Scale Development and Validation for Evaluation of Premium Car Purchases

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Abstract

This paper investigated the beliefs and evaluations embarked on by a premium car buyer during the process of arriving at a decision to buy a premium car. The authors developed a scale using a sample of premium car buyers across the major cities in India, via two iterations. The first iteration was conducted to identify items that significantly represented beliefs and evaluations of premium car purchases by means of EFA. The second iteration further refined the items using coefficient alpha and confirmatory factor analysis and yielded two constructs. The scale was tested and was found to be reliable and valid in premium car purchases. The scale represented a good initial contribution to understanding premium car purchases and additional investigations are warranted with different samples to establish its reliability and validity.

Keywords: **scale development, premium cars, evaluation, consumer behavior**

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According to India Brand Equity Foundation (2016, p. 20), the Indian luxury car market expanded at a CAGR of 37.12% during FY07-15, with 50,000 units in 2015 (about 1% of the passenger vehicle market in India). The market is dominated by players such as BMW, Mercedes, Audi, and Jaguar. Audi sold 11,292 units in 2014-15, while the biggest luxury car seller Mercedes-Benz sold around 11,213 cars in FY15. India has the world's 12th-largest HNI population, with a growth of 20.8% (highest among the top 12 countries). With expansion in the education and realty sectors, and increasing wealth of IT professionals, more consumers aspire to own luxury cars. Affluent class of the country is driving the demand of the luxury cars. The Indian luxury car market is estimated to expand at a CAGR of 25% during 2012 - 2020 and reach 150,000 units by 2020 (accounting for 4% of the estimated 6.8-million-unit domestic car market). The luxury SUV segment is growing at about 50%, while luxury sedans are increasing at 25 - 30%.

According to Lapersonne, Laurent, and Le Goff (1995) :

> Automobiles are an interesting product to analyze, since they are very costly, purchased infrequently, and lead to high involvement…. A car, apart from a house or apartment, is the most expensive thing most people will buy. It will be extensively used for several years. Cars are high involvement products in all aspects: High interest, high symbolic value, high hedonic value, and high risk. An additional argument relates to the length of the inter-purchase interval. The problem of car brand

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> consideration is the closest to consideration set problems encountered in other product categories. In contrast, the problems of model considerations are very different due to the differences in the number of available variants, and the environmental characteristics of the purchase situation. (p. 57)

Dubois, Czellar, and Laurent (2005) observed :

> The English "luxury," the French "luxe," the Italian "lusso," as well as the Spanish and Portuguese "lujo" are all derived from the Latin term "luxus." According to the Oxford Latin Dictionary (1992), "luxus" signifies "soft or extravagant living, "(over) indulgence" and "sumptuousness, luxuriousness, opulence" . From the beginning of human history, luxury has been present in diverse forms of consumption practices. Its role was just as important in Ancient Egypt, Greece, and Rome as it is in modern societies (Berry, 1994). In contemporary marketing usage, "luxury" refers to a specific tier of offer in almost any product or service category. Dubois, Czellar, and Laurent (2005) observed that the English "luxury," the French "luxe," the Italian "lusso," as well as the Spanish and Portuguese "lujo" are all derived from the Latin term "luxus." According to the Oxford Latin Dictionary (1992), "luxus" signifies "soft or extravagant living, (over-)indulgence" and "sumptuousness, luxuriousness, opulence." From the beginning of human history, luxury has been present in diverse forms of consumption practices. Its role was just as important in Ancient Egypt, Greece, and Rome as it is in modern societies (Berry, 1994). In contemporary marketing usage, "luxury" refers to a specific tier of offer in almost any product or service category. (p. 115)
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> Throughout the twentieth century, research has been conducted on luxury in diverse disciplines, including historical analysis (e.g. Berry, 1994), econometric modeling (e.g. Bagwell & Bernheim, 1996; Coelho & McClure, 1993), economic psychology (e.g. Braun & Wicklund, 1989 ; Leibenstein, 1950 ; Mason, 1981 ; Veblen, 1899) and marketing (e.g. Dubois & Laurent, 1993; Kivetz & Simonson, 2002 a,b). (p. 115)

According to Quelch (1987), "Although the characteristics of what is "premium" vary by category, premium brands are typically of excellent quality, high priced, selectively distributed through the highest quality channels, and advertised parsimoniously" (p. 39). Literature in the concept of luxury is found to be using the words "premium" and "luxury" interchangeably. The focus of this article is to develop and validate a theoretical scale to measure the beliefs and evaluations influencing premium car purchases. The need for a scale to measure the evaluation process of premium cars is required to help premium car marketers to understand and design products that suit consumer requirements. Secondly, there is no available scale in literature that can be used to evaluate the premium car purchase behavior.

Literature Review

Padmanabhan and Rao (1993) studied the implications of warranties when the market is heterogeneous. Risk preferences are likely to vary with individuals. The results of the logistic regression model showed that firms should market extended services warranty contracts given the heterogeneity of the market. The second finding of the study was that the degree of risk associated with the purchase was influenced by the warranty length. The third finding was that people with higher incomes showed more preference to the extended services warranty contracts.

The fourth finding was that people who purchased more expensive automobiles and single owners showed an increased requirement for extended services warranty contracts.

For experienced products, many customers feel that known solutions are satisfying and no further search is required. They buy the same product they had previously bought. In such a purchase scenario, the consumer has a "consideration set of size one, a single brand". Lapersonne et al. (1995) examined if this kind of decision process, that is, buying the same product the consumers had previously bought, is common, and if yes, then what indicators to look for to predict customers who are likely to have a consideration set of the previous brand. The outcome of the analysis showed that 17% of car buyers considered only their previous brand and customer satisfaction provided the most obvious set of predictors.

Gupta and Lord (1995) undertook a research to identify determinant perceptual attributes of new cars and then transformed them into corresponding design attributes. This research revealed nine determinant objective attributes. They were : Price, Reliability, Gas Mileage, Rear Leg Room, Front Leg Room, Acceleration, Routine Handling, and Luggage Capacity.

Häubl (1996) tested a hypothetical model having relationships among psychological constructs including country of manufacture image, brand image, evaluation of product attributes and appearance, the attitude towards a product, and the behavioral intention a propos the product. Brand name and country of origin were found to have significant impact on consumer attitudes. The other outcome of this research was the car's appearance was found to impact buying intention.

In late 1990s, American, European, and Japanese car manufacturers were locked in a struggle for the luxury car market. Rosecky and King (1996) examined the luxury car owners' perceptions of desired product characteristics of luxury cars. The authors discovered that no one car fulfilled the ideally desired luxury car. Sullivan (1998) examined the effect of brand names on product demand by analyzing the relative prices of twin pair in the used car market. The finding of this research was that the parent brand name had a significant impact on the demand of individual twin cars.

Byun and DeVaney (2006) researched the household characteristics of prestigious car owners. Income, business ownership, gender, and educational attainment, length of planning horizon were significant in predicting prestigious automobile ownership.

Grinblatt, Keloharju, and Ikäheimo (2008) investigated whether social influences existed in consumption of a particular important commodity-Automobiles. The finding of this research was that the purchases of neighbours, who are geographically most proximate, influence a consumer's purchases of automobiles and this influence was short lived.

Kaushik and Kaushik (2008) attempted to assess the buying behavior of passenger cars in South West Haryana. They surveyed 85 respondents and used descriptive statistics and multidimensional scaling for analysis of data. Results of the MDS showed that brand name, fuel efficiency, and price were the primary determinant of car purchases.

Walters, Chalupa, and Harris (2009) explored the factors that influenced consumer perceptions of quality of American auto industry. Factors those were responsible for quality assessment of American cars were advertisement campaigns of automobile manufacturers, opinion of friends and family, long term reputation of the manufacturer, fit and finish, mileage, reliability of the car, durability of the car, repairability of the car, dealership performance, and customer service reach.

Sohail and Sahin (2010) conducted a research to determine the underlying factors that drove the consumers in Saudi Arabia market to evaluate the products by country-of-origin. They also attempted to illustrate how Saudi markets evaluated attributes of automobiles from four nations-Souths Korea, Europe, Japan, and U.S. The study demonstrated that European cars ranked very highly and had a favorable perception. Japanese cars were rated highly on quality, but were moderate in social acceptance. U.S. cars had a moderate rating in all aspects. South Korean cars had the lowest rating. The study also provided evidence of Saudi consumers, evaluating the cars based on country-of-origin, when quality and social acceptance were crucial.

Landwehr, McGill, and Herrmann (2011) undertook a study to examine how people decoded emotional 'facial' expressions from product form and how this induces the liking of the design. Data analysis was done through regression modeling, and the study suggested a consumer liking for an upturned grille with slanted headlights.

Menon and Raj (2013) investigated the differentiating parameters influencing the consumer purchase behavior of passenger cars in the state of Kerala. The data analysis was done using confirmatory factor analysis. Results of the study showed that after sales service, dealer and showroom experience, price, and advanced technology impacted purchases of passenger cars.

Methodology

This article adopted the scale development model suggested by Churchill (1979). Churchill recommended the following steps for scale construction :

(1) Specify the domain of the construct,

(2) Generate the sample of items,

(3) Collect data,

(4) Purify the measure,

(5) Collect data,

(6) Assess reliability,

(7) Assess validity,

(8) Develop norms.

The first step is to specify the domain of the construct. The domain of the construct was premium car purchases, and the purpose was to develop and validate a theoretical scale that impacts the beliefs and evaluation of premium car purchases.

To generate a sample of measures, Hinkin (1995) suggested two basic approaches. The first is deductive, and the second is the inductive method. Deductive method requires a thorough review of literature to develop the theoretical definition of the construct under examination and derive items from the previously defined theoretical universe. Deductive method is used in this study to generate the items.

Churchill (1979) proposed the method to conduct the purification of measures. The first step is to calculate the coefficient alpha of all the items and deleting items with low alphas and with low item total correlations and then conducting factor analysis. Hinkin (1995) also advised dropping of items that have a factor loading of less than 0.4. Churchill (1979) also recommended the "looping back" or consecutive iteration of the items and suggested the use of confirmatory factor analysis at the later stage.

The analysis was done in two iterations; the first iteration calculated the coefficient alpha of all the items and factor analysis was conducted to identify the items that significantly impacted the beliefs and evaluations of premium car purchases and to drop the "garbage items". Once these significant items were identified, again, coefficient alpha was calculated and the items whose deletion improved coefficient alpha and items with low item total correlations were dropped, and confirmatory factor analysis was conducted of the factors involved. Finally, tests for reliability and validity were performed to confirm the validity and reliability of the scale.

The data for this study was collected between September 2014 and March 2015. The sampling frame contained premium car buyers in the last three years, which was bought from a private agency based in New Delhi. The questionnaire was sent by email to over 19, 500 premium car buyers and 477 of them responded to the survey.

Table 1. Variables Impacting Car Purchases

Sl.no	Variables Influencing purchase decisions	Identified in/by	Abbreviation used
1	Price	Gupta and Lord (1995)	EXP
2	Brand name	Sullivan (1998)	BRN
3	Country of Origin	Häubl (1996)	COO
4	Appearance	Landwehr, McGill, & Herrmann (2011)	APP
5	Previous car	Lapersonne, Laurent, & Le Goff (1995)	PRV
6	Manufacturer's warranty	Padmanabhan and Rao (1993)	WAR
7	Advertising campaigns	Walters, Chalupa, & Harris (2009)	ADC
8	Social Status of occupation	Byun & DeVaney (2006)	OCC
9	Luggage capacity	Gupta and Lord (1995)	LUG
10	Opinions of friends and families	Grinblatt, Keloharju, & Ikäheimo (2008)	OPI
11	Reputation of the manufacturer	Wiedmann, Hennigs, Schmidt, & Wuestefeld (2011)	RMA
12	Fit and finish	Walters, Chalupa, & Harris (2009)	FNF
13	Durability	Rosecky and King (1996)	DUR
14	Dealership performance	Bucklin, Siddarth, & Silva-Risso (2008)	DEA
15	Repairability	Walters, Chalupa, & Harris (2009)	REP
16	Reliability	Rosecky and King (1996)	REL
17	Gas mileage	Gupta and Lord (1995)	MIL
18	Routine handling	Rosecky and King (1996)	ROU
19	Customer Service reach	Bucklin, Siddarth, & Silva-Risso (2008)	CUS
20	Rear leg room	Gupta and Lord (1995)	REA
21	Ride	Rosecky and King (1996)	RID
22	Front seating	Gupta and Lord (1995)	FRT
23	Acceleration	Rosecky and King (1996)	ACC

Table 2. Case Processing Summary

		N	%
Cases	Valid	477	100.0
	Excluded[a]	0	.0
	Total	477	100.0

a. Listwise deletion based on all variables in the procedure.

Table 3. Reliability Statistics

Cronbach's Alpha	*N* of Items
.861	23

Analysis and Results

From literature review of automobiles, several scholars have researched several variables which impact the beliefs and evaluations made during the purchase of cars. The variables researched and found to be impacting car buying decisions are summarized in the Table 1. The field study was designed to collect data from existing premium car users. A five point, multi-item scale format was used. The 23 items were administered to 477 existing premium car users using Google forms.

(1) First Iteration : Initial coefficient alpha was calculated using SPSS 20 and the Tables 2 and 3 show the results of the test. According to Malhotra (2010), coefficient alpha value of 0.6 or less generally indicates unsatisfactory

Table 4. Pattern Matrix[a]

	Component				
	1	2	3	4	5
EXP					
APP					
BRN			.766		
COO					
PRV					
WAR					
ADC					
OCC					
LUG					
OPI					
RMA					
FNF					
DUR	.755				
REP	.765				
REL					
MIL					
ROU					
CUS					
REA					
RID		.809			
FRT		.891			
ACC					
DEA					

Extraction Method: Principal Component Analysis.
Rotation Method: Promax with Kaiser Normalization.
a. Rotation converged in 7 iterations.

Table 5. Structure Matrix

	Component				
	1	2	3	4	5
EXP					
APP					
BRN					
COO					
PRV					
WAR					
ADC					
OCC					
LUG					
OPI					
RMA					
FNF					
DUR	.806				
REP	.799				
REL	.769				
MIL					
ROU					
CUS					
REA					
RID		.803			
FRT		.806			
ACC					
DEA					

Extraction Method: Principal Component Analysis.
Rotation Method: Promax with Kaiser Normalization.

Table 6. Coefficient Alpha for the Five Items

Reliability Statistics		
Cronbach's Alpha	**Cronbach's Alpha Based on Standardized Items**	***N* of Items**
.723	.732	5

Table 7. Item Total Statistics

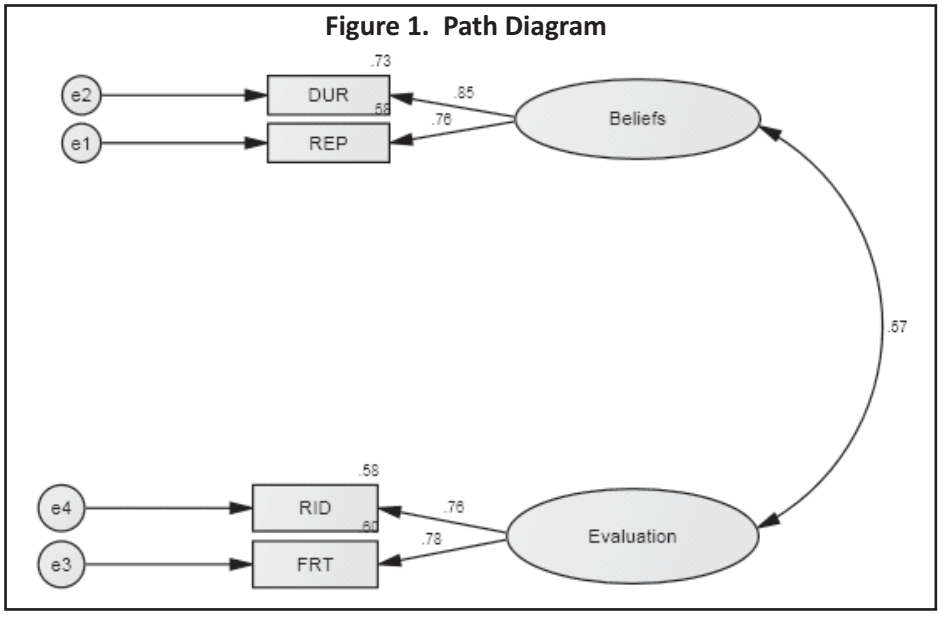
Item-Total Statistics					
	Scale Mean if Item Deleted	**Scale Variance if Item Deleted**	**Corrected Item-Total Correlation**	**Squared Multiple Correlation**	**Cronbach's Alpha if Item Deleted**
DUR	17.61	4.958	.544	.471	.653
REP	17.75	4.611	.561	.473	.642
RID	17.66	4.887	.578	.462	.641
FRT	17.80	4.847	.509	.446	.664
BRN	17.94	5.402	**.266**	.109	**.766**

Table 8. Fit Indices and their Acceptable Thresholds for Structural Equation Modeling

Fit Index	Acceptable Threshold Levels	Description
Absolute Fit Indices		
Chi-Square χ^2	Low χ^2 relative to degrees of freedom with an insignificant *p* value ($p > 0.05$)	
Relative χ^2 (χ^2/df)	2:1 (Tabachnik & Fidell, 2007) 3:1 (Kline, 2005)	Adjusts for sample size.
Root Mean Square Error of Approximation (RMSEA)	Values less than 0.07 (Steiger, 2007)	Has a known distribution. Favors parsimony. Values less than 0.03 represent excellent fit.
GFI	Values greater than 0.95	Scaled between 0 and 1, with higher values indicating better model fit. This statistic should be used with caution.
AGFI	Values greater than 0.95	Adjusts the GFI based on the number of parameters in the model. Values can fall outside the 0-1.0 range.
RMR	Good models have small RMR (Tabachnik and Fidell, 2007)	Residual based. The average squared differences between the residuals of the sample covariances and the residuals of the estimated covariances. Unstandardized.
SRMR	SRMR less than 0.08 (Hu and Bentler, 1999)	Standardized version of the RMR. Easier to interpret due to its standardized nature.
Incremental Fit Indices		
NFI	Values greater than 0.95	Assesses fit relative to a baseline model which assumes no covariances between the observed variables. Has a tendency to overestimate fit in small samples.
NNFI (TLI)	Values greater than 0.95	Non-normed, values can fall outside the 0-1 range. Favours parsimony. Performs well in simulation studies (Sharma et al., 2005; McDonald & Marsh, 1990)
CFI	Values greater than 0.95	Normed, 0-1 range.

Adapted from D. Hooper, J. Coughlan, and M. R. Mullen (2008). *Structural equation modelling: Guidelines for determining model fit* (p.58). Retrieved from http://arrow.dit.ie/cgi/viewcontent.cgi?article=1001&context=buschmanart

Figure 1. Path Diagram



internal consistency. As in this case, the value of 0.861 was found satisfactory and no reduction in number of items was required.

The criteria adopted for selection of factors was that they should have an Eigen value of greater than one and for the selection of items in the factors, the condition was that they should have a factor loading of greater than 0.75. EFA was conducted for the items and a five factor structure with Eigen values of 6.754, 1.763, 1.653, 1.258, and 1.066 was found. The first factor accounted for 29.36 %, the second factor accounted for 7.664%, the third factor accounted for 7.185%, the fourth factor for 5.468%, and the fifth factor accounted for 4.635% of the total variance extracted. All the factors put together accounted for 54.32% of the total variance extracted. The pattern matrix and the structure matrix is displayed in the Table 4 and Table 5. The factor analysis was conducted using principal component method using promax rotation and factor loadings below 0.75 were suppressed.

Five items were derived from factor analysis. Durability *(DUR)* and repairability *(REP)* loaded on factor 1 and Factor 1 is named as Beliefs Associated with the Premium Car. Ride *(RID)* and front seating *(FRT)* loaded on the factor 2 and Factor 2 is termed as Evaluations Associated with the Premium Car. Brand Name *(BRN)* loaded on factor 3 and Factor 3 is labeled as Brand Relationships Associated with the Premium Car.

(2) Second Iteration : The next step was to check the internal consistency of all the five items and coefficient alpha was calculated, and the results are depicted in the Table 6 and Table 7. Analysis of Table 7 suggests that brand name (BRN) needs to be deleted to improve the internal consistency of the scale. Hence, brand name was deleted from the scale and further analysis was conducted using confirmatory factor analysis and by testing the scale for validity. The Table 8 provides norms for fit indices and acceptable thresholds for structural equation modeling.

Confirmatory factor analysis was performed using Amos 20.0 to further detect the dimensionality of the scale. The analysis confirms the two factor structure of the scale. Chi-square value is 0.115 with d.f. 1. The *p* value is insignificant with 0 .735. Values of the fit are excellent. *GFI* is 1.00, *AGFI* is 0.999, *NFI* is 1.00, *TLI* is 1.009, and *RMSEA* is 0.00. The Figure 1 depicts the path diagram.

The final stages are to assess reliability and validity, and developing norms to implement the scale. Convergent and discriminant validity was assessed from the Amos output. Convergent validity was determined through the average variance extracted. The AVE for the first factor is 0.5905 and for the second factor, the same is 0.653. These AVE values are greater than the required value of 0.50, and hence, convergent validity is established. Discriminant validity should be investigated by comparing the square root of the AVE of each construct to the correlations of the construct to all the other constructs (Chin, 1998). The square root of AVE of the first factor and second factor, which is 0.768 and 0.808 is greater than the correlation between the first and second factor, which is 0.571, and hence, discriminant validity is established for the scale.

Construct reliability of first factor is 0.86 and for second factor, it is 0.831, which is greater than the required value of 0.7 for construct reliability. The first factor is labelled as Beliefs Impacting the Purchases of Premium Cars as it has items - durability *(DUR)* and repairability *(REP)*, and the second factor is termed as Evaluations Impacting Purchase of Premium Cars as it contains items - ride of the car *(RID)* and front seating of the car *(FRT)*.

Discussion

The purpose of this paper is to develop and validate a theoretical scale for the measurement of the evaluation of premium car purchases. The scale provides evidence that the evaluation of premium cars is a two dimensional construct. The reliability analysis reveals that the scale has a coefficient alpha of 0.759. The scale demonstrates adequate convergent and discriminant validity. The scale also demonstrates adequate construct reliability.

The findings of this article are contrary to the finding of Gupta and Lord (1995). Their research revealed nine determinant objective attributes. They were : Price, Reliability, Gas Mileage, Rear Leg Room, Front Leg Room, Acceleration, Routine Handling, and Luggage Capacity. This study found only the front leg room *(FRT)* as a

determinant variable among those uncovered by Gupta and Lord (1995). The other attributes did not impact premium car purchases. The reason for this variation from that of Gupta and Lord (1995) could be because they had researched a broad segment of cars buyers ; whereas, this study targeted only premium car buyers.
Kaushik and Kaushik (2008) revealed that brand name, fuel efficiency, and price were the primary determinants of car purchases. Our present study did not find the same variables impacting premium car purchases as our study has been conducted in the luxury segment, and in this segment, prices and savings are not important to this class of car buyers. Brand name was found to be important, but this variable had to be deleted as it affected the reliability of the scale.

Managerial Implications and Conclusion

The growth of the premium goods market in emerging markets like India presents an exciting marketing opportunity to marketers. To address this developing market, marketers need tools to understand buying behavior of the target segment and their motivations. The existence of several variables impacting consumer buying behavior can confuse the focus of marketing activities. Marketers need tools that can facilitate their understanding of variables that are central in product evaluation. This scale lends a hand to marketers to focus on designing cars that meet the requirement of durability, repairability, provide a comfortable ride, and have excellent front seating. The two factor scale developed in this study is a reliable, valid, and easy to administer scale to evaluate the premium car buying behavior of consumers. This will help car marketers understand and predict premium car purchases.

Limitations of the Study and Scope for Further Research

Though this study illustrated the reliability, validity, and stable two factor structure for evaluation of purchase behavior in premium cars, there are a few limitations. Firstly, the study was conducted on just one sample; additional replication studies are required to establish the reliability, validity, and stability of the scale. The second limitation is that this scale is specifically developed to measure and evaluate premium car purchases in India, and its applicability needs to be tested for other countries and other car segments. Further research is required to extend this scale to different car segments and different managerial and theoretical contexts.

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