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Investigating the Components Assessing Customer Loyalty in the context of Retail Using Confirmatory Factor Analysis

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Abstract:

The multidimensionality of the CustLoy theoretical framework is tested in this study using "confirmatory factor analysis". The study considers the latent costructs for first order components as indications to the single factor from the second order, first attempting to establish a "first-order CFA model" and then developing a "second-order CFA model". It was found that, retailers need to stress on diverse need of customers while designing loyalty program.

Key words: Store attributes, Confirmatory factor analysis, theoretical model, loyalty program.

Literature Review:-

According to Kim & Kim (2009); Clark et al. (1995); Sheth & Parvatiyar (1992, 1995); Lind-green et al. (2006) and other researchers and manufacturing fields, affiliation marketing has gained traction in the retail industry as a means of achieving success, advancement, and assessing the relationship between retail outlets and customers. The crucial concepts of promise, trust and relationship have been shown to bias association marketing outcomes.

Additionally, studies have shown that association quality influences purchasing behavior (Odekerken-Schroder et al. 2003) and enhances loyalty (De Wulf et al. 2003; De Wulf et al. 2001; Robert's et al. 2003). Nine store-specific characteristics were discovered by previous studies: post-purchase service, shortest mail, relational communication, preferred conduct, merchandise, promotions, outlet/store atmosphere, convenience, and physical swags. Nonetheless, the studies showed that measuring the things examined in qualitative research requires a suitable study. According to De Wulf et al.'s (2001) framework, perceived relationship outlay biases perceived relationship outcome or quality, which in turn exaggerates consumer interaction loyalty. As association marketing tools, the report suggests direct mail, personalized treatment, interactive collaboration or communication, along with tangible rewards. Boulding and Kirmani (1993) signaling theory states that in order to encourage a cooperative communication, one party must explain its meaning and inform the other side of its unidentified goals. shop qualities give customers a positive perception of the offerings and image of the shop (Martineau, 1958), and it is well known that an offer from retailer may act as action for the marketing purpose on the road to relationship formation with customer base (De Wulf et al. 2001, 2003). In a retailer-customer connection, store qualities are therefore crucial.

Relationship perception. As per De Wulf et al. (2001), adequate investment is the process by which a business is said to invest money, energy, and curiosity in order to maintain or improve relationships with its clientele. According to Balu's (1964) social exchange concept, the investment of effort, time or different resources in an affiliation indicates a responding connection (a customer) to maintain the relationship. A customer often perceives benefits in the transaction process as method to measure the relationship status or quality. As per De Wulf et al. (2001), the single metric that raises relationship fulfillment, trust, and a propensity for duty is professed relationship quality. Although belief is a buyer's self-sufficiency in a seller's honesty towards this shopper, relationship pleasure refers to the sensitive position of the consumer, which is caused by the general assessment of the customer's association with an outlet (De Wulf et al. 2001). De Wulf et al. (2003) stated, compulsion denotes a customer's intention to establish a long-term connection with a retail firm.

In order to determine the appropriate model, the two competing models were predicted and confirmed using the basis as De Wulf et al.'s model (2001). According to Du Wors and Hains (1990), customer loyalty typically indicates behavioral aspects such as the total amount purchased (Cunningham, 1956), the option to purchase (Massey et al. 1970; Farley, 1964), and the manner in which they make purchases. In the 1990s, loyalty and bondage programs were popular in the US and the UK; in the 2000s, they were also well-known in India. In India, these particular marketing initiatives are still in their infancy, and consumers have not yet fully embraced the benefits (Colloquy, 2009). Organized business stores like Arvind stores, Reliance Trends, and others were known for carrying out such activities, while outlets like Pantaloon, Big Bazaar, and others were acknowledged as significant participants in India. The Gulbarga area's Peter England, Levi's, and Basics Life stores were selected as retail locations for data collecting.

Methodology

The need to focus on customer loyalty from merchant's context is high and for this reason, the first step in this study was to perform a literature review that targeted factors such as store qualities, bondage program and fulfillment, store attributes, and loyalty. Both item exploration and comprehension of the research gap have been aided by the literature study. Both quantitative and qualitative methods for research were employed. First, a qualitative analysis was performed to identify the advantages of bondage/loyalty programs, loyalty, and retail features. Wang and Ha (2011), Store attributes impacting relationship or collaboration marketing: a research of department shops, is the source of the items/variables used in this study. Thirty loyalty program participants at Levi's, Peter England, and Basics Life stores participated in unstructured interviews with store owners, which assisted in identifying the initial factors. These stages helped in recognizing appropriate items in the framework of store retailers. The variables used in this study are attached as an annexure-1.

Many stores fail to ascertain the suitable items and constructs/factors resulting towards consumer loyalty intentions. And, recently businesses have recognized the significance of shop characteristics in the realm of retail, but neglect to highlight the crucial elements to achieve the intended outcomes in the long term. As no study was found, which has been conducted to identify factors resulting consumer loyalty in the context of organized apparel retailer's context in this region, need was felt to take-up a detailed survey of retailers and members to explore the variables related to store attributes measuring loyalty intentions and critically analyse each of the variables & factors contributing to customer loyalty intentions and examine the relationships. Later, the numerical approach was used with the assistance from questionnaire. The data were collected from the consumers from loyalty program at Levi's, Peter England, and Basics Life Store during August 2017 to March 2018 through self-administered survey. In analysis the methods similar to factor analysis, CFA and "structural equation modelling" were deployed.

Objective

To develop Measurement Model by confirming & testing the factors assessing customer loyalty from the retail firm's perspectives or context.

Sampling Method

The attempts were undertaken to obtain the roster of participants in loyalty schemes of multiple designated merchants. But to ensure confidentiality in the business scenario, these retailers who agreed to allow data collection from their loyalty members were averse to produce the list of loyalty program members. The absence of the sample frame needs attention as it induces the scope to use non-probability sampling method such as purposive sampling and more specifically judgment sampling was used, which is characterized as choosing participants arbitrarily for some criterion or unique characteristics or their experiences, attitudes, or perceptions (Cooper and Schindler).

Data Collection

The survey was conducted from June 2018 to February 2019 on all weekdays to ensure the diversity of samples. The managers form the stores shows ethical considerations as they advised to collect responses from the customers after the product purchase session. The goal behind this motive was to prevent customers to face inconvenience in the purchase

process. For this particular reason, the survey took place among the participants with membership programs. Apart from that, the participants included members with proper intention to take part as it helped in the valid data collection process. Before using the questionnaire, each participant was informed about the objective of this study to prevent partiality or biasness. Out of 615 questionnaires distributed among the loyalty program members 540 completely and correctly filled questionnaires were received, there by observing about 13 per cent non-response rate.

Measurement concept or theory highlights how observed variables illustrate constructs. It is possible to assess indicators such as observed variables in a direct manner, and the latent construct is the one that cannot be assessed in a direct manner but through observed variables (Hair et al., 2008). In the previous section, the CustLoy theoretical model was developed covering five store attribute factors by performing "Exploratory Factor Analysis (EFA)". In this section "Confirmatory Factor Analysis (CFA)" is used to assess the multiple dimensions of CustLoy theoretical model. First, the portion or section illustrates the formation of "first-order CFA model" and in later period it develops the "second-order CFA model", it further indicates the "first order latent constructs" often acts as indicators to the "single second order factor".

Development of Model for Measurement

"Confirmatory factor analysis" was useful as it helped to assess the viability or validity of CustLoy theoretical framework. Byrne (2010) suggested, in assessing the legitimacy of the factorial framework, it aims to detect the extent up to which the aspects or components are constructed to assess the specific aspect or factor. For the purpose to assess the above aspect or factor, the research formulated "confirmatory factor analysis". The analysis or inspection of information or data was tested or conducted with "structural equation modeling" utilizing software for statistical analysis such as AMOS ("Analysis of Moment Structures") version 18.0. The phase begins with initial evaluation of the information and constructing different CFA framework for each crucial element of the conceptual factor framework that was detected in the prior section.

Preliminary Data Evaluation or Analysis

Before assessing the framework or model, an initial evaluation of the information or data was conducted. A normality assessment, outliers and linearity were conducted to confirm the outcomes.

Assessment of Normality

Normality is essential as it speaks about variation in the data about a solo variable. Normality is crucial as it indicates a conventional assumption for the multivariate integration as the huge variation or differences from the regular distribution often creates invalid outcomes (Tabachnick & Fidel, 2001; Hair et al., 2008). It is possible to assess normal or typical distribution by Skewness and Kurtosis tests (Tabachnick & Fidell, 2001; Field, 2005; Hair et al., 2008). Table 1 illustrates the outcome of the kurtosis along with the skewness tests. The outcome from the Skewness along with the Kurtosis illustrated that all the variables are disseminated or distributed in a normal manner.

Table 1 Descriptive Statistics of Store Attribute Dimensions

Factor	N	Min.	Max.	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
SE	540	5.00	20.00	12.542	4.407	-.040	.105	-1.327	.210

ME	540	4.00	20.00	13.068	4.473	-.273	.105	-1.338	.210
IC	540	3.00	15.00	9.138	3.587	.002	.105	-1.494	.210
PT	540	2.00	10.00	6.016	2.571	.102	.105	-1.352	.210
PTS	540	3.00	15.00	9.940	3.448	-.400	.105	-1.184	.210
Valid N	540								

Data Linearity Testing

Linearity refers to connection among the factors or variables or aspects where the transformation or change in an individual variable causes a transformation in another variable. The multivariate approaches include factor analysis, multiple regression, logistic regression, "structural equation modelling" and these have an indirect assumption as per linearity correlation measures for the purpose to identify association (Hair et al., 2008). The linearity can be assessed by a trivial scatter plot or appropriate Pearson's correlations (Field, 2005; Hair et al., 2008; Tabachnick & Fidell, 2001). It is identified that available correlations are positively and has significant correlation with each other. Visual investigation of the scatter plot matrix was used to detect the nonlinear association or relationship.

Assessment of Outliers

Outliers are crucial as it refers to the aspects that are detected as distinctly alternative or not equal to the other inspections or observations in a proper data set. Mahalanobis D Square measure is a conventional process as it is helpful to detect multivariate outliers. This approach measures each observation's differences or separation in multi-dimensional space from the average or mean centre of all the inspections. No multivariate outliers were found in the output from the AMOS.

First-order Measurement Model of CustLoy

Hair et al., (2008) and Anderson & Gerbing (1988) estimated in two different phases in "First-order Measurement Model". At the initial or first phase, the assessment framework is estimated, and in second phase this similar model is set for the purpose acquire estimation about the structural model. The ultimate outcomes of CFA for each individual factor models are joined to develop model for measurement purpose. The final "first order CFA model" from five structures about factors and it also consists 16 items. The crucial schematic illustration is showed in Figure 1. As per Byrne (2010), the research formulated the hypotheses to assess or test the "first-order CFA model" of CustLoy structure.

The model consists of the identified five factors as first order factors

a) Each item has a non-zero loading on its chosen factor and zero loadings on all other factors
b) The five factors are correlated
c) The error terms associated with each item measurements are uncorrelated.

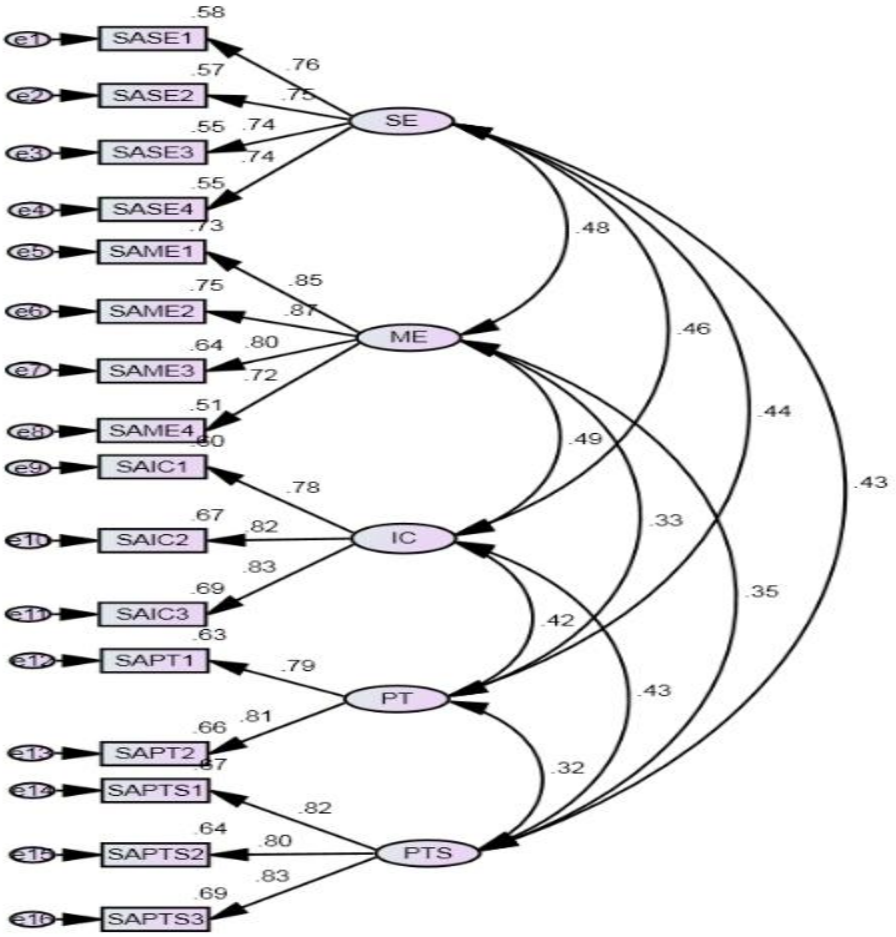

Figure 1: Result of First-order CFA Model of CustLoy

Model Summary

The Table 2 depicts the outcomes of model for measurement for the first order.

Table 2: Final Result of First Order Measurement Model

χ^2	Df	χ^2/df	GFI	AGFI	NFI	CFI	IFI	TLI	RFI	RMSEA
190.25	**94**	**2.02**	**0.984**	**0.977**	**0.929**	**0.962**	**0.963**	**0.952**	**0.909**	**0.044**

The model or framework has a proper fit with a outcome of χ^2/df ratio 2.02, implying that the framework or model is appropriate and acceptable. The numbers or values or outcomes in the above Table includes crucial aspects and these are CFI, AGFI, RFI, GFI, TLI, IFI are more than 0.90 & RMSEA is 0.044 and these are under the suggested level, specifying that the model form five factor fits in a proper manner and shows a reasonably close estimation of the population.

Validity and Reliability Tests of Model for Measurement for the first order

The inspection of CFA framework or model is partial in case the entire calculation relies on fit. The outcome of reliability and construct validity is essential for secondary proof (Hair et al., 2008). The inspection of model for measurement was conducted through diverse approaches: reliability about Construct along with the validity for Construct.

Convergent validity, validity for face, nomological validity and validity for discriminant are present in the construct validity (Churchill, 1979).

Validity

Face Validity

The prior literature's outcomes or recommendations from the experts acted as a crucial support as it helped in the face validity detection phase.

Convergent Validity

It was investigated by three approaches or measures: average variance extracted (AVE), standardized coefficients from the five factors, and "construct reliability (CR)" for each component or factor. As per Table 3 it is evident that each indicator has a high statistical significance with 0.001, which demonstrates that they are substantially connected to their particular constructs. As per Hair et al., (2008), it is evidently identified that each indicator has an estimation more than 0.50 (ranging from 0.60 to 0.74), aligning with a benchmark evaluation 0.50 as a minimum value. As per the Table 4.44, the AVE value for individual construct surpasses the lowest threshold of 0.50. As per Hair et al., (2008), it shows that assessed variables from the construct distributed in a significant fraction of variance in usual or common.

Table 3: "AMOS Results of CustLoy First order Measurement Model"

Regression Paths		Standard Loadings	CR#	P*	AVE	CR
Store environment						
SASE1	SASE	0.76	**	0.000	0.60	0.95
SASE2	SASE	0.75	21.60	0.000		
SASE3	SASE	0.74	23.43	0.000		
SASE4	SASE	0.74	23.87	0.000		
Merchandise						
SAME1	SAME	0.85	**	0.000	0.64	0.96
SAME2	SAME	0.87	21.71	0.000		
SAME3	SAME	0.80	19.99	0.000		
SAME4	SAME	0.72	20.26	0.000		
Interpersonal Communication						
SAIC1	SAIC	0.78	**	0.000	0.65	0.93
SAIC2	SAIC	0.82	22.47	0.000		
SAIC3	SAIC	0.83	22.45	0.000		
Preferential Treatment						
SAPT1	SAPT	0.79	**	0.000	0.63	0.89
SAPT2	SAPT	0.81	11.50	0.000		
Post transaction Service				0.000		
SAPTS1	SAPTS	0.82	**	0.000	0.74	0.96

SAPTS2	SAPTS	0.80	23.02	0.000		
SAPTS3	SAPTS	0.83	21.62			

Note: ** Probability level of 0.001; ** the crucial proportion or ratio is inaccessible, as the weights for regression are set at 1; "CR# = Critical Ratio"; "CR= Construct Reliability"; "AVE= Average Variance Extracted".*

Discriminant Validity

The validity for Discriminant signifies the potential scope to which a concept is genuinely separate from other concepts (i.e., one-dimensional). The validity for Discriminant was guaranteed through the contrast of variance extracted (VE) approximations for every construct, "squared inter-construct correlations (SIC)" connected with constructs. The estimation for entire derived variance were higher than "squared inter-construct correlations", indicating that every construct is distinct and encapsulates an encounter which other assessments lacks (Table 4).

Table 4 "First-order Measurement Model Results: AVE and Squared Inter-Construct Correlations (SIC) for Discriminant Validity"

	SE	ME	IC	PT	PTS	AVE
SE	*					**0.60**
ME	**0.13**	*				**0.64**
IC	**0.12**	**0.13**	*			**0.65**
PT	**0.11**	**0.06**	**0.10**	*		**0.63**
PTS	**0.10**	**0.07**	**0.09**	**0.06**	*	**0.74**
AVE	**0.60**	**0.64**	**0.65**	**0.63**	**0.74**	

Table 5: "First-order Measurement Model Results: Construct Correlations with Significance Level for Nomological Validity"

Path	Estimate	CR	P
IC ⟷ PT	**0.415**	**8.115**	**0.000**
IC ⟷ PTS	**0.435**	**9.369**	**0.000**
IC ⟷ SE	**0.462**	**9.760**	**0.000**
IC ⟷ ME	**0.486**	**10.022**	**0.000**
PT ⟷ PTS	**0.316**	**7.298**	**0.000**
PT ⟷ SE	**0.440**	**6.301**	**0.000**
PT ⟷ ME	**0.333**	**8.575**	**0.000**
PTS ⟷ SE	**0.435**	**8.882**	**0.000**
PTS ⟷ ME	**0.352**	**7.083**	**0.000**
SE ⟷ ME	**0.483**	**9.556**	**0.000**

Note: Probability level 0.001; CR-Critical Ratio

Nomological Validity

The validity for the nomological context was assessed by inspecting whether the Pearson product-moment connection or correlations among the concepts within an evaluation structure or model is logical. From Table 5 showed, the entire findings on correlations are statistically significant and positive. It shows that the constructs have viability or validity and these show nomological attribute.

Reliability

Construct reliability is useful as it inspects the internal indicator's consistency of the CFA factor. The ranges between the reliability level for construct for the factors are from 0.89 to 0.96. Which are equivalent or similar to the lowest threshold of 0.70. Hence, the reliability level among the scales was considered sufficient (Bagozzi & Yi, 1988).

Second-order Measurement Model of CustLoy

After the "first-order CFA model" development completion, an initiation is conducted to formulate the "second-order CFA model", as per the latent from first order formulates as indicators or signs to the solo factor for the secondary order.

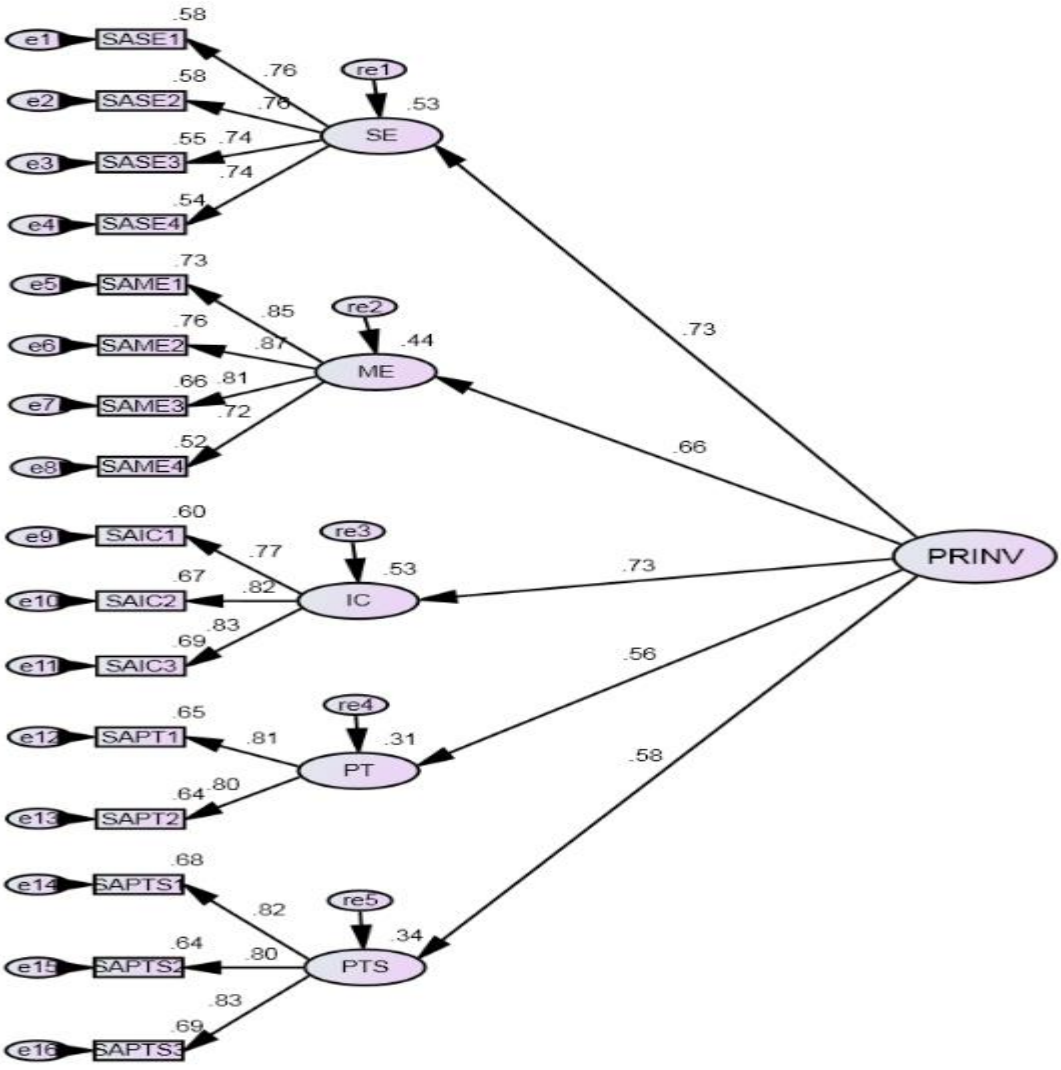

Figure 2: CustLoy Second-order CFA model

Table 6: "Results of Second Order Model Fit Indices of CustLoy"

χ^2	df	χ^2/df	GFI	AGFI	NFI	CFI	IFI	TLI	RFI	RMSEA
190.82	99	1.92	0.984	0.979	0.929	0.964	0.964	0.956	0.914	0.041

Model Assessment

The table 6 is crucial as it includes proper values for the analysis process. As per the analysis process, the outcomes indicate proper findings such as The df= 99, χ^2 = 190.82, χ^2/df= 1.92. The model includes indices such as CFI, AGFI, NFI, GFI, RFI, TLI and IFI values or outcomes are more than 0.90. Value for the RMSEA is 0.041 illustrating the second-order CustLoy model for measurement or framework has proper fit. Table 7 shows the second order measurement model.

Table 7: "Results of Second-order CustLoy Measurement Model"

Second Order Factor	First-order Factors	Standard Second order Loading	R^2	P	AVE	CR
Perceived Relationship Investment	SE	0.73(16.29)	0.53	0.000	0.44	0.94
	ME	0.66 (14.34)	0.44	0.000		
	IC	0.73 (18.52)	0.53	0.000		
	PT	0.56 (11.57)	0.31	0.000		
	PTS	0.58 (13.08)	0.34	0.000		

Note: "Standard second order loading" is the general weight for regression for each first-order factor's loading on to the loyalty level for the store construct. Figure in brackets is crucial ratios from the un-standardized solutions.

Significant at p value 0.000; "AVE=Average Variance Extracted"; R^2=Squared Standard regression weight; "CR= Construct Reliability".

The viability or validity for convergent was assessed through the conventional estimates of the indicators form first order along with the reliability for construct. As per the analysis process, the outcome requires proper attention as it crossed 0.70 and it is the suggested level. On the other hand, AVE is a rigorous assessment of viability or validity for convergent. *"AVE is a more conservative measure than CR. On the basis of CR alone, the researcher may conclude that the convergent validity of the construct is adequate, even though more than 50% of the variance is due to error." (Malhotra and Dash, 2011, p.702).*

Table 8: "Comparison of CustLoy First and Second-order Measurement Model Fit Indices"

First Order CustLoy Measurement Model Fit Indices										
χ^2	df	χ^2/df	GFI	AGFI	NFI	CFI	IFI	TLI	RFI	RMSEA
190.25	94	2.02	0.984	0.977	0.929	0.962	0.963	0.952	0.909	0.044
Second-order CustLoy Measurement Model Fit Indices										

χ^2	df	χ^2/df	GFI	AGFI	NFI	CFI	IFI	TLI	RFI	RMSEA
190.82	99	1.92	0.984	0.979	0.929	0.964	0.964	0.956	0.914	0.041

From the Table 8 it was noticed that, the model has fit indices above the recommended level ensuring the good fit. The slight differences in the estimations are due to the differences in the degrees of freedom.

Conclusion

The measurement model for first order was constructed by deriving five crucial elements i.e. interpersonal communication, store environment, preferential treatment, merchandise, service after transactions and each factor was assessed for reliability and validity by utilizing "confirmatory factor analysis". The measurement model for second order was constructed conjoining one second order factor i.e., Customer Loyalty into the first-order factors. Besides, quantitative findings the resulting notes were identified with the help of qualitative study during the process of developing survey instrument and data collection. Most of the members are of the opinion that the card holders who are exclusively buying from single company should get additional rewards compared to multiple card holders. Store managers are of the opinion that, only conservative customers show patience and are keen to join loyalty program. The retailers have to emphasize on customizing the membership program as per the diverse need of the customers/members, to implement best mechanism to inform about points accumulation and redemption. In future, research could conduct the study in different retail context using probability sampling method.

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