

Examining Online Grocery Purchase Intentions Through an Extended TAM Framework : A Mediation Analysis Approach

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Abstract

Purpose : The present study has attempted to extend the TAM framework for online grocery shopping (OGS) by adding convenience (CON) and subjective norms (SN) as exogenous constructs and examines direct and sequential mediation among CON, SN, perceived ease of use (PEOU), perceived usefulness (PU), attitude toward (ATT) OGS, and online grocery purchase intention (OGPI).

Methodology : This study proposed a conceptual model for OGS, for which data from 453 respondents across India were collected. Furthermore, this study employed a sequential mediation approach and tested the proposed constructs' direct relationships.

Findings : This study revealed that CON significantly impacted PEOU and PU, while PEOU significantly influenced PU and ATT. SN also influenced PU. Additionally, PU significantly affected ATT, and ATT influenced OGPI. Moreover, PU and ATT as sequential mediators significantly affected the relationships among SN–OGPI, PEOU–OGPI, and CON–OGPI, out of which complete mediation was found for PEOU–PU–ATT–OGPI, and the other two were partial mediation. Furthermore, CON–PEOU–ATT–OGPI was also found to have partial sequential mediation. This study added to the literature on OGS by extending TAM with SN and CON, a hitherto under-researched area in this domain.

Practical Implications : The study had practical implications for e-retailers. Grocery e-retailers need to focus on the CON aspects of consumers. Additionally, website design characteristics need to be focused on, which in turn would have an impact on the PEOU of the website, which would favorably impact consumer ATT OGS.

Originality : This study sought to address a critical gap in the research literature on OGS by examining the collective impact of SN and CON on the TAM constructs.

Keywords : online grocery, TAM model, mediation analysis, convenience, subjective norms

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An increasingly globalized business environment facilitated by the rapid growth of the internet redefined how goods and services can be procured. This has translated into a significant rise in online transactions both among businesses and between businesses and consumers (Bagla & Khan, 2017; Mahadevan & Joshi, 2021). Online grocery shopping (OGS) is an internet-based shopping application that has caught consumers' attention over the last decade and more so in the last few years (Kurnia, 2008; Pramod & Arora, 2021). OGS refers to the purchasing of groceries through the Internet by the consumer and the delivery of those groceries purchased online to the consumer (Ghazali et al., 2006). The perishable nature of grocery items could pose challenges on the delivery logistics front and with respect to product returns by consumers (Kurnia & Chien, 2003). The very nature of the grocery products, therefore, means that the decision-making process in OGS would be very different from the process followed for other generic online shopping (Bauerová, 2018).

The online grocery market size in India is of the order of US\$ 1.9 billion and has been growing at a compounded annual growth rate of around 60% over the period 2016–2019. Despite such a healthy growth rate, online grocery constituted only a mere 0.3% of the total grocery spend of US\$ 603 billion in 2019. The online grocery market in India is expected to constitute almost 3% (approximately US\$ 24 billion) of the total grocery opportunity in 2025, as reported by Agarwal (2021). This growth in the online grocery market in India has been fuelled by an increasing number of smartphone users, a young, busy population with less time to devote to offline grocery purchases, and the easy access to browsing, shopping, and delivery provided by OGS (Sreeram et al., 2017).

Previous research has examined OGS from the perspective of adoption, customer satisfaction, and purchase intention and has studied the impact of multiple factors such as trust and visibility (Kurnia & Chien, 2003), enjoyment and convenience (CON) (Childers et al., 2001), subjective norms (SN) (Jasti & Syed, 2019), and perceived behavioral control (Hansen et al., 2004; Hansen, 2005). Krishnamurti and Gupta (2017) examined the OGS behavior of consumers to observe differences between male and female shoppers and between married and unmarried respondents. Prasad and Sharma (2016) observed the socioeconomic and demographic influences that shaped the usage of online channels for the purchase of food and grocery items by consumers. Davis (1989) stressed the need to explore the impact of additional constructs on the intention of users to adopt newer technologies. Sangwan et al. (2022) extended the TAM model through the examination of additional constructs of monetary benefits and information reliability on the intention of customers to use social media. Phonthanukitithaworn et al. (2016) posited that the predictive power of TAM can be improved through the addition of external constructs and, therefore, have extended the TAM model through the addition of external constructs such as compatibility, SN, perceived risk, perceived trust, and perceived cost. In light of the same, this study attempts to develop a more comprehensive understanding of OGS behavior through the investigation of additional factors (beyond the TAM constructs), such as CON and SN. CON has been associated with online shopping, which offers consumers the option of shopping from their homes (Eastlick & Lotz, 1999). Research on online shopping behaviors has also indicated that consumers adopt online technologies when persons important to them advise them to do so (Driediger & Bhatiasevi, 2019), which has been identified as the construct of subjective norms in the research literature.

An examination of previous research in the field of OGS has revealed that the collective impact of subjective norms and convenience on the TAM constructs has remained an area wherein significant research has not been carried out. This research study addresses this gap in the literature and extends the existing TAM framework through the use of CON and SN as external constructs. The impact of the extended TAM on the attitude toward OGS (ATT) and online grocery purchase intention (OGPI) is sought to be assessed. Accordingly, this study seeks to address the following objectives:

➤ To extend the TAM model using the external constructs of SN and CON and assess their influence on the TAM constructs (PEOU, PU, ATT, and OGPI).

- ↳ To assess the mediation effect of PU and ATT with respect to the relationship among the exogenous constructs of SN, PEOU, CON, and the endogenous construct of OGPI from a sequential mediation perspective.
- ↳ To assess the mediation effect of PEOU and ATT with respect to the relationship between the exogenous construct of CON and the endogenous construct of OGPI from a sequential mediation perspective.
- ↳ To form managerial guidance and recommendations concerning the acceptance of OGS.

Literature Review

Online Grocery Shopping

OGS refers to a form of electronic commerce through which consumers place orders online for groceries, which could typically include foodstuff, household utilities, and even perishables (Driediger & Bhatiasavi, 2019). Previous research has examined the phenomenon of online shopping for groceries from multiple lenses. Hansen et al. (2004) investigated the effect of SN and perceived behavioral control on attitude and intention toward OGS. Hansen (2005) attempted to study online consumer behavior in OGS by examining the impact of factors such as perceived information accessibility, perceived relative advantage, perceived internet grocery risk, and perceived order accessibility. Clemes et al. (2014) examined several factors affecting the adoption of OGS, including service quality, CON, price, consumer resources, perceived risk, and SN on the adoption of OGS in China. Sreeram et al. (2017) investigated the impact of factors such as perceived ease of use, perceived usefulness, social influence, entertainment value, design aesthetics, physical effort, and time pressure on satisfaction and loyalty in OGS. Chakraborty and Altekari (2021) explored the mediating role of trust and customer involvement concerning people's usage of grocery applications. Padmanabh et al. (2016) studied the factors that impede the purchase of household items by consumers, while Sreelata et al. (2016) attempted to segment consumers in food and grocery retail.

Theoretical Framework

The research literature on the acceptance of technologies and their use thereof has resulted in various theoretical frameworks that have been validated in empirical settings by multiple research studies in a wide range of contexts, such as the information systems success model (DeLone & McLean, 2003), technology acceptance model (Davis, 1989), the extended TAM model (Venkatesh & Davis, 2000), and the unified theory of acceptance and use of technology (Venkatesh et al., 2003). Among all the above frameworks, the TAM framework is one of the most extensively used theoretical frameworks in studies relating to technology acceptance (Yuen & Ma, 2008).

Davis (1989) posited that TAM attempts to explain the factors that determine computer acceptance, and the model, therefore, is capable of providing insights into user acceptance and adoption for varied user populations across a wide range of computing technologies. The TAM framework has proved its robustness, validity, and parsimony in several empirical studies (Davis & Venkatesh, 1996; Horton et al., 2001), which have been conducted on varying sample sizes and users across different populations, organizations, applications, and industries.

The TAM framework has found application in various studies in the online space. Bauerová and Klepek (2018) investigated OGS intention using the TAM model. Driediger and Bhatiasavi (2019) employed the TAM framework to assess consumer acceptance and usage behavior in OGS. Sarmah et al. (2021) extended the TAM framework using trust as an external variable to assess intentions and actual use of mobile wallets by millennials. Chauhan et al. (2016) employed the TAM model constructs to understand the influence of demographic factors, such as age, gender, etc., on adoption behavior toward Internet banking in India.

The variable SN has been adopted from the theory of reasoned action (TRA), which posits that the intention of an individual to indulge in a particular behavior depends on the social pressure on them. SN has been defined as “a person's perception of the social pressures put on him to perform or not perform the behavior in question” (Ajzen & Fishbein, 1980, p. 6). Schepers and Wetzels (2007) studied the overall impact of SN in conjunction with the TAM model and concluded that SN has a positive influence on PU.

Constructs and Hypotheses

The TAM-Related Constructs – PEOU, PU, ATT, and OGPI

PEOU has been outlined as one of the critical factors that influence a user's decision to adopt a particular technology and its usage (Davis, 1989). Studies across disciplines have stipulated that users typically use technology or technology-based systems that they perceive to be easy to understand and use. Davis (1989), therefore, defined PEOU as “the degree to which a prospective user expects the target system to be free of effort.”

The PU of a system has been defined as “the extent to which the user believes that using the new technology will improve the user's performance” (Davis, 1989). The causal effect of PEOU on PU has been established by several studies (Gefen, 2003; Venkatesh & Davis, 2000). Other researchers have also proffered that PEOU has an impact on PU, ATT, and behavioral intention in studies carried out in mobile commerce (Wu & Wang, 2005) and electronic commerce (Ha & Stoel, 2009).

ATT can be construed to be the state of mind through which individuals perceive the environment around them and also determine how to respond to stimuli in the environment (Jasti & Syed, 2019). ATT has been defined as “an individual's acquired pre-disposition to react positively or negatively to a given situation that needs to be addressed” (MacKenzie & Lutz, 1989). Several studies in the online shopping context have construed ATT to be mediating the relationship between the TAM variables of PEOU, PU, and behavioral/ purchase intentions (Bauerová & Klepek, 2018; Kurnia & Chien, 2003; Sreeram et al., 2017).

The TAM framework has postulated that individuals' perception of ease of use and usefulness can affect their attitude, which can create a behavioral intention to adopt a specific technology (Davis, 1989). Accordingly, from an OGS perspective, we define OGPI as “the behavioral intention of the consumer to purchase groceries online.” The following hypotheses are put out by this research study based on the TAM framework of PEOU, PU, ATT, and the intention to employ a specific technology:

- ↗ **Ha1** : PEOU has a significant positive effect on PU in OGS.
- ↗ **H01** : PEOU has no significant effect on PU in OGS.
- ↗ **Ha2** : PEOU has a significant positive effect on ATT in OGS.
- ↗ **H02** : PEOU has no significant effect on ATT in OGS.
- ↗ **Ha3** : PU has a significant positive effect on ATT in OGS.
- ↗ **H03** : PU has no significant effect on ATT in OGS.
- ↗ **Ha4** : ATT has a significant positive effect on OGPI.
- ↗ **H04** : ATT has no significant effect on OGPI.

Subjective Norms (SN)

The variable SN has been adopted from the TRA, which posits that the intention of an individual to indulge in a

specific behavior is based on the social pressure on them. SN has been defined as “a person's perception of the social pressures put on him/her to perform or not perform the behavior in question” (Ajzen & Fishbein, 1980, p. 6). SN can also be construed as the social pressure perceived by individuals to indulge in a particular behavior.

Extending this concept to OGS, Driediger and Bhatiasavi (2019) contended that consumers would carry out OGS if they felt that people who were important to them and were influential in their environment would think that OGS is a good option for grocery shopping. Venkatesh and Davis (2000), in their extended TAM, have stipulated that SN has a positive impact on PU. This research study, therefore, attempts to hypothesize as follows:

⇒ **Ha5** : SN has a significant positive effect on PU in OGS.

⇒ **H05** : SN has no significant effect on PU in OGS.

Convenience (CON)

CON has been long associated with the behavior of consumers to adopt non-store-based shopping options such as online shopping (Eastlick & Lotz, 1999). OGS offers consumers the benefits related to the “when” and the “where” of shopping. Childers et al. (2001) contended that consumers who perceived greater CON in shopping online also perceived greater ease of use as well as increased usefulness of OGS. Consumers who perceive the value of CON in online shopping are also more likely to indulge in purchases over the Internet and may also spend more money on shopping online (Clemes et al., 2014). This research study, therefore, proposes to examine the following hypotheses:

⇒ **Ha6** : CON has a significant positive effect on PEOU in OGS.

⇒ **H06** : CON has no significant effect on PEOU in OGS.

⇒ **Ha7** : CON has a significant positive effect on PU in OGS.

⇒ **H07** : CON has no significant effect on PU in OGS.

Mediation Effects

The TAM model proposed by Davis (1989) has received significant support from academia as well as industry practitioners over the previous few decades. The TAM model is well-established as a framework for forecasting customer adoption of new technologies (Ahmad et al., 2020). Various studies have used this model to examine consumer behavior in online shopping (Ha & Stoel, 2009; Lin & Sun, 2009), and as such, the essential relationships between the TAM variables have been well-researched. Sreeram et al. (2017) studied the various factors that influenced satisfaction and consumer loyalty in OGS in India and concluded that PEOU had a positive impact on PU, which, in turn, had a positive impact on the behavioral intentions of consumers. They also examined SN, which was posited as a social influence in their study and found that social influence had a positive effect on PU in OGS. Kurnia and Chien (2003) proffered that there was a positive relationship between PEOU and ATT as well as PU and ATT in OGS through a study conducted in Australia. The authors also found that there was a significant relationship between PEOU and PU, PU and behavioral intentions, as well as between ATT and behavioral intentions.

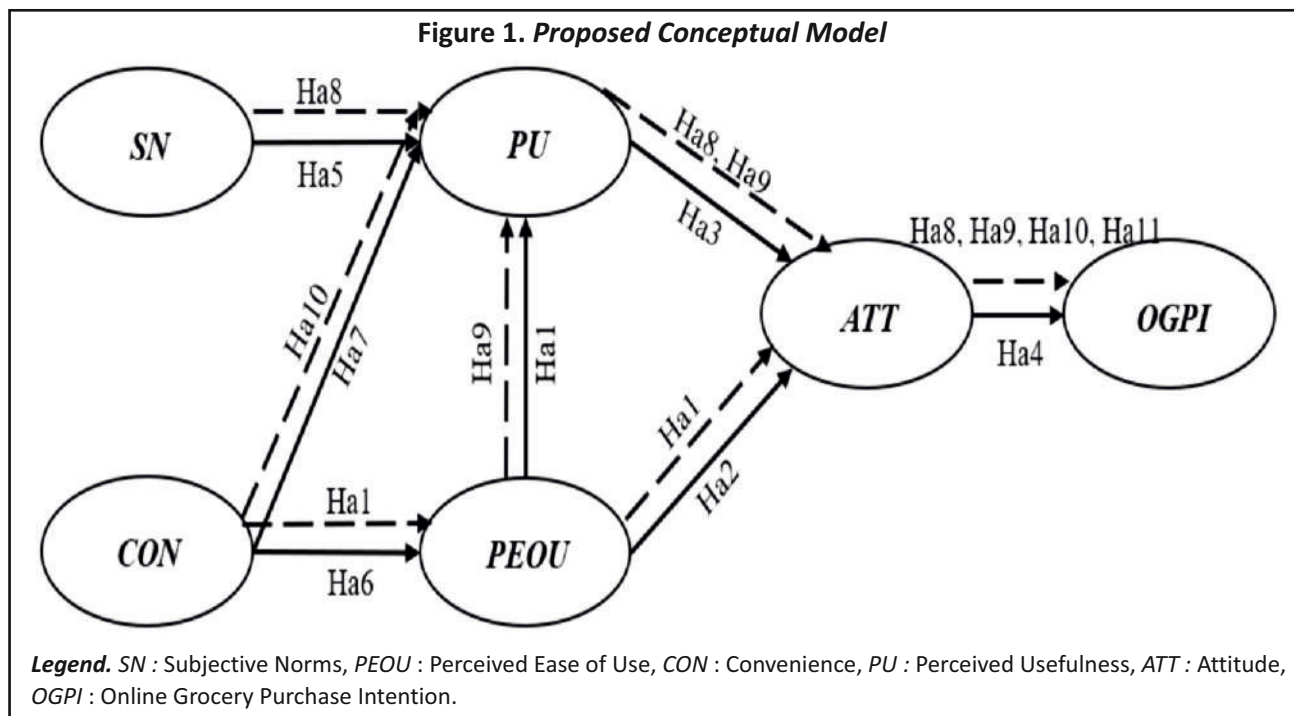
The empirical evidence above indicates that researchers have posited the PEOU, PU, and ATT as mediators in relationships between various external constructs and behavioral intentions through simple mediation analysis (Driediger & Bhatiasavi, 2019; Hansen et al., 2004; Jasti & Syed, 2019). However, the influence of SN and CON as external constructs on the TAM model has not been given adequate attention in the literature. Additionally, the

sequential mediation relationships have not been researched in depth, with only one study examining the sequential mediation effects of trust and PU between PEOU and behavioral intentions and between SN and behavioral intentions in the online fashion retail industry (Rao et al., 2020).

Given the above argument, this research study theorizes that SN, PEOU, and CON are related to OGPI initially through PU and, after that, through ATT. Additionally, this study theorizes that PEOU and ATT also sequentially mediate the relationship between CON and OGPI. Based on the above discussion, the following hypotheses are proposed:

- ↪ **Ha8** : The relationship between SN and OGPI is sequentially mediated by PU and ATT.
- ↪ **H08** : The relationship between SN and OGPI is not sequentially mediated by PU and ATT.
- ↪ **Ha9** : The relationship between PEOU and OGPI is sequentially mediated by PU and ATT.
- ↪ **H09** : The relationship between PEOU and OGPI is not sequentially mediated by PU and ATT.
- ↪ **Ha10** : The relationship between CON and OGPI is sequentially mediated by PU and ATT.
- ↪ **H010** : The relationship between CON and OGPI is not sequentially mediated by PU and ATT.
- ↪ **Ha11** : The relationship between CON and OGPI is sequentially mediated by PEOU and ATT.
- ↪ **H011** : The relationship between CON and OGPI is not sequentially mediated by PEOU and ATT.

Apropos to the above discussion and hypotheses, the conceptual model for this research study is provided in Figure 1.



Research Methodology

Measures

This research study adopted a descriptive, cross-sectional approach to test the hypotheses developed. The study examined the relationships between the exogenous constructs (SN, CON), the mediators (PEOU, PU, and ATT), and the endogenous construct (OGPI). A field survey was conducted through the use of a structured questionnaire, which consisted of 25 items on the constructs outlined above and demographic questions.

The constructs of PEOU are measured using three items from Davis (1989) and two items from Kurnia and Chien (2003). PU is also measured using three items from Davis (1989) and two items from Kurnia and Chien (2003). CON is measured by adapting four items from Childers et al. (2001). SN is measured using two items from Hansen et al. (2004) and two items from Venkatesh and Davis (2000). ATT is measured using two items from Hansen et al. (2004) and three items from Kurnia and Chien (2003). OGPI is measured using one item from Venkatesh and Davis (2000) and two items from Putrevu and Lord (1994). Twenty-five items are employed to measure the six constructs used in the study. A 7-point Likert scale is used wherein each item is measured on a range from *strongly disagree* to *strongly agree*.

Sampling

Sampling was carried out purely through electronic channels, chat applications, and social media during the period from January to April 2022 across multiple cities in Maharashtra (Mumbai, Pune, Nagpur, and Nasik). The questionnaire was shared with 830 potential respondents, from which a total of 453 responses were received, accounting for a response rate of 54.58%. As the data did not have any missing values, the entire sample set is used for data analysis. Table 1 provides the demographic profile of the respondents.

Table 1. Demographic Profile of the Respondents

Categories	Frequency	%
Gender		
- Male	159	35.1
- Female	294	64.9
Age		
- 18–24 years	29	6.40
- 25–34 years	155	34.2
- 35–44 years	111	24.5
- 45–54 years	86	19.0
- Above 55 years	72	15.9

Analysis and Results

KMO and Bartlett's Test

The measures for the Kaiser–Meyer–Olkin (KMO) and Bartlett test to assess sampling adequacy are provided in Table 2. These measures are within acceptable limits.

Table 2. KMO and Bartlett's Test

KMO measure of sampling adequacy		0.941
Bartlett's test of sphericity	Approx. chi-square	9587.938
	df	561
	Sig.	0.000

Reliability and Validity of the Constructs

To assess the conceptual model's reliability, Cronbach's alpha coefficients are extracted. As shown in Table 3, the values for each of the constructs are found to be satisfactory, as per Hair et al. (2014). Likewise, the construct

Table 3. Factor Loadings and Indicators for Reliability and Validity

Construct/ Variable	Items in Questionnaire	Factor Loadings	Cronbach's Alpha	AVE	CR
PEOU	Learning to use the OGS website is easy for me.	0.678	0.823	0.505	0.804
	I find OGS through the website/app to be flexible.	0.731			
	It is easy to become skillful at using OGS.	0.719			
	My interaction with the process of OGS is clear and understandable.	0.716			
PU	OGS enables me to save time.	0.637	0.879	0.484	0.824
	The online grocery website/app makes it easier for me to do my grocery shopping.	0.698			
	The OGS website/app helps me to be more effective in purchasing groceries.	0.681			
	Using online shopping can improve my efficiency in purchasing groceries.	0.705			
	OGS is convenient to use.	0.753			
SN	Members of my family think that it is a good idea to buy groceries online.	0.845	0.836	0.546	0.827
	Most of my friends and acquaintances think that OGS is a good idea.	0.679			
	People who influence my behavior think that I should buy groceries online.	0.702			
	People who are important to me think that I should buy groceries online.	0.719			
CON	OGS helps me save time while shopping.	0.736	0.804	0.493	0.789
	OGS is less time-consuming.	0.609			
	OGS is a convenient way to shop for groceries.	0.881			
	OGS allows me to shop for groceries whenever I choose.	0.531			
ATT	Online shopping for groceries is attractive to me in my daily life.	0.790	0.90	0.632	0.896
	Buying groceries online is well suited to the way in which I usually shop for groceries.	0.781			
	Shopping for groceries online is a good idea.	0.785			
	Using OGS to purchase groceries is pleasant.	0.796			
	Using OGS is beneficial to me.	0.821			
OGPI	Given that I have access to the Internet, I would prefer to purchase groceries online.	0.883	0.879	0.737	0.894
	I intend to go online for grocery shopping whenever I need groceries.	0.809			
	I will regularly use OGS in the future.	0.882			

validity is confirmed by conducting confirmatory factor analysis (CFA), where values of the factor loading, composite reliability (CR), and average variance extracted (AVE) are measured. As stated in Table 3, values of all 25 items reveal a factor loading of more than 0.4, thus indicating good convergent validity. The values of CR are also found to be in the range of 0.789 and 0.896, therefore, acceptable as per Nunnally (1978). For AVE, Fornell and Larcker (1981) have advised the value of 0.5. For this research study, four constructs are above this value, and two are slightly less than 0.5. Nevertheless, in the same study, Fornell and Larcker (1981) also stated that “based on *pn* (composite reliability) 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” (p.46). Furthermore, this has been supported by Punjani and Kumar (2021) and Punjani and Mahadevan (2022).

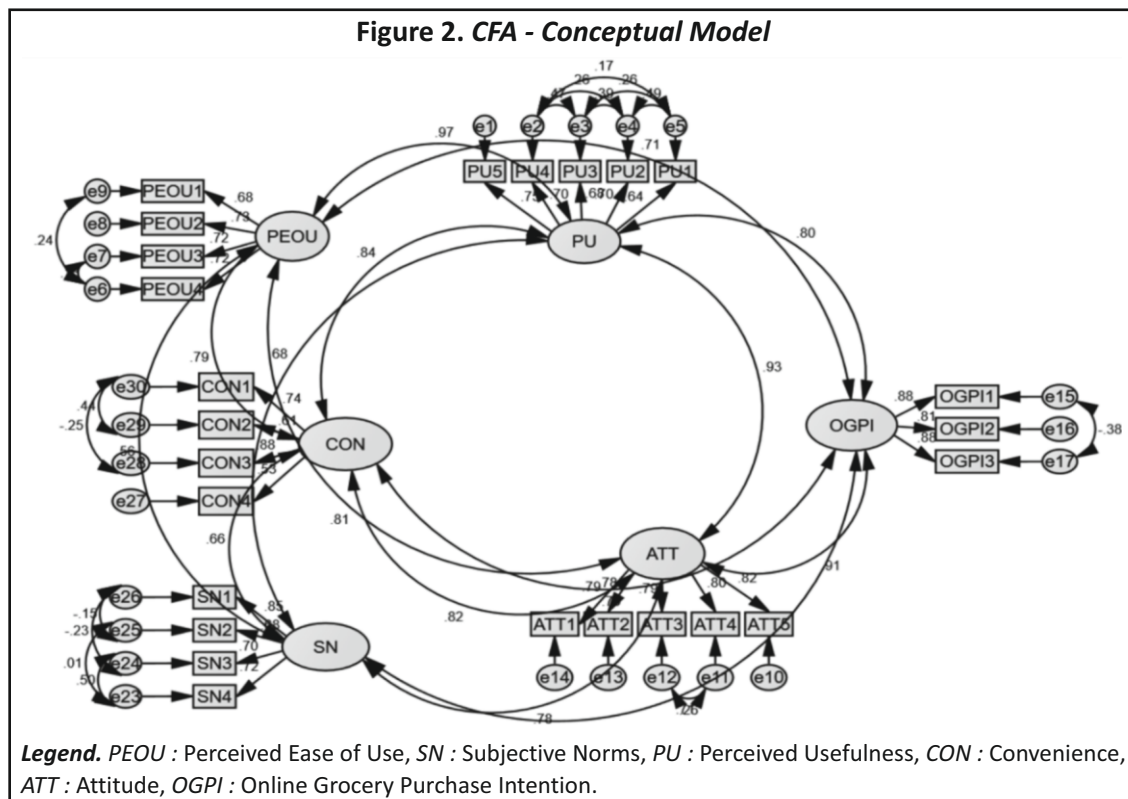


Table 4. CFA - Fit Indices

Fit Indices	Suggested Value	Observed Value	Result
CMIN/df (Minimum discrepancy as indexed χ^2)	Between 1 and 3, " <i>p</i> " is less than 0.05	2.054 <i>p</i> = 0.001	Good fit
GFI (Goodness of fit index)	More than 0.9	0.920	Good fit
CFI (Comparative fit index)	More than 0.95	0.966	Good fit
NFI (Normed-fit index)	More than 0.95 (good fit) Between 0.9 and 0.95 (acceptable fit).	0.935	Acceptable fit
TLI (Tucker – Lewis index)	More than 0.95	0.958	Good fit
PNFI (Parsimonious normal fit)	More than 0.6	0.761	Good fit
RMSEA (Root-mean-square error of approximation)	Less than 0.08	0.048	Good fit
SRMR (Standardized root-mean-square residual)	Less than 0.08	0.037	Good fit

Furthermore, since this research study has adapted the established scales, the measurement model is tested through CFA, as depicted in Figure 2. Using AMOS 24 software, values of several fit indices are determined, and as noted in Table 4, these values indicate a good model fit (Hair et al., 2014; Tabachnick & Fidell, 2007).

Because structural equation modeling (SEM) is frequently utilized in consumer behavior-related research, it is chosen to validate the proposed hypotheses of this study (Kazi et al., 2018; Kumar & Malik, 2022; Pahari et al., 2023). First, linear regression is used to examine direct correlations between the constructs (see Table 5). Seven direct hypotheses are thus accepted because of the significant p -values ($p < 0.05$) that were obtained. Figure 3 shows the structural model for each of the direct linkages.

To test the significance of the four sequential mediation hypotheses (Ha8 to Ha11), the method suggested by Preacher and Hayes (2004) is utilized. The mediation effect is measured using Andrew F. Hayes' "PROCESS" macro for SPSS, which reveals that there exists a complete mediation for the relationship PEOU – PU – ATT – OGPI (Ha9). Table 6 shows that all of the remaining alternative hypotheses (Ha8, Ha10, and Ha11) are found to exhibit partial mediation.

Table 5. Results of Hypotheses Testing

Hypotheses	Direct Relationships	β - value	Significance	Result
Ha1	$PEOU \rightarrow PU$	0.803	***	Significant
Ha2	$PEOU \rightarrow ATT$	0.844	***	Significant
Ha3	$PU \rightarrow ATT$	0.836	***	Significant
Ha4	$ATT \rightarrow OGPI$	0.936	***	Significant
Ha5	$SN \rightarrow PU$	0.499	***	Significant
Ha6	$CON \rightarrow PEOU$	0.566	***	Significant
Ha7	$CON \rightarrow PU$	0.717	***	Significant

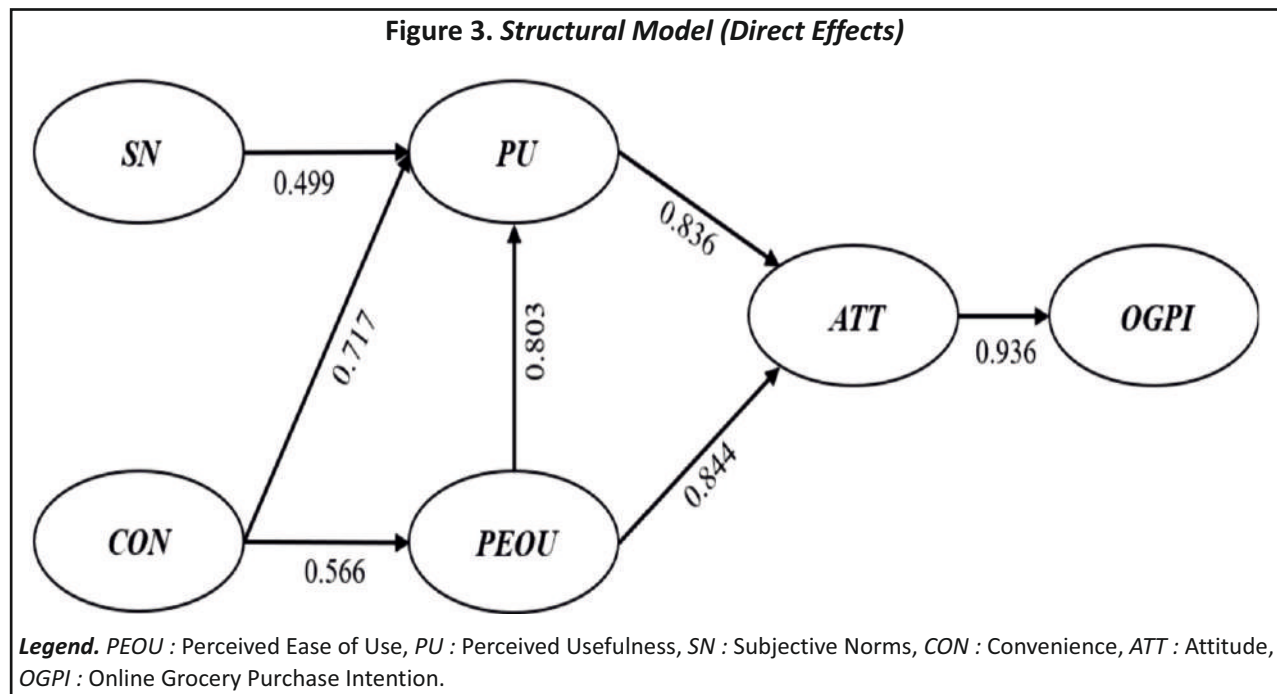


Table 6. Sequential Mediation Results

	Total Effect			Direct Effect			Indirect Effect			Outcome	
									Bias Corrected Bootstrap Confidence Intervals (95%)		
	Est	SE	t-value	Est	SE	t-value	Est	SE	LLCI	ULCI	
Ha8 :											
SN-PU-ATT-OGPI	0.735	0.044	16.838	0.171	0.041	4.143	0.192	0.023	0.150	0.238	Partial Mediation
Ha9 :											
PEOU-PU-ATT-OGPI	0.857	0.055	15.587	0.064	0.057	1.126	0.281	0.030	0.223	0.342	Full Mediation
Ha10 :											
CON-PU-ATT-OGPI	0.845	0.050	16.92	0.169	0.051	3.333	0.257	0.027	0.206	0.311	Partial Mediation
Ha11 :											
CON-PEOU-ATT-OGPI	0.845	0.050	16.92	0.187	0.050	3.723	0.179	0.026	0.131	0.231	Partial Mediation

Legend. *Est* : Estimate, *LLCI* : Lower-Level Confidence interval, *ULCI* : Upper-Level Confidence Interval.

Discussion

This research study attempts to extend the TAM model in the OGS context by including the exogenous constructs SN and CON. A conceptual framework is designed with seven direct and five mediating hypotheses. All these 12 hypotheses are accepted with statistically significant values. Out of the five mediating hypotheses, one is found to have a full sequential mediation, and the remaining four are observed to have partial sequential mediation. CON is found to influence PEOU and PU significantly, and SN also has a substantial impact on PU. The direct relationships are found to be significant among PEOU-PU, PEOU-ATT, PU-ATT, and ATT-OGPI, which is in line with Davis's TAM framework. Thus, this research explains TAM's theoretical significance in the online grocery context. These findings indicate that CON of OGS affects consumers' PEOU and PU and further SN, i.e., consumers' perceptions about the social pressure also influence their PU. The PEOU for OGS is found to be influencing consumers' PU as well as ATT towards using online grocery apps/ websites. Additionally, consumers' ATT toward OGS is also affected by PU. Ultimately, ATT results in affecting the purchase intentions of consumers for buying groceries online. These findings are found to be consistent with Bauerová and Klepek (2018) and Kurnia and Chien (2003).

Furthermore, this research study has stressed the sequential mediation relationship among CON, SN, and other TAM constructs (Ha8 to Ha12). PU and ATT are found to be sequentially mediating the relationship between OGPI as an endogenous construct and SN, PEOU, and CON as exogenous constructs, as hypothesized in Ha8, Ha9, and Ha10. This is a significant contribution of this research study as previous researchers have investigated the sequential mediation effect of constructs like trust and PU (Rao et al., 2020) and ATT and intention (Ahmad et al., 2020). Still, the combined effect of PU and ATT as sequential mediators in the online grocery context has not yet been researched. Thus, while considering the impact of SN, PEOU, and CON on OGPI, online grocery marketers need to focus on consumers' PU and ATT as well.

Furthermore, the relationship between CON and OGPI is also found to be sequentially mediated by PEOU and ATT, which indicates the significance of developing perceptions of ease while using online grocery apps/websites. Complete mediation demonstrated by Ha9 (PEOU–PU–ATT–OGPI) is in line with the TAM framework, and thus, this research validates TAM's theoretical significance in the online grocery context. This also has implications for online grocery retailers as consumers who find a grocery website easy to use would perceive it to be helpful and have a positive attitude, resulting in a favorable purchase intention.

Conclusion

The findings of this research study have validated the extendibility of the TAM framework with the addition of the two external constructs – SN and CON. All the constructs preferred by the TAM framework and the associated relationships envisaged, in addition to that, demonstrated applicability in the dataset considered by this study. It is evident from the data analysis that consumers who perceived the CON offered by OGS also felt that shopping online was accessible and useful. Additionally, consumers place great importance on the opinions of people who are important to them. This was amply evident from the fact that SN had a significant impact on the consumers' perception of the usefulness of OGS. The importance of CON and SN on the consumers' PEOU and PU, thereby affecting their attitude towards OGS, has emerged as a significant takeaway from this research. The suitability of the TAM framework and its constructs of PEOU and PU having an impact on the consumers' attitude and intention towards OGS is also a significant finding. The consumers' ultimate intentions (OGPI) being driven by the sequential mediation of PU–ATT and PEOU–ATT is also a significant contribution made by this study, which is different from the other existing studies in the online grocery domain.

Implications

Theoretical Implications

This research study enhances the existing research literature in the domain of online grocery by identifying factors such as SN and CON, which have not been extensively examined in the OGS context and further empirically testing their influence on OGPI. The effect of both these constructs together in extending the TAM framework is an under-researched area, and this research study seeks to fill this gap. Secondly, the study also revalidates the applicability of the TAM framework and the mediating roles of both PU–ATT and PEOU–ATT in enhancing the relationship between the exogenous constructs and the consumers' intention to indulge in OGS. A third contribution of this research study is the examination of the extended TAM framework in an inherently Indian context concerning OGS. This research study thus enriches the academic literature in the OGS domain.

Managerial Implications

Perceptions of the consumers concerning how easy it is to shop for groceries online (reflected by PEOU) and the usefulness of the online route to carry out grocery purchases (reflected by PU) have a significant influence on the attitude that consumers would profess toward online grocery retail. The PEOU and PU are, in turn, influenced by the CON that is offered to the consumer through enabling online grocery purchases at any time and any place. Online grocery retailers, therefore, need to enhance their website capabilities and interface and make it as easy as possible for consumers to carry out their transactions online. Enhanced perceptions of CON by a large mass of consumers would lead to greater word of mouth that would translate into consumers advocating the online route for grocery purchases to their near and dear ones (indicated in this research study by the significant influence of

SN). The attitude of consumers toward OGS, along with the perception of ease of use and usefulness, also play a significant mediating role in influencing the overall intention of the consumers to use the online route to purchasing groceries. This attitude would then steer the consumers toward a firm intention to shop for groceries online.

Limitations of the Study and Future Research Directions

This research study is carried out using responses from Indian consumers, and therefore, the results of this study may not be amenable to generalization across other cultures. This limitation, however, opens up this research domain for future research across multiple cultures. This research study collected data from respondents who purchase groceries through websites and/or mobile applications. However, with the increasing use of mobile apps for online purchases, it may be interesting to examine whether the specific type of online platform used has any impact on the constructs examined, and this could offer scope for further research. Finally, while this research study extends the TAM framework through the inclusion of SN and CON, further studies could examine the influence of other constructs such as enjoyment, website aesthetics, personalization, e-service quality, and perceived risk to the intention of consumers to make online grocery purchases.

Authors' Contribution

Kala Mahadevan conceived the idea to undertake the empirical study. Krunal K. Punjani and Kala Mahadevan conceptualized the methodology, developed the questionnaire using established scales, and carried out the data collection. Krunal K. Punjani carried out the data analysis in consultation with Dr. Sujata Joshi. Kala Mahadevan and Krunal K. Punjani wrote the manuscript, and Dr. Sujata Joshi supervised and edited the manuscript.

Conflict of Interest

The authors certify that they have no affiliations with or involvement in any organization or entity with any financial interest or non-financial interest in the subject matter or materials discussed in this manuscript.

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