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Article

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An empirical assessment of online shopping behavior among Saudi college students: applying SEM

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ABSTRACT

Purpose: In such a volatile environment, it is difficult to understand customer behavior, especially in online market scenarios, and understanding this area is critical for developing online retailers' strategies. In the Kingdom of Saudi Arabia (KSA), the number of online users is growing very rapidly, before covid-19 online shopping is at a nascent stage, but now it is entering a growth stage with indefinite lockdowns and restrictions growing worldwide. In this scenario, the lack of knowledge regarding online shopping behavior makes it very difficult to measure it. Therefore, this research is designed to understand online shopping behavior and at the same time develop empirical measures for the assessment of online shopping behavior.

Design/Approach: This study utilizes the extended Technology Acceptance Model (TAM) to examine the factors that influence Saudi college students' online shopping behavior for the assessment and testing of hypotheses. Structural equation Modeling (SEM) was used.

Proposed Findings: The outcomes of this research are as follows: Perceived enjoyment, perceived ease of use, social norms, and perceived risk tend to have significant influences on online shopping behavior among college students in the Kingdom of Saudi Arabia (KSA).

Originality/Value: As stated above that before covid-19, online shopping is at a nascent stage in the Kingdom of Saudi Arabia and is now growing rapidly. To address this research gap, this study analyzes the factors influencing customers' decisions to shop online through a sample of students from Saudi universities. This research makes a unique contribution to understanding, developing, and empirically testing these measures. This study also contributes to the empirical application of the technology acceptance model (TAM) to Saudi consumers.

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1. Introduction

In today's hypercompetitive markets, organizations need to be innovative and should know how to attract and retain customers. With developments in the field of Information Technology and growth in the Internet, more innovative methods to manage information are being introduced, and businesses are using these innovative methods to serve their customers better. Internet shopping is also growing, and in Asia, Europe, and the USA, the growth of online sales surpasses traditional sales. Moreover, it is predicted that this will further increase and the trend will continue. Yang et al. (2007) suggest that retail industries have observed changing customer behavior from showrooming to webrooming.

This change has rapidly engulfed the markets of developing and developed nations due to the power of the Internet and indefinite lockdowns during the period of covid-19. Numerous factors affect consumer behavior, such as economic, psychological, physiological, and other external factors. This behavior of exploiting the potential of the online market posed research curiosity to investigate the factors that impact consumer behavior in online markets. Gopal and Jindoliya (2016) and Heijden (2012) also

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concluded this notion and stated that the continuous evolution of new technologies is making consumer behavior and research based on them more challenging.

The success of many companies such as Amazon, Flipkart, and Alibaba have urged many other companies to change their business models from traditional to online modes. In this regard, it is worth noting that global electronic retail sales were USD 840 billion in 2014 and are predicted to reach USD 1606 billion in 2022. According to the McKinsey Global Institute (2013), only China surpassed electronic retail sales of USD 190 billion in 2012 and is estimated to reach more than 650 billion dollars in 2022.

This upcoming trend shows promising market potential. The research was conducted in this regard in the context of Saudi consumers, and it was found that the same trend prevailed in the Kingdom of Saudi Arabia. It was concluded that lack of awareness, computer literacy, use of the Internet, cost, and language are the major barriers associated with the adoption of online shopping in developing countries (Ahmar et al., 2016). Al-Mobaireek (2013) conducted a survey in Africa based on a sample of Egyptian customers and concluded that online activities mainly constitute Internet surfing checking on emails and online shopping ranks last in the list.

However, the number of online shoppers is predicted to increase with the development of the internet. The global Internet penetration rate is approximately 60%. The number of Internet users and online shoppers in the Kingdom of Saudi Arabia (KSA) is also rapidly increasing. Especially in the era of covid-19, the emergence of many new websites for online shopping has been witnessed, especially web centric ones, which try to meet customer demand through online modes in turbulent times. Therefore, there is a need to investigate the factors affecting the behavior of online customers to provide better decision-making for companies engaged in online shopping.

Considering that online shopping is at a nascent stage in the Kingdom of Saudi Arabia (KSA), there is a need to investigate the factors that influence the adoption of online shopping among Saudi students. To fill this research gap, this study utilizes a sample of graduate and undergraduate students studying at different universities in the Kingdom of KSA. The study also utilizes the technology acceptance model (TAM) and empirically contributes to the application of the TAM to Saudi consumers in order to enhance the knowledge of online retailers about user acceptance and the factors that drive consumers towards online shopping.

2. Technology acceptance model (TAM): framing literature

To understand and measure consumer behavior, the adoption of information systems plays a significant role in healthy potential. However, many companies have failed to apply these systems in their businesses. Davis (1989) proposed the technology acceptance model (TAM) to predict consumers' behavior in adopting new information systems. According to this model, perceived usefulness affects individual behavior. Perceived usefulness is the tendency of a person to assume the usefulness of the system; perceived ease of use (PEOU) is the tendency of the system regarding the effort required to use it.

The chance of adopting any technology is directly proportional to the ease and usefulness of the system. The technology acceptance model has been updated by many researchers, and many new variables have been added. This model is of great significance and has been applied by many researchers owing to its simplicity (Al-Adwan et al., 2022; King & He, 2006; Lai, 2017; Ma & Liu, 2004; Schepers & Wetzels, 2007).

Moreover, the model has been used widely and has gained popularity for investigating the adoption of technology in the context of online shopping customers in both developed and developing countries (Albarq, 2014; Faqih, 2013; Heijden, 2012; Jin et al., 2015; Yang et al., 2007). However, many studies have advocated that a close examination is needed when applying this model to different contextual and cultural settings (Al-Hattami et al., 2023; Gopal & Jindoliya, 2016; Lim & Ting, 2012; Wei et al., 2018; Yadav & Mahara, 2019; Zhou et al., 2007).

2.1. The proposed model and hypothesis development

2.1.1. Perceived usefulness (PU)

Perceived usefulness (PU) is a central concept in the Technology Acceptance Model (TAM) proposed by Davis (1989). It refers to the degree to which a person believes that using a particular system would

enhance their job performance. In the context of online shopping, PU can be understood as the extent to which consumers believe that online shopping improves the efficiency and effectiveness of their shopping experience. Research by Kim et al. (2004) and Zarrad and Debabi (2012) highlights that the ease of searching for information, comparing prices, and placing orders online contributes significantly to the perceived usefulness of online shopping. Studies have consistently shown that PU positively influences consumers' attitudes and intentions towards online shopping, thus supporting the hypothesis that PU has a direct influence on actual online shopping behavior (AOSB). Therefore, the following hypotheses were tested:

H1: There is a direct influence of PU on Actual online shopping behavior (AOSB)

2.1.2. *Perceived ease of use (PEOU)*

Perceived ease of use (PEOU) is a critical concept in understanding consumer behavior in the context of online shopping. PEOU refers to the degree to which consumers believe that engaging in online shopping will require minimal effort, implying that no additional training or specialized skills are necessary to complete the process. This perception significantly influences consumers' willingness to adopt and use online shopping platforms.

Research has consistently demonstrated a positive relationship between PEOU and actual online shopping behavior (AOSB). Johar and Awalludin (2011), for example, found that consumers are more likely to shop online if they perceive the process to be straightforward and user-friendly. Similarly, Kim (2012) highlighted that the simplicity and ease of navigation on online shopping platforms play a pivotal role in encouraging repeat purchases and fostering customer loyalty. Li (2016) further supported these findings by illustrating that an intuitive and accessible online shopping experience can significantly enhance consumers' satisfaction and increase their likelihood of engaging in online shopping.

The underlying rationale for this relationship is grounded in the Technology Acceptance Model (TAM), which posits that PEOU is a fundamental determinant of users' acceptance of technology. According to TAM, when consumers perceive that using an online shopping platform is easy and requires minimal effort, they are more likely to develop a positive attitude towards it, leading to increased usage intentions and actual behavior.

In light of this theoretical foundation and empirical evidence, the following hypothesis is proposed to examine the impact of PEOU on AOSB:

H2: There is a direct influence of PEOU on actual online shopping behavior (AOSB).

2.1.3. *Perceived enjoyment (PE)*

Perceived enjoyment (PE) refers to the level of pleasure and satisfaction a customer experiences during the online purchase process through an online shopping portal. It is a critical factor in influencing consumer behavior in the context of e-commerce. When consumers find the online shopping experience enjoyable, they are more likely to spend additional time on the website, explore more products, and consequently, increase their likelihood of making a purchase. This positive experience can lead to higher customer retention and increased sales for the online retailer.

The concept of perceived enjoyment is supported by the work of several researchers. For instance, Kim (2012) highlighted that when customers perceive an online shopping experience as enjoyable, it significantly enhances their engagement and willingness to make purchases. Similarly, Li (2016) found that the enjoyment derived from shopping online directly influences consumers' attitudes towards the shopping portal, thereby affecting their actual online shopping behavior (AOSB).

Research indicates that perceived enjoyment can be a stronger predictor of online shopping behavior than other factors like perceived usefulness or ease of use. This is because enjoyment adds an emotional component to the shopping experience, which can create a more profound and lasting impact on customer behavior. When customers enjoy their shopping experience, they are likely to develop a positive attitude towards the online store, leading to repeated visits and purchases.

Therefore, the hypothesis for this relationship can be stated as follows:

H3: There is a direct influence of Perceived Enjoyment (PE) on Actual Online Shopping Behavior (AOSB).

2.1.4. *Perceived risk (PR)*

It is also believed that online shopping involves risk and uncertainty, and consumers are more vulnerable to these risks than traditional modes of shopping. Consumers perceive risk if they face negative outcomes, uncertainty, or negative consequences (Kim et al., 2009). There are numerous risks involved in online shopping transactions, which are well classified by Li and Huang (2009). There are risks associated with the transactions, known as transaction risk, which is related to products or services and arises when they do not provide intended benefits or remain undelivered. There are risks associated with online transactions, as they involve credit card usage and the misuse of personal data. All these risks are important and should be considered.

Therefore, this study includes all types of risk involved, as it is believed that if the risk is higher, customers try to avert online shopping and try to move to traditional modes of purchase. Therefore, Choi and Lee (2003), Dabrynin and Zhang (2019), and Kim (2012), concluded that perceived risk hurts customers' online shopping behavior. This study also hypothesized the same relationship between perceived risk and online shopping behavior. Therefore, the following hypothesis is proposed:

H4. There is a negative influence of PR on Actual online shopping behavior (AOSB)

2.1.5. *Subjective norms (SN)*

Subjective norms (SN) refer to the influence of social pressure that individuals perceive from their social environment regarding whether they should engage in a particular behavior. These norms are based on the beliefs about how people important to the individual, such as family, friends, and colleagues, view and judge the behavior in question. When it comes to online shopping, subjective norms encompass the perceived expectations of others regarding the use of online shopping platforms.

Subjective norms play a crucial role in shaping individual behaviors because humans are inherently social beings who often seek approval and acceptance from their peers. The perception of what others think can significantly impact decision-making processes. For instance, if a person believes that their peers view online shopping positively, they are more likely to engage in online shopping themselves. Conversely, if the social circle views online shopping negatively, the individual may be discouraged from engaging in it, despite personal preferences.

Numerous studies have established a strong direct relationship between subjective norms and online shopping behavior. For example, Schepers and Wetzels (2007) and Yu and Wu (2007) found that subjective norms significantly influence an individual's intention to shop online. These studies suggest that when individuals perceive positive opinions and support from their social circle regarding online shopping, they are more likely to participate in it.

The underlying mechanism can be understood through the lens of social influence theory, which posits that individuals conform to the expectations of others to gain social approval or avoid social disapproval. This conformity is particularly evident in online shopping behaviors where social validation and the fear of missing out (FOMO) can drive consumer actions.

Given the strong empirical evidence supporting the influence of subjective norms on online shopping behavior, the following hypothesis is proposed:

H5. There is a direct influence of Subjective Norms (SN) on Actual Online Shopping Behavior (AOSB).

2.1.6. *Internet experience (IE)*

The concept of Internet experience (IE) has garnered significant attention in the realm of technology acceptance and online behavior research. Venkatesh and Bala (2008) integrated IE into the extended Technology Acceptance Model (TAM) as a moderating variable that influences the relationship between perceived ease of use and perceived usefulness. Their work posits that individuals with greater internet experience are likely to find technology easier to use and more useful, thus enhancing their overall acceptance and utilization of online systems.

Furthermore, the significance of IE extends beyond the context of technology acceptance to encompass online shopping behavior. Amoroso and Hunsinger (2009) highlighted that individuals with extensive IE are more adept at navigating online shopping platforms, which in turn positively influences their

shopping behaviors and decisions. Similarly, Zarrad and Debabi (2012) corroborated these findings, emphasizing that a higher level of IE equips users with the necessary skills and confidence to engage more frequently and effectively in online shopping activities.

The correlation between IE and online shopping behavior can be attributed to several factors. Experienced internet users are generally more familiar with various online shopping interfaces, understand the procedures for secure transactions, and are more comfortable with the digital environment. This familiarity reduces the perceived risks and barriers associated with online shopping, thereby fostering a more positive attitude towards it.

In light of these insights, it is hypothesized that:

H6: There is a direct influence of Internet Experience (IE) on Actual Online Shopping Behavior (AOSB)

2.1.7. Foreign sites role (FS)

The influence of foreign websites on online shopping behavior is a critical factor in understanding consumer behavior, particularly in Arab developing nations. Al-Mobaireek (2013) reported that one of the significant bottlenecks preventing widespread adoption of online shopping in these regions is the scarcity of successful Arabic websites. Instead, most online shopping platforms are foreign and operate predominantly in other languages, which poses a substantial barrier for local consumers.

In developing Arabic countries, the language of a website plays an instrumental role in shaping online shopping behavior. Consumers in these regions typically prefer to engage with websites that are written in Arabic. This preference is largely due to the limited proficiency in foreign languages among the general population. When online platforms are not available in the native language, it creates a sense of discomfort and mistrust, discouraging potential shoppers from making purchases. The lack of Arabic content can lead to misunderstandings about product details, transaction processes, and customer service policies, further deterring consumers from engaging in online shopping.

Moreover, the cultural context also contributes to this behavior. Language is closely tied to cultural identity, and consumers tend to gravitate towards websites that reflect their cultural norms and values. Foreign websites, even when accessible, may not resonate culturally with the local consumers, thus affecting their shopping decisions. This cultural disconnect can result in a lower perceived trustworthiness and relevance of the foreign websites.

To address this challenge, it is crucial for e-commerce platforms aiming to penetrate the Arab markets to invest in creating Arabic-language content and culturally relevant user interfaces. This adaptation can significantly enhance the user experience, build trust, and ultimately drive higher engagement and conversion rates.

Given these insights, it is hypothesized that:

H7: There is a direct influence of Foreign Sites (FS) on Actual Online Shopping Behavior (AOSB).

3. Research methodology

3.1. Data collection and data validation

Previous research in this area emphasizes the importance of demographics in determining online shopping behavior. Researchers have concluded that online shopping customers are mostly younger, wealthier, and more educated (Li & Zhang, 2002). The younger generation in any nation has a greater tendency to accept changes in technology; therefore, they are more aware of their benefits. Therefore, it is assumed that young Saudi college students have more accepting attitudes towards online shopping.

Therefore, it was decided that the sample consisted of young and educated people. Furthermore, a structured questionnaire was developed using Google Forms. The research instrument was designed and administered to graduate and undergraduate students at various universities in the Kingdom of Saudi Arabia. The questions were based on 5-point likert's scale. The research instrument was sent in July 2021 and the survey was open for almost six months. A total of 450 responses were collected; over 4000 students were contacted based on convenience sampling, and a response rate of approximately 10.7% was achieved. Various methods suggested by Atif et al. (2012) applied reminders and many reminders and sent them as follow-up mail.

All responders' identities were kept private during this study, and a cover letter was sent to let them know ahead of time about the confidentiality and purpose of the data. The following grounds led the ethics committee to forego the ethical approval.

- Under the Data Protection Act, ethical reviews would not be necessary for personal data.
- Studies utilising de-identified records and data sets that are accessible to the general public, such as those from the UK Data Archive or the Office for National Statistics, where the necessary authorizations have already been secured and the data makes it impossible to identify specific individuals.
- Purely observational (non-intrusive, non-interactive) studies of public activity, unless the recorded observations identify people (names, images), which may put them at danger of damage, stigma, or punishment. Why Studies in which subjects are not classified as "vulnerable" and involvement won't result in unnecessary psychological stress or worry when using insensitive, fully anonymous educational assessments and surveys
- Consumer acceptability studies include assessments of taste and food quality, provided that the food is eaten unadulterated or contains agricultural, chemical, or environmental contaminants for a purpose and at a level deemed safe by the applicable national food safety agency. UCL (2024).

For the assessment of descriptive analysis SPSS 22.0 was used and lisrell 8.80, was used for further analysis. The descriptive analysis of the respondents was as follows (Table 1):

There are multiple opinions regarding the sample size. Some researchers agree that 150 responses are sufficient when there is no missing data. However, other studies have stated that the minimum sample size should be more than 200. There is a technique to identify a proper sample size, which suggests that the ratio should be 5:1 (Hair et al., 2014; Kline, 2011). The developers of Lisrel 8.80 suggested a formula to calculate the appropriate sample size. Joreskog and Sorbom (1993, p. 26) provided a formula for the assessment of an appropriate sample size for estimating the structural model:

$$k(k-1)/2$$

where, k=no. of variables

The number of variables in this study resulted in a recommended minimum sample size of 28, which is substantially smaller than our final sample size of 374 cases.

The sample size chosen for this study was much larger, which was suggested by the developers. After ensuring a proper sample size, a close analysis of the demographic aspect of the data was carried out, and it was found that many of the respondents, more than 74% of the respondents, were below the age of 30 years and were using the Internet for more than five years. In this sample, 25% of the respondents spent more than six hours a day on the Internet, 50% used the Internet for one hour per day, and the remaining 25% used the Internet for half an hour per day. More than 80% of the respondents shop

Table 1. Showing demographics of the respondents.

Demographics	Frequency	Percentage (%)
Sector		
Public Universities	300	80.21
Pvt Universities	74	19.89
Course		
Professional Courses	299	80
Nonprofessional Courses	75	20
Level of education		
Under Graduate	24	6.4
Graduate	150	40.10
Masters	100	26.73
Above	100	26.73
Gender		
Male	264	70.58
Female	110	29.41
Age		
20-30 yrs	74	19.89
30-40 yrs	200	53.22
40yrs and above	100	26.73

online twice a month, and the remaining 20% shop online more than five times a month, showing sample appropriateness for the study.

3.2. Response and item completion rates

A 56% response rate was obtained for the analysis of data. As many academics have noted, item completion rate is calculated for this research and is regarded as a relevant indicator (Klassen & Jacobs, 2001). The item completion rate is the proportion of completed surveys that are used for analysis. Twenty six of the 600 initial responses were found to be incomplete and were removed from the research. The efficacy of the survey used in this research was quite good, with 96% of the items completed.

3.3. Biases in response and non-response

3.3.1. Response bias

While respondents make mistakes while answering the questionnaire, it's referred to as response bias. Throughout the questionnaire's development, a number of the techniques suggested to reduce this inaccuracy were used. These measures aim to prevent biases by adhering to the recommendations and maintaining a simple and clear vocabulary for the scale. The respondent and their responses were kept private, and it was promised that the responses would only be used for research. It was also explained that only the aggregate responses would be analysed, and the researcher would not identify or use any particular response for his personal interest.

3.3.2. Non-response bias

Some responders are slow to react or don't respond at all. This bias resulted from these non-existent replies. Significant mean differences were consistently advised in order to examine the early and late responders. The data was supplied by managers at different organisational hierarchy levels, as Table 2 show. As a result, it seems sense to claim that the data represented every answer. The representation of respondents demonstrates the normality of the sample and the data.

3.4. Assessment of multicollinearity and common method bias

Eight factors emerged after performing EFA and all the constructs were moderately correlated therefore the issue of multicollinearity was not encountered. Common method bias describes mistakes made when correct approaches are used incorrectly or incorrectly. It is brought on by a variety of factors in general or errors in the gathering process. For instance, respondent bias from an online poll might exaggerate or deflate the findings. To confirm this inaccuracy, the EFA was carried out. A study is said to have a substantial common technique bias if one component accounts for the majority of the variation. There were eight components created for the present research, and the results of the Harman's single factor test are shown in Table 3. It is fair to conclude that the research is unaffected by common-method bias.

3.5. Skewness and kurtosis

The data's skewness suggests that it is typical. Data sets might be positively or negatively skewed, symmetrical, or both. The skewness value of symmetrical data is zero when it is displayed from both the left and the right side. The acceptable bounds for skewness and kurtosis for a normal distribution are -2 and +2. We find that we are inside an acceptable range for each variable. The outcomes are shown in Table 4.

3.5.1. Convergent validity

Campbell and Fiske said that it illustrates the strength of the relationship between the conceptions. It guarantees that the objects will converge on a single idea. Researchers claim that when they share a

Table 2. Showing non-response bias (group statistics).

	Constructs	No	X	Standard. Dev	Standard. Err Mean
PU	Ely	299	2.245	1.353	.272
	Late	75	3.145	1.364	.242
PEOU	Early	299	1.236	1.365	.281
	Late	75	3.211	1.123	.291
PE	Early	299	1.314	1.393	.295
	Late	75	2.017	1.483	.263
PR	Ely	299	2.315	1.353	.272
	Late	75	3.615	1.362	.245
FS	Early	299	1.816	1.362	.244
	Late	75	3.221	1.121	.256
SN	Early	299	1.324	1.323	.233
	Late	75	2.037	1.421	.238
IE	Ely	299	2.325	1.312	.253
	Late	75	3.625	1.354	.225
AOSB	Early	299	1.816	1.332	.282
	Late	75	3.211	1.134	.290

Table 3. Showing component transformation matrix.

Component	1	2	3	4	5	6	7	8
1	.452	.455	.415	.347	.351	.281	.222	.131
2	-.124	.355	-.469	.267	-.419	.543	-.0226	.181
3	-.025	-.257	-.155	.785	.211	-.348	-.322	.231
4	-.024	-.155	.027	-.362	.442	.434	-.501	.472
5	-.8022	.305	.076	.055	.411	.054	.161	-.228
6	-.322	-.257	.676	.165	-.417	.174	.081	.272
7	.092	-.554	-.161	.224	.171	.534	.161	-.523
8	-.020	-.253	-.360	-.055	.151	-.042	.711	.533

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

Table 4. Showing normalcy of data.

Measures	Skewness	Kurtosis
PU	-0.212	-0.055
PEOU	-0.222	-0.044
PE	-0.122	-0.381
PR	-0.115	-0.254
FS	-0.283	-0.605
SN	-0.200	-0.321
IE	-0.212	-0.055
AOSB	-0.342	-0.066

PU: Perceived usefulness, PEOU: Perceived ease of use, PE: Perceived enjoyment, PR: Perceived risk, FS: Foreign sites role, SN: Subjective Norms, IE: Internet Experience.

significant amount of variation, it is taken into consideration. Numerous techniques may be used to assess convergent validity.

Path values, t values, and NFI indices may be used to identify it (Hair et al., 2014; Malhotra & Dash, 2011). To demonstrate convergent validity, more metrics are obtained. For example. The T-value findings validate the scale's convergent validity, while provided support for the scale's ought to. For the size of the present study, there were more than two. This implies a high degree of convergent validity (see Table 5).

3.5.2. Discriminant validity

Since the scales are convergent on a single component, a significant relationship between them may exist. As a result, discriminant validity is assessed to look at how unrelated each study measure is. The researcher employs this validity to make sure that each scale varies somewhat from the others in order to obtain discriminant validity, as this problem may develop since all of the scales are generated from the same theory, model, or field. Table 6 shows the association between the constructs.

The correlation values in the table above vary from low to high, indicating the possibility of discriminant validity. Another technique to confirm discriminant validity is to look for high GFI values, which

Table 5. Convergent validity- loading values, NFI, NNFI and t-values.

Measures	Range Loading value	NFI	NNFI	Range of t-values
PU	0.51 – 0.86	0.86	0.83	5.56 – 17.70
PEOU	0.62 – 0.95	0.90	0.90	11.64 – 14.26
PE	0.54 – 0.67	0.90	0.90	10.26 – 13.56
PR	0.44 – 0.57	0.90	0.89	4.56 – 6.78
FS	0.53 – 0.76	0.86	0.83	5.36 – 13.70
SN	0.63 – 0.85	0.90	0.90	11.34 – 12.26
IE	0.53 – 0.67	0.90	0.90	10.36 – 11.56
AOSB	0.50 – 0.96	0.86	0.83	5.51 – 12.70

Table 6. Correlations for establishing discriminant validity.

Measures	PU	PEOU	PE	PR	FS	SN	IE	AOSB
PU	1							
PEOU	.161	1						
PE	.137	.611	1					
PR	.334	.563	.747	1				
FS	.353	.800	.900	.662	1			
SN	.383	.715	.855	.713	.766	1		
IE	.511	.810	.397	.900	.715	.511	1	
AOSB	.655	.383	.715	.855	.713	.674	.876	1

indicate that the items are distinct and discriminant from those on other scales since they are fully committed to their own measures. Discriminant validity is thus validated.

3.6. Structural Equation Modeling (SEM)

Structural Equation Modeling (SEM) was conducted using Lisrel 8.80 for the assessment of measurement and structural models. This technique allows researchers to simultaneously estimate relationships with multiple independent and dependent variables (Bogazzi & Yi, 1988; Erasmus et al., 2015). Structural equation modeling has advantages over many other regression techniques, as it supports related variables that are unobservable and can be used in the model as well (Gefen et al., 2000). Therefore, to examine the model fit and test the hypothesis of online buying behavior, the maximum likelihood technique (MLE) was utilized.

3.6.1. Measurement model assessment: assessment of unidimensionality

Confirmatory factor analysis (CFA) was conducted, and it was observed that all the path values should be more than 0.30. Path values less than this acceptable range removed one factor from the analysis (Table 7). All the path values were found to be in acceptable ranges as shown in Figure 1.

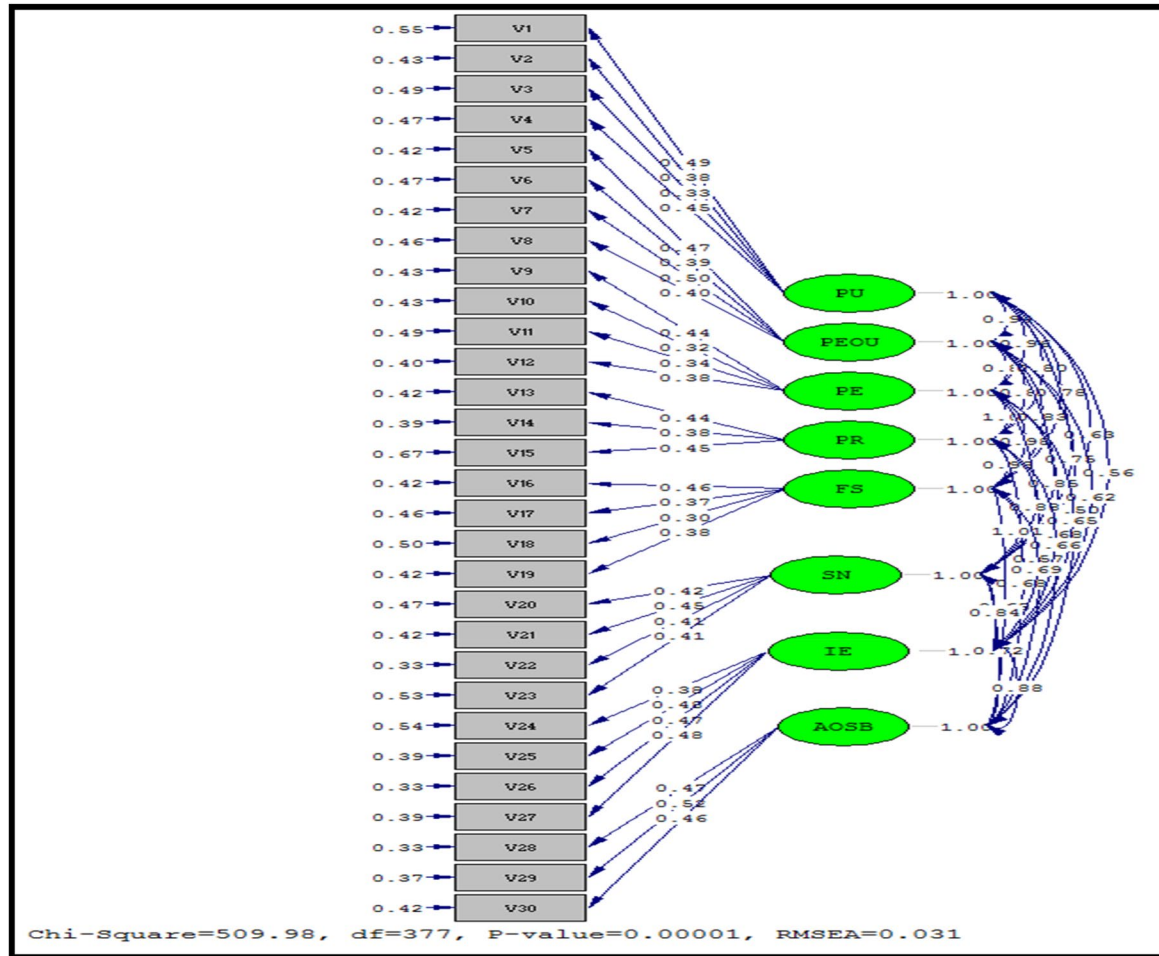
3.6.2. Structural model

The structural model is shown in Figure 2 and includes items that affect students' online shopping behavior. The output of structural equation modeling includes all factors identified from the literature that influence online shopping behavior. Alpha values were used to ensure the reliability of the constructs. As all the alpha values were more than 0.70, it can be easily ascertained that all the constructs show strong reliability. The validity of all the constructs was ensured through factor loadings obtained from the confirmatory factor analysis, as the entire path values were more than 0.40, which assures the validity of all the research constructs (Table 8). The structural model shows a 68% variation in online shopping behavior. All indices were within acceptable ranges, demonstrating a good model fit (Bogazzi & Yi, 1988) (Refer Table 6).

The results observed from the structural equation model show a significant direct relationship between most independent and dependent variables. The results confirm that there is a significant relationship between factors such as PEOU, PE, PR, SN, IE, and AOSB the estimates (PEOU to AOSB, $b=0.98$, $p=0.001$), (PE to AOSB, $b=0.02$, $p<0.001$), (PR to AOSB, $b=0.65$, $p<0.001$), (SN to AOSB, $b=0.13$, $p<0.001$), (IE to AOSB, $b=0.73$, $p<0.001$), in the light of the results Hypotheses H2, H3, H4, H6, H7, were accepted and the estimates regarding PU and FS were insignificant therefore H1, and H5 were not accepted.

Table 7. Fit Indices for the study scales in CFA.

MODEL	Scale Version*	GFI	NFI	NNFI	CFI
CFA	Original	0.68	0.53	0.50	0.58
	Refined	0.90	0.80	0.70	0.80

**Figure 1.** Showing factor loadings of all research constructs.

4. Discussion

The proposed research framework has seven hypotheses, and the current findings have accepted only five hypotheses and confirmed that consumers prefer to shop from websites that are easy to use and explain all the product characteristics in an organized manner. Therefore, retailers have to invest money and effort in making their websites user-friendly and develop online platforms for the comparison of products in an organized manner.

The current study also included a direct influence of perceived enjoyment on actual online shopping behavior (PE to AOSB, $b=0.02$, $p<0.001$). In light of these findings, some previous studies have also confirmed that the ease of use of technology directly influences customers' online shopping behavior (PEOU to AOSB, $b=0.98$, $p=0.001$). Perceived risk plays an important role in influencing online shopping behavior in Saudi consumers. These findings imply that electronic retailers must put some effort into increasing site security and customer awareness about these measures by mentioning customer rights, refund policies, and return policies to decrease the risk associated with online shopping. However, personal usefulness has a negative or insignificant impact on online shopping behavior.

The results confirm that family and friends' opinions influence respondents to shop online; therefore, companies should emphasize this area when designing their marketing strategies. Retailers can also

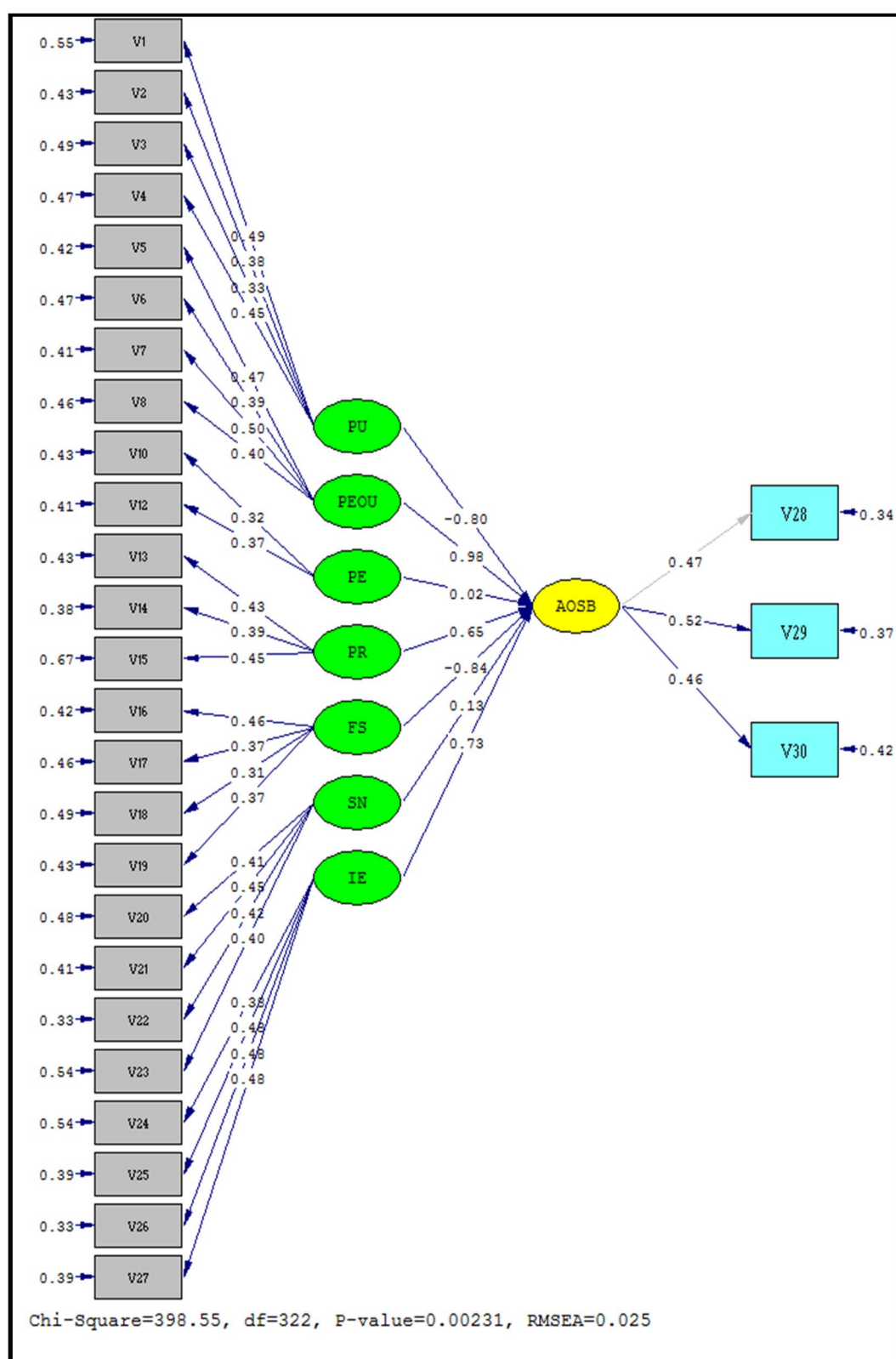


Figure 2. Showing structural model for all research constructs.

Table 8. Fit indices for the structural model.

MODEL	GFI	NFI	NNFI	CFI
Structural	0.89	0.73	0.86	0.88

promote their products through social media platforms to reduce the perceived risk. Many studies conclude that the use of credit cards in KSA is hampering online shopping, and the findings do not confirm these results as a large chunk of customers use credit cards for online shopping.

Retailers can introduce new channels for payment, such as cash on delivery/Google Pay/pay pals if they believe that the use of credit cards is a barrier to online shopping. The findings regarding the language used on the website are assumed to be a bottleneck in online shopping, but they negate this assumption. However, the Internet experience has a direct influence on online shopping behavior among Saudi consumers.

5. Conclusion

This research delves into the factors influencing online shopping behavior among Saudi college students, utilizing the extended Technology Acceptance Model (TAM) and Structural Equation Modeling (SEM). The study investigates the role of Internet Experience (IE) and Foreign Sites (FS) in shaping Actual Online Shopping Behavior (AOSB). The findings offer valuable insights into the dynamics of online consumer behavior in a specific cultural context, contributing both theoretically and practically to the field of e-commerce and technology acceptance.

6. Theoretical contributions

This study extends the application of TAM by incorporating Internet Experience (IE) as a moderating variable, following the framework suggested by Venkatesh and Bala (2008). By doing so, it highlights the importance of individual differences in technology acceptance and usage, particularly in the context of online shopping.

The inclusion of Foreign Sites (FS) as a variable emphasizes the significant impact of cultural and linguistic factors on technology acceptance and online shopping behavior. This addition enriches the TAM framework by accounting for contextual variables that are particularly relevant in non-Western settings, providing a more holistic understanding of consumer behavior in diverse cultural contexts.

The use of Structural Equation Modeling (SEM) provides a rigorous empirical validation of the proposed hypotheses. This methodological approach strengthens the reliability and validity of the findings, offering a robust model that can be utilized in future research to explore similar constructs in different cultural settings.

6.1. Practical contributions

The research offers actionable insights for e-commerce platforms operating in Saudi Arabia and other Arab developing nations. Understanding the critical role of Internet Experience (IE) can help these platforms design user-friendly interfaces and provide educational resources to enhance users' online shopping experiences. Also, the findings regarding the influence of Foreign Sites (FS) underscore the necessity for e-commerce platforms to localize their content. By offering Arabic-language websites and culturally relevant user interfaces, these platforms can significantly improve user engagement and conversion rates among Arabic-speaking consumers.

For policymakers and stakeholders in the e-commerce industry, this research highlights the need to support the development of local e-commerce platforms. Encouraging the creation of Arabic-language websites and providing incentives for local entrepreneurs can boost the growth of the online shopping market in the region.

The study also points to the importance of educational initiatives aimed at improving digital literacy. By enhancing internet experience and familiarity with online shopping processes, educational programs can empower consumers to make more informed decisions and increase their participation in the digital economy.

7. Future research directions

The study opens several avenues for future research. Further investigations could explore the role of additional moderating variables such as trust, perceived risk, and social influence in the context of online

shopping behavior. Moreover, expanding the research to include other demographic groups and geographical regions would provide a more comprehensive understanding of the factors influencing online shopping behavior across different cultures and contexts.

Author contribution statement

Syed Khusro Chishty: Conception and Design; Sonia Sayari: Analysis and interpretation of the data.

Institutional review board statement

No experimental or physical activity was carried out. Although it was an intellectual participation, no ethical approval was required. Other justifications for waiving ethical committee approval were presented in the methodology section of the research paper.

Informed consent statement

Informed consent was obtained from all subjects involved in the study.

Disclosure statement

The authors declare no conflicts of interest.

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Data is available on request by author Syed Khusro Chishty.

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