# An Algorithmic Evidence for The Relationship between Social Media Behaviour and Brand Engagement Perception of Consumers in Chennai City

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## Abstract

The social media engagement behaviour is considered a unified study between social media influencers on consumer buying behaviour through the powerful social media platforms like Facebook, Twitter, YouTube, and other popular social media platforms. The engagement of consumers using the content is generated by social media platforms with the aspects of following, liking, commenting, and sharing the information with other social media users on the same platform. The main aim of this research is to establish the relationship between components of social media behaviour and elements of brand engagement perception among consumers. To verify the objectives and test the hypotheses, the researcher adopted simple random sampling methods to collect 30 samples from all 15 zones of Chennai city and was able to get 437 usable samples for conducting the research. Exploratory factor analysis, confirmatory factor analysis, and structural equation model are used subsequently to verify the objectives and test the hypotheses. It is found that there is a significant relationship between social media behaviour of consumers and their brand engagement perception in any marketing arena.

*Keywords*: Social Media Behaviour; Brand Engagement.

## 1. Introduction

The social media engagement behaviour is considered a unified study between social media influencers on consumer buying behaviour on powerful social media platforms like Facebook, Twitter, YouTube, and other popular social media platforms. The engagement of consumers using the content is generated by the social media platforms with the aspects of following, liking, commenting, and sharing the information with other social media users on the same platform. Social media users often interact with marketers and other social media users through the powerful communication facilities of social media platforms. Some of the social media users are inclined towards peers for all the social information, the frequent interaction regarding the user-generated contents and motivates them to comment on the recently received information from social media platforms, Danesh & Emadi (2014). The social media platforms are also useful to build a social media group and provide appropriate information for their buying behaviour(Ad Edge, 2020; Digital Marketing Institute, (2023).

The social media platforms are dominating the psychology of consumers and compel them to engage with different brands available in the market and to get more information from social media platforms to change their consumer behaviour. These social media platforms are useful to engage the consumers actively through newsfeed, vlogs, tweets, photos, and posts on the arrival of new products or services. Khan (2023). The brand engagement process is the major outcome of social media marketing strategies of marketers and manufacturers to have direct brand association and the determination of brand performance. These strategies are highly responsible for motivating consumers to compare the brand performance and influence their purchasing decision process. The consumers' motivation and conspicuous changes in their buying behaviour due to social media engagement activities and the sharing of information among the community of social media users. They perceived that these social media platforms are the strategies used by marketers and manufacturers to give new information about the newly introduced products in the form of brands and names (Arora & Sanni, 2019; Ghazanfari et al., 2018).

The rapid development in the information technology industry, along with the influence of social media activities, creates multifarious defects in the buying behaviour of consumers. The communication capabilities of social media, along with the brand engagement process, completely change the buying behaviour of consumers and the customer management of manufacturers. Lund & Wang (2021). The brand engagement process is crucial in gaining a competitive advantage and changing the behaviour and attitude of consumers towards satisfaction. Therefore, the present study is very important to determine the components of social media perception and brand engagement as well as to find the intrinsic and extrinsic relationships among these components (Mohajer, 2017; Rethinam et al., 2018).

## 2. Literature Reviews

Ku (2023), in this empirical study, the authors identified the customer motivation process and interaction process through social media activities as well as the role of social media platforms. The active users of social media sites and their information regarding products and services are immediately highlighted, are the changes in the attitude and behaviour of consumers. The dynamic social media users follow the information of fellow users and are involved in a brand engagement process.

Comevo (2021). This study mainly focused on differences in the dynamic changes in the consumer behavioural aspects, consumer trust, and brand engagement process due to social media engagement behaviour. It is emphasised that negative information is also spread among the users regarding the products as a matter of digital pollution on social media platforms. The overload of redundant and false information and the spreading of spam and fake news negatively affected the psychology of consumers and their brand engagement process.

Dodoo & Padovano (2020), these authors enumerate the social media engagement behaviour of consumers over the important components, namely trust, scepticism, psychological changes, and the dynamic purchase decision process. The fundamental issue addressed by these authors mainly focused on the effects of the digital marketing phenomenon through social media and the consumer engagement in the critical issue of buying behaviour.

Xiong et al. (2018) these authors suggested the need for maintenance of the customer engagement process and customer relationship maintenance process through the digital marketization of social media activities. They perceived that the maintenance of customer loyalty and the psychological changes of consumers positively towards brands can be identified through direct relationships with marketers and manufacturers, and customers through social media engagement activities.

Zeller (2023). This study mainly focused on the consumer engagement process and the role of social networking sites and platforms in the optimistic social media engagement behaviour. The brand engagement towards the reputed marketers can be easily achieved through the information gathering phenomenon available in social media sources. Social media platforms like Facebook, YouTube, and Twitter can easily spread messages regarding the brand management characteristics in no time.

Antwi & Oppong (2021) these authors identified the role of social media platforms as well as their unique attributes in the functionality associated with visual contents, audio contents, and messages through social media. In comparing the social media networking sites and the changing attributes of consumer engagement behaviour can be estimated through the video richness and trustworthiness of social media.

Barnhart (2023). These authors mainly distinguished the approach of social media engagement behaviour and the brand engagement behaviour of consumers in the context of advertisement, social media information, liking and sharing of information on social media websites, and a better understanding of richness and trustworthiness, as well as the reputation of the brands.

Bresnick (2021). In another study, the researchers identified the contextual perspective of changing behaviour of consumers due to the influence of social media engagement behaviour and dynamic changes in the content sharing over social media platforms. The customer engagement process depends upon the social media transformation properties and the brand switching phenomenon.

## 3. Gaps in Literature

The foreign and domestic research works on social media engagement behaviour, brand engagement perception of consumers, revealed that social media behaviour and perception are not unique phenomena, whereas it is the conglomeration of intrinsic and extrinsic components that emerges out of social media platforms. These reviews also revealed three predominant gaps that are not addressed with full empirical evidence, namely the predominant factors responsible for the determination of social media perception, followed by the components responsible for the measurement of the brand engagement process. Similarly, these components are not independent but interrelated to each other, which can be established by the behavioural aspects of consumers, particularly towards social media and reputable brands in the market. Therefore, the present research work focuses on venturing into the above-mentioned research gaps to provide appropriate empirical evidence based on the responses of consumers in the study area.

## 4. Objectives of the Study

The predominant gaps in the literature ultimately lead to the following objectives more suitable and appropriate for the research title
1. To find the components responsible for the determination of social media behaviour of consumers in the study area.
2. To analyze the elements of brand engagement perception prevailing among the consumers.
3. To establish the relationship between components of social media behaviour and elements of brand engagement perception among consumers.

## 5. Hypotheses

The gaps in the literature, as well as the objectives of the research, ultimately lead to the verification of the following notable relationship among the components of social media behaviour and the elements of brand engagement in the form of the following hypotheses.
1. The components of social media behaviour of consumers differ significantly.
2. The elements of brand engagement perception prevailing among the consumers differ significantly.
3. There is a significant relationship between components of social media behaviour and elements of brand engagement perception.

## 6. Methodology

This research is accomplished through the contribution of both primary and secondary data available from different sources of consumers, as well as the records. The primary data design of this research is aimed at ascertaining the perception of consumers regarding their social media behaviour, activities of the social media platforms, and their attraction towards social media platforms, as well as their perception regarding the brand engagement process. The secondary data can be obtained from the sources of literature reviews, company profiles, and periodic data released by government sources. The research design is descriptive, well supported by primary data sources as well as secondary data sources. The main aim of the research design is to verify the objectives and to test the hypothesis that generally arises from gaps in the literature. The research is conducted in the great metropolitan city of Chennai, segmented into 15 zones in the study area. The

popular products are considered as a basis to work upon the theory regarding social media behaviour and the brand engagement perception, respectively (Benedict et al., 2016).

## 7. Construction of Questionnaire

To ascertain the main aim of the research, of verifying the objectives and testing of hypotheses, the researchers designed a questionnaire that consists of four important segments, namely demographic profile of consumers, purchase details of consumers, followed by social media behavioural components, and brand engagement perception of consumers, respectively. The first two parts comprise both unique optional type questions as well as multiple-choice type questions, respectively. The third and fourth parts are given in the form of statements regarding social media behaviour and brand engagement perception of the consumers to facilitate them to express their psychological opinion on a point Likert scale. These psychological scales are also useful to convert discrete-type random variables into continuous-type random variables by computing the total average scores for each component, and the development of social media behaviour and the brand engagement perception, respectively.

## 8. Pilot Study and Normality Check

After designing the questionnaire, the researcher intended to conduct the testing process, using pilot study methods to check the normality of the data, useful for reliability and validity purposes. In the style of three testing processes, a continuous interaction with subject experts, statistical experts, consumers, social media users, and marketers of the reputed brands enlightened the researcher to develop the research questionnaire with appropriate, meaningful, and innovative questions. After the pre-testing process, it is followed by pilot study methods to verify the reliability of the statements generated by the researcher from literature reviews. Therefore, the researcher converted the questionnaire into a Google Form as well as the physical form to collect at least 10 responses from all 15 zones of the great metropolitan city of Chennai to check the reliability of the data.

After the collection of usable 150 samples for the pilot study, they were entered into numerical values in the SPSS package version 23. These numerical values are useful to check the reliability of the data using Cronbach's alpha methods, specifically designed for a point Likert scale. The value of the Cronbach's alpha derived for all the statements about social media behaviour, brand engagement product perception was found to be 0.902, which is above the benchmark value of the minimum requirement value 0.75. This implies the statements generated by the researcher from literature reviews for social media behaviour and brand engagement process are well understood by the respondents and approved the way to express the transparent perception regarding social media behaviour and the brand engagement without any hindrances and dissertations.

## 9. Sample Selection Process

After the successful verification of the pilot study process, the researcher carried out the research by collecting the responses for the main study from all 15 zones of the great metropolitan city of Chennai. The researcher adopted simple random sampling methods to collect 30 samples from all 15 zones of Chennai city and was able to get 437 usable samples for conducting the research. The researcher adopted both the Google Forms through an online data collection process and the physical form of questionnaires to physically circulate among the respondents in the study area. The representations are rational to exactly ascertain the population parameters regarding social media behaviour and the brand engagement process. The researcher took more than 15 days to have frequent interactions with both offline and online consumers to exactly ascertain their opinion without any reference. Among the circulated 450 questionnaires, 13 of them did not return the questionnaire even after calling them through mobile phone and interacting with them in person. So these respondents are eliminated from the proceedings of the research, and the remaining 437 usable samples are considered for the present research work. After the collection of usable 437 responses from all the 15 zones of Chennai city, their opinion are coded into numerical values and entered into the SPSS package version 23 to exactly ascertain the perception of consumers in the backdrop of social media behaviour and brand engagement process respectively.

## 10. Data Analysis and Statistical Tools

After coding the data and entering them into the SPSS package version 23 and the researcher intended to analytically analyse all the variables about social media behaviour and the brand engagement process through the univariate and multivariate statistical tests. The researcher adopted Statistical techniques in the backdrop of univariate and multivariate statistical techniques. At the point of inception, the researcher exploited the notions of both exploratory factor analysis and confirmatory factor analysis researcher computed the total average scores for the components of social media behaviour and the brand engagement process, respectively. These computations of average scores ultimately lead to the continuous type random variables, and their emergence is useful to analyse the data using higher-order statistical tools. After exploratory and confirmatory factor analysis, the researcher also adopted linear multiple regression analysis and the structural equation model to evaluate the reliability and validity of the data.

## 11. Analysis and Discussion

In this section, at the first stage, the researcher applied exploratory factor analysis to 15 variables about social media behaviour. This exploratory factor analysis is useful to analyze the normal distribution of the 15 variables in a point Likert scale, and useful to reduce the dimension into meaningful factors regarding social media behaviour of respondents. The exploratory factor analysis with varimax rotation brought the following results for normal distribution verification and sampling adequacy test.

**Table 1:** Normality Check Using Gaussian Distribution-SMB

| Kaiser-Meyer-Olkin calculation. | | **.793** |
|---|---|---|
| Bartlett's Test of Sphericity | Chi-Square | 1461.033 |
| | df | 105 |
| | Sig. | .000 |

From the above table, it is found that the KMO value, Bartlett's test of sphericity for sample adequacy, are statistically significant to prove the normal distribution among all the 15 variables of the five-point Likert scale statements regarding social media behavior of respondents. This also designates the existence of predominant factors among the 15 variables, which are explained in the following variance table

**Table 2:** Derivation of Predominant SMB

| Input | Variance calculation | | | Cumulative loadings | | |
|---|---|---|---|---|---|---|
| | **Average** | **Variance derivation** | **Cumulative** | **Average** | **Variance derivation** | **Cumulative** |
| 1 | 3.855 | 25.703 | 25.703 | 3.855 | 25.703 | 25.703 |
| 2 | 1.604 | 10.691 | 36.394 | 1.604 | 10.691 | 36.394 |
| 3 | 1.261 | 8.406 | 44.799 | 1.261 | 8.406 | 44.799 |
| 4 | 1.079 | 7.190 | 51.989 | 1.079 | 7.190 | 51.989 |
| 5 | .965 | 6.431 | 58.420 | .965 | 6.431 | 58.420 |
| 6 | .924 | 6.160 | 64.581 | | | |
| 7 | .771 | 5.137 | 69.718 | | | |
| 8 | .742 | 4.947 | 74.664 | | | |
| 9 | .691 | 4.604 | 79.268 | | | |
| 10 | .666 | 4.440 | 83.708 | | | |
| 11 | .599 | 3.997 | 87.704 | | | |
| 12 | .554 | 3.694 | 91.398 | | | |
| 13 | .473 | 3.155 | 94.553 | | | |
| 14 | .412 | 2.750 | 97.303 | | | |
| 15 | .405 | 2.697 | 100.000 | | | |
| Extraction Method: Principal Component Analysis. | | | | | | |

The variance table identified the existence of five predominant factors out of 15 variables pertaining to social media behaviour, with the three underlying variables in each of those factors. They have cumulative as well as individual variance. The first factor consists of all the information-gathering phenomenon variables; hence, this factor can be called "Information searching". The second factor completely deals with the variables regarding reviewing the information gathered from the social media platforms; therefore, this factor can be called "Reviewing". The third factor is encountered with the five-point Likert scale variables regarding social media behaviour, particularly towards sharing of information; hence, this factor can be called "Sharing". The fourth factor deals with the variables regarding social media content; therefore, this factor can be logically called "content generating". The fifth factor of social media behaviour leads to the five-point Likert scale statements regarding the interaction among social media users; therefore, this factor can be called "Interacting". These five factors of social media behaviour, namely information searching, reviewing, sharing, content generating, and interacting, must be confirmed based on the responses of social media behaviour of respondents; therefore, the researcher computed total average scores for all the underlying variables of these factors and applied confirmatory factor analysis and derived the following results

**Table 3:** Best Fit Verification-SMM

| Computed statistical indices | Numerical derivations | Requirement values |
|---|---|---|
| Chi-square | 15.556 | - |
| P-value | 0.298 | >.05 |
| Goodness of fit index(GFI) | 0.990 | >.9 |
| Comparative fit index(CFI) | 0.988 | >.9 |
| Normed fit index(NFI) | 0.989 | >.9 |
| Root Mean Square Error of Approximation(RMSEA) | 0.061 | <=0.08 |

The research supported by confirmatory factor analysis through the derivation of 6 fit indices for the high reliability of five factors derived from exploratory factor analysis. These 6 fit indices are expected to satisfy the record benchmark values, with high variance, revealing that the five factors of social media behaviour, namely information searching, reviewing, sharing, content generating, and interacting, are evaluated as per the perception of consumers. The diagrammatic representation of confirmatory factor analysis is confirmed with the correlation values between observed and unobserved factors, respectively.

Similarly, the exploratory factor analysis is subsequently applied on the 15 variables of brand engagement statements in five five-point Likert scales as per the perception of consumers in the sample unit. The application of the exploratory factor analysis revealed the value of total variance that can be exhibited by all 15 variables to prove the normality of the data as well as the sampling adequacy.

**Table 4:** Normality Check for Brand Engagement

| Kaiser-Meyer-Olkin calculation. | | **.775** |
|---|---|---|
| **Bartlett's Test of Sphericity** | **Chi-Square** | 1997.797 |
| | df | 105 |
| | Sig. | .000 |

The KMO test and Bartlett's test of sphericity values, along with chi-square values, come from the normal distribution of 15 variables of brand engagement perception of consumers in the study area, and also designate the existence of grouping of variables to form the predominant factors regarding brand engagement as per the perception of consumers.

**Table 5:** Derivation of Brand Engagement Factors

| Input | Variance calculation | | | Cumulative loadings | | |
|---|---|---|---|---|---|---|
| | Average | Variance derivation | Cumulative | Average | Variance derivation | Cumulative |
| 1 | 4.027 | 26.844 | 26.844 | 4.027 | 26.844 | 26.844 |
| 2 | 2.087 | 13.913 | 40.757 | 2.087 | 13.913 | 40.757 |
| 3 | 1.405 | 9.364 | 50.122 | 1.405 | 9.364 | 50.122 |
| 4 | 1.040 | 6.934 | 57.056 | 1.040 | 6.934 | 57.056 |
| 5 | .914 | 6.091 | 63.147 | .914 | 6.091 | 63.147 |
| 6 | .889 | 5.926 | 69.074 | | | |
| 7 | .764 | 5.092 | 74.166 | | | |
| 8 | .713 | 4.756 | 78.922 | | | |
| 9 | .641 | 4.274 | 83.197 | | | |
| 10 | .513 | 3.422 | 86.618 | | | |
| 11 | .481 | 3.210 | 89.828 | | | |
| 12 | .452 | 3.014 | 92.842 | | | |
| 13 | .422 | 2.816 | 95.658 | | | |
| 14 | .339 | 2.263 | 97.921 | | | |
| 15 | .312 | 2.079 | 100.000 | | | |
| Extraction Method: Principal Component Analysis. | | | | | | |

The total variance derived from the 15 variables is found to be 63.147% with the individual variance of five factors 27%, 14%, 9%, 7% 6% respectively. These individual variances can form the meaningful factors of brand engagement as per the perception of consumers. The first factor deals with varying engagement of consumers based on the reputation of the brands therefore, this factor can be called a reputation engagement. It is followed by the second encounter with the variables regarding product characteristics; therefore this factor can be called attributes engagement. The third factor deals with individual variables regarding the cost of the brand of products; therefore, this can be called cost engagement. The fourth factor completely deals with lifestyle perception and perceived prestige regarding the reputed brands and the purchase prevailing among the consumers; therefore, this factor is called Prestige engagement. The fifth factor deals with the purchase decision process; therefore, this factor can be called decision engagement. The five factors of brand engagement, namely reputation engagement, attributes engagement, cost engagement, prestige engagement, and decision engagement, are the different types of engagements perceived by consumers when they intend to venture into the purchase of reputed brands available in the market.

**Table 6:** Validity of Brand Engagement

| Computed statistical indices | Numerical derivations | Requirement values |
|---|---|---|
| Chi-square | 21.129 | - |
| P-value | 0.413 | >.05 |
| Goodness of fit index(GFI) | 0.992 | >.9 |
| Comparative fit index(CFI) | 0.990 | >.9 |
| Normed fit index(NFI) | 0.988 | >.9 |
| Root Mean Square Error of Approximation(RMSEA) | 0.059 | <=0.08 |

It is further confirmed and approved through confirmatory factor analysis for the validity of the five factors, and the results are revealed in the form of a diagram of the table. The diagrammatic representation of five factors of brand engagement revealed the correlation value between the unobserved factor and observed factors, namely 42,.42,.66,.67, and 58 are highly significant in explaining the different context of brand engagement perceived by consumers in the study area. Similarly, it is further confirmed through the 6 fit indices and the satisfaction with the required benchmark values.

In the third part of the analysis, as per the objectives and hypotheses, the relationship between the components of social media behaviour and elements of brand engagement perception can be established through a structural equation model, which is the combination of confirmatory factor analysis followed by linear multiple regression analysis. The subsequent applications of exploratory factor analysis and confirmatory factor analysis confirmed that the factors of social media behaviour and brand engagement, respectively, begin to seek a relationship among these components of social media behaviour and elements of brand engagement perception. This can be derived through the structural equation model, particularly through linear multiple regression analysis. The structural equation model outcomes can be ascertained through the model diagram and the existence of the required 6 fit indices.

**Table 7:** Validating the Relationship between Social Media Behaviour and Brand Engagement

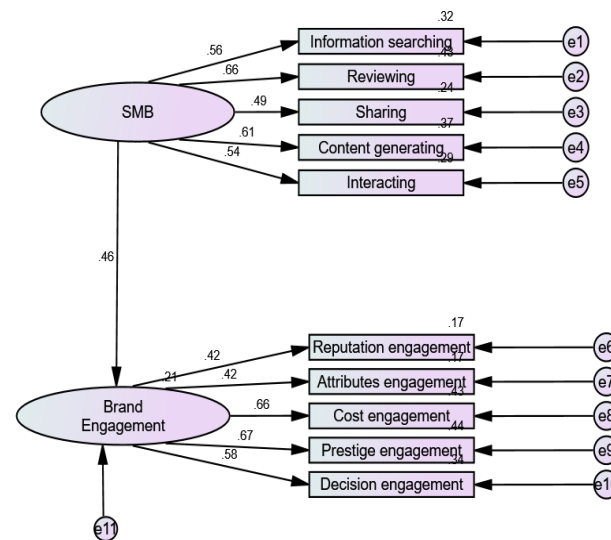| Computed statistical indices | Numerical derivations | Requirement values |
|---|---|---|
| Chi-square | 17.564 | - |
| P-value | 0.542 | >.05 |
| Goodness of fit index(GFI) | 0.992 | >.9 |
| Comparative fit index(CFI) | 0.989 | >.9 |
| Normed fit index(NFI) | 0.985 | >.9 |
| Root Mean Square Error of Approximation(RMSEA) | 0.069 | <=0.08 |

**Fig. 1:** Overall Model Fit Validation

The model diagram indicated that the correlation coefficient between the unobserved factor social media behaviour and the observed factors information searching, sharing, reviewing, content and generating, and interacting are highly significant to confirm these factors of social media behaviour of consumers. Similarly, the diagram indicated the relationship between unobserved factor brand engagement and the observed factors reputation engagement, attributes engagement, cost engagement, prestige engagement, and decision engagement are highly significant, which can be further consolidated in the satisfaction of 6 fit indices. The fit indices are expected to satisfy as per the benchmark, which is exactly satisfied by all the factors of social media behaviour and brand engagement perception, with a correlation value of 0.97 proving that there is a significant relationship between the components of social media behaviour of consumers and the elements of brand engagement perception of consumers. This leads to testing the hypothesis as per the structural equation model, and the proposed 3 hypotheses of the study are supported and accepted as per the existence of satisfactory 6 fit indices.

## 12.    Findings and Conclusion

The algorithmic approach in the determination of components of social media behaviour of consumers and the elements of brand engagement factors revealed that there is a significant relationship between social media behaviour of consumers and the brand engagement perception in any marketing arena. The social media behaviour of consumers is technologically derived as information searching, reviewing, sharing, content generating, and interacting. After the arrival of social media platforms in the marketing Arena, both marketers and consumers find it very important for frequent interactions directly without any middlemen and some agencies. Marketers and manufacturers directly interact with consumers through social media and introduce the newly introduced products and the reputation of brands to engage their consumers. The brand engagement perception is not a unique phenomenon, whereas it depends upon the five important factors, namely brand reputation, product attributes of the brands, cost of the brand, perceived prestige to engage their life style perception, and purchase decision process in purchasing the brands. Before the purchase of reputed brands of products or services the consumers engage with them independently with the help of social media information and interactions with marketers. Therefore, it can be concluded that social media behaviour and social media marketing are unavoidable in the present liberalised, globalised, and technologically augmented world.

## 13.    Suggestions

The study revealed that social media behaviour of consumers is very essential in the present liberalised and globalised economic scenarios to have deep interactions with marketers and manufacturers therefore it is suggested that the marketers and manufacturers should use their different social media engagement behaviour of consumers to have direct interaction with the consumers to identify the positive and negative comments on their brands of the products and services. As far as the brand engagement is concerned, the brand reputation and cost is important for consumers to engage themselves towards the brands; therefore, the marketers and manufacturers should use their social media platforms to increase their brand reputation and reveal the transparency of the cost of the brands of the products or services to increase their customer base.

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