Adaptation and Validation of Online Consumer Behavior, Acceptance and use of Tech, and Social Media Engagement Scales to Arabic: The case of Yemen[1]

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ARTICLE INFO	ABSTRACT
	Purpose – The research aims to develop a robust tool for analyzing and comprehending consumer behavior concerning online shopping in Arab countries, with a specific focus on Yemen. Given the limited availability of Arabic scales in this context, the study employs a multi-scale adaptation approach to identify the factors influencing the adoption of online shopping and the role of social media engagement in targeting potential customers. **Design/Methodology/Approach** – The study follows established best practices, back translation, exploratory and confirmatory factor analyses, as well as reliability and validity assessments, to create and validate the adapted scales using AMOS and SPSS software. The investigation uncovers distinct factors within the Arabic-adopted scales compared to their original versions. **Findings** – The research findings shed light on the unique factors influencing online shopping adoption and social media engagement in Arab countries, particularly in Yemen. The online consumer behavior scale reveals three factors: awareness, social cognition, and online business perception, while the extended scale derived from the unified theory of acceptance and use of technology encompasses usability, price value, and adoption intention. in contrast, the social media engagement scale yields a single predominant factor. **Discussion** – The study's outcomes hold significant implications for shaping future models and understanding the distinct consumer behavior patterns in Yemen and similar countries. Furthermore, these insights can inform strategies to enhance the online shopping industry, ensuring it aligns with the specific needs and preferences of consumers in the region.

1. Introduction

Over the last decade, there has been a major increase in the literature on online consumer behavior (Darley, Blankson, & Luethge, 2010), and as a result, it has become an emergent subject of research. Hence after examination of previous research reveals that researchers drew hypotheses from traditional consumer behavior research such as attitude models (Fishbein, 1975), information processing (Bettman,1979), personality research (Folkes, 1988), and behavioral learning (Skinner, 1990). However, we acknowledge that the application is not as simple as merely copying theories because there are substantial distinctions between customers' online and offline behavior.

With the growing popularity of online shopping in Yemen, the advancement of technology, and increased access to the Internet, online shopping has become increasingly popular in Yemen. Despite being in the middle of a civil war, the country is experiencing a growing trend in online shopping and e-commerce, which is why it has become important to understand the behavior of online consumers in the country.

Understanding social media engagement is important when examining online consumer behavior in Yemen because it can influence purchasing decisions and provide valuable insights into consumer behavior, such as their preferences, attitudes, and opinions, helping businesses to understand their target market better and tailor their marketing strategies accordingly.

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[1]This study is derived from the Ph.D. thesis of Nasr Abdulaziz G. Murshed, Consumer behavior towards online business and the role of social media engagement in adopting online shopping: An exploratory study of Yemeni market, which was prepared under the consultancy of Prof. Dr. Erginbay Uğurlu.

It can also facilitate communication between businesses and consumers, allowing for direct feedback and engagement, which can improve customer relationships and loyalty. Overall, understanding social media engagement is crucial in the digital age as it can greatly impact online consumer behavior in Yemen.

Researchers mostly use Online Consumer Behavior scales (OCBS) to understand consumer behavior in the online environment. However, most OCBS were developed in English and may not be suitable for the Yemeni environment. This study aims to minimize the gap between the availability of valid research scales in Arabic compared to English and build a valid scale to understand and examine the behavior of online consumers in Yemen and identify key trends and challenges in the e-commerce market.

To do that, the research adopted three different scales from English into Arabic and made the needed editions to make it most suitable for the Yemeni environment; the original scales are:

First: The online consumer behavior scale developed by Ansari (2019) contains 35 items defined into seven variables: Attitude, Trust, Cultural factors, social factors, Situational factors, Web atmosphere, and E-Retailors image.

Second: Social Media Engagement scale developed by Ni et al. (2020) contains 11 items defined into three variables which are: Behavioral Engagement, Cognitive Engagement, and Affective Engagement

Third: Extended scale from the unified theory of acceptance and use of tech developed by Venkatesh, Thong, & Xu (2012), which contains 17 items defined into five variables: Performance expectancy, Effort expectancy, Facilitating condition, Price value, and Behavioral intentions.

In the article of Venkatesh et al. (2012), there are more dimensions of the "unified theory of acceptance and use of tech" (UTAUT2). As Hedonic motivation, habit, and social influence; however, we did not include them to this research due to the following reasons:

Firstly, research focus: The scope and focus of this research have differed from the specific research objectives and context of the original UTAUT2 study. As a result, we have chosen to prioritize certain dimensions that were more relevant to my research question or hypothesis. As this research focuses on the adoption of online shopping in a Yemeni market which is still very new to this kind of shopping and people are not used to it while the UTAUT2 was mainly about keep using the technology which the consumers who may be familiar with it.

Secondly, Available resources: The inclusion of additional dimensions and items from UTAUT2 would require substantial data collection and analysis, especially in the structural equation model. Given the constraints of time, resources, and the specific objectives of my thesis, we have made choices to streamline the research process while still maintaining the integrity of the study.

Thirdly, Conceptual framework: The conceptual framework was developed for this research included an online consumer behavior scale that contains Attitude, Social Factors, and Situational Factors, those variables are close to Social Influence, Hedonic Motivation, and Habit from UTAUT2, of course not the same but may have some similarity, although in online consumer behavior scale the variables was closer to the research goals so we chose them instead.

The newly adopted scales have been properly validated and have demonstrated adequate reliability and validity. This includes evaluating the scale's internal consistency, its content, criterion-related, and construct validity, the scale's applicability to the population and research context, and its feasibility for administration and data analysis.

This research will be considered one of the few first, if not the first, studies to analyze the online shopping environment in Yemen and give businesses insights into how social media users behave towards online shopping, which will help online businesses to understand the major factors influencing overall consumer behavior. The outcome of this research will help businesses build suitable strategies to target new consumers for their online business and maintain the current ones by understanding and improving on the most affected factors to create more positive behavior towards online shopping.

2. LITERATURE REVIEW

Consumer behavior is a multidimensional field of study within marketing and behavioral sciences that aims to understand and analyze the actions, decisions, and cognitive processes individuals, groups, or organizations undertake when acquiring, using, and disposing of products, services, experiences, or ideas to meet their needs and desires (Schiffman & Kanuk, 2010; Solomon, 2019; Kotler & Keller, 2016).

The conceptualization of consumer behavior revolves around a central understanding of the underlying motivations and influences that drive consumer actions. Internally, consumers' psychological factors, such as perceptions, attitudes, beliefs, personality traits, and individual preferences, contribute to their choices. Externally, social, cultural, economic, and situational factors come into play, including societal norms, cultural values, family influences, reference groups, marketing communications, pricing strategies, and the overall market environment (Engel et al., 2014).

Consumer behavior is a dynamic field that continually evolves with societal changes, technological advancements, and shifts in consumer preferences and expectations. The digital revolution has significantly impacted consumer behavior, with the proliferation of online shopping, social media engagement, and the generation of vast consumer data for analysis (Hawkins et al., 2021).

Factors influencing consumer behavior in online business can be categorized into several key dimensions. These factors play a crucial role in shaping consumers' attitudes, intentions, and behaviors in the context of online shopping These factors provide insights into the complex dynamics of consumer behavior in online business. It is crucial for businesses to understand and address these factors effectively to attract and retain online consumers. By focusing on trust-building, enhancing usability, mitigating perceived risks, leveraging social influence, providing comprehensive product information, and offering competitive pricing and perceived value, businesses can optimize their strategies and improve consumer engagement in the online marketplace.

The decision-making process in online shopping involves several stages that consumers go through before making a purchase. This process includes problem recognition, information search, evaluation of alternatives, purchase decisions, and post-purchase evaluation. Consumers engage in active information searches to gather relevant product information, read reviews, compare prices, and evaluate different online retailers. The decision-making process is influenced by various factors, including personal preferences, product characteristics, perceived risks, trust in the online platform, and social influence (Murshed & Ugurlu, 2023).

One prominent theory that explains the decision-making process in online shopping is the Theory of Planned Behavior (Ajzen, 1991). According to this theory, individuals' behavioral intentions are influenced by their attitudes towards the behavior, subjective norms (perceived social pressure), and perceived behavioral control (perceived ease or difficulty of performing the behavior). In the context of online shopping, consumers' attitudes towards online shopping, the influence of friends and family, and their perceived control over the online shopping process all play a role in shaping their decision-making process and subsequent adoption intentions.

Furthermore, consumer decision-making in online shopping is often influenced by factors such as trust, security, and perceived risks. Trust is a crucial element in building confidence and reducing perceived risks associated with online transactions (Jarvenpaa, Tractinsky, & Vitale, 2000). Consumers' trust in the online platform, including its security measures, privacy policies, and reliability, significantly affects their decision-making process and adoption intentions.

The importance of social media engagement also lies in its role in influencing consumer perceptions and purchase decisions. Research has shown that consumers are more likely to trust and be influenced by recommendations from their peers or social media influencers (Muntinga, Moorman, & Smit, 2011). Engaging with consumers on social media allows businesses to leverage the power of word-of-mouth marketing and user-generated content, which can significantly impact consumer attitudes, brand perception, and purchase intent.

Moreover, social media engagement contributes to the overall customer experience. By actively responding to customer inquiries, providing timely support, and delivering personalized content, businesses can enhance customer satisfaction and loyalty. According to a study by Verhoef et al. (2010), engaged customers are more likely to become brand advocates and recommend a brand or product to others. Therefore, fostering social media engagement can lead to positive customer advocacy and ultimately drive business growth.

Furthermore, studies have highlighted the impact of social media on online shopping behavior in Yemen. Social media platforms, particularly Facebook and Instagram, have become popular channels for promoting products, engaging with consumers, and facilitating online transactions. The active presence of businesses and sellers on social media platforms has created a vibrant online marketplace, allowing consumers to discover new products, read reviews, and make purchase decisions. The influence of social media extends beyond product discovery, as it also plays a role in building trust and credibility. Consumers often rely on recommendations and feedback from their social networks, including friends and influencers, to guide their online shopping decisions.

3. Methodology

3.1. Translation procedures

Before any process, the three scale developers were contacted through e-mail to request permission to adapt the original scale to the Arabic language, and the necessary permissions were received. After getting permission from the scale's developers and since the original scales are in English, further processes were needed to translate it into Arabic and make it suitable for the Yemeni environment.

The translation process from English into Arabic was a complex and delicate task, as it was important to maintain the meaning and intent of the original scale while also ensuring it was appropriate for the Yemeni context.

The back-translation procedure ensured a translated text's accuracy and cultural appropriateness. The back-translation procedure is crucial in ensuring the validity and reliability of translated research instruments and is widely used in cross-cultural research to overcome language and cultural barriers (Twinn,1997). The process involves translating the translated text back into the original language and comparing it with the original text to identify any differences or errors (Beins, 2013).

The back-translation process is commonly used in the translation of questionnaires, surveys, and other research instruments to ensure that the meaning and intent of the original text are preserved in the translated version. This is particularly important in cross-cultural research, where language and cultural context differences can result in misunderstandings or misinterpretations of the original text (Brislin, 1970).

According to Chapman & Carter (1979), The back-translation procedure involves the following steps:

1. Translation of the original text: A professional translator translates the original text into the target language.
2. Back-translation of the translated text: A second translator, who is unfamiliar with the original text, back-translates the translated text into the original language.
3. Comparison of the original text and back-translation: The original text and back-translation are compared to identify any discrepancies or differences in meaning.
4. Revision and correction: If any discrepancies or differences are identified, the original translation is revised and corrected as necessary.
5. Final review: The final review is conducted by a team of experts to ensure the accuracy and cultural appropriateness of the translated text.

The first language experts who followed the required Arabic translation process was Ahmed Fuad Musawa, PhD, Osmania University, India, and the second expert was Mohammed Al-Ariqy, PhD, University of Utah, USA.

To verify the suitability of the scale items for the Yemeni environment (Face validity), two scholars reviewed and approved the Arabic version; the first approval was from Ahmed G. A. Gawas, PhD, Ankara Yildirim Beyazit University, Turkey, and the second one is Hosam Alsaeedi, PhD, from Sanaa University, Yemen.

The back translation processes were done to ensure that the Arabic versions of the scales are in good shape compared to the original English versions and are a good fit for the Yemeni context.

3.2. Ethics approval

This study was carried out in compliance with the Istanbul Aydin University Institute of Graduate Studies Ethics Committee's decision dated 04.08.2022 and numbered 2022/13.

3.3. Pilot study

The pilot study was conducted to ascertain the instrument's reliability after receiving favorable feedback on the face validity of the instrument from relevant experts. A link was prepared using google forms to reach a random sample of social media users in Yemen, and 100 responses were collected for the Pilot study analysis.

Respondents are also asked to provide any pertinent comments and feedback, including noting spelling mistakes, grammatical confusion, or ambiguous sentences, as well as any suggestions for enhancing an instrument's quality. The data from each completed questionnaire was then entered into the SPSS software version 28 for reliability analysis.

According to Pallant (2016), Cronbach's alpha value of 0.6 or higher is regarded as reliable and in a respectable index range. Based on the results in Table 1 below, all three scales have good to excellent internal consistency, with the Online Consumer Behavior scale having the highest level of internal consistency (Cronbach's alpha of 0.941). These coefficients indicate that the items within each scale are measuring their intended constructs consistently.

Table 1. Reliability Statistics for the pilot study

Scale	Cronbach's alpha	N of items
Social Media Engagement scale	.855	11
Online consumer behavior scale	.941	34
Extended scale from the unified theory of acceptance and use of tech.	.926	17

3.4. Sample and data collection

The research population is social media network users in Yemen; according to Napoleoncat (2022), the population is 3.5 million, using the unlimited population formula and assuming a population proportion of 0.5 within 5% confidence intervals, a Confidence Level is 95% and that z score for a 95% confidence level is 1.96; the sample size is 385 respondents.

The researcher prepared a link using google forms to gather the full data sample by online questionnaire in Yemen from August to October 2022, and 395 responses were collected. The questionnaire contains a total of 73 questions which are 11 demographical questions and 62 items in Likert 5-point style. The collected data means is 215.87, and variance is 1577.512 with a standard deviation of 39.718 and the inter-item covariances is 0.393, and the inter-item correlation is 0.274.

3.5. Testing Normality

In order to estimate the likelihood that a random variable underlying the data set is normally distributed, normality tests are used. Since the data size is above 300, the best way to check normality is by skewness, and kurtosis tests, as Hair et al. (2010) argued that data is considered normally distributed if skewness and kurtosis absolute value is between -2.58 and +2.58 at .01 significance level and the absolute value is between -1.96 and +1.96 at .05 significance level. The results showed that all items are normally distributed as the results support accepting the null hypothesis, which states that data are taken from a normally distributed population.

4. Analysis and results

4.1. The need for new structure for the adopted scales

According to Loehlin (2003), it is generally recommended to conduct CFA before EFA in scale development and validation. Based on the fit indices results in the Table 2 for the scales (SME, OCB, UAT), we can interpret the results as follows:

Table 2. CFA for original scales structure

Value	cut-off	SME	OCB	UAT
Comparative Fit Index (CFI)	0.90	0.836	0.875	0.844
Tucker-Lewis Index (TLI)	090	0.815	0.849	0.830
Bentler-Bonett Non-normed Fit Index (NNFI)	0.90	0.815	0.849	0.830
Bentler-Bonett Normed Fit Index (NFI)	090	0.808	0.831	0.816
Goodness of fit index (GFI)	0.90	0.890	0.868	0.878
Root mean square error of approximation (RMSEA)	0.08	0.091	0.096	0.087
Standardized root mean square residual (SRMR)	0.08	0.061	0.076	0.060

Comparative Fit Index (CFI): The CFI values for all variables (SME: 0.836, OCB: 0.875, UAT: 0.844) are below the commonly suggested cutoff of 0.90. The Tucker-Lewis Index (TLI) and Bentler-Bonett Non-normed Fit Index (NNFI) values for all scales (SME: 0.815, OCB: 0.849, UAT: 0.830) are also below the cutoff of 0.90. Similarly, to CFI, they indicate a relatively good fit, although not meeting the commonly suggested threshold. The Bentler-Bonett Normed Fit Index (NFI) and Goodness of Fit Index (GFI) values for all scales (SME: 0.808, OCB: 0.831, UAT: 0.816, GFI: 0.890, OCB: 0.868, UAT: 0.878) are below the cutoff of 0.90 as well.

The Root Mean Square Error of Approximation (RMSEA) values for all variables (SME: 0.091, OCB: 0.096, UAT: 0.087) exceed the suggested cutoff of 0.08. These values indicate that the hypothesized factor structure may not fit the observed data well, suggesting some room for improvement. Although The standardized Root Mean Square Residual (SRMR) values for all variables (SME: 0.061, OCB: 0.076, UAT: 0.060) are below the cutoff of 0.08, indicating a good fit between the hypothesized factor structure and the observed data.

Overall, the results suggest that the hypothesized factor structure shows a not very good fit to the observed data indicate room for improvement. As fit indices for the adopted scales in Confirmatory Factor Analysis (CFA) indicate a poor fit to the observed data, it suggests that the current factor structure may not adequately capture the underlying constructs. In such cases, there is a need for a new factor structure for the adopted scales.

4.2. Exploratory Factor analysis

To explore alternative factor structures through further analysis, such as conducting Exploratory Factor Analysis (EFA) will be done to identify the underlying factor structure in an exploratory manner. EFA allows for the data to drive the identification of factors rather than relying on a pre-defined structure. It can help in discovering new patterns, grouping of items, or potential revisions to the scale. To examine the adopted scales, an exploratory factor analysis for each scale was conducted using SPSS 28 software.

In factor analysis, the goal is to identify patterns of co-variation among a set of variables, and the communalities are used to measure the degree to which each variable is associated with the underlying factors. The communalities are usually represented as a proportion or percentage, with a value between 0 and 1. A value of 1 indicates that all the variance in the variable is explained by the factors, while a value of 0 indicates that the variable is unrelated to the factors. It has been suggested that communalities between 0.25 and 0.4 are acceptable cut-off values, with communalities of 0.7 or higher being preferable. (Eaton, Frank, Johnson, & Willoughby, 2019)

Communalities results for Social Media Engagement scale showed that most of the communalities appear to be in the range of 0.2 to 0.5, with some items having communalities above 0.4 (e.g., Item9 and Item11). This suggests that the extracted factors explain a moderate to a substantial portion of the variance in these items, indicating that they are reasonably well-represented by the factors derived from the factor analysis.

As for extended scale from the unified theory of acceptance and use of tech most of the communalities have increased compared to their initial values. This suggests that the extracted factors explain a significant portion of the variance in these items, and they are well-represented by the factors derived from the factor analysis. Items 14, 15, 16, and 17 have very high communalities after extraction, indicating that the extracted factors explain a large portion of the variance in these items.

Finally, Communalities for online consumer behavior scale showed some of the communalities have decreased compared to their initial values, which suggests that not all items are well-represented by the extracted factors. However, items with higher communalities after extraction still retain a substantial portion of their variance in the factor structure.

KMO test and Bartlett's test serve as initial steps in EFA to determine the adequacy of data for factor analysis. The KMO and Bartlett's tests of sphericity for all three scales (Social Media Engagement, Online Consumer Behavior, and Extended Scale from the Unified Theory of Acceptance and Use of Technology) indicate excellent sampling adequacy and suitability for factor analysis. KMO values of 0.880, 0.927, and 0.915, respectively, all of which are above the recommended threshold of 0.80, Bartlett's test of sphericity p-values of less than 0.001 for all three scales. This suggests that the variables in each scale are highly correlated, and that factor analysis can be used to identify a smaller number of underlying factors that explain the majority of the variance in the data.

Table 3. KMO and Bartlett's Test

KMO and Bartlett's Test		SME	OCB	UAT
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.880	.927	.915
Bartlett's Test of Sphericity	Approx. Chi-Square	1101.018	3811.629	2518.165
	df	36	190	66
	Sig.	<.001	.000	.000

To extract the underlying structure in a set of variables Maximum Likelihood Factor Analysis (MLFA) method has been used in the Exploratory Factor Analysis (EFA).

It is also important to keep in mind that the goal of factor analysis in social research is not just to achieve a high percentage of explained variance but also to extract factors that are meaningful, interpretable, and have theoretical relevance to the research question. Ultimately, the decision about the acceptable percentage of variance will depend on the specific goals and context of the study. (Timmerman & Lorenzo-Seva, 2011).

As seen in Table 4, Table 5, and Table 6, the social media engagement scale has one factor with Eigenvalues above 1, which explains 41% of the underlying structure of the data. The online consumer behavior scale has three factors with eigenvalues above 1, which explain 47% of the underlying structure of the data. Finally, the extended scale from the unified theory of acceptance and use of tech has three factors with eigenvalues above 1, which explain 60% of the underlying structure of the data.

Table 4. Total Variance Explained - Social Media Engagement scale.

Factor	Initial Eigenvalues		
	Total	% Of variance	Cumulative %
1	4.516	41.055	41.055

Table 5. Total Variance Explained - Online consumer behavior scale.

Factor	Initial Eigenvalues		
	Total	% Of variance	Cumulative %
1	12.195	35.866	35.866
2	2.288	6.729	42.595
3	1.651	4.857	47.452

Table 6. Total Variance Explained - Extended scale from the unified theory of acceptance and use of tech.

Factor	Initial Eigenvalues		
	Total	% of variance	Cumulative %
1	7.819	45.996	45.996
2	1.284	7.553	53.549
3	1.143	6.721	60.270

The factor analysis results are reported in the Factor matrix, a table containing the factor loadings, which are the correlation coefficients between the variables and the factors. The factor loadings represent the degree to which each variable is associated with each factor. The factor matrix is used to obtain the patterns of covariances among the variables and identify the variables that are highly associated with a given factor. It is an important tool for obtaining the factor loadings, which are the coefficients that indicate the degree of association between each variable and each factor. The factor loadings are used to determine which variables are most strongly associated with each factor and, therefore, the variables most indicative of the underlying construct being measured. The factor loading for each newly developed item should be greater than 0.5. and for an already proven scale, every item should be 0.6 or higher (Awang, 2014); after choosing only the items with loadings equal to or above 0.5, the results will be as follows.

The social media engagement scale was measured and characterized by the ABC theory, introduced by Myers (1993), which stated that the structure of human attitude was made up of attachment, conduct, and cognition. However, in the Arabic-adopted scale, only one factor has been extracted from the data as well as dropping two items from the original scale as those items do not have the minimum required loadings. As seen in Table 7 below, only nine items have loadings above 0.5 into one factor, which represents the whole social media engagement scale. Hollebeek (2011) stated that engagement is multi-dimensional, including behavior, cognition, and affection, consistent with past research and theory.

Table 7. Factor loadings - Social Media Engagement scale

Item	SME	Item	SME	Item	SME
Item1	.607	Item5	.584	Item 9	.733
Item3	.596	Item7	.544	Item10	.631
Item4	.522	Item8	.628	Item11	.703

As for the online consumer behavior scale, the original English version has 35 items defined into seven factors; however, in the Arabic-adopted version, only three factors have been extracted, totaling 20 items. Based on the results of the factor analysis shown in Table 8, the three extracted factors which include items that have loadings above 0.5 are online business perception (9 items), awareness (6 items), and social cognition (6 items).

Table 8. Factor loadings - Online consumer behavior scale

Item	OBP	AW	SC	Item	OBP	AW	SC
Item1		.689		Item22	.726		
Item2		.616		Item24	.633		
Item3		.565		Item25	.600		
Item8		.539		Item26	.846		
Item9		.743		Item27	.841		
Item12			.510	Item28	.715		
Item13			.740	Item32	.655		
Item14			.853	Item33	.577		
Item15			.668	Item34	.857		
Item17			.529				
Item19		.505					

Online business perception is one of the most discussed components in the literature, and it includes several web-specific aspects such as navigation; screen clarity, content relevance, link relevance; website characteristics, retailer image and reputation, and retailer reputation (Park, Han & Kaid, 2012). A retailer's image and reputation can help alleviate client anxiety by minimizing transaction risks and improving virtual interactions. In this regard, Kim & Lennon (2008) suggested that an online store's user interface be developed in such a way that it attracts and keeps cross-cultural customers.

Social cognition is the next component that has been addressed in consumer behavior literature (Adnan, 2014). Regarding social considerations, the theory of reasoned action (TRA) contends that even our best friends' wishes regarding purchasing specific products impact our purpose. Similarly, many researchers discovered that e-consumers' social impact is a powerful motivation for online purchases. Researchers also argued that social considerations, such as outside experiences, communication with people who share similar interests,

peer group participation, and social standing, substantially influences online interferences and e-consumers, highlighting its importance in online consumer behavior. (Dubrovski, 2001).

Awareness refers to the consumer's understanding and recognition of the availability and convenience of purchasing products and services through the Internet. This can encompass an awareness of various e-commerce platforms, online payment methods, shipping options, and other key aspects of the online shopping experience. A consumer with a high level of awareness of online shopping is more likely to take advantage of these opportunities and make purchases through the Internet, whereas a consumer with low awareness may be less likely to engage in this type of shopping behavior (Kotler & Keller, 2016).

The last factor analysis was done on the adopted version of the extended scale from the unified theory of acceptance and use of tech, which in the original English version has 17 items defined into five factors. However, in the Arabic-adopted version, only three factors could be extracted, including 12 items. Based on the results of the factor analysis shown in Table 9, the three extracted factors, which include items that have loadings above 0.5, are price value (3 items), usability (6 items), and adoption intention (3 items).

Table 9. Factor loadings - Extended scale from the unified theory of acceptance and use of tech.

Item	US	AI	PV	Item	US	AI	PV
Item2	.521			Item12			.783
Item4	.842			Item13			.731
Item5	.676			Item14			.853
Item6	.733			Item15		.823	
Item7	.657			Item16		.852	
Item9	.605			Item17		.890	

Price value, the same factor in the original English scale, refers to the relationship between the price of a product or service and the perceived value or benefit that a consumer receives from purchasing it. In online shopping, consumers have access to a wide range of products and prices and can compare prices and values from different sellers and websites (Venkatesh & Davis, 2000).

Usability refers to perceived ease of use and perceived usefulness, which in the context of online shopping refer to consumers' attitudes and beliefs about the ease of use and the usefulness of e-commerce websites for purchasing products and services. Perceived ease of use refers to the degree to which an individual finds the online shopping process to be user-friendly and easy to navigate, including factors such as website design, functionality, and accessibility. Perceived usefulness refers to the degree to which an individual perceives online shopping as beneficial, including convenience, speed, product selection, and cost savings (Davis,1989).

Adoption intention, which is also the same factor in the original English scale, refers to a consumer's likelihood or desire to start using or continue using e-commerce websites to purchase products and services (Venkatesh & Davis, 2000).

Worth mentioning that the original scale the term behavioral intention was used instead of "Adaptation intention"; although in this research we will use Adoption intention as it may be a suitable term to convey the idea of consumers' willingness or intention to adapt or incorporate new technology into their lives. This terminology aligns well with the concept of technology acceptance and the process of individuals adapting to and adopting new technologies such as online shopping.

4.3. Confirmatory Factor analysis

Confirmatory Factor Analysis (CFA) is used to test the measurement model of a construct. Specifically, it is used to assess whether a set of observed variables measures a specific underlying construct (also known as a latent variable).

To evaluate the significance of the factor loadings in the CFA, z-value is used, as a high positive z-value indicates that the factor loading estimate is significantly different from zero and supports the presence of an association between the observed variable and the latent factor. In contrast, a high negative z-value indicates that the factor loading estimate is significantly different from zero but in the opposite direction. In general, a z-value is statistically significant if it is greater than 1.96 (Kline, 2016).

Based on the Loehlin (2003) loadings interpretation, we can say that the CFA loadings matrix for Social Media Engagement scale showed that the nine items in the factor have loadings range from 0.562 to 0.795, indicating moderate to strong associations between the variables and the factors. CFA loadings matrix for the online consumer behaviour scale showed that 20 items in the three factors had factor loadings ranging from 0.626 to 0.838, indicating moderate to strong associations between the variables and the factors. A loading of 0.838 is a strong positive association, while a loading of 0.626 is a moderate positive association. Only one item (AW4) had a lower loading of 0.475 which may indicate a less moderated association than the other items, although since it is still a significant association, there is no need to delete it. CFA loadings matrix for extended scale from the unified theory of acceptance and use of tech showed that 12 items in the three factors had factor loadings ranging from 0.686 to 0.925, indicating moderate to strong associations between the variables and the factors. A loading of 0.925 is a strong positive association, while a loading of 0.686 is a moderate positive association.

CFA covariance matrixes for the online consumer behaviour scale indicate that there are moderate positive relationships between awareness (AW) and social cognition (SC) with a covariance of 0.666, awareness (AW) and online business perception (OBP) with a covariance of 0.681, and finally social cognition (SC) and business perception (OBP) with a covariance of 0.669. CFA covariance matrixes for extended scale from the unified theory of acceptance and use of tech indicate that there are moderate to strong positive relationships between Price value (PV) and Usability (US) with a covariance of 0.698, Price value (PV) and Adoption intentions (AI) with a covariance of 0.715, and finally Usability (US) and Adoption intentions (AI) with a covariance of 0.714.

The path diagram used to visually represent the structure of the CFA results, including the number of factors, the relationships among the variables, and the strength of the connections between the variables. Based on the CFA results, we can confirm that all the items have significant loadings into factors that have been extracted before during the EFA (Loehlin, 2003).
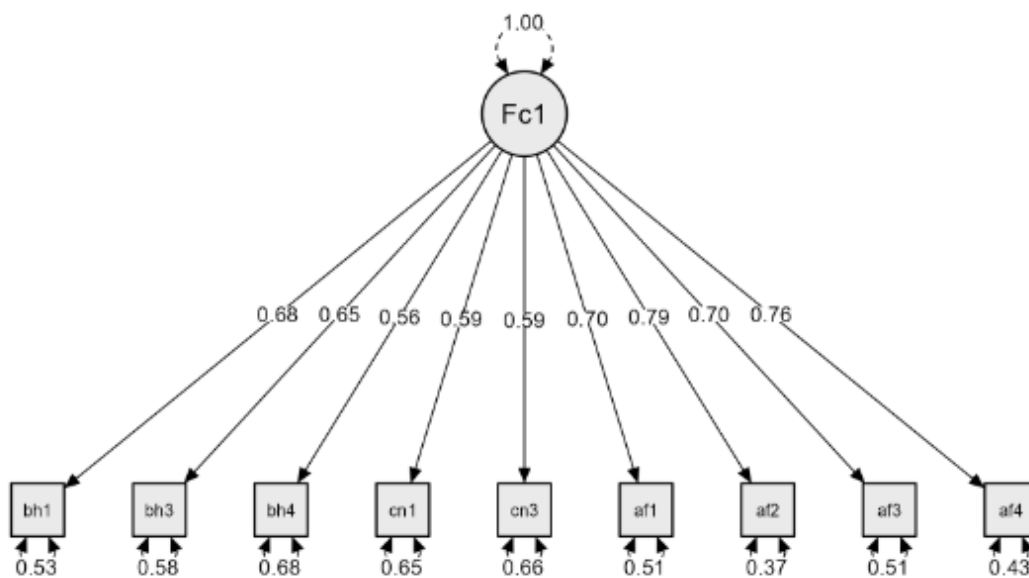
Figure 1. CFA path diagram - Social media engagement scale
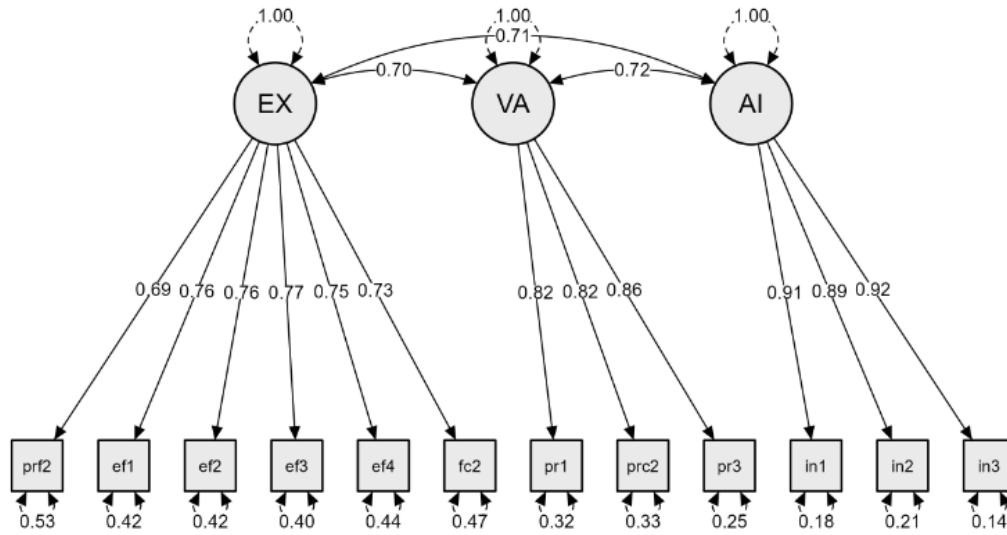
Figure 2. CFA path diagram - Online consumer behavior scale
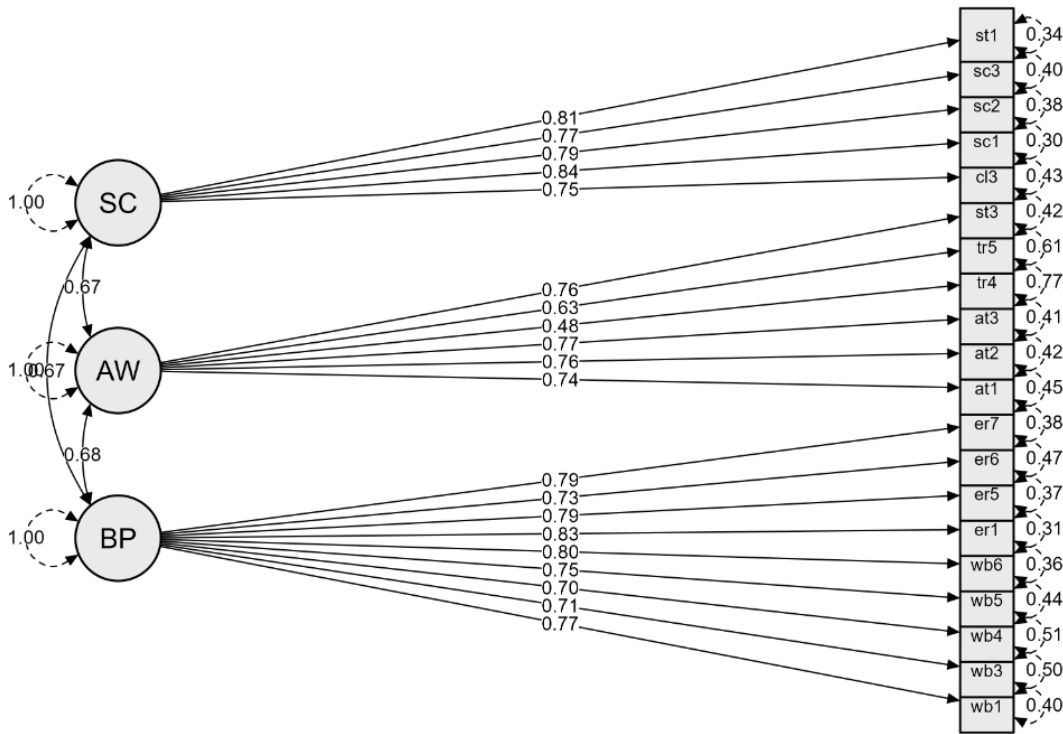
Figure 3. CFA path diagram - Extend scale from the unified theory of acceptance and use of tech.

To examine the observed gap between theory and observation, a confirmatory factor analysis was conducted using JASP 0.16.4 software, and based on Hu and Bentler (1999) cut-offs, the results were as follows:

Table 10. Fit indices

Value	cut-off	SME	OCB	UAT
Comparative Fit Index (CFI)	0.90	0.985	0.990	0.999
Tucker-Lewis Index (TLI)	090	0.979	0.989	0.999
Bentler-Bonett Non-normed Fit Index (NNFI)	0.90	0.979	0.989	0.999
Bentler-Bonett Normed Fit Index (NFI)	090	0.979	0.984	0.997
Goodness of fit index (GFI)	0.90	0.988	0.988	0.997
Root mean square error of approximation (RMSEA)	0.08	0.080	0.066	0.027
Standardized root mean square residual (SRMR)	0.08	0.057	0.060	0.035

As seen in Table 10 above, the social media engagement scale (SME) had CFI=0.985, TLI=0.979, NNFI=0979, NFI=0.979, GFI=0.988, RMSEA= 0.08, and SRMR = 0.057. Online consumer behaviour scale (OCB) had CFI=0.99, TLI=0.989, NNFI=0989, NFI=0.984, GFI=0.988, RMSEA= 0.066, and SRMR = 0.06. The extended scale from the unified theory of acceptance and use of tech (UAT) had CFI=0.999, TLI=0.999, NNFI=0999, NFI=0.997, GFI=0.997, RMSEA= 0.027, and SRMR = 0.035, which all in the accepted range of cut-offs values (Hu & Bentler,1999).

The results of the Confirmatory Factor Analysis indicate that the factors in the adopted scales are a good representation of the underlying structure of the data concluding that the CFA results support the validity of the adopted scales.

4.4. Reliability of the adopted scales

Cronbach's alpha is often used to evaluate the internal consistency of a scale. The value of Cronbach's alpha is usually considered acceptable if it is greater than 0.7, and as seen in Table 11 below, all the factors have high Cronbach's alpha, which means they are reliable (Pallant, 2016).

Table 11. Reliability Analysis

scale	Variable	Cronbach's Alpha	N of Items
Social Media Engagement scale	scale	.847	9
Online consumer behaviour scale	Awareness	.780	6
	Social cognition	.863	5
	Online Business perception	.901	9
Extended scale from the unified theory of acceptance and use of tech.	Price Value	.873	3
	Usability	.848	6
	Adoption intention	.902	3

Overall, Cronbach's Alpha values provided insights into the internal consistency of the scales used in the study. These values suggest that the items within each scale reliably measure the intended constructs, thereby increasing the confidence in the validity of the study's findings related to social media engagement, online consumer behavior, and acceptance and use of technology.

Following the reliability analysis, our next step is to assess convergent and discriminant validity through the item-total correlation method. This analysis allows us to examine how well the individual items within each scale are related to the overall score of their respective constructs.

First, let's consider the Social Media Engagement Scale. We observe that the corrected item-total correlation values as reported in Table 14 range from .480 to .664. These values indicate how strongly each individual item in the scale is correlated with the overall score for social media engagement. The results showed that all items within this scale are reasonably well-correlated with the overall construct of social media engagement.

Moving on to the Online Consumer Behavior Scale, we found that the corrected item-total correlation values reported in Table 15 span from .346 to .691. This range again indicates that the individual items in this scale exhibit a notable degree of correlation with the overall score for online consumer behavior. While there is some variability in the strength of these correlations, the fact that they generally fall within this range suggests that the items within this scale are collectively measuring the same underlying construct, reinforcing the scale's reliability.

Lastly, we consider the Extended Scale from the unified theory of acceptance and use of technology. The corrected item-total correlation values for this scale, reported in Table 16, range from .566 to .727. These values demonstrate a consistent and strong correlation between the individual items and the overall score for this construct. The range of .566 to .727 reflects a high degree of alignment among the items, indicating that they are effectively capturing the intended concept within this scale and contributing to its overall reliability.

All items have high to middle item-total correlation, which indicates that the items on the scales item are well-correlated with the overall score, which indicates that they are measuring the same construct and are reliable.

5. Findings

This study highlights the significance of understanding consumer behavior towards online shopping in Arabic-speaking countries, especially Yemen, and the importance of having a valid research tool to examine that behavior.

The study, through many processes, adopted three different scales for the Arabic language, which suffered from the lack of quality scales in many fields and validated those scales using a sample of 395 random respondents from Yemeni social media users. The scales were the social media engagement scale developed by Ni et al. (2020), the online consumer behavior scale developed by Ansar (2019), and the extended scale from the unified theory of acceptance and use of tech developed by Venkatesh, Thong, & Xu (2012), as seen in Table 12 which shows the summary of scales before and after adoption.

The results of the exploratory factor analysis (EFA) showed that the social media engagement scale is a unidimensional concept, meaning that it can be measured with a single factor. The online consumer behavior scale, on the other hand, is a multidimensional concept, consisting of three distinct factors: awareness, social cognition, and online business perception. The extended Unified Theory of Acceptance and Use of Technology (UTAUT) scale was found to be a valid measure of the three key factors that predict adoption: price value, usability, and adoption intention.

The results of the confirmatory factor analysis also indicated that the factors in the adopted scales are a good representation of the underlying structure of the data as the values of all indicators such as CFI, TLI, NNFI, NFI, GFI, RMSEA, and SRMR represents excellent fit concluding that the results support the validity of the adopted scales.

6. Conclusion and Discussion

This study emphasizes the critical importance of understanding consumer behavior in online shopping within Arabic-speaking countries, particularly Yemen. It also highlights the significance of having valid research tools to examine this behavior effectively. The research involved adopting and validating three distinct scales for the Arabic language, namely the social media engagement scale, the online consumer behavior scale, and the extended Unified Theory of Acceptance and Use of Technology (UTAUT) scale. These scales provide valuable insights into consumer behavior in the context of online shopping in Yemen and other Arabic-speaking regions.

This research carries implications that transcend academic spheres, presenting actionable insights tailored for businesses and policymakers in Arabic-speaking countries, with a particular focus on Yemen. For businesses engaged in the online shopping sector, the validated scales furnish a sturdy framework for strategic planning.

Recognizing the multifaceted dimensions of consumer behavior—encompassing awareness, social cognition, online business perception, price value, usability, and adoption intention—empowers businesses to fine-tune their marketing, user experience, and pricing strategies to resonate with the precise needs and expectations of their target demographic.

In practical terms, businesses can leverage the insights from this study to craft personalized marketing campaigns that effectively communicate the value propositions of their products or services. By understanding the factors that influence consumer behavior, such as perceptions of online businesses and the importance placed on price and usability, companies can tailor their messaging to address these specific concerns and preferences.

Furthermore, the study's findings offer guidance on how businesses can optimize their online platforms to enhance user experience and facilitate smoother transactions. For instance, by investing in user-friendly interfaces and ensuring seamless navigation, businesses can reduce friction in the shopping process and increase the likelihood of conversion.

Moreover, the research sheds light on the factors driving consumer adoption of online shopping in Arabic-speaking countries, providing valuable insights for businesses looking to expand their presence in these markets. By understanding the unique cultural and economic contexts in which online shopping operates, companies can adapt their strategies accordingly and position themselves for success.

For policymakers, the study underscores the importance of creating an enabling environment for e-commerce growth, including policies that support digital infrastructure development, consumer protection, and online payment systems. By addressing these key areas, policymakers can foster a conducive ecosystem for online businesses to thrive and contribute to economic development.

Educators and industry stakeholders can also benefit from the findings of this research by incorporating them into training programs and professional development initiatives. By equipping individuals with the knowledge and skills needed to navigate the complexities of online consumer behavior, these efforts can help strengthen the competitiveness of businesses operating in Arabic-speaking countries.

Finally, the study underscores the importance of continued research in this field. Future studies can delve deeper into the online consumer behavior in specific Arabic-speaking countries and explore evolving trends and preferences over time. This ongoing exploration is essential for maintaining relevance and effectiveness in addressing the dynamic nature of online shopping behavior within these cultural contexts. In essence, this study not only contributes to the current understanding of consumer behavior in online shopping but also paves the way for future inquiries that will further enhance our insights into this complex and ever-changing landscape of online consumer behavior.

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Appendix1: Summary of scales before and after adoption

Table 12. Summary of scales before and after adoption.

		SME	OCB	UAT
Before adopting	Number of items	11 items	35 items	17 items
	Variables	Behavioral Engagement, Cognitive Engagement, Affective Engagement	Attitude, Trust, Cultural Factors, Social Factors, Situational Factors, Web Atmosphere, E-Retailors Image	Performance expectancy, effort expectancy, facilitating condition, price value, Behavioral intentions.
	Fit indicates	CFI = 0.836, TLI = 0.815, NNFI = 0.815, NFI = 0.808, GFI = 0.890, RMSEA= 0.091, SRMR = 0.061.	CFI = 0.875, TLI = 0.849, NNFI = 0.849, NFI = 0.831, GFI = 0.868, RMSEA=0.096, SRMR = 0.076.	CFI = 0.844, TLI = 0.830, NNFI = 0.830, NFI = 0.816, GFI = 0.878, RMSEA = 0.087, SRMR = 0.060
After adopting	Number of items	9 items	20 items	12 items
	Variables	Social media engagement	Awareness, Social cognition, Online Business perception	Price Value, Usability, Adoption intention
	Fit indicates	CFI=0.985, TLI=0.979, NNFI=0979, NFI=0.979, GFI=0.988, RMSEA=0.08, SRMR = 0.057	CFI=0.99, TLI=0.989, NNFI=0989, NFI=0.984, GFI=0.988, RMSEA=0.066, SRMR = 0.06	CFI=0.999, TLI=0.999, NNFI=0999, NFI=0.997, GFI=0.997, RMSEA=0.027, SRMR = 0.035

Appendix2: Final English scales

Table 13. Final Social Media Engagement scale variables and items

Code	Items
SME1	Using social media is my daily habit.
SME2	Even if it's late, I'll take a look at social media before sleep.
SME3	I often use social media to relax in habit
SME4	I get fulfilled from the attention and comments of others on social media.
SME5	Using social media, I am satisfied with the relationship between myself and my friends.
SME6	Compared to the real world, social media makes me feel more comfortable.
SME7	I feel bored when I can't use social media.
SME8	Compared to the real world, I am happier when I socialize on social media.
SME9	I feel anxious when I can't use social media

Table 14. Final Online consumer behaviour scale variables and items

Variable	Code	Items
Awareness	AW1	I am aware of online shopping
	AW2	I know that I can shop world class brands from home
	AW3	I know that I can shop from anywhere in the world from home
	AW4	I feel my personal information is kept confidential by online shopping sites.
	AW5	My financial information is safe and secure with online shopping sites.
	AW6	I have sufficient knowledge of using internet shopping.
Social cognition	SC1	I feel online shopping is more convenient.
	SC2	I get motivated when my reference group prefers online shopping.
	SC3	I get convinced when my friends do shopping from online sites.
	SC4	I feel encouraged when my family members shop from online sites.
	SC5	Online shopping suits my customs and traditions.
Online Business perception	OBP1	Easy navigation in online websites makes it more convenient to shop
	OBP2	I feel delighted with color combination (attractiveness) of the website.
	OBP3	Video and 3D displays encourages online shopping.
	OBP4	Clarity of the website influences my decision of purchase.
	OBP5	Speed of the shopping website improves my search among varied collection of products.
	OBP6	Online shopping provides a wide range of product selection.
	OBP7	Good customer support/service motivates me for online shopping.
	OBP8	Flexible payments systems attract me to shop online.
	OBP9	Shopping sites which preserve good return policy motivate me to shop online.

Table 15. Final Extended scale from the unified theory of acceptance and use of tech variables and items

Variable	Code	Items
Price Value	PV1	Online shopping is reasonably priced.
	PV2	Online shopping is a good value for the money
	PV3	At the current price, online shopping provides a good value
Usability	US1	Using online shopping helps me accomplish things more quickly
	US2	Learning how to use online shopping is easy for me.
	US3	My interaction with online shopping is clear and understandable.
	US4	I find online shopping easy to use.
	US5	It is easy for me to become skillful at using online shopping.
	US6	I have the knowledge necessary to use online shopping
Adoption intention	AI1	I intend to continue using online shopping in the future.
	AI2	I will always try to use online shopping in my daily life
	AI3	I plan to continue to use online shopping frequently

Appendix3: Final Arabic scales

الفقرات	المتغير	م
المتخدام وسائل التواصل الاجتماعي عادي وطبيعي بالنسبة لي.		
سوف ألقي نظرة في وسائل التواصل الاجتماعي قبل النوم، حتى لو كان الوقت متأخرًا		
غالبًا ما استخدم وسائل التواصل الاجتماعي للراحة والترفيه عن نفسي.		
تعليقات الآخرين وتفاعلهم في وسائل التواصل الاجتماعي تشعرني بالرضا.		المشاركة في وسائل التواصل الاجتماعي
أشعر بالرضا عن لقطاتي ومنشوراتي من المتخدام وسائل التواصل الاجتماعي.		
تجعلني وسائل التواصل الاجتماعي أشعر براحة أكبر مقارنة بالعالم الحقيقي		
أشعر بالملل عندما لا أستطيع المتخدام وسائل التواصل الاجتماعي.		
أنا أكثر سعادة عندما أكون اجتماعيًا في وسائل التواصل الاجتماعي مقارنةً مع العالم الحقيقي		
أشعر بالقلق عندما لا أستطيع المتخدام وسائل التواصل الاجتماعي.		
لدي دراية بوجود التسوق عبر الإنترنت	الادراك	
ألجأ إلى الإنترنت لشراء ماركات عالمية من المنزل		
اعرف أنه يمكنني التسوق من أي مكان في العالم من المنزل		
أشعر أن مفهوم الشراء يختصر ليظل العميل عند التعامل مع موقع التسوق عبر الإنترنت.		
مفهوم الملكية آمنة و محفوظ في موقع التسوق عبر الإنترنت.		
لدي معرفة كافية بكيفية التسوق عبر الإنترنت.		
أشعر أن التسوق عبر الإنترنت ملائم لكل ظروف التسوق	الوعي الاجتماعي	العوامل البيئية
تحفزني التسوق عبر الإنترنت عندما يقوم بزيارتي أصدقائي		
أتوقع أكثر عندما يستخدم أصدقائي موقع التسوق عبر الإنترنت		
أشعر بالتشجيع عندما يتسوق الأفراد المهمين من الموقع عبر الإنترنت.		
التسوق عبر الإنترنت بالمقارنة مع العادي والتقليدي		
سهولة التنقل في موقع الويب في التسوق عبر الإنترنت تجعل التسوق أكثر سهولة	تصور المال التجارية عبر الإنترنت	
الألوان المختلفة في تصميم موقع التسوق عبر الإنترنت تشعرني بالراحة.		
الفيديوهات واللقطات التوضيحية للحركة تشجعني أثناء التسوق عبر الإنترنت.		
يؤثر وضوح وصف المنتج في موقع التسوق عبر الإنترنت في قراري بالشراء.		
سرعة موقع التسوق عبر الإنترنت تساعد في عملية البحث عن المنتجات المتنوعة.		
يوفر التسوق عبر الإنترنت خيارات وسلعة من المنتجات المطلوبة.		
يحفزني يتوفر خدمة / دعم عملاء جيد في التسوق عبر الإنترنت		
تجذبني أنظمة الدفع المرن الملائم في التسوق عبر الإنترنت.		
تحفزني المواقع التي تقدم نظام إعادة وارجاع للمنتجات في التسوق عبر الإنترنت.		
منتجات التسوق عبر الإنترنت أسعارها معقولة.	القيمة السعرية	العوامل الاقتصادية
يعد التسوق عبر الإنترنت ذاتي فعالية من ناحية المال الذي يوفره عليه		
بالأسعار الحالية يوفر التسوق عبر الإنترنت قيمة جيدة		
يساعدني المتخدام التسوق عبر الإنترنت في إنجاز اشيائي بسرعة أكبر	سهولة الاستخدام	
المتعمال موقع التسوق عبر الإنترنت سهل بالنسبة لي		
التسوق عبر الإنترنت واضح ومفهوم		
من السهل بالنسبة لي أن أصبح ماهرًا في استخدام التسوق عبر الإنترنت.		
من السهل لي الحصول في الحصول على المعرفة لازم للتسوق عبر الإنترنت		
في المستقبل أنوي استمرار في المتخدام التسوق عبر الإنترنت.	الترفيه الاستخدام	
سأحاول دائمًا المتخدام التسوق عبر الإنترنت في حياتي اليومية.		
أخطط للاستمرار في المتخدام التسوق عبر الإنترنت بشكل متكرر.		