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Mobile shopping intentions: Do trustworthiness and culture Matter?

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Abstract

Purpose: This research aims to verify the role of mobile shopping attributes, trustworthiness, and cultural dimensions on mobile shopping intentions in Saudi Arabia. The originality of the model stems from the verification of the moderating impact of cultural variables, namely collectivism and masculinity, and from the integration of trustworthiness as a variable depending on mobile shopping attributes. **Research design, data and methodology:** A survey was distributed to 233 consumers with different nationalities living in the Kingdom of Saudi Arabia. Structural equation modeling and multi-group analysis were carried out to verify the conceptual model and the moderating variables. **Results:** The findings support the influence of several innovation attributes, namely complexity and trialability on behavioral intentions, while relative advantage has a direct impact on trustworthiness. A few paths are moderated by masculinity and collectivism. **Conclusions:** Culture and mobile commerce attributes need to be thought out by managers as factors influencing mobile commerce segmentation for expatriates and locals. Trustworthiness is also a key factor of mobile shopping adoption. Limitations and future research ideas are presented to enrich the proposed model and improve its predictive validity.

Keywords : Mobile shopping, Trustworthiness, Culture, Behavioral intention, Innovation attributes

JEL Classification Code : M31, M39, Z19, L81

1. Introduction

Mobile commerce is an increasingly global phenomenon although it is still noticed that conducting online transactions is lagging in many countries (Merhi & Ahlualia, 2017). Statistics show that the e-commerce market revenue in 2019 equals 1,924,568 Million US Dollars and it is expected to reach 2,958,843 in 2024 (STATISTICA, 2019). In some countries, most of the companies selling online give the possibility to pay on delivery to increase e-commerce revenues. One possible reason for that is the impact of culture on the attitude towards e-commerce adoption in particular and technology use in general (Van Slyke, Lou, Belanger, & Sridhar, 2010; Choi & Geistfeld, 2004). In the Kingdom of Saudi Arabia (KSA), 94% of the population have internet access at least once every day and smartphone users are 92% of the population (Trend, 2020). Generally, customers now have the choice of shopping via different channels: Visiting Brick and mortar stores, online shopping, or mobile shopping (Ryu, 2019). We focus on mobile shopping which is the newest form of shopping.

The relations between culture and mobile technology acceptance variables still need consideration in KSA (Alkhowaiter, 2020). In addition, expatriates from different cultures exist in important numbers. Global media insight (2020) reveals that more than 30% of the KSA population in 2018 are expatriates from many countries such as Bangladesh (826,777), India (1.54 million), Pakistan (1.06 million), Philippines (708,666,), Siri Lanka (649,611), Indonesia (472,444), Turkey (94,489) various Western countries (118,111) and Arab countries (more than 3 million

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from MENA region).

This research aims to verify a comprehensive model integrating culture, trust, and mobile commerce innovation attributes as factors explaining the behavioral intentions toward mobile shopping. The originality of this research is related to the impact of culture, which is justified by the diversity of consumers, including expats, in the Saudi market.

2. Literature review

2.1. Attributes of Mobile shopping as an innovation

Rogers (1995) proposed that the adoption of innovations is explained by five factors. The first is the compatibility of the innovation with the needs of the potential user, his practices, experiences, values, and skills. The second is complexity, which refers to the beliefs regarding the difficulties of manipulating the new product.

The third factor is the observability. People may observe the outputs of using the innovation which is a factor facilitating the adoption. The fourth is trialability, defined as the possibility of experimenting with the innovation in with limited consequences (Bae & Chang, 2012). The fifth is the most used variable as a predictor of the new technology acceptance: Relative advantage. It refers to the extent to which the utility of the innovation is better than prior products (Bae & Chang, 2012; Roger, 1995). It is similar to perceived usefulness (Asu & Ichim, 2017; Taylor & Todd, 1995) but in a comparative way (Mombeuil, 2020). These factors have been tested as predictors of the behavioral intentions toward Mobile services (Le, Ngo & Trinh, 2020) and mobile commerce (Chung, 2014, Tanakinjal, Deans, & Gray, 2010). We focus on behavioral intention as a dependent variable because "it has diagnostic value" leading to its importance as a proxy variable of actual behavior (Ambarwati, Harja, & Thamrin, 2020, p. 483).

H1: Mobile shopping behavioral intentions are directly influenced by innovation attributes, namely, compatibility (H1a), complexity (H1b), observability (H1c) Trialability (H1d), and relative advantage (H1e).

2.2. Trustworthiness

Trust is a phenomenon which occurs in complex relationships, and which can be defined as a manifestation of a "strong will" which is determined by a stable product reliability (Cha & Seo, 2019, p. 23). It develops as a means reducing risks and "facilitates decision making in uncertainty" (Surucu, Yesilada & Maslaksi, 2020, p.354). Trustworthiness is a main factor of trust. The trustworthiness of commercial Websites is important in the context of consumer-oriented e-commerce (Van Slyke et al., 2010). Based on the limitations of Rogers's models (1962, 1983), Chung (2014) introduces trustworthiness as a factor that influences the attitude toward innovation in general and the behavioral intention in the context of e-commerce using mobile devices. He considers that trustworthiness helps users overcome the problems of uncertainty, which leads to having favorable expectations of desired benefits (Chung, 2014).

This view supports different studies indicating trust as a determinant of the behavioral intentions toward electronic transactions (Van Slyke et al., 2010; Gefen, Karahanna, & Straub, 2003), e-commerce consumers' decisions (Hongjun & Aiwu, 2014), Ecommerce acceptance (Gefen et al., 2003) and e-commerce frequency of use (Guzzo, Ferri, & Grifoni, 2016). In the special case of mobile shopping tools, He, Kim and Lee (2019) advocate that trust is positively affecting the use intention regarding mobile applications.

Accordingly,

H2: Trustworthiness has a positive impact on the behavioral intention.

Innovation characteristics have an impact on the risk of adopting innovations and on the trust towards it. Moreover, the trustworthiness is dependent on expected consequences of the use of the new product or service. Trialability is the extent to which a new product or practice can experiment in limited conditions (Bae & Chang, 2012). Therefore, it reduces the risk of using the new service, which has a positive impact on trustworthiness. The relative advantage gives more worth to give trust to something interesting, which supports the positive impact of relative advantage on trustworthiness. The observability creates a perception of the transparency of the effects of the innovation and a belief that the innovation has been used before, which reduces the risk and enhances the trust.

As Complexity, perception corresponds to the relative difficulty of using the service or product (Rogers, 1995). It is expected to have an impact on attitudes in a negative way (Asu & Ichim, 2017; Taylor & Todd, 1995). The direct positive impact of the ease of use, which is the inversed evaluation of complexity, has been tested in different contexts of e-commerce adoption (Mahroeian, 2012; Van Slyke *et al.*, 2010). Therefore, the expected impact of complexity on trustworthiness is negative.

H3: trustworthiness is influenced by the Innovation characteristics, namely, compatibility (H3a), complexity (H3b), observability (H3c) Trialability (H3d), and relative advantage (H3e).

2.3. The impact of culture

Culture involves collective thinking, feeling ad acting patterns as well as shared values distinguishing affiliates of a human group from others (Hernandez-Ortega, Aldas-Manzano, Ruiz-Mafe, & Sanz-Blas, 2017; Hofstede, 1980). It distinguishes between people of various societies, using their collective mind, which is characterized by time orientation, individualism vs collectivism, masculinity vs feminism, uncertainty avoidance, and power distance (Hofstede, 1991).

Societies valuing uncertainty avoidance tend to reduce the chance of unknown situations and they favor strict rules, laws, and principles (Hernandez-Ortega et al., 2017).

The framework of Chung (2014) confirms the impact of numerous cultural dimensions (Uncertainty avoidance, Collectivism, Power Distance, Masculinity) on the five perceived characteristics of innovation. The Compatibility dimension is influenced by culture (Van Slyke, Belanger & Sridar, 2005). It is also found as one of the cultural dimensions (Chung, 2014). In fact, culture influences the extent to which electronic transactions are compatible with the consumer's beliefs, practices, and values (Van Slyke et al., 2010).

According to Arts, Frambach, and Bijmolt (2011), adoption intention is enhanced for innovations with low levels of uncertainty. Generally, consumers are disposed to accept and use new products that are less complex.

Technology adoption literature advocates that individuals are often inclined to rely on recommendations and views of peers to avoid uncertainty driven by technology (Park et al., 2019), particularly mobile shopping (Yang & Forney, 2013).

According to Peltokorpi and Zhang (2020), expatriates' adjustment can be achieved through uncertainty reduction. They have described adjustment as a diminishing factor of the stress accumulation, which is done via the exhibition of behaviors fitting with the host country's norms and values.

In this research, we consider that culture has a moderating effect rather than a direct one. The rationale is that the perception of characteristics of the innovation and the trust towards them are more related to the variation of the perceptions that have been formed after the use of the information search about the new product or process. The differences in terms of culture would change the intensity of the impact of these characteristics on trust and behavioral intentions.

H4: Culture has a moderating impact on the relations between innovation characteristics and trust.

H5: Culture has a moderating impact on the relations between innovation characteristics and behavioral intentions toward mobile shopping.

As a summary, the research model is represented below in Figure 1.

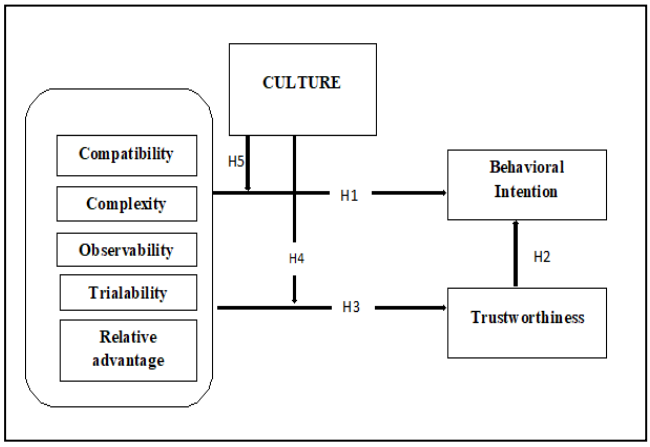

Figure 1: Conceptual Model

3. Research methodology

3.1. Measures

Five-point Likert scales have been used to measure each item of the measurement scales adopted from prior studies. Three items are adapted from Chung (2014) to assess behavioral intentions toward mobile shopping.

Trustworthiness is assessed using four items adapted by Hupcey, Penrod, Morse and Mitcham (2001). Hofstede (1980) cultural scale involves 13 items based on the work of Yoo and Donthu (2002). Chung (2014) have used Rogers' (1983) framework and contextualized his measure to mobile commerce. We used this scale which measured the five innovation attributes.

3.2. Sampling procedure

Self-completed questionnaires have been distributed in King Abdul-Aziz Medical City to 300 full-time employees from different nationalities in different fields within the National Guard Hospital. The choice of this institution is justified by the high level of diversity employees. Two versions of the questionnaire have been used: manual and electronic version using Google survey which link has been distributed to the employees who have been asked to diffuse the link to their relatives and friends. Several papers and submissions were disqualified and a total of 233 valid observations were collected and included in the analysis. The demographic characteristics of the participants are characterized by a number of females (166) which is larger than the sample of males (67). This percentage was

expected because of the nature of the work environment in the healthcare sector. The largest age frequency corresponds to the subsample of people between 30 and 40 years which counts for 92 individuals. The second most frequent age category is between 41 and 50 (74 persons) and the third is the 18 to 29 years old individuals (51 persons), while the lowest frequent age category counts 16 persons having an age above 50. In addition, the sample includes people from different countries, namely 60 from Saudi Arabia, 123 from Philippines, 8 from South Africa, 21 from Morocco, five from Egypt and five from Malaysia. The sample includes also one or two people from India, USA, Soudan, Palestine, Bahrein, Nigeria and Syria.

4. Results

First, we made exploratory analyses to check the dimensions and reliability of the scales. Second, a confirmatory factorial analysis allowed us to verify two main results: the validity and adjustment quality of the measurement model. Third, the structural model is applied to verify the hypotheses.

Table 1 : Reliability and validity of measurements

	1	2	3	4	5	6	7
1	**.**897						
2	.467	**.798**					
3	.577	.425	**.836**				
4	.435	.343	.244	**.860**			
5	.584	.625	.605	.304	**.831**		
6	.440	.514	.334	.159	.447	**.914**	
7	.599	.639	.531	.435	.813	.413	**.845**
CR	.93	.78	.87	.89	.87	.94	.88
AVE	.81	.64	.70	.74	.69	.84	.71

Note: 1. Behavioral intentions, 2.observability, 3.trust,4.trialability, 5.Reltive Advantage, 6-complexity (inverted),7.Comatibility

The main indicators of reliability and validity resulting from the first and second steps are the Cronbach Alpha, Composite Reliability, Loadings, and the Average Variance Extracted. The measurement model has satisfactory outputs, showing good reliability, convergent and discriminant validity. Indeed, the factorial analysis and exploratory reliability analysis leaded to confirm the dimensionality and reliability of the scales, which had all Cronbach Alpha values above 0.7. In addition, loadings, and CRs are above 0.7; AVEs are higher than 0.5 and AVEs are all superior to correlations (Table 1). Moreover the fit indicators show acceptable values (GFI: 0.901; NFI:0.927; IFI:0.964; RMSEA:0.061; Chi-square:244.59; DF:131).

Regarding the structural model, Table 2 shows the statistics of each path of the model along with fit indicators. The impacts of compatibility, observability, and relative advantage have P values above 0.05. Thus, H1a, H1c, and H1e are rejected. The effects of complexity and trialability are significant because their P values are below the 5% threshold. Besides, the inverted measure of complexity has a positive impact, which supports the negative impact of complexity on behavioral intentions. Therefore, H1b is accepted. Trialability showed a positive impact on behavioral intentions. H1d is accepted.

The trustworthiness of mobile shopping showed a positive and significant impact on behavioral intentions. H2 is accepted.

Concerning the third hypothesis as per Table 2, trustworthiness showed non-significant paths with compatibility, complexity, observability, and trialability. H3a, H3b, H3c, H3d are all rejected. In contrary, H3e is accepted because the path between relative advantage and trustworthiness is significant and positive.

Table 2: Model paths

Variable		B	SE	P
Dependent	**Independent**			
Intention	Compatibility	.243	.164	.139
	Complexity(inv)	.208	.068	.002
	Observability	-.04	.105	.706
	Trialability	.237	.072	.001
	Relative advantage	.111	.153	.467
	Trustworthiness	.332	.078	.000
Trust-worthiness	Compatibility	.026	.182	.885
	Complexity(inv)	.072	.074	.330
	Observability	.040	.115	.727
	Trialability	.056	.078	.475
	Relative advantage	.537	.160	.000

To test the moderating influence of culture, four dimensions of culture have been changed to discrete variables using a K-Means classification on each factor. The chosen number of clusters is two. Indeed, the sample cannot be divided into more clusters because of the relatively low number of observations. Moreover, the interpretation of differences would be more complicated if we obtain a high number of clusters.

Uncertainty avoidance has been eliminated from the analysis because the cluster analysis obtained 228 individuals in group1 and only 5 in the second group. The same is remarked for the power distance because the second group for this cluster analysis is below 50 observations (only 48).

Using collectivism, the sample has been classified into two groups. The first includes 146 individuals with a high level of collectivism (Table 3) and 87 observations having a low level of collectivism. Besides, the masculinity dimension allowed us to classify the sample into two groups. The first group counting 108 of individuals having high scores of masculinity. The opposed group counts 125 individuals.

Table 3: Collectivism and masculinity groups

Dimension	level	N	Mean	SD	Min	Max
Collectivism	High	146	0.62	0.59	-0.18	1.78
	Low	87	-1.04	0.61	-2.81	-0.22
Masculinity	High	108	0.90	0.52	0.15	2.46
	Low	125	-0.78	0.57	-1.71	0.03

The moderating impact of each of the remaining cultural dimensions is verified separately on the structural model. Amos allows performing multi-group analysis via the critical ratio matrix. The comparison between parameters comes after the verification of the Chi-square difference between the free model and the constrained model. The Chi-square difference test is significant for the comparison based on collectivism (difference =37.285, P=0.041)

Looking at the path parameters comparison in Table 4, it is obvious that the impact of relative advantage on trust is significant for the group with a high collectivism score (B=0.670, P=0.00) while not significant for the second group (P=0.524). Compatibility, complexity, observability, and trialability are not accepted as antecedents of trust for both groups. Thus, collectivism does not moderate these variables' impact on trustworthiness. Since at least one dimension of culture is moderated by collectivism, H4 is accepted.

Table 4 also shows that only the impacts of complexity and trialability on behavioral intentions are different in favor of the high collectivism group. H5 is accepted.

Regarding masculinity, the chi-square difference between the constrained and free model is significant (difference =39.971, P=0.022).

The parameter comparison shows many differences between the two groups. Trustworthiness relation with relative advantage is significant only for the low masculinity group (Pmasculinity1=0.67; Pmasculinity2= 0.00). This difference is not tested for compatibility, complexity, observability, and trialability because, in both groups, the paths are not significant. However, we conclude that culture has a moderating impact on the link between innovation attributes and trustworthiness because at least one of the paths is different between culture groups. This supports the acceptance of H4.

The path between innovations attributes and behavioral intentions are different between groups for the following independent variables:

- Complexity which has a more intense impact on behavioral intentions in the case of high masculinity group.
- Observability which has surprisingly a negative impact on the high masculinity group and no impact on the second group.
- Trialability which impact is significant only for the low masculinity group.

Regarding the impact of relative advantage and compatibility, it is non-significant in both groups. As a whole, we can conclude that culture moderates the impact of innovation attributes on behavioral intentions. This supports the acceptance of H5.

Table 4: Comparison between path parameters

Variable		Collectivism		Masculinity	
Dependent	Independent	High	Low	High	Low
Behavioral Intention	Complexity	.18*	.26	.40*	.17
	Observability	.09	-.83	-.95*	.17
	Trialability	.23*	.35	.18	.26*
	Relative advantage	.16	.32	-.68	.30*
	Compatibility	.11	.77	1.74	-.02
Trust	Relative advantage	.67*	.47	.16	.68*
	Compatibility	-.14*	.37*	.53	-.21
	Complexity	-.03	.19	-.07	.18*
	Observability	.14*	-.34	.09	.02
	Trialability	.08*	.07	-.06	.13

** <0.05*

5. Discussion

This study showed the impact of innovation attributes of mobile commerce on trustworthiness and behavioral intentions regarding mobile shopping.

The relative advantage was a significant antecedent of trust. Its direct impact on behavioral intensions is non-significant. This result is different from the findings of Chung (2014) who verified the direct impact of relative advantage and trustworthiness on behavioral intentions. The difference may be explained by the paths we tested simultaneously. Indeed, our model verified the impact of relative advantage on trustworthiness, while Chung (2014) verified only the direct impacts. The same is noticed when comparing our results with mobile commerce adoption literature. For instance, Lee and Cormier (2010) have proven the impact of the utilitarian use of mobile commerce

on mobile commerce adoption. Thus, our results add new information to literature: the relative advantage may have an indirect impact on intentions.

Compatibility and observability have no impact, neither on trust nor on behavioral intentions. This result is not in line with previous researches supporting the impact of a similar concept: facilitating conditions (Venkatesh, Thong, & Xu, 2012). However, similar results have been found in the context of the purchase of high-tech products (Yi & Su, 2014).

Complexity has a direct impact on behavioral intentions, which is in line with the findings of previous researches using the diffusion of innovation theory (Chung, 2014), the unified theory of acceptance and use of technology (Venkatesh et al., 2012) and Technology acceptance model (Davis et al., 1989). Indeed, the ease of use or effort expectancy, which is the positive evaluation regarding the low complexity, have been verified as antecedents of intentions in many contexts (Apanasevic, Markendahl, & Arvidsson, 2016; Liébana-Cabanillas, Marinkovic, Ramos de Luna, & Kalinic, 2018; Liébana-Cabanillas, Marinković, & Kalinić, 2017). However, this result is different from the findings of Cho (2019): the ease of use does not have a direct impact on behavioral intentions, when a mediator like value or satisfaction exist.

Trustworthiness has shown a positive impact on behavioral intentions. This result is in accordance with previous studies (Chung, 2014; Van Slyke et al., 2010; Hongjun & Aiwu, 2014; Gefen et al., 2003; Guzzo et al., 2016). This is an added evidence about the importance of trust in electronic and mobile commerce.

Regarding culture, only two dimensions remained in the analysis because they have enough variation to compare between groups. These dimensions are masculinity and collectiveness. At the best of the authors' knowledge, their moderation impact on the link between innovation attributes and trust has never been tested in prior researches. Thus, results are among the novelties of this research. Culture has a moderating impact, via its collectivism dimension, on the path between relative advantage and trustworthiness. The higher the collectivism is, the more significant is the impact of relative advantage on the perception of trustworthiness related to mobile-commerce. This can be explained by the fact that people with high collectivism need to have an obvious comparative advantage to give potential trust to mobile commerce in general or to mobile commerce providers in particular. Besides, collectivism intensifies the impacts of complexity and trialability on behavioral intentions. To change the habit of interacting with others in the traditional commerce venues, collectivist people need to find comfort in the new way of commerce by its ease of use and the possibility to try it without important consequences. Collective cultures are characterized by a high dependence on coordination, which stresses old traditions and sense of belonging. Thus, social values are crucial. In contrary, values of individualistic cultures focus on autonomy and encourage inner confidence (Sadeghi, Amani, & Mahmudi, 2013). This may explain the reliance of the collectivist group on more benefits in forms of comparative advantage and trialability to trust the new way of commerce (mobile commerce) which is based on individualistic behaviors since no social interaction are involved in the mobile shopping experience. These results support the idea that investigations into the collectivism and its relation with purchase intention is important in marketing (Choi, Lee, & Yang, 2014).

Complexity has a greater impact on behavioral intentions in the case of the high masculinity group. The explanation is that high masculinity has an overemphasis on competition and progress (Sadeghi et al., 2013; Hofstede, 1980). This cultural dimension characterizes persons who appreciate assertiveness and acquisition of money and material possessions. Particularly, high masculinity cultures are considered as instrumental cultures. Individuals belonging to these cultures are assertive and challenging complexity in order to attain advancement and material success (Tata, 1999; Hofstede, 1980). This may also explain the negative impact of observability in the high masculinity group. Besides, Sharma (2011) affirms that masculine orientation makes consumers more prone to adopt conspicuous consumption as a success indicator and as a way to validate their accomplishments.

6. Conclusion

6.1. Theoretical implications

The originality of the proposed model, in this research study, is about testing the moderating impact of cultural variables and about the integration of trustworthiness as variable depending on mobile shopping attributes. This research has verified relations between innovation attributes regarding mobile commerce, trustworthiness, behavioral intentions and the moderation of cultural dimensions, namely collectivism and masculinity. Several relations are not verified in prior researches, such as the moderating impact of collectivism and masculinity, as well as the direct impact of innovations attributes on trustworthiness. Trustworthiness showed a mediating role between relative advantage and behavioral intentions for the studied sample which is dominated by expatriates. This opens new insights to researches regarding the role of culture in the context of

mobile commerce adoption, especially in countries known for their population diversity.

6.2. Managerial implications

We propose to increase the trustworthiness of the provider's mobile platforms and application by advertising their competitive advantages and communicating information about delivery warranties and refund policies. Moreover, the provider of the mobile shopping application can rely on the retailer's corporate image to improve the trustworthiness of the application. Indeed, prior researches have shown that corporate image is a factor enhancing purchase intentions (Ie. Su, Jeong, Choi, & Kim, 2015).

Complexity is an important obstacle to mobile shopping adoption. Thus, it is recommended to focus on creating user-friendly mobile shopping websites and applications. Besides, culture and mobile commerce attributes need to be thought out by managers as factors influencing mobile commerce segmentation for expatriates and locals.

6.3. Limitations and Future researchs

Limitations are mainly related to the sample size and disequilibrium between genders of respondents. In fact, more studies are needed using larger samples to address this disequilibrium. Besides, the participants of this study were from National Guard Hospital, it would be interesting to extend the scope of the sample and use the research model to examine the mobile commerce adoption determinants within different domains and regions, to understand the role of cross-national differences on mobile commerce adoption. The electronic survey was in English only; it will be useful to translate the survey into the Arabic to maximize the number of responses. Finally, the cultural dimensions used in this research have been taken from similar previous studies; it will be interesting to extend the research model by including the six dimensions determined by Hofstede.

Another interesting avenue is to integrate the variables based on regulatory focus theory. This theory proposes two motivational approaches, based mainly on three types of focus, namely promotion vs prevention vs regulatory focuses (Lee, 2017). The model can also be enriched with the quality factors of mobile applications. We refer to the work of Park and Lee (2019) who studied mobile applications of health sector services. Their framework integrating quality and satisfaction can be integrated to our model to improve the predictive validity. Researchers can also integrate individual variables as moderators. The anthropomorphism is particularly a new moderating concept verified in mobile shopping context by Kim and Park (2020). Similarly personality traits like openness to experience and neuroticism, tested by Han (2020) as indirect predictor of behavioral intentions, can be integrated.

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