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An Empirical Study Of The Mediation Effect Of Online Shopping Decision Making Ability Between Cognitive Factors And Online Shopping Behaviour Of Indian Consumers

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Abstract

This study aims to empirically identify the mediation effect (direct, indirect, and total effect) of Online Shopping Decision Making Ability (OSDMA) Between Cognitive Factors (CF) and Online Shopping Behavior (OSB) of Indian Consumers. An empirical approach using structural equation modeling (SEM) was performed to describe the linear and nonlinear relationships in the proposed model of the Online Shopping Decision Making Ability, Cognitive Factors and Shopping Behavior of Indian Online Consumers. The empirical results reveal that there is a considerable relationship between Cognitive Factors (CF) and Online Shopping Behavior (OSB). The Cognitive Factors (CF) has a significant effect on Online Shopping Decision Making Ability (OSDMA). There is a considerable relationship between Online Shopping Decision Making Ability (OSDMA) and Online Shopping Behavior (OSB). It is also found that Online Shopping Decision Making Ability (OSDMA) has no mediation in between Cognitive Factors (CF) and Online Shopping Behavior (OSB), therefore the Online Shopping Decision

Making Ability does not mediate between Cognitive Factors and Online Shopping Behavior.

Keywords- Online Shopping Decision Making Ability; Cognitive Factors; Online Shopping Behavior; Structural Equation Modelling (SEM).

1. Introduction

The online shopping behavior is based on the various factors like cognitive factors, and online shopping decision making ability factors. The cognitive factors are emotions and sentiments whereas the online shopping decision making ability factors are scanning ability, interpretation ability, and action ability. The cognitive factors are the independent latent variable, online shopping decision making ability factors are the latent mediation variable, and online shopping behavior is the dependent latent variable in this study. The mediation effect of scanning ability, interpretation ability, and action ability under online shopping decision making ability factors are checked between emotions/sentiments and online shopping behavior. The emotions, sentiments, scanning ability, interpretation ability, and action ability play a vital role in the online shopping decision making. These closed linked and intermingle variables are tested using Structural Equation Modelling (SEM), Artificial Neural Network (ANN) approach. Cognitive factors, such as perception, knowledge, and attitudes, influence how Indian consumers make decisions when shopping online. These factors can shape their preferences, expectations, and overall satisfaction with the online shopping experience. Perception plays an important role since it influences how consumers interpret and evaluate online shopping platforms, product descriptions, and customer reviews. Positive perception can lead to increased trust and likelihood of making a purchase. Knowledge about online shopping, such as understanding security measures, payment options, and return policies, can significantly impact decision-making. Consumers with more knowledge are likely to make informed choices and feel more comfortable shopping online. Attitudes towards online shopping, including trust in e-commerce platforms, perceived risks, and convenience, can shape the behavior of Indian consumers. Positive attitudes can lead to increased online shopping behavior, while negative attitudes can deter consumers from making online purchases.

Additionally, factors like website design, user experience, and personalized recommendations can further influence decision-making ability and online shopping behavior. A well-designed and user-friendly website can enhance the overall shopping experience and encourage consumers to make more purchases. It's important to note that individual preferences and cultural factors may also come into play when examining the online shopping behavior of Indian consumers. Understanding these factors can help businesses tailor their strategies and offerings to better meet the needs and preferences of Indian online shoppers.

2. Literature review

Literature is very important to understand the nature of the problems. It gives a clear understanding of all the aspects of research areas, related new findings, and methodology. The researcher can know the different types of research design and procedures for research. The previous literature was be explored through Google Scholar, the J-Gate portal, online library, and other reliable sources of national and international journals. The Mendeley reference manager is used for reviewing the previous literature in the APA (American Psychological Association 7th edition) style. The previous authors findings are as follows: A marketing plan cannot fully eliminate or impede a customer's ability to make choices. There are also some reservations regarding neuromarketing. While employing technology in market research is not bad, others believe that activating a buy button has the effect of removing all of the consumers' freedom of choice. Customers' reasoning brain processes will be entirely erased, and in their place, human robots designed to react to marketing stimuli will be built. In other circumstances, individuals may be converted into pre-programmed shopping machines designed to consume certain items. Neuromarketing is gaining popularity among businesses, and more are adopting its services. **(Sharma et al., 2023)** Neuromarketing is an interesting area that, by applying neuroscience approaches to investigate the unconscious processes that drive consumer behaviour, has the potential to transform consumer decision-making. Despite difficulties such as standardization and ethical considerations, neuromarketing has the potential to enhance marketing techniques and ethical business practices. Businesses may build goods that fulfill client expectations by concentrating on individual wants and preferences. Neuromarketing may help

businesses satisfy client requirements and gain a competitive edge in the marketplace. **(Misra, 2023)** Customers' perceptions of refurbished items may be influenced by their knowledge of the product's past.it was observed that customers were more inclined to acquire a remanufactured product if they are aware of the product's similarities to new items and the pricing. It is still unknown how customer choices are influenced by information regarding different types of reconditioned items. Using an integrated research model based on complexity theory, we evaluate the impact of different forms of product knowledge on consumers' purchase choices for remanufactured items in this study. **(Alyahya et al., 2023**) Colour is important in influencing customer purchasing behaviour, invoking emotions, and moulding impressions. To gain a competitive edge, brands must understand the influence of colour on their target audience. Colours that connect with company values and elicit desired emotions are critical for successful marketing activities. These assertions have a significant T-value of less than 0.05. (P. K. Singh et al., 2023) The human mind is critical in assessing if a product is suitable for people. Colour, symmetry, and branding all have an impact on the product's attraction. Because humans seek out opinions via reviews and comments, internet persuasion is more successful. This tendency has been amplified by the epidemic, with social media playing a large part in internet persuasion. More study is required, however, to understand how psychology effects product decision-making. **(Joshi, 2022)** The brain plasticity that guides the human being will be present once again in this post-pandemic period, adapting needs, desires, and purchasing processes, where stimuli provided by real people, the projection of social comfort, the attentional capacity of brands, involvement in collective purposes, or even the digitalization of the simplest or most complex daily path will be CB drivers. Companies must thus maintain an engaging, rapid, and continuous purchasing process across all channels, surprise customers with authenticity, fresh and immersive experiences, enabling beliefs to develop and be cemented, and increasing consumers' willingness to repeat the behaviour. **(Veiga & Diogo, 2022)** Strategic decision-making is influenced by attention, memory, ideation, emotion, and sentiment. Strategic decision-making is influenced by five elements. Learning how to communicate with people is essential for personal development and professional partnerships. Entrepreneurs with great cognitive talents may cultivate a big,

high-quality social network in order to market their firm and achieve peak performance. **(Feng et al., 2022)** Colour attracts customers, thus commercial enterprises should concentrate on individual demands and product presentation. Neuromarketing aids in the identification of client preferences and the facilitation of decision-making. Provide additional product information and be cautious while determining pricing. Observe customer behaviour and use neuromarketing techniques to solve marketing issues and enhance product packaging. **(Ismajli et al., 2022)** Consumers' online shopping habits are heavily influenced by the confidence they put in a specific website, the convenience with which they use the internet, and the services given by e-tailers. The survey also discovered that rural customers' internet purchasing habits varied from those of urban consumers. It is recommended that e-tailers pay close attention to the personal information they request from customers and give them with adequate product information. Because rural and urban consumers have distinct tastes, they must be approached differently. **(A. Singh et al., 2020)** Neuromarketing is a new idea that focuses on developing novel content to better understand and assess consumer psychology. As the capacity of the human brain is not completely known to us, no one technology has been able to obtain comprehensive knowledge of this potential. It is not a substitute for conventional marketing approaches, but rather a notion to be utilized in conjunction with existing ways to acquire a greater understanding of a consumer's behaviour on certain issues. Although neuromarketing gives insight into the continuous judgments in a customer's thinking, it is still necessary to understand the explicit decisions that the brain makes and generates consumer attraction to a brand. **(Kari et al., 2020)** The rate of rejection of a product exceeds the rate of purchase. This is especially true for today's picky buyers. Companies are dying as a result of traditional marketing, which means they can no longer entice clients by exquisite advertising or even celebrity endorsement. Customers will learn the actual face of the items or businesses as they gather information and peer around corners. Furthermore, few businesses understand how to personalize their adverts based on the information they get from each consumer. Companies who utilize such data to properly target their clients will thrive in the market. **(Narayanan & Raj, 2020)** Neuromarketing has several advantages over standard marketing tactics. Neuromarketing is a field that suggests value addition in

marketing research and pushes businesses to employ result-oriented marketing inputs. The advancement of Neuromarketing as a scientific theory helps to improve quality and customer comprehension. The research sheds light on neuromarketing applications in consumer advertising in online shopping. The findings may allow the researchers to expand their research on the influence of Neuromarketing on customer attitudes. According to the report, enhanced consumer impression and brand image development are required criteria for a successful marketer. **(S. Singh, 2020)** Many new marketing approaches are developing in the current environment, but the demand remains the same: to match the requirements and desires of consumers. India is a nation that is diverse in every way. One set of opinions has little influence on others, but it has an effect on a certain civilization. It draws significant investment when major Bs can contribute but not otherwise. Few individuals may object to men's inner awareness being tested. It is yet another function of this program. But there was little question that neuromarketing would lead the way for new products and customer benefits. (**Nagalatha, 2018)** Marketers, psychologists, and economists may use neuromarketing to better understand customer preferences and behaviour. It delivers fast response on marketing stimuli, making this method more appealing to huge firms. Neuromarketing provides a more in-depth knowledge of how messages are viewed and processed, as well as insights regarding company sustainability and linkages with other factors. As it matures, it will uncover complexities influencing consumer behaviour, enabling for the creation of goods and services that please customers. However, issues about privacy and ethics persist, and researchers must prioritize consumer rights and interests. **(Devaru & Devi, 2018)** Neuromarketing is an innovative technology that investigates people's brain processes and changes during decision making in order to forecast consumer purchase behaviour. More than 90% of choices are made unconsciously and illogically. According to the findings of this research, neuromarketing has a vital effect in the buying choice of customers. It is a powerful technique used by marketers to determine and anticipate client tastes and preferences. **(Bhandari, 2018)** Over the past decade, online shopping has grown in popularity. This service is incredibly handy and is largely used by the "Net- Generation." Although internet purchasing may be incredibly easy and profitable, it can also cause some issues. Consumers have been

seen to exhibit distinct purchasing behaviours while shopping online vs in real retail establishments. Statistical approaches were used to discover that there is no significant difference in the responses of male and female management students at Jaipur National University in Jaipur (Raj.). This emphasizes the need of merchants studying customer behaviour and making adjustments in order to stay profitable and prospering. The overall findings indicate that respondents viewed internet shopping favourably. This certainly supports the expansion of the online purchasing enterprise. Various firms may also utilize the statistics to determine their target client categories. Online shopping in India has a bright future. **(Kala, 2015)** There is a substantial association between perceived risk and attitude toward online buying, and the other three hypotheses, namely that there is no significant relationship between online shopping and perceived delight, perceived ease of use, or perceived utility, have been rejected. Perceived Risk is the most important element that may influence customers' online buying behaviour in Delhi, out of the four. Perceived risk implies a lack of trust among customers, as well as a variety of other factors such as the possibility of being tricked, lower product quality, non-returnable policy, and so on. **(Jain et al., 2014)**

3. Objectives

The specific objectives of this research are as follows:

- To find the effect of Cognitive Factors on the Online Shopping Behavior of Indian Consumers.
- To find the effect of Online Shopping Decision Making Ability on the Online Shopping Behavior of Indian Consumers.
- To find the effect of Cognitive Factors on the Online Shopping Decision Making Ability.
- To find the mediation effect of Online Shopping Decision Making Ability In between Cognitive Factors and Online Shopping Behavior of Indian Consumers.

4. Hypotheses

Since three main constructs of the study are: Cognitive Factors, Online Shopping Decision Making Ability, and Online Shopping Behavior, therefore using these constructs the researcher formulated four null hypotheses.

The null hypotheses formulated are as follows:

- H01: There is no significant effect of Cognitive Factors on the Online Shopping Behavior of Indian Consumers.
- H02: There is no significant effect of Online Shopping Decision Making Ability on the Online Shopping Behavior of Indian Consumers.
- H03: There is no significant effect of Cognitive Factors on the Online Shopping Decision Making Ability.
- H04: Online Shopping Decision Making Ability does not mediate between Cognitive Factors and Online Shopping Behavior of Indian Consumers.

5.0 Methodologies

The reliability analysis, validity analysis, exploratory factor analysis, confirmatory factor analysis, the path analysis, measurement model analysis and in the end, the structural equation modelling techniques were used in this research study. The EFA and CFA were performed individually on the selected factors/latent variables under the head of scale development and tool standardization. The reliability was checked using Cronbach's alpha. The construct validity can be checked using three approaches such as the multi-trait multi-method matrix, item to total score correlation in a scale, and factor analysis. The factor analysis was used to prove validity and data reduction. Here the researcher applied the items to total score correlation in a scale, and factor analysis approach. The validity of individual item in the scale was tested by measuring the correlation between the item and the total score under corrected item total correlation (CITC). The high correlation items were valid whereas low correlation (below 0.300) items were dropped from the scale. The exploratory factor analysis was done using the principal component analysis. Under principal component analysis, Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and percentage of variance were calculated. The confirmatory factor analysis was done to finalize the construct for further analysis of the measurement model and the structural model. All the required model fit indices (GFI, AGFI, TLI, CFI, NFI, RMSEA) were used for good model fit. The minimum CMIN/DF was achieved for each construct under measurement model and structural model. The exploratory research design was used for the formulation of the hypothesis and a descriptive research design was used for testing the hypothesis. The null hypothesis was tested through the path analysis using SEM (Structural Equation

Modelling). The IBM SPSS 23.0 and add on AMOS 23.0 version software were used for data entry, data coding, value label, and inferential analysis. The significance level was set in advance at 5% for accepting and rejecting the null hypothesis.

6. Data

The researcher used a web-based survey questionnaire to collect primary data through snowball sampling, with a sample size of 600. The initial questions were in nominal scale whereas construct and items question were in interval scale. The Likert 5-point scale was used in such a way that 1 is considered as strongly agree and 5 strongly disagree. All other responses were between1 to 5. The 3 point was considered as neutral/ neither agree nor disagree response.

7. Measurements of variables

The reliability and validity analysis were applied on each construct. The factor analysis using PCA was performed individually on the selected construct under the head of scale development and tool standardization. Finally, as a standard for final assessment, a minimum alpha of 0.70, minimum corrected item-total correlation (CITC) values above 0.300, and a Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy value above 0.500 were checked for the final selection of items in the different constructs. Under confirmatory factor analysis (CFA), all the model fit indices were checked for a better fit of each model of the different constructs. The standardized regression weight above 0.300 of each item under different constructs was also checked.

7.1 Cognitive Factors (CF) construct

Under the Cognitive Factors (CF) construct, the following statements were used to measure the cognitive construct. 1. "I feel excited and enthusiastic when shopping online." 2. "I experience a sense of convenience and ease while shopping online." 3. "I feel satisfied with the overall online shopping experience." 4. "I trust online platforms to deliver quality products and services."

7.2 Online Shopping Decision Making Ability (OSDMA) construct

Online Shopping Decision Making Ability construct was measured under following points as 1. I feel confident in

making online shopping decisions. 2. I thoroughly research products before making a purchase online. 3. I consider multiple options and compare prices before buying online. 4. I trust online reviews and ratings in making my purchasing decisions. 5. I rely on recommendations from friends and family when shopping online. 6. I feel comfortable navigating through various online shopping platforms.

7.3 Online Shopping Behavior (OSB) construct

Online Shopping Behavior construct was measured under following points as 1. I enjoy shopping online for a wide variety of products. 2. I feel confident about the security of my personal and financial information when shopping online. 3. Online shopping offers me convenience and saves me time. 4. I trust online reviews and ratings when making purchasing decisions. 5. I frequently compare prices and seek discounts before making a purchase online. 6. I prefer shopping from online marketplaces rather than individual websites. All the three constructs were measured on 5 points Likert scale stating 1 as strongly disagree, 5 as strongly agree and 3 as neither agree nor disagree. The SPSS summary results of reliability and factor analysis are as follows:

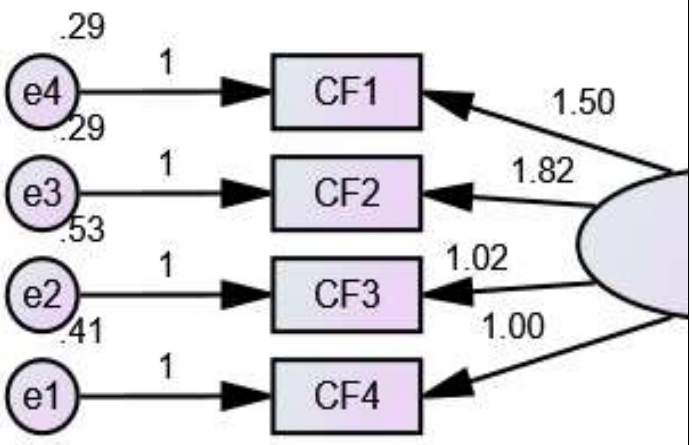
Table 1: Reliability statistics & Principal components analysis results of CF, OSDMA and OSB

Construct	**Cronbach's Alpha**	**KMO Test**	**% of Variance**	**No. of Items**	**Results**
Cognitive Factors (CF)	0.638	0.688	48.466	4	Acceptable
Online Shopping Decision Making Ability (OSDMA)	0.824	0.869	53.545	6	Excellent
Online Shopping Behavior (OSB) construct	0.816	0.816	52.247	6	Excellent

Source: SPSS 23.0 output

It is clear that the Cronbach's Alpha value is 0.638, which is low, but it is near to the acceptable value (0.700). Kaiser-Meyer-Olkin value is 0.688, which is above the preferable value (0.500). All the four items under the Cognitive Factors (CF) construct explain the 48.466% percentage of variance. It is clear that the Cronbach's Alpha value is 0.824, which is excellent and above the acceptable value (0.700), and the

Kaiser-Meyer-Olkin value is 0.871, which is above the preferable value (0.500). All the six items under the Online Shopping Decision Making Ability (OSDMA) construct explain the 53.545% variance percentage. It is also very clear that the Cronbach's Alpha value is 0.816, which is very high and above the acceptable value (0.700), and the Kaiser-Meyer-Olkin value is 0.816, which is above the preferable value (0.500). All the six items under Online Shopping Behavior (OSB) construct explain the 52.247% percentage of variance. (See Table 1: Reliability statistics & Principal components analysis results of CF, OSDMA and) These results were reconfirmed through the confirmatory factor analysis for CF, OSDMA and OSB construct. The confirmatory factor analysis for the CF, OSDMA and OSB construct was as follows:



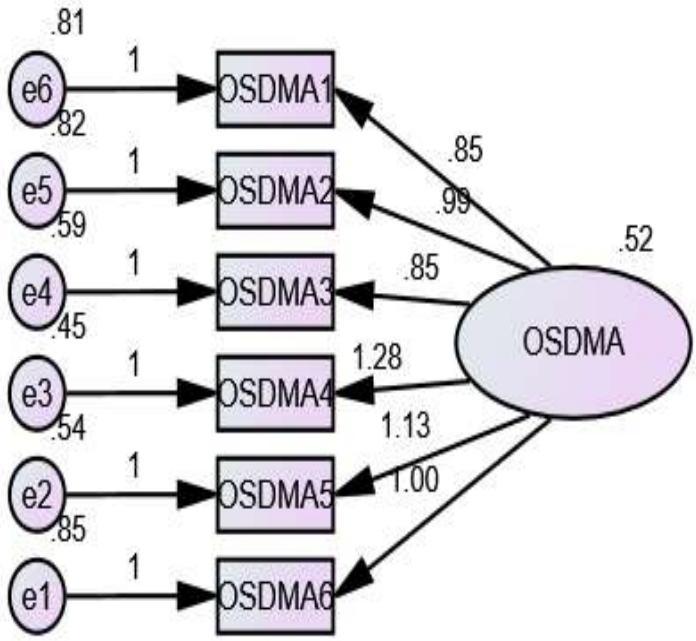
CMIN	DF	P	CMIN/DF
2.321	2	.313	1.161
RMR	GFI	AGFI	NFI
.009	.998	.990	.993
RMSEA	CFI	TLI	RFI
.016	.999	.997	.978

Figure 1: Confirmatory factor analysis for Cognitive Factors (CF)

The figure depicts that Cognitive Factors (CF) has four items represented by the rectangular shape, also known as observed variables, and an oval shape represents latent variable CF. The acceptable range of GFI, AGFI, TLI, CFI, and NFI should be near to 0.9, CMIN/DF should be in between 2 to 3, and RMSEA values should be below 0.05, hence all the model fit indices show that the CFA model is a good fit

model. From figure 1, it is clear that all the results of confirmatory factor analysis were acceptable and that this construct is used in further statistical analysis of the measurement model and structural model.

Source: AMOS 23.0 output

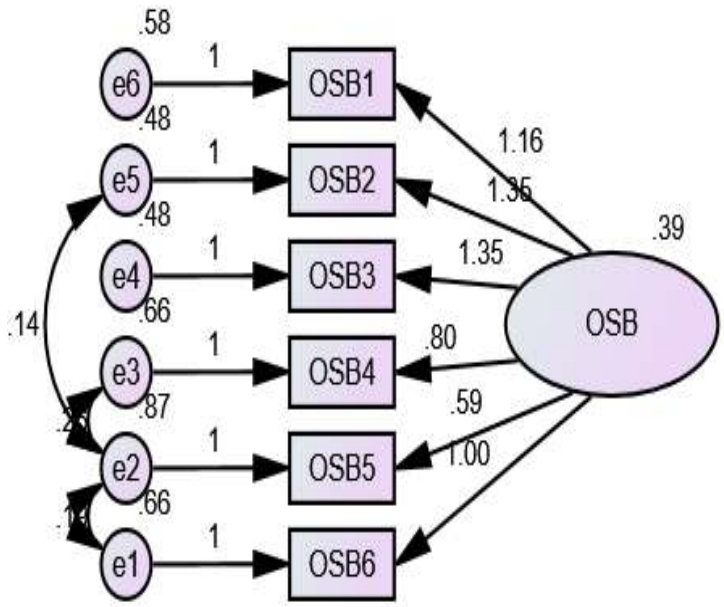


CMIN	DF	P	CMIN/DF
12.910	9	.167	1.434
RMR	GFI	AGFI	NFI
.022	.993	.983	.988
RMSEA	CFI	TLI	RFI
.027	.996	.994	.981

Figure 2: Confirmatory factor analysis for Online Shopping Decision Making Ability (OSDMA)

The figure depicts that Online Shopping Decision Making Ability (OSDMA) has six items represented by the rectangular shape and latent variable individual stress is represented by an oval shape. The acceptable range of GFI, AGFI, TLI, CFI, and NFI should be near to 0.9, CMIN/DF should be in between 2 to 3, and RMSEA values should be below 0.05, hence all the model fit indices show that the CFA model is a good fit model. From figure 2, it is clear that all the results of confirmatory factor analysis were acceptable and this construct was used in further statistical analysis of the measurement model and structural model.

Source: AMOS 23.0 output



CMIN	DF	P	CMIN/DF
17.820	6	.007	2.970
RMR	GFI	AGFI	NFI
.026	.990	.966	.984
RMSEA	CFI	TLI	RFI
.057	.990	.974	.961

Figure 3: Confirmatory factor analysis for Online Shopping Behavior (OSB)

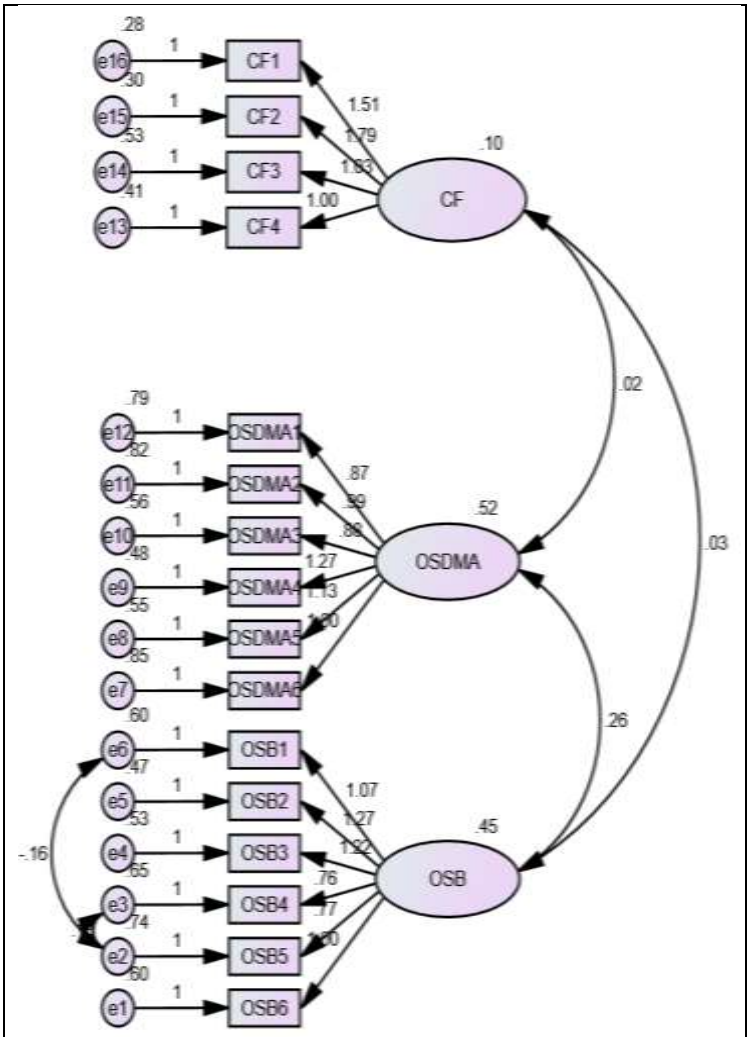
The figure depicts that Online Shopping Behavior (OSB) consists of six items represented by the rectangular shape and latent variable OSB is represented by oval shape. The acceptable range of GFI, AGFI, TLI, CFI, and NFI should be near to 0.9, CMIN/DF should be in between 2 to 3, and RMSEA values should be below 0.05, hence all the model fit indices show that the CFA model is a good fit model. From figure 3, it is clear that all the results of confirmatory factor analysis were acceptable, and this construct was used in further statistical analysis of the measurement model and structural model.

Source: AMOS 23.0 output

8. Findings

8.1 Measurement Model

The measurement model is the association amongst all three constructs. The covariance is calculated between CF and OSDMA, OSDMA and OSB, and CF and OSB. By the suggestions of modification indices, the error variables e2-e3 and e2-e6 were also correlated to achieve better model fit indices.



CMIN	DF	P	CMIN/DF
225.493	99	.000	2.278
RMR	GFI	AGFI	NFI
.042	.956	.939	.922
RMSEA	CFI	TLI	RFI
.046	.955	.945	.906

Figure 4: Measurement model

The figure depicts that the measurement model has three constructs named CF, OSDMA, and OSB. The CF having four items and OSDMA and OSB having six items respectively.

The acceptable range of GFI, AGFI, TLI, CFI, and NFI should be near to 0.9, CMIN/DF should be in between 2 to 3, and RMSEA values should be below 0.05, hence all the model fit indices show that the CFA model is a good fit model.

Source: AMOS 23.0 output

8.2 Standardized regression weight

The standardized regression weight of each item under the three constructs was calculated using the measurement model. All estimates were above the acceptable value (0.300).

Table 2: Standardized Regression Weights

Direct path			**Estimate**
OSB6	<---	OSB	.654
OSB5	<---	OSB	.511
OSB4	<---	OSB	.531
OSB3	<---	OSB	.747
OSB2	<---	OSB	.776
OSB1	<---	OSB	.681
OSDMA6	<---	OSDMA	.614
OSDMA5	<---	OSDMA	.738
OSDMA4	<---	OSDMA	.798
OSDMA3	<---	OSDMA	.644
OSDMA2	<---	OSDMA	.618
OSDMA1	<---	OSDMA	.576
CF4	<---	CF	.443
CF3	<---	CF	.409
CF2	<---	CF	.716
CF1	<---	CF	.666

Source: AMOS 23.0 output

It is clear that all the items under each construct have a standardized regression weight above 0.300, which is acceptable for further statistical analysis under structural equation modeling. (See Figure 4)

8.3 Correlation matrix

The correlation matrix shows the covariance between OSDMA and CF, OSB and OSDMA, OSB and CF. The error variables e2-e3 and e2-e6 are also correlated to achieve a better-fit model. All the relationships were significant, except for OSDMA and

CF. The estimates and p-values are shown in this correlation matrix.

Table 3: Correlation & Covariance Estimate

			Correlation Estimate	**Covariance Estimate**	**P**
OSDMA	<-->	CF	.082	.019	.131
OSB	<-->	OSDMA	.548	.264	***
OSB	<-->	CF	.154	.032	.006
e2	<-->	e3	.265	.185	***
e2	<-->	e6	-.239	-.159	***

Source: AMOS 23.0 output

It is clear that all the constructs are positively correlated in such a way that there is a very low (0.082) and insignificant (0.131) correlation between OSDMA and CF. There is a moderate (0.548) and significant (***) correlation between OSB and OSDMA. Again, there is a low (0.154) and significant (0.006) correlation between OSB and CF. The correlation between error variables (e2-e3 and e2-e6) was low and significant (all the correlations were significant at a 5% level of significance). (See Table 3)

8.4 Structural model

The structural equation model is a combination of factor analysis and regression analysis. In this model, the simultaneously hypothesis testing is possible among the different constructs. There are three constructs in this model. The first construct is Cognitive Factors (CF), the second is Online Shopping Decision Making Ability (OSDMA), and the third is Online Shopping Behavior (OSB) construct. There were four items retained under Cognitive Factors (CF), and six items retained under Online Shopping Decision Making Ability (OSDMA) and Shopping Behavior (OSB), respectively. The hypothesis testing was performed among the CF, OSDMA, and OSB.

8.4.1 Direct effect of CF on OSB

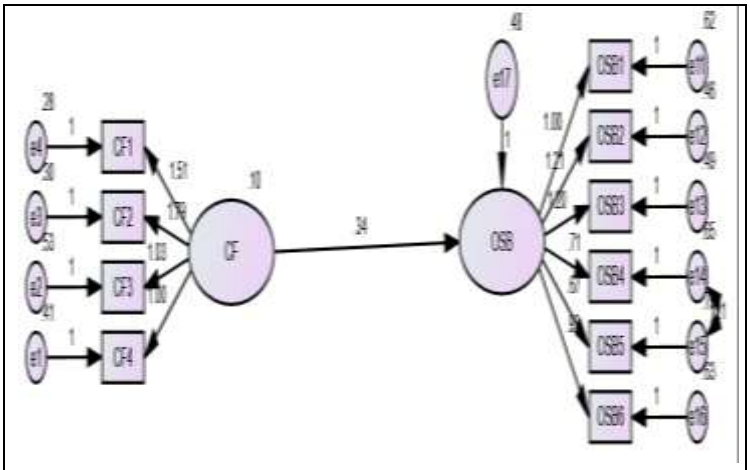


Figure 5: Direct effect of CF on OSB

The figure depicts that CF has a significant effect on OSB. The latent variable CF has four items, whereas OSB has six items. The error variables are e1 to e15 and e11 to e16. The e17 error variable is associated with the dependent latent variable OSB.

Source: AMOS 23.0 output

Table 4: Unstandardised Regression Weights: Between CF & OSB

Direct Path			Estimate	S.E.	C.R.	P	Results	Hypothesis
OSB	<--	CF	.340	.125	2.726	.006	Significant	H01 Rejected

Source: AMOS 23.0 output

It is clear that the p value is 0.006, which is less than 0.05. Hence, null hypothesis H01 is safe to reject. There is a significant effect of Cognitive Factors on Online Shopping Behavior. (See Table 4)

.8.4.2 Direct effect of CF on OSDMA

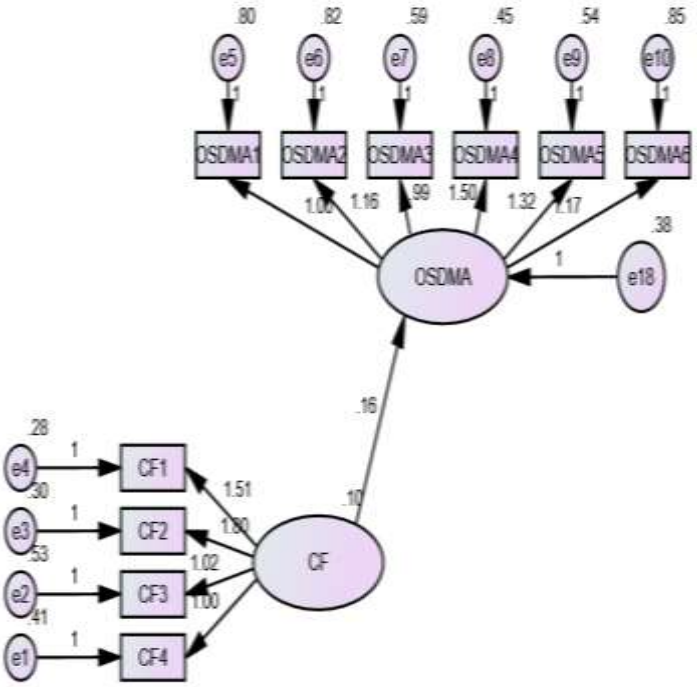


Figure 6: Direct effect of CF on OSDMA

The figure depicts that CF has an insignificant effect on OSDMA. The latent variable CF has four items, whereas OSDMA has six items. The error variables are e1 to e10. The e18 is also an error variable associated with the dependent latent variable OSDMA.

Source: AMOS 23.0 output

Table 5: Unstandardized Regression Weights: Between CF & OSDMA

Direct Path			**Estimate**	**S.E.**	**C.R.**	**P**	**Results**	**Hypothesis**
OSDMA	<---	CF	.160	.106	1.506	.000	Significant	H02 Rejected

Source: AMOS 23.0 output

It is clear that, the p value is 0.000 which is less than 0.05, hence the null hypothesis H02 is rejected, therefore there is a significant effect of Cognitive Factors (CF) on Online Shopping Decision Making Ability (OSDMA). (See Table 5)

8.4.3 Direct effect of OSDMA on OSB

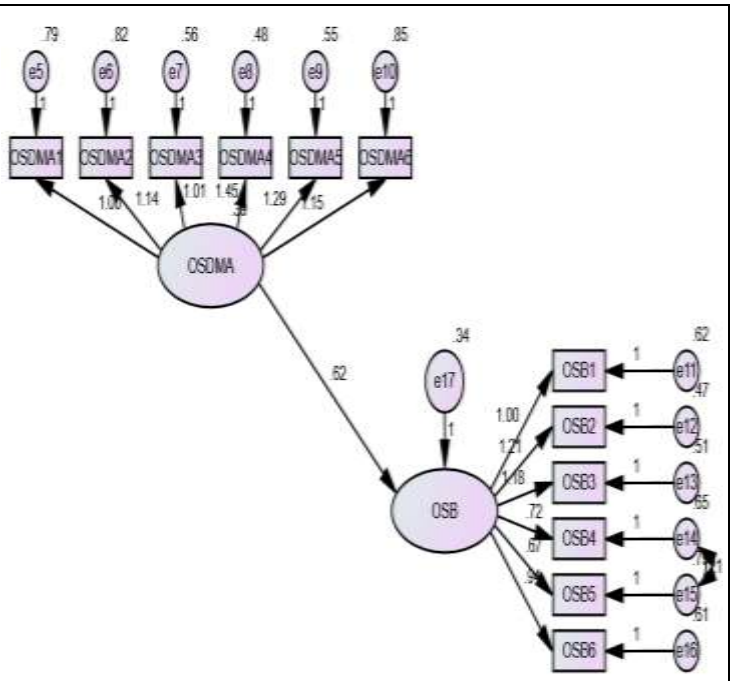


Figure 7: Direct effect of OSDMA on OSB

The figure depicts that OSDMA has a significant effect on OSB. The latent variable OSDMA has six items as well as OSB has six items. The error variables are e5 to e10 and e11 to e16. The e17 is also the error variable associated with the dependent latent variable OSB.

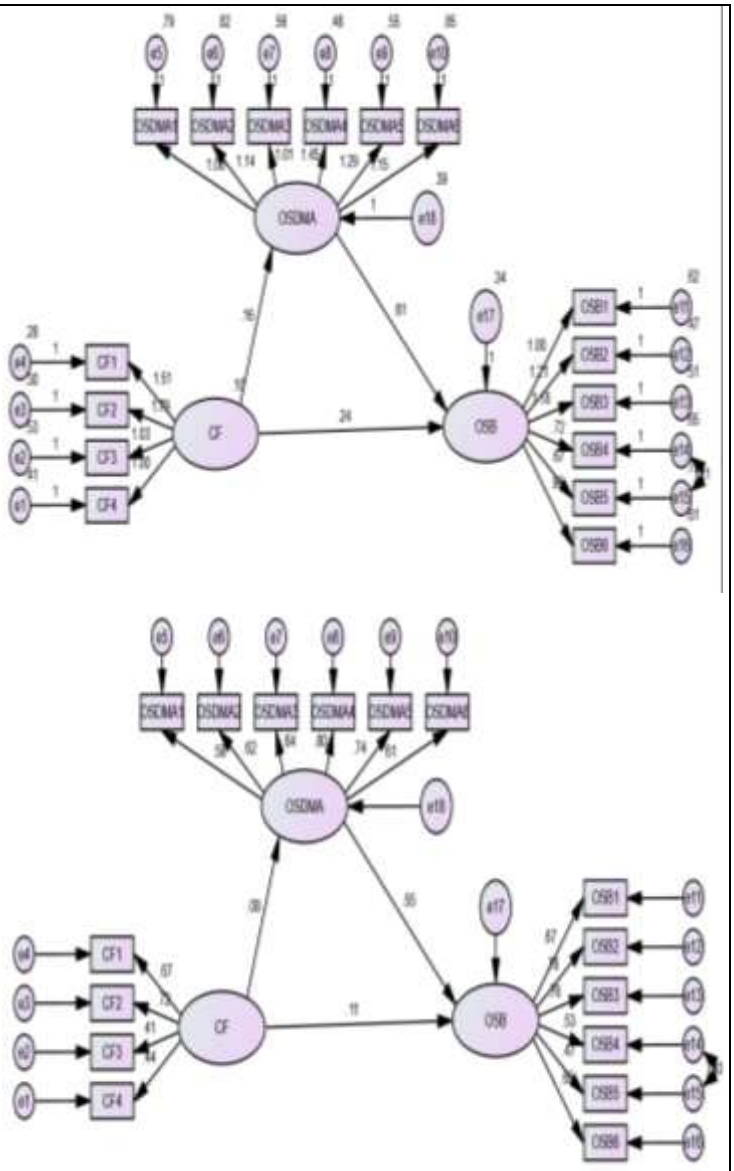
Source: AMOS 23.0 output

Table 6: Unstandardized Regression Weights: Between OSDMA & OSB

Direct Path			**Estimate**	**S.E.**	**C.R.**	**P**	**Results**	**Hypothesis**
OSB	<--	OSDMA	.621	.068	9.072	***	Significant	H03

Source: AMOS 23.0 output

It is clear that the p value is 0.000, which is less than 0.05. Hence, null hypothesis H03 is safe to reject. There is a significant effect of the Online Shopping Decision Making Ability (OSDMA) on the Online Shopping Behavior (OSB). (See Table 6)



CMIN	DF	P	CMIN/DF
253.224	100	.000	2.532
RMR	GFI	AGFI	NFI
.043	.950	.932	.913
RMSEA	CFI	TLI	RFI
.051	.945	.934	.895

Figure 8: Structural Model: Unstandardized (Above) & Standardized Estimates (Below)

The figure shows that CF is a latent independent variable, whereas OSDMA and OSB are considered dependent latent variables. The error variables e1 to e18 are used in such a way that e18 and e17 are associated with the dependent latent variable. The three paths are tested among CF, OSDMA, and OSB. The regression estimate is shown on the

three main arrows connecting the three constructs. The oval, rectangle, and circular shapes are used for the latent variables (factor), for observed variables, and for error variables, respectively. The acceptable range of GFI, AGFI, TLI, CFI, and NFI should be near to 0.9, CMIN/DF should be in between 2 and 3, and RMSEA values should be below 0.05. Hence, all the model fit indices show that the CFA model is a good fit model.

Source: AMOS 23.0 output

9. Mediation Analysis

In order to determine whether or not a variable acted as a mediator, we looked at the degree to which it carried the influence of one independent variable (IV) onto another independent variable (DV). In general, we can say that mediation has taken place when the following conditions are met: (1) the IV significantly affects the mediator; (2) the IV significantly affects the DV when the mediator is not present; (3) the mediator has a significant, unique effect on the DV; and (4) the effect of the IV on the DV is reduced when the mediator is added to the model. (Baron & Kenny's Method).

Table 7: Mediation results on the introduction of OSDMA in between CF and OSB (Baron & Kenny's Method)

Effect	**Standardised Estimation**	**P Value**	**Results**	**Mediation**	**Hypothesis**	**Decision**
Total Effect	0.137	.006	Significant	**No Mediation**	Accepted H04	Not Supported
Direct Effect	.095	.042	Significant			
Indirect Effect	0.042	0.129	Insignificant			

Source: Author’s Calculation based on AMOS 23.0 output

It is clear that OSDMA has no mediation in between CF and OSB, therefore the fourth null hypothesis is accepted, therefore it can be finally concluded that the Online Shopping Decision Making Ability (OSDMA) does not mediate between Cognitive Factors (CF) and Online Shopping Behavior (OSB). (See Table 7) The decision rules are stated as if direct effect p

value is more than 0.05 (insignificant) then there exist full mediation but other two must be significant with reduction in standardised estimate. If all the p value is less than 0.05 (significant) then partial mediation with reduction in standardised estimate, and If indirect effect p value is more than 0.05 (insignificant) as in this case then no mediation with very small reduction standardised estimate.

10. Discussion

The p value is clearly 0.006, which is less than 0.05. As a result, rejecting null hypothesis H01 is safe. Cognitive Factors have a substantial impact on online shopping behaviour. (See Figure 4) The p value is 0.000, which is less than 0.05, indicating that the null hypothesis H02 is rejected, indicating that Cognitive Factors (CF) have a substantial influence on Online Shopping Decision Making Ability (OSDMA). (Please see Table 5) The p value is clearly 0.000, which is less than 0.05. As a result, null hypothesis H03 may be safely rejected. The Online Shopping Decision Making Ability (OSDMA) has a considerable impact on Online Shopping Behaviour (OSB). (See also Table 6) The current results are supported by **(A. Singh et al., 2020)** Because it is obvious that OSDMA does not mediate between CF and OSB, the fourth null hypothesis is accepted, and it can be inferred that the Online Shopping Decision Making Ability (OSDMA) does not mediate between Cognitive Factors (CF) and Online Shopping Behaviour (OSB). (See Figure 7) The results by **(Jain et al., 2014)** also similar to this study. The decision guidelines specify that complete mediation exists if the direct impact p value is more than 0.05 (insignificant), but the other two must be significant with a drop in standardised estimate. If all of the p values are less than 0.05 (significant), then partial mediation with a decrease in standardised estimate is possible; otherwise, no mediation with a very modest reduction in standardised estimate is possible.

11. Conclusion

In this study, there were mainly three constructs were used. The first and second constructs were Cognitive Factors (CF), Online Shopping Decision Making Ability (OSDMA), and the third construct was Online Shopping Behavior (OSB). The Cognitive Factors (CF) was identified as 1. "I feel excited and enthusiastic when shopping online." 2. "I experience a sense of convenience and ease while shopping online." 3. "I feel satisfied with the overall online shopping experience." 4. "I

trust online platforms to deliver quality products and services." . The Online Shopping Decision Making Ability (OSDMA) was identified 1. I feel confident in making online shopping decisions. 2. I thoroughly research products before making a purchase online. 3. I consider multiple options and compare prices before buying online. 4. I trust online reviews and ratings in making my purchasing decisions. 5. I rely on recommendations from friends and family when shopping online. 6. I feel comfortable navigating through various online shopping platforms. The Online Shopping Behavior (OSB) was identified as 1. I enjoy shopping online for a wide variety of products. 2. I feel confident about the security of my personal and financial information when shopping online. 3. Online shopping offers me convenience and saves me time. 4. I trust online reviews and ratings when making purchasing decisions. 5. I frequently compare prices and seek discounts before making a purchase online. 6. I prefer shopping from online marketplaces rather than individual websites. Based on the results and findings, there is a considerable relationship between Cognitive Factors (CF) and Online Shopping Behavior (OSB). The Cognitive Factors (CF) has a significant effect on Online Shopping Decision Making Ability (OSDMA). There is a considerable relationship between Online Shopping Decision Making Ability (OSDMA) and Online Shopping Behavior (OSB). It is also found that Online Shopping Decision Making Ability (OSDMA) has no mediation in between Cognitive Factors (CF) and Online Shopping Behavior (OSB), therefore the Online Shopping Decision Making Ability does not mediate between Cognitive Factors and Online Shopping Behavior.

Declaration

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Availability of data and materials

The primary data were collected using a web-based survey questionnaire through snowball sampling, with a sample size of 600. The previous researches were properly cited in the manuscript. The American Psychological Association (APA) 7th edition referencing style was used for the previous studies on Online Shopping Behavior under the environment of Cognitive Factors (CF) , Online Shopping Decision Making Ability (OSDMA).

Ethical consideration

The ethical consent was taken by stating the statement at the beginning of the questionnaire to each respondent, as "Any information filled in the questionnaire will not be used for any commercial purpose both during the research and after its publication". All the information technology professionals have given their consent for this study.

Disclaimer

The findings & conclusions in this study are those of the authors and do not necessarily represent the official position.

Competing interests

No competing interests were disclosed.

Authors' contributions

Both authors read and approved the final manuscript.

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