned variables are highly correlated, then only they explain the same construct. If the results are otherwise, then some individuals have a leading edge status due to their new technology application ; whereas, others can be put into the same class due to early recognition of needs. It is important to test this continuous behaviour of the construct "LES" in the context of individual buyers for its validity and reliability among a randomly chosen set of respondents, which will include both "innovative" and "non - innovative" users of technology products. It has also been observed that lead users play the role of an opinion leader in the diffusion process (Urban & von Hippel, 1988) in spreading information about new products and services. However, there is no empirical study conducted on Indian consumers supporting this claim. It is possible to study the relationship between lead user status (LES) with diffusion of innovation, that is, the innate innovativeness of adopters (Midgley & Dowling, 1978) and the characteristics of adopters as a function of time of adoption (Rogers, 1962, 1995), which the current research is trying to capture.

Review of Literature

Consumer innovativeness and adoption are popular concepts in marketing literature. Consumer innovativeness was studied initially on how consumers adopt new products and services (Rogers, 1962, 1995). Rogers posited about time of adoption, while the study conducted by Midgley and Dowling (1978) was based on innate

innovativeness. Innovators are defined as those individuals or units of adoption, possessing high level of innovativeness, where 'innovativeness' is the degree to which an individual or unit of adoption is relatively earlier in adopting new ideas than other members of the social system. Rogers (1995) proposed a unimodal distribution of the population along the adoption of time dimension (famously called the bell shape curve of diffusion) and measured 'innovativeness' as a behavioural construct. Midgley and Dowling (1978) measured innate innovativeness as a trait characteristic of innovators. They defined innovativeness as an inherent desire to experiment with the novel rather than a situational response - the extent to which consumers make adoption decisions independent of the communicated experience of others.

The concept of lead users emerged as a critical dimension to understand the nature of innovation management (Franke, Von Hippel, & Schreier, 2006 ; Lilien, Morrison, Searls, Sonnack, & von Hippel, 2002 ; Morrison, Roberts, & Midgley, 2004). Lead users are likely to trigger innovations due to higher incentives. Lead users were identified to possess more consumer knowledge and use experience in the field of investigation than ordinary users (Schreier & Prügl, 2008). They were found to have a high internal locus of control (Schreier & Prügl, 2008) and demonstrated stronger domain-specific innovativeness (Schreier, Oberhauser, & Prügl, 2007). Successful innovations are crucial in today's volatile business environment with insurgent brands disrupting entire categories where lead users play a major role in propagating innovative and novel product ideas ahead of market demand (Leary & Kaulartz, 2019). Brem, Bilgram, and Gutstein (2018) also emphasized on the participation and contribution of lead users in conceptualizing innovative products and services. It was observed that users, rather than marketers, were the initial developers of any commercially viable new product (Shaw, 1985 ; von Hippel, 1988). Innovations by users are mostly concentrated in the hands of the lead users of new products (Shah, 1999 ; Urban & von Hippel , 1988 ; von Hippel, 1986). Evidences from other empirical studies also suggest about innovations by end users.

Simbeck (2013) observed that lead users influence business performance, particularly small business enterprises in developing innovative solutions. A number of researchers found that dissatisfied lead users, with reference to a conventional product or service, tend to use social networks, namely blogs and web-communities, to share experiences and knowledge to develop innovative alternatives (Ernst, Brem, & Voigt, 2014 ; Ernst & Brem, 2017) and also exchange use experiences (Jeppesen & Laursen, 2009 ; Mahr & Lievens, 2012). Developing a strong relation with lead-users can have a strong effect on the commercial success of radical innovations (Vanhaverbeke & Du, 2010). Empirical studies revealed that users ranging from 6% to 40% developed and modified products (Baldwin & Von Hippel 2011). This emphasized the fact that users are developers of a significant number of innovations that exist in the market today. Baldwin and Von Hippel (2011) further argued that there has been a gradual shift from the traditional producer innovation model to a user and open collaborative innovation model. Lead users were found to assume the role of entrepreneurs as they propelled the innovations in the market (Haefliger, Jäger, & Von Krogh, 2010 ; Shah & Tripsas 2007). User innovators developed this insight into commercial potential by using and gaining experience with the product or service they have developed for their own use (Haefliger et al., 2010).

A number of lead user entrepreneurial innovations were identified in the Indian context by Yadav and Goyal (2015) namely, cotton-stripper in Gujarat, mitticool in Gujarat, bullet-santi in Gujarat, biomass-gasifier in Rajasthan, multipurpose processing machine in Haryana, etc. Rural innovations have been predominantly promoted by the lead users (Khanna & Palepu, 2010). In one of their studies, Bhattacharya and Roy (2014) found that innovative marketing activities undertaken by firms in rural areas were inflicted by problems of affordability and availability, though the initiatives addressed the accessibility and awareness issues adequately. Rajan and Xavier (2015) found in their studies with farm producing agro-fertilizers that self help groups (SHGs) can play a pivotal role in introducing marketing innovations in rural markets. Propagation of innovation was also studied in the context of urban and semi-urban markets, and it was found that co-consumers, particularly women, referred to innovative contents that provided them with gratifications relating to social acceptance and were more liable to

positively influence their intent to purchase (Venkataraman & Raman, 2016).

The manufacturers are sometimes ignorant about an innovation as they perceive risk in a new - product launch and hardly estimate market potential of a new innovation. All this happens at a time when lead users experience the motivation to innovate. Lack of clarity about market attractiveness and poor estimation of future potential reduces manufacturer's incentive to bring in new products. An example for this might be the reason for late entry of most of the high technology products in emerging markets like India. Lack of motivation on the part of the manufacturers to introduce an innovative product increases the likelihood of lead users developing their own innovative solutions for leading edge needs, which subsequently becomes a part of the market.

Additionally, Franke and Shah (2001) analyzed the innovative behaviour of 197 members for four sports communities, and revealed that one third of the surveyed respondents had innovated with one in seven innovations termed as a completely new product by the innovator. Bilgram, Brem, and Voigt (2013), on the other hand, tried to identify the source of mining for user centric innovations and found that lead users often used online-collaborative tools to design innovative product concepts. Foxall (1989) argued that for discontinuous innovation, lead users are important in providing detail experience to later adopters and play an important function in supporting marketing communication. Uses of social media and viral marketing have helped many new products for a faster diffusion of innovation. Trondsen (1996) found that early adoption makes lead users valuable in database marketing and help in viral marketing. The researchers compared characteristics of innovating customers with non-innovators and found that the innovators displayed characteristics of lead users. These people received higher benefits and were ahead of the trend, much in the same line as the lead users being early adopters of new products. Furthermore, a study conducted by Urban and von Hippel (1988) revealed that lead users adopted technologies, on an average, seven years before non-lead users. Therefore, it might be worthwhile to study the relationship of lead users to other measures of early adoption of innovation in the Indian market.

Objectives of the Study

The current study is based on a set of concatenate objectives in the context of the Indian rural markets, which are listed below :

(1) To test the construct 'leading edge status (LES)' for validity and consistency in both individual buying situations and in the context of the Indian rural market.

(2) To test whether the selected variables explain a single construct, leading to better understanding of this construct for Indian rural markets.

(3) To adapt the construct individual disposition innovation (IDI) and find its consistency for the Indian rural market.

(4) To find out the correlation between LES, IDI, TOA, and other general behaviour measures to explain consumer innovativeness.

(5) To explain the mediating role of LES in explaining consumer innovativeness and adoption behaviour.

Material and Methods

(1) Research Design : One of the major issues with studying the lead user status among the Indian rural context is associated with adopting 'constructs' and 'scales' developed by Western academics. The rural consumer behaviour in India is an area of lesser focus for Indian management academia. Structural challenges of the Indian

rural market, customers' educational levels, and access to desired market information are some of the other reasons limiting academic research in this domain. Therefore, the current study has adopted the construct 'leading edge status (LES)' (Morrison, Roberts, & Migley, 2002) with suitable modifications for this study. 'Lead user' is defined on the basis of two factors, which are : the recognition of benefit from an innovation early in the process and secondly, the potential for acquiring large benefits (von Hippel, 1978). It is proposed that lead users generate new applications and solutions. It is important to validate this construct in the context of Indian, individual rural consumers. One of the ways to test the validity and reliability of the constructs is through confirmatory factor analysis (CFA) along with determining the value of the reliability measure (Cronbach's apha ≥ 0.70), which aids in testing the validity and reliability of this construct. If all the items and variables are loaded on one factor, it can then be concluded that the construct is consistent and holds onto all the variables (Hair, Anderson, Tatham, and Black, 1998).

In order to operationalize the construct - leading edge status (LES), the current study uses four measures, which are : (a) benefits recognized early, (b) high benefits expected, (c) application generation from self, and (d) application generation from others. These four variables can be used for testing the consistency (Morrison, Roberts, & Midgley, 2002). Once the construct LES is validated, then its relationship with behavioural and background characteristics of innovators can be studied, which in turn is expected to aid us to understand the characteristics of high LES members.

The next important task of the study is to determine the relation between LES and other constructs such as innate innovativeness and time of adoption. These constructs were taken from earlier studies as discussed in the section pertaining to the literature survey. It is proposed that the construct 'leading edge status' is expected to be closely related to the construct 'individual dispositional innovativeness' (IDI) (Midgley & Dowling, 1978), a modified construct to suit individual customers and time of adoption (TOA) (Rogers, 1995). Both LES and IDI refer to a cross category predisposition to innovate. It is expected that IDI will be a key determinant of LES in the Indian rural market context.

One of the primary objectives of the current study is scale development for LES. In order to conduct a complex behavioural study as this one, it is important to select a proper sample. The sample selected should bear a high degree of heterogeneity by including both innovative and non-innovative buyers as well as variation in the degree of adoption rate. Multi-item scales are used for measuring the constructs LES and IDI. The time of adoption (TOA) is measured for five different categories of products - computation (laptops), entertainment (DVDs), mobility (mobile phones), wireless devices (tablets), and photographic instruments (DSLR cameras). General adoption behaviour is studied for these items in the context of self and family consumption. The Table 1 explains the multiple items used for measurement of LES. The eight measures of LES are used to validate the construct. It is important to measure this variable and relate it to traditional constructs like 'traits of adopters' and adoption rate (TOA).

Bergkvist and Rossiter (2007) strongly recommended single item measurement scale for 'doubly concrete constructs'. Doubly concrete constructs, as explained by Rossiter (2010), are constructs that have a simple, clear object (e.g., a brand, user status, etc.) and single-meaning attribute (e.g. adoption). Examples of doubly concrete constructs include attitude toward the advertisement, brand attitude, brand purchase intention, etc. In this study, consumers' attitude to lead innovation adoption has been focused upon. There have been criticisms of Bergkvist and Rossiter's observations as Kamakura (2014) proposed that multi-item scales are more likely to induce predictive validity in the model.

However, Bergvist (2015) refuted Kamakura's propositions and posited that single-item scale is comparable with multi-item scale on the ground of yielding results in correction for attenuation: the correlations with the criterion variables are virtually the same as for the multiple-item measures corrected for attenuation ; criterion variables (from delayed studies) are not that significant to induce differences in results when correlations are obtained from predictor variables and common-method variance is negligible on the basis of marker variable analysis (Lindell & Whitney, 2001; Malhotra, Kim, & Patil, 2006).

Table 1. Measure of Leading Edge Customer Status

Scale Item	Sentence Used/Item Wording for the Scale Item	Scale	Value of Cronbach's Alpha (if Item is Deleted)
Respondent recognizes early	As an individual, I am always ahead of others in planning for new products and services.	5 point scale: 1= *Definitely disagree* 5= *Definitely agree*	0.787
High level of benefits expected	As a customer, I can enjoy the benefits by early adoption and use of innovative products.	5 point scale: 1= *Definitely disagree* 5= *Definitely agree*	0.913
Perceived LES by self	How leading edge customer are you (definition of lead user given) ?	5 point scale 1 = *Not a lead user* 5 = *Is a lead user*	0.791
Perceived LES by others	A count of how often people quote him as a leading edge user.	5 point scale 1= *Never* 5 = *Most often*	0.812
Application Innovativeness	I often find that I am suggesting others about new application of innovative products.	5 point scale: 1= *Definitely disagree* 5 = *Definitely agree*	0.798
	I have also used product prototypes before others, even when the product is not launched in the market.	5 point scale: 1 = *Definitely disagree* 5 = *Definitely agree*	0.83
	I share a close relationship with the shopkeeper from who I buy new generation products.	5 point scale: 1= *Definitely disagree* 5= *Definitely agree*	0.781
	I am always regarded as someone who has pioneered the use of advance technology.	5 point scale: 1 = *Definitely disagree* 5 = *Definitely agree*	0.816

Source: Midgley and Dowling (1978) ; Rogers (19

Traits of adopters are measured by six items (Midgley & Dowling, 1978) adapted to Indian rural markets. Individual dispositional innovation (IDI) is measured by using these six items. The adoption behaviour is measured by 'time of adoption' and 'number of innovations adopted' (Rogers, 1995). The second measure captures general adoption behaviour. Confirmatory factor analysis (CFA) is used to estimate the measurement model using

Table 2. Items Used for Calibration of Constructs Related to Leading Edge Status

Individual Dispositional Innovation (IDI) Measure	Adoption Behaviour Measure
(Cronbach's Alpha = 0.863) (Construct Reliability = 0.71)	
As a person, I am innovative. I take advantage of opportunities. I am willing to experiment.	1.Time of Adoption (TOA) (Use of Rogers's Adoption Categories)
I am an individual who loves to take risks. I advise people to wait before adopting. I also rely on other's opinions.	2.Number of Innovations Adopted (Scale value between 1 and 5)

Source : Compiled from Midgley and Dowling (1978)

maximum likelihood in LISREL (Baron & Kenny, 1986). The LES construct has a Cronbach's alpha and construct reliability of 0.71. The list of variables, as summarized from the previous studies, is explained in Table 2.

(2) Sampling and Data Analysis Plan : As explained earlier, it is important to find out the validity and consistency of the construct LES and Indian rural market adaptation of IDI construct for individual adoption process (B2C). A heterogeneous sample with both innovative and non-innovative buyers will help in testing the validity and consistency. The sample selected for this study included rural, middle class consumers within an age span of 20-50 years. The sample profile of the respondents was defined by demographical variables like educational background, annual disposable income, availability of risk capital to buy innovative products, and few psychographic measures covering their interest in electronic gadgets, modern forms of entertainment, usage of social media and the Internet. However, only relevant background measures are taken into consideration for analyzing 'innovative traits' of the sample members. Data collected from 540 eligible respondents were reanalyzed during the study. The study was conducted over a period of six months starting from October 2017 to April 2018 in selected rural areas in Eastern India.

The Census of India defines any habitation with a population density of less than 400 per square kilometre, where at least 75% of the male working population is engaged in agriculture, as a rural habitation. This definition of rural habitation is used for selecting sample and locating the sample members for research. The rural population constitutes of 800 million people, with 164 million households, and 70% of the Indian market and has proven to be an attractive market for marketers. A survey on the Indian rural market revealed the presence of 200 million rural mobile users, which turned out to be more than the total mobile subscribers in Brazil. Additionally, there are 14 million DTH connections in rural areas with a lion's share of the market of 20 million and 87 million Kisan credit cards, indicating rural people having access to credit. The rural markets are growing faster than urban markets (durable growth of 25% compared to urban growth of 10%) ; 11% of the total car sales come from rural India. The rural markets account for 56% of India's total income; 64% of expenditure ; 33% of savings ; 67% of villages are connected by all-weather roads; 30% is the tele-density among rural consumers ; 60% of villages have continuous flow of electricity leading to big opportunity for consumer durables. All of these factors have increased the purchasing power of rural consumers leading to enhanced appetite for new generation tech-enabled goods and services (Gupta, Sankhe, Dobbs, Woetzel, Madgavkar, & Hasyagar, 2014).

Confirmatory factor analysis (CFA) is used for testing validity and consistency of LES construct by using maximum likelihood model in LISREL. Pairwise correlation is used for testing the relationship between LES, IDI, and TOA. The mediating effect of LES on IDI and TOA is measured by using LISREL on route path analysis. The following section of the paper is devoted towards analyzing the results and discussing the findings.

Analysis and Results

The first level of analysis is done to find out whether all the variables are loaded on the construct "leading edge status" (LES) in the context of the Indian rural market. This construct is measured by using item scale (refer to Table 1) for testing of reliability and validity. The coefficient alpha (alpha = 0.863) with 540 observations explains high reliability. No variable was dropped from the test. We used confirmatory factor analysis to measure the uni-dimensionality of the construct LES and how the items are loaded on LES. As explained in the Table 3, all the items are loaded on a single factor. The construct reliability of 0.71 is fairly high for the model fitment.

In this context, it is also thought worthwhile to map the fit of the LES construct with traditional literature in the context of the Indian rural market. It is relevant to do a direct comparison between LES and traditional measurement of innovativeness, that is, innate innovativeness (IDI) and time of adoption (TOA) along with measure of general behaviour variables like 'number of innovations adopted'. Pairwise correlation between these constructs reveals that at 95% confidence level, all are highly significant (p =.000). The Table 4 explains how LES

Table 3. Confirmatory Factor Analysis for LES Constructs

Constructs	Items Used in the scale	Unst. ML Estimates	Std ML Estimates	*t*- value
LES	I recognize benefits early.	0.564	**0.761**	13.97
	I expect higher benefits from the innovation.	0.668	0.265	5.41
	Perceived LES by self.	1	**0.798**	
	Perceived LES by others.	0.257	0.365	7.76
	I suggest new applications.	0.653	**0.721**	14.6
	I enjoy testing prototypes.	0.598	**0.661**	13.91
	I build a close relationship with the retailer/distributor.	0.541	0.629	13.05
	I have pioneered new applications of the innovation among community members.	0.813	**0.765**	17.39
IDI	As a person, I am innovative.	0.567	**0.768**	12.38
	I take advantage of opportunities.	0.621	**0.777**	13.02
	I am willing to experiment.	0.672	**0.812**	17.98
	I am an individual who loves to take risk.	0.328	0.452	9.72
	I advise people to wait before adopting.	0.311	0.398	8.21
	I also rely on other's opinions.	0.587	**0.672**	11.09
BEHAV	I adopt innovative offers instantly.	0.231	0.354	11.44
	I adopt innovative offers after getting feedback from users.	0.681	**0.768**	16.29
	I advise others to adopt innovative offers instantly.	0.342	0.421	12.75
	I advise others to adopt innovative offers after getting feedback from users.	0.723	**0.801**	17.84
	I have not adopted any innovation in the last one year.	0.412	0.511	14.21
	I have adopted one innovation in the last one year.	0.651	**0.721**	15.98
	I have adopted more than one innovation in the last one year.	0.124	0.213	9.89

Note. GFI =.929, AGFI = .916, NFI = 0.976, CFI = 0.981, RMSEA = 0.097

Composite Reliability = 0.75

Table 4. Pairwise Correlation Between Individual Dispositional Innovation, Leading Edge Status, and Innovativeness

		IDI	LES	Behavioural Measures (BEHAV)	
				TOA	NIA
IDI	Pearson Correlation	1	.766**	.643**	.203*
	Sig. (2-tailed)		.000	.000	.002
LES	Pearson Correlation		1	.847**	.273*
	Sig. (2-tailed)			.000	.006
Behavioural Measures (BEHAV)	Pearson Correlation			1	.674**
TOA	Sig. (2-tailed)				.006
NIA	Pearson Correlation				1
	Sig. (2-tailed)				

Note. **. Correlation is significant at the 0.01 level (2-tailed).

Note.*. Correlation is significant at the 0.05 level (2-tailed), *N* = 540

is more closely related to the trait (IDI) than to the behaviour measures (TOA) and number of innovations adopted (NIA).

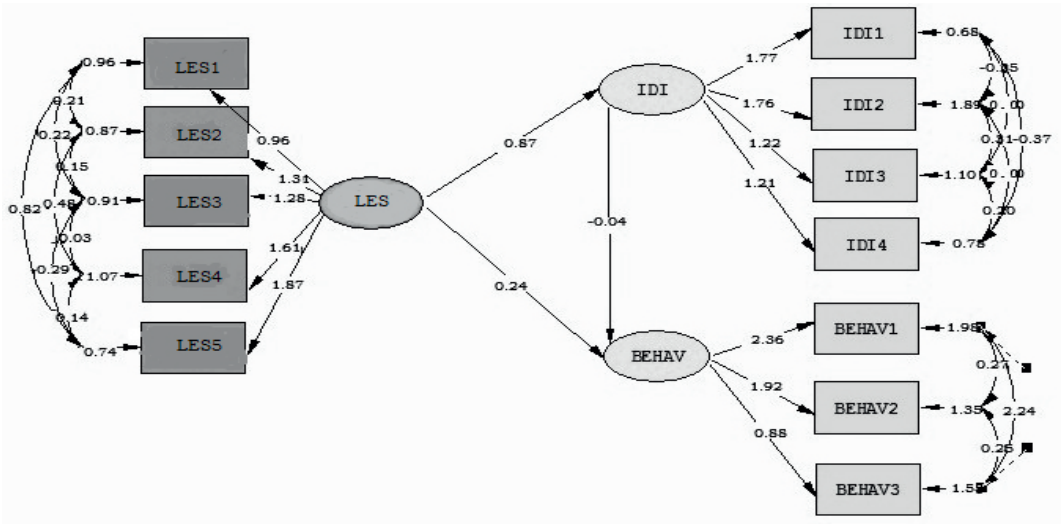
We also tested whether the construct LES is a mediator between IDI and behavioural pattern (TOA and number of innovations adopted) by using multiple regression analysis. Two models are tested : (a) LES with TOA (Rogers, 1995 behaviour measure) and (b) more general behaviour construct (number of innovations adopted) for mediating effects of leading edge status (LES). The study uses the statistical technique of multiple regression using SPSS, with an objective of identifying the significance level of this mediating effect. The Table 5 represents the summary results. In both the models, LES is found to play a significant mediation effect on the relationship between IDI and adoption behaviour. Both the models have significant *R* square values (.718 and .403), representing adequate explanation of variance in the dependent variables (TOA & NIA) by the independent variable (IDI). The strength of mediation is higher on the relationship between IDI and TOA ($\beta = .859$, $t = 6.595$, sig. =.000) compared to the relationship between IDI and NIA ($\beta = .583$, $t = 4.677$, sig. =.001).

The path in Model 1 and Model 2 between LES and IDI need to be significant for establishing the mediating

Table 5. Results of Mediating Effects of LES

	Model	Model Summary				ANOVA		Coefficients		
		Const.	*R*	*R* Square	Adjusted *R* Square	*F*	Sig.	Beta	*t*	Sig.
Behavioural	1 (dep.	IDI	.847	.718	.671	15.249	.000	.215	1.63	.011
Measures (BEHAV)	variable TOA)	LES						.859	6.595	.000
	2 (dep.	IDI	.635	.403	.303	4.048	.045	.066	.191	.852
	variable NIA)	LES						.583	4.67	.001

Figure 1. The Route - Path Model Showing Mediating Impact of LES on BEHAV Through IDI



Note.
LES: Leading edge status
LES1 to LES5: Observed variables of leading edge status (as per CFA results in Table 3).
IDI: Individual dispositional innovation, IDI1 to IDI4: Observed variables of individual dispositional innovation (as per CFA results in Table 3).
BEHAV: Behavioural measures
BEHAV1 to BEHAV3: Observed variables of behavioural measures (as per CFA results in Table 3).

effects between the constructs. It is also important to note that the path between the mediator and dependent variable should also be significant. While the significance level in the first path establishes the effect, the second path's significance confirms the effect. It is evident from the Table 5 that all these requirements are satisfied. The ideal solution for complete mediation should come when coefficient of IDI in Model 3 is zero. This requirement is satisfied when (TOA) is a dependent variable. The magnitude of coefficient for 'number of innovations adopted' (as a dependent variable) in Model 2 is minimal (though significant). Therefore, it can be concluded that LES is substantially mediating the relationship between IDI and adoption behaviour, which indicates that LES is able to capture large amount of variation in the adoption behaviour. A structural model confirming the mediating effect of LES is also identified using LISREL (maximum likelihood model) (Figure 1).

The final section of data analysis and discussion brings into foray how these three variables LES, IDI, and TOA are related to individual characteristics of the respondents. A set of relevant demographic and psychographic variables are taken into account for a pairwise correlation test. The results are presented in the Table 6. This Table 6 reveals that there are significant differences between these variables. This implies that high LES customers' decisions to adopt new innovation are driven by individual and personal decisions than other influencers' opinion in adopting the same innovation. It is also found that lead users proactively search for information from various sources (0.335) compared to the two other sets. So, lead users with high LES seek information from multiple sources and prefer making their own decisions while buying innovative products.

Table 6. Characteristics of Innovators and Lead Users

Pairwise Correlations	IDI	LES	TOA
Size of the family	0.391	0.497	0.207
Total disposable income for buying innovative products	0.197	0.336	0.289
Level of education	0.243	0. 368	0.403
Level of annual income	0.319	0.354	0.159
Autonomy in decision making on innovation	0.396	0.413	0.251
Cash based transactions for innovative products	0.313	0.351	0.223
Sources of communication used for innovative product information	0.199	0.335	0.129
Other's opinion while buying an innovative product	0.446	0.291	0.317
Importance given to services of innovative products while making a choice	0.187	0.434	0.388

It shows that people with high LES have larger families than people with high IDI and TOA. Autonomy in decision making is highly correlated with high LES customers than high IDI and TOA. This implies that high LES customers' decision to adopt new innovation is driven by individual and personal decisions than other influencer's opinion in adopting the same innovation. It is also found that lead users proactively search for information from various sources (0.335) compared to the other two sets. So, lead users with high LES seek for information from multiple sources and prefer making their own decisions while buying innovative products.

Theoretical Implications

One of the key findings from this research is validation of LES as an independent construct in the Indian rural market setting and in business to consumer (B2C) buying situations. von Hippel (1986) defined lead user as a bimodal and discrete variable. However, the current work establishes an opportunity for lead users to be identified with a continuous construct called leading edge status (LES). Adaptation of lead user status into the Indian rural marketing context confirms the validity and reliability test done on earlier studies (Morrison, Roberts, & Midgley,

2002). In the future, there is an opportunity to test the distribution pattern of this continuous construct 'LES' in the Indian rural markets. The same can be compared with the behavioural adoption of innovating consumers (Rogers 1963, 1995). It will be interesting to observe how lead user behaviour pattern data changes when we use LES as a continuous variable from current conception of bimodal and discrete variable in both B2B and B2C markets in rural India. The loading of factors like 'early benefits expected' (0.564) and 'expectations of higher benefits' (0.668) are the most important attributes explaining the LES construct. The study also lends support to the theoretical propositions made by Thomke and von Hippel (2002) and von Hippel and Katz (2002), highlighting the role of customers as innovators.

Managerial Implications

Studying the relationship between LES and other two traditional constructs IDI and TOA in the Indian marketing context also helps in exploring the linkage between behavioural diffusion and trait based characteristics of innovative consumers. It is also found out that LES is mediating significantly between IDI, TOA, and general behaviour measures. Leading edge users serve as a valuable asset for marketing organizations and provide support to the diffusion of the innovation process as posited by von Hippel and Katz (2002). The behavioural pattern of these users in patronizing innovations may be integrated and analyzed to develop more radical products. The sub-altern markets (conventionally known as rural markets) are rapidly undergoing psycho-geo-demographical changes due to rapid penetration of technology. Therefore, identifying leading edge users has become an absolute imperative for the marketing organizations for penetrative marketing.

Limitations of the Study

The study is limited to specific geographical sphere (rural) and demography. In addition, the study focuses on a limited number of innovative products suitable to find a place in the rural markets.

Future Research and Extrapolations

There is also a possibility of studying how LES is moderating between behavioural and trait based adoption measures of innovative customers. Furthermore, studies investigating how variations in dependent variables like background characteristics of consumers increases or decreases mediating/moderating role of leading edge status can also be conducted. By definition, 'lead users' are people who sense and seek new innovation early. This phenomenon can be used to forecast market potential and strategize timely introduction of new products. Lead users also play the role of opinion leaders which can be utilized in both viral and social media marketing. Further research can also be done to study application of lead user status construct across industries and market situations.

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