

12-7-2022

Explaining Consumers' Intention to Use Omni-channel Shopping

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Recommended Citation

Li, Mingye; Kurnia, Sherah; Liu, Libo; and Molla, Alemayehu, "Explaining Consumers' Intention to Use Omni-channel Shopping" (2022). *ACIS 2022 Proceedings*. 12.

<https://aisel.aisnet.org/acis2022/12>

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Explaining Consumers' Intention to Use Omni-channel Shopping

Full research paper

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Abstract

Retail businesses are increasingly merging online and offline channels into integrated omni-channel services. However, without an in-depth understanding of why consumers oscillate between online and offline channels, the future of omni-channel retailing remains uncertain. This paper aims to promote a greater understanding of the demand and supply side factors that contribute to omni-channel use. We developed a research model drawing from UTAUT2 and the security, inconsistency, and service quality attributes of omni-channel contexts. We tested both the direct and moderated effects of the constructs on the intention to use omni-channel shopping services with a sample of 362 Chinese survey participants. The results show that besides UTAUT2 variables, perceived inconsistency, and perceived service quality show significant effects on consumers' intention to use omni-channel services. Furthermore, our results show that age, gender, and online shopping frequency moderate the relationship between perceived service quality and use intention.

Keywords Omni-channel Shopping, Consumer Use Intention, Contextual Factors, UTAUT2.

1 Introduction

Omni-channel retailing, defined as “an integrated sales experience that melds the advantages of physical stores with the information-rich experience of online shopping” (Rigby 2011, p. 75), provides a continuous shopping experience where consumers seamlessly switch between online and offline service channels (Trenz et al. 2020). It is considered as the third e-commerce revolution and an integrated platform (Juaneda-Ayensa et al. 2016). By synergizing online and offline channels across locations and devices, retailers can provide more options to consumers (Trenz et al. 2020; Verhoef et al. 2015). These include online order and offline pick up, rewarding customers irrespective of where and how they shop; and efficient reordering and returning processes. According to a report by BusinessWire (2022), in 2020, the market for omni-channel retailing generated 5.8 billion US dollars worldwide.

However, omni-channel service is a challenge for retailers (Trenz et al. 2020). For example, a survey by McKinsey indicated that two-thirds of Chinese B2C retailers were looking for solutions to improve omni-channel services (Sawaya et al. 2022). One of these solutions could be to identify the factors that drive omni-channel integration service use, which in turn could lead to improving the service. Prior research has investigated consumers' channel preference for online or offline channels (Herhausen et al. 2015), channel switching behaviour (Chiu et al. 2011), and challenges and strategies in channel integration from the perspective of retailers (Verhoef et al. 2015). Hence, there is a need for research that develops constructs to capture the unique attributes of omni-channel services and that integrates those with established theories for better explanation of the future of omni-channel retailing. This paper takes a user perspective to explain the drivers of omni-channel shopping at the consumer level by paying attention to the unique characteristics of omni-channel services as well as the individual differences in omni-channel services adoption. The study is guided by the following two questions:

RQ1. What are the key factors that drive consumers' intention to use omni-channel shopping?

RQ2. To what extent do the socio-demographic variables moderate the effects of those key factors on consumers' intention to use omni-channel shopping?

To address these research questions, we propose a research model that integrates the core constructs of the unified theory of acceptance and use of technology (UTAUT2) with omni-channel context specific variables and formulate a set of theory-based hypotheses. To test the research model and hypotheses, we conducted an online survey with a sample of 362 participants from China. The results show that a consumer's intention to use omni-channel services is affected by habit, perceived service quality, performance expectancy, hedonic motivation, perceived inconsistency, and effort expectancy. Apart from direct effects, age, gender, and online shopping frequency are found to moderate the relationship between perceived service quality and use intention, where older male consumers with greater online shopping frequency are stronger in such relationship. The present study makes several contributions to the body of knowledge concerning omni-channel integration services.

The rest of the paper proceeds as follows. In section 2, we provide an overview of omni-channel retailing concept. In section 3, we propose our research model and the associated hypotheses. Section 4 elaborates on the research methodology. Section 5 depicts the research results derived from the quantitative study. Section 6 discusses the findings and research contribution, outlines research limitations, and concludes this paper with suggestions for future research.

2 Overview of Omni-Channel Retailing

Shopping via multiple channels is becoming a burgeoning phenomenon as retailers continuously offer new retailing channels and consumers use various digital devices (e.g., mobile phone and mobile tablet) to access them ubiquitously (Verhoef et al. 2015). Multi-channel retailing uses more than one-way selling channels or mediums to serve consumers, including offline channels (i.e., physical stores), online channels (e.g., web shopping platforms), and traditional direct mass-marketing channels (e.g., television) (Verhoef et al. 2015). Consumers may seek for a merchandise and obtain useful information of products in one channel (e.g., online channel), and purchase the product in another channel (Verhoef et al. 2015). However most of retailers develop and manage multiple channels separately (Verhoef 2012). This results in limited service integration (Juaneda-Ayensa et al. 2016), inconsistent information among different channels, and difficulty for consumers to manage their information.

Omni-channel retailing has the potential to resolve these issues by providing integrated services. “Omni” is a Latin word which means “all” or “universal”, and therefore, the meaning of “omni-channel” is “all channels together” (Rigby 2011). Additionally, Kamel and Kay (2011), p. 1) add that an ideal omni-channel shopping experience implies the “*desire to serve the customer however, whenever and*

wherever they wish to purchase merchandise and return it". Hence, the concept of omni-channel involves the integration of diverse retailing channels to serve consumers in a seamless, consistent, and interactive way throughout their search, purchase, and post-purchase processes. Besides, with marketing communication platforms and channels being integrated (i.e., integrated marketing communication), focused messaging could spread across multiple points of customer contact (i.e., 360-degree marketing), which allows retailers to optimize their image and relationship with consumers (Deshpande et al. 2015; Finne and Grönroos 2017). As the channels are integrated seamlessly and consistently, the perceived interaction is not with the channel, but instead the brand (Piotrowicz and Cuthbertson 2014), which leads to a disruptive impact on the retail industry (Rigby 2011).

There are three main concerns in omni-channel shopping: security, consistent and seamless shopping experience, and service quality (Herhausen et al. 2015; Juaneda-Ayensa et al. 2016; Susanto et al. 2018; Zhang and Zhao 2019). First, omni-channel practices involve interactions with online channels. The exposure of individual information including sensitive information (e.g., credit card details) is ubiquitous when shopping online, which raises consumers' concerns about cybersecurity (Mayer-Schönberger 2011). Second, in the omni-channel context, customers can transfer effortlessly across channels (physical stores, web, mobile devices, and social media) within a brand (Brynjolfsson et al. 2013), utilizing the information-rich virtual environment and the vivid physical context (Frazer and Stiehler 2014; Rigby 2011). Juaneda-Ayensa et al. (2016) state that consumers expect to obtain a unique, consistent, and seamless shopping experience regardless of the channel they use. Last, services are the most tangible objects that consumers receive from omni-channel retailers. As omni-channel retailing provides consumers with multiple touchpoints, consumers can obtain firsthand sensory product evaluation while in the physical stores, observe product attributes online prior to purchase, or assess product quality after home delivery. Hence, consumers care about not only the quality of the services per se but also whether the service quality is the same on different channels (Melis et al. 2015). We thus consider these three characteristics in our study.

3 Research Model and Hypotheses Development

In this study, the UTAUT2 model is adopted as the baseline research model as it is one of the most comprehensive models to explain technology use intention (Venkatesh et al. 2012). It combines widely-used theories such as technology acceptance model (TAM) and innovation diffusion theory (IDT) while presenting a better explanation of variance for use intention (Martins, Oliveira & Popovic 2014). To extend this model, we add three additional factors specific to the omni-channel context (i.e., perceived security, perceived inconsistency, perceived service quality) to the research model. We also include the moderating effects of demographics variables. Figure 1 depicts the tailored theoretical research model. Details of each construct are explained below.

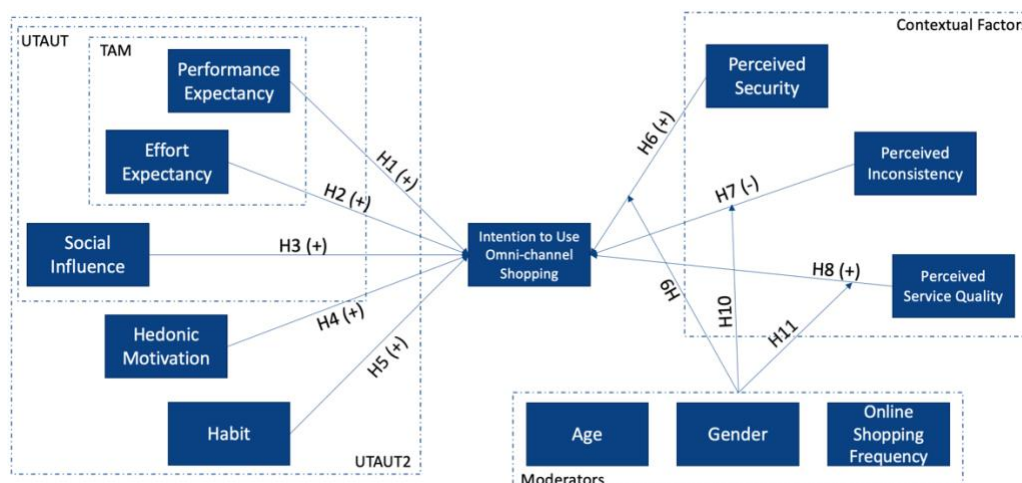


Figure 1: Research Model

3.1 The Original UTAUT2 Constructs

Performance expectancy is defined as the degree to which using multiple channels and/or technologies (physical store, web shop, mobile app, and social media) will offer consumers potential benefits when

they purchase products (Juaneda-Ayensa et al. 2016; Venkatesh et al. 2003). In this study, performance expectancy refers to the potential benefits that consumers receive while using omni-channel integrated services. Previous studies consistently demonstrate that performance expectancy is the strongest determinant that affects behavioural intention (Frasquet et al. 2015; Juaneda-Ayensa et al. 2016; Venkatesh et al. 2012). Aligned with the prior research, we propose the following hypothesis:

H1: Performance expectancy positively affects consumers' intention to use omni-channel shopping.

Effort expectancy is the extent of ease associated with consumers' learning and actual use of different channels and/or technologies (mainly online) when purchasing products (Juaneda-Ayensa et al. 2016; Venkatesh et al. 2003). The construct is significant and positively affects use intention (Frasquet et al. 2015; Juaneda-Ayensa et al. 2016; Venkatesh et al. 2012). In our study, we adopt this construct in the context of omni-channel integrated services. Therefore, we conjecture the below hypothesis:

H2: Effort expectancy positively affects consumers' intention to use omni-channel shopping.

Social influence is the degree to which consumers perceive that people who are important to them (relatives, friends, celebrities, etc.) believe that they should adopt and use the technologies (Venkatesh et al. 2003). Juaneda-Ayensa et al. (2016) adopt the impact of social influence on the technology adoption into the context of omni-channel integrated services. It refers to the degree to which consumers perceive that people who are important to them (relatives, friends, celebrities, etc.) believe that they should use omni-channel integrated services for shopping depending on their needs and situations (Juaneda-Ayensa et al. 2016; Venkatesh et al. 2003). Prior research shows social influence positively affects user's intention to use technologies (Bilgicer et al. 2015; Juaneda-Ayensa et al. 2016; Venkatesh et al. 2003; Venkatesh et al. 2012). Hence, the following hypothesis is postulated:

H3: Social influence positively affects consumers' intention to use omni-channel shopping.

Hedonic motivation is defined as the fun or pleasure obtained from using technologies when purchasing products (Juaneda-Ayensa et al. 2016; Venkatesh et al. 2012). Venkatesh et al. (2012) add hedonic motivation in UTAUT2 model when they adopt UTAUT into the context of consumer use. In the context of omni-channel integrated services, hedonic motivation refers to the pleasure obtained from using different channels when purchasing products (Juaneda-Ayensa et al. 2016; Venkatesh et al. 2012). Numerous studies on Information Systems have shown that hedonic motivation plays a significant role in determining consumer use intention of the technology (Frasquet et al. 2015; Juaneda-Ayensa et al. 2016; Venkatesh et al. 2012). Therefore, the below hypothesis is proposed:

H4: Hedonic motivation positively affects consumers' intention to use omni-channel shopping.

Habit is defined as the extent to which individuals tend to perform behaviours automatically due to prior use (Venkatesh et al. 2012). It has been identified as a predictor of consumer use intention and has exhibited a positive impact on use intention (Juaneda-Ayensa et al. 2016; Venkatesh et al. 2012). In the omni-channel context, habit is referred to as user's habit of using omni-channel integrated services for shopping. Drawing from the literature, the following hypothesis is proposed:

H5: Habit positively affects consumers' intention to use omni-channel shopping.

Given the unique characteristics of omni-channel shopping, this study excludes price value (PV) and facilitating conditions (FC) of the original UTAUT2. They are eliminated since the technology now becomes a common asset available everywhere and employed by individuals for purchases in an omni-channel scheme (Susanto et al. 2018).

3.2 Contextual Factors Embedded in Omni-channel Shopping

Based on the unique features of omni-channel shopping as outlined in section 2, arguably consumers' major concerns towards omni-channel shopping include perceived security, perceived inconsistency, and perceived service quality. Thus, we add these three factors in the research model.

First, perceived security is defined as consumers' perception regarding the omni-channel providers utilize digital technology tactics (e.g., authentication and encryption) to ensure information security throughout the shopping journey (Juaneda-Ayensa et al. 2016; Susanto et al. 2018). It can prevent data leakage and cyber frauds effectively. Previous research indicates that the greater consumers' perceived security of the technology, the more likely they will use the technology (Frasquet et al. 2015; Herhausen et al. 2015; Juaneda-Ayensa et al. 2016). In the context of e-commerce, consumers will be more likely to use online transactions if they perceive less risk (Herhausen et al. 2015). Likewise, the more consumers' perceived security during the omni-channel shopping, the more likely they will use it. Hence, the following hypothesis is formulated:

H6: Perceived security quality positively affects consumers' intention to use omni-channel shopping.

In the omni-channel context, consumers expect to acquire an extraordinary, consistent, and seamless shopping experience or service regardless of the channel they use (Juaneda-Ayensa et al. 2016). Huré et al. (2017) define the consumer-oriented concept, perceived consistency, as the consumers' perceived consistency among the multi-channels of touch points and their perception of fluidity or effortlessly when they move from one channel to another. Recent studies on Chinese grocery retailing argue that the omni-channel services provided by the grocers exhibit obvious issues such as inconsistent price of grocery products across online and offline channels (Xu and Zhang 2017; Zhang and Zhao 2019). In this study, we define perceived inconsistency as the consumers' perceived discrepancy in their shopping experience when switching among multi-channels. Perceived inconsistency negatively affects consumers' intention to use omni-channel shopping (Herhausen et al. 2015; Melis et al. 2015; Verhoef et al. 2015). Thus, we propose the following hypothesis:

H7: Perceived inconsistency negatively affects consumers' intention to use omni-channel shopping.

Perceived service quality is defined as the consumers' overall subjective judgment about the quality of services received from different channels (Herhausen et al. 2015). Prior studies have confirmed the positive influence of service quality on consumers' transaction intention (Seiders et al. 2007) and consumers' switching of service providers (Trenz et al. 2020). Especially, Trenz et al. (2020) showed online transaction quality positively influences online channel choice. In the context of omni-channel, consumers' perceived service quality exhibits a positive impact on consumers' intention to use online-offline channel integration (Herhausen et al. 2015). We thereby postulate the following hypothesis:

H8: Perceived service quality positively affects consumers' intention to use omni-channel shopping.

3.3 Moderating Effects

Similar to UTAUT2, we include social-demographic variables (i.e., age, gender, and omni-channel shopping frequency) into the research model. The moderating effects of age and gender have been widely studied. Online shopping frequency reflects consumers' experience of using omni-channel services for shopping. Recent studies on omni-channel adoption include the moderating effect of online purchasing experience (Herhausen et al. 2015; Melis et al. 2015). As UTAUT2 have already studied the moderating effects of age, gender, and experience on the original constructs (Venkatesh et al. 2012), in this study we focus on the moderating effect of age, gender, and omni-channel shopping frequency on the relationships between contextual factors (i.e., perceived security, perceived inconsistency, and perceived service quality) and consumers' intention to use omni-channel integration shopping.

Prior research indicates that men are willing to be more task-oriented compared with women (Lynott and McCandless 2000). Therefore, men are more sensitive regarding to the transactions' security issues and service quality. They tend to spend more time and effort to be involved in the transaction to pursue their goals (Venkatesh et al. 2012). Therefore, men pay more attention to perceived security and perceived service quality compared with women.

Younger age has been proved to be associated with less sensitivity to online shopping quality as they are accustomed to shopping online, while older people present more interests of online shopping if they are provided with high-quality shopping experience (Hernández et al. 2011; Kwon and Noh 2010).

Individuals' previous experience of using a specific technology can prompt the effect of facilitating expectancy since they have already been familiar with the technology and therefore exhibit more expectations of the services (Venkatesh et al. 2003). In other words, consumers who frequently shop online are more sensitive to the novel benefits from omni-channel shopping (e.g., perceived security and perceived service quality). Likewise, consumers with less experience tend to depend more on the external support (Venkatesh et al. 2003). For example, consumers with less shopping frequency rely more on the consistent and seamless services.

In addition, age, gender, and online shopping frequency have a joint influence on the relationship between perceived security and use intention. As consumers become older, the gender difference will be more significant (Venkatesh et al. 2012). Older men will emphasise more on the service security and service quality than younger men. Online shopping experience may further moderate the above relationships. When consumers have more experience, the influence of gender and age on those relationships will be more significant as they have more expectation on the service quality.

H9: Age, gender, and online shopping frequency will moderate the effect of perceived security on consumers' intention to use omni-channel shopping, such that the effect will be stronger for older men with higher levels of online shopping frequency.

H11: Age, gender, and online shopping frequency will moderate the effect of perceived service quality on consumers' intention to use omni-channel shopping, such that the effect will be stronger for older men with higher levels of online shopping frequency.

Moreover, age, gender, and online shopping frequency have a joint influence on the relationship between perceived inconsistency. Compared with men, women tend to put less time and effort in overcoming problems to achieve their objectives (Venkatesh et al. 2003). Venkatesh et al. (2012) show that women tend to pay more attention on external supporting factors (e.g., facilitating conditions) during the online shopping. Thus, women maybe more sensitive with service consistent and seamless shopping experience than men. As discussed before, this effect will be more significant as consumers become older. Similarly, online shopping experience will further moderate the relationship. For consumers with less experience, the influence of gender and age on the relationship will be more significant. Therefore, we propose the following hypothesis:

H10: Age, gender, and online shopping frequency will moderate the effect of perceived inconsistency on consumers' intention to use omni-channel shopping, such that the effect will be stronger for older women with less online shopping frequency.

4 Research Methodology

The data for this study was collected from a well-known Chinese omni-channel grocery-store from Fresh Hema (www.freshhema.com). It is under Alibaba's 'New Retail' initiative, generates 40 billion annual turnovers across multiple channels and touchpoints, and has more than 300 outlets located in surrounding communities in China through collaboration with traditional grocery stores. By using the Fresh Hema website and mobile app, consumers can search for the product details and purchase groceries online and afterward receive delivery promptly or visit a physical store to pick up the purchased products, which showcases the basic features of seamless omni-channel integration services. Hence, the research setting is considered as appropriate for our study context of omni-channel and could support investigating the effects of unique omni-channel characteristics.

	Number	Percentage		Number	Percentage
Age			Occupation		
18-24	100	27.62%	Student	76	20.99%
25-34	84	23.20%	Homemaker	18	4.97%
35-44	94	25.97%	Unemployed	7	1.93%
45-54	66	18.23%	Retired	23	6.35%
55-64	11	3.04%	Self-employed	45	12.43%
65+	7	1.93%	Employee	193	53.31%
Gender			Residential Area		
Male	177	48.90%	Urban	347	95.86%
Female	185	51.10%	Rural	15	4.14%
Educational Level			Online Shopping Frequency		
High school or below	33	9.12%	Never	0	0.00%
Diploma	61	16.85%	Seldom	19	5.25%
Bachelor	182	50.28%	Sometimes	74	20.44%
Master	85	23.48%	Usually	204	56.35%
Doctorate	1	0.28%	Always	65	17.96%

Table 1. Demographic Characteristics of Respondents

The measurement scales of constructs are derived from existing scales that have been shown to be reliable and valid (Herhausen et al. 2015; Huré et al. 2017; Juaneda-Ayensa et al. 2016; Venkatesh et al. 2012). The items of each construct are reflective. All items, with minor wording modifications to fit the

research context, were applied. The participants were instructed to rate their agreement with each item describing their omni-channel shopping experience by the 5-point Likert scales. The questionnaire was pilot tested with 15 Chinese grocery consumers who were excluded from the final results. The data collection phase started in January 2020 and completed in March 2020. After screening the submissions for missing data, we received 362 valid responses. Table 1 shows the participants' socio-demographic information. The cohort of the participants was representative of the Chinese grocery consumer characteristics according to the recent government report (CNNIC 2019).

5 Data Analysis and Results

Partial least squares structural equation modelling (PLS-SEM) was employed for data analysis since it is capable of testing the interactive effects of numerous latent factors associated with their indicators on the dependent variables in the path model (Hair et al. 2013). SmartPLS 3.0 and IBM SPSS 23 were used to perform statistical analysis. The analysis involved two stages. We first assessed the measurement model to examine the reliability and validity of the model constructs. Subsequently, in order to address the research question, we undertook the assessment of the structural model to evaluate the effects of various latent factors on consumers' intention to use omni-channel shopping.

5.1 Measurement Model Assessment

A confirmatory factor analysis was first conducted from which we made a few amendments to our model. Two items of the "perceived inconsistency" construct, PI1 and PI4, exhibited low factor loadings and high cross-loadings. We thereby deleted them to improve the convergence of our model. The factor loadings of all the indicators except PI2, PS2, and PS3 were greater than 0.70, suggesting that the indicators achieved a satisfactory level of reliability. As for the exceptions, the loadings of PI2, PS2, and PS3 fell in the marginal [0.50, 0.70] interval. However, the internal consistency reliability and convergent validity of PI and PS achieved a good level. We thus decided to accept the random variation and keep PI2, PS2, and PS3 in the model.

Table 2 shows internal consistency reliability, convergent validity, and discriminant validity. Internal consistency reliabilities of multi-item scales of each construct indicated by Cronbach's α and composite reliability (CR) were 0.70 or higher, demonstrating that all the constructs were reliable. Additionally, convergent validity was confirmed provided AVE was greater than 0.50 in all cases, which represented the indicators converge with their corresponding factors. Furthermore, all the heterotrait-monotrait ratio of correlations (HTMT) values did not exceed 0.85, we thereby confirmed that discriminant validity was established. Hence, we concluded that our research model achieved satisfactory quality and we could then turn to the assessment of the structural model.

	α	CR	AVE	EE	HM	HT	PI	PE	PS	PSQ	SI	UI
EE	0.88	0.88	0.70	0.84								
HM	0.92	0.92	0.79	0.54	0.89							
HT	0.93	0.93	0.87	0.59	0.66	0.93						
PI	0.77	0.77	0.53	0.41	0.42	0.26	0.73					
PE	0.82	0.83	0.61	0.57	0.55	0.57	0.25	0.78				
PS	0.77	0.76	0.53	0.55	0.53	0.37	0.65	0.45	0.73			
PSQ	0.80	0.80	0.58	0.51	0.47	0.43	0.77	0.44	0.70	0.76		
SI	0.81	0.81	0.59	0.48	0.62	0.50	0.44	0.55	0.50	0.47	0.77	
UI	0.91	0.91	0.78	0.65	0.65	0.73	0.35	0.66	0.54	0.64	0.54	0.88

Table 2. Internal Consistency Reliability, Convergent Validity, and Discriminant Validity

5.2 Structural Model Assessment

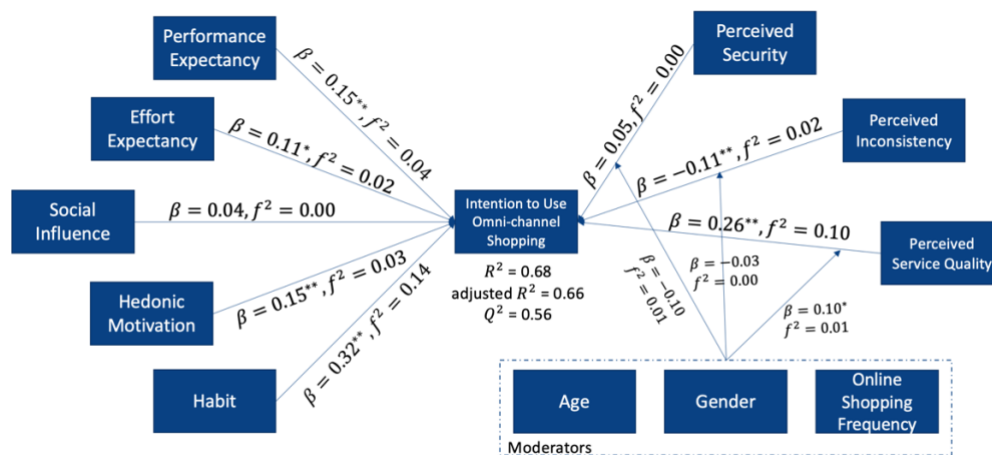
We first examined multicollinearity issues by reviewing the variance inflation factor (VIF) values of all exogenous constructs. All VIF values were found to be around 2 to 3 and saliently lower than the conservative threshold of 5, thus suggesting that collinearity was not a critical issue.

The sign, magnitude, and significance criteria of the path coefficients, and effect sizes are summarized in Figure 2. The results indicated that performance expectancy, effort expectancy, hedonic motivation, habit, and perceived service quality have a significant effect on use intention of omni-channel shopping, with coefficients of 0.15 ($p < 0.01$), 0.11 ($p < 0.05$), 0.15 ($p < 0.01$), 0.32 ($p < 0.01$), and 0.26 ($p < 0.01$) respectively. Thus, H1, H2, H4, H5 and H8 are supported. Perceived inconsistency showed a significant negative effect on consumers' intention to use omni-channel shopping, with path coefficient of -0.11 ($p < 0.01$). Therefore, H7 is supported.

However, social influence and perceived security do not have a significant effect on consumers' intention to use omni-channel shopping. Thus, H3 and H6 are not supported.

Figure 2 also shows the effect sizes indicated by f^2 . The strongest f^2 effect size (= 0.14) occurred in the relationship between habit and intention to use. The relationship also had the highest path coefficients of 0.32. All the other significant relationships exhibited relatively smaller effect sizes, sorted in descending order as follows: PSQ -> UI (= 0.10), PE -> UI (= 0.04), HM -> UI (= 0.03), PI -> UI (= 0.02), and EE -> UI (= 0.02). The remaining f^2 effect sizes in the structural model were negligible.

Besides, our hypotheses pertained to new moderated relationships, as aforementioned, about the role of perceived security, perceived inconsistency, and perceived service quality, and interaction terms as predictors. Considering the complexity of the proposed relationships, except for the figures shown in Figure 2, we depicted interaction plots where the moderation effect is stronger when the absolute value of the slope is larger to understand the pattern of results. We report the support for our hypotheses according to the cumulative evidence from multiple analyses. H11 is supported since the effect of the interaction term (i.e., PSQ * AGE * GEN * OSF) on the endogenous construct (UI) was significant.



Note: * $p \leq 0.05$; ** $p \leq 0.01$; all other relationships are insignificant.

Figure 2: Results of the Structural Model

6 Discussions and Conclusion

Based on the survey results, we have addressed the two research questions - "What are the key factors that drive consumers' intention to use omni-channel shopping?" and "To what extent do the socio-demographic variables moderate the effects of those key factors on consumers' intention to use omni-channel shopping?". Our research model can explain 68% intention to use omni-channel integrated shopping ($R^2 = 68\%$). Our findings show that a consumer's intention to use omni-channel services is affected by habit, perceived service quality, performance expectancy, hedonic motivation being able to use multiple channels, perceived inconsistency, and effort expectancy. In addition to direct effects, age, gender, and online shopping frequency are shown to moderate the relationship between perceived service quality and use intention, where older men with higher online shopping frequency are more sensitive. Surprisingly, social influence and perceived security do not influence omni-channel use intention. The joint moderating effects of age, gender, and online shopping frequency on the relationship between perceived service quality and intention to use and the relationship between perceived inconsistency and intention to use are not significant.

Although the literature has emphasized the effect of social influence on individuals' attitudes, intentions, and behaviour (Bilgicer et al. 2015; Venkatesh et al. 2003; Venkatesh et al. 2012), our results show that

social influence does not affect consumers' intention to use omni-channel options for purchasing products. This phenomenon could be because online shopping has been widely adopted by individuals nowadays (CNNIC 2019) and numerous retailers that offer omni-channel services are located surrounding the communities (Xu and Zhang 2017). Therefore, consumers choose omni-channel shopping based on their own needs rather than suggestions from others.

Our study findings show that perceived security does not have an impact on consumers' intention to use omni-channel shopping. One plausible explanation of the insignificant influence of perceived risk in online shopping is because of the research context involved in our study. As local grocers provide consumers with the option of traditional in-store payment methods, conservative consumers who perceive online shopping as a risk could visit a physical store for purchasing products.

In line with the previous literature (Herhausen et al. 2015; Melis et al. 2015; Venkatesh et al. 2003; Venkatesh et al. 2012), we find that age, gender and online shopping frequency are significant moderators in the research model. Our results show the joint moderating effect of age, gender, and online shopping frequency on the relationship between perceived service quality and consumers' intention to use omni-channel shopping. Specifically, the effect of perceived service quality on intention to use will be stronger for older men with higher levels of online shopping frequency.

Furthermore, habit positively influences intention to use. As more and more retailers implement effective omni-channel strategies, consumers are allowed to use omni-channel simultaneously through their shopping journey. Once individuals have established a habit of using omni-channels for shopping, consumers are more likely to adopt omni-channel behaviour (Juaneda-Ayensa et al. 2016). Omni-channel retailers could design the systems to help consumers to use them easily. The influence of hedonic motivation on omni-channel use intention is found to be significant with a positive effect. The omni-channel environment provides consumers with opportunities to use multiple seamless channels and touchpoints when purchasing commodities. People can browse for the product details and purchase them online during their leisure period, and afterward receive delivery promptly, which can make them feel grocery shopping enjoyable. They can also visit a physical store for shopping or pick up the purchased products, and their mood can be promoted as well through direct sensory stimulation when evaluating products (Xu and Zhang 2017). The results also show that effort expectancy is a significant factor in predicting the adoption of omni-channel shopping. In keeping with the previous research (Juaneda-Ayensa et al. 2016; Venkatesh et al. 2003; Venkatesh et al. 2012), the ease of discovering how something will work when switching across different channels determines people's use intention. Hence, making multiple retailing channels easy to learn and use should be a priority of omni-channel retailers.

Perceived service quality shows a significant influence on consumers' intention to use omni-channel shopping. In our context of grocery industry, the products are perishable and fragile and hence their freshness indeed determines their value (Xu and Zhang 2017). In the omni-channel shopping, retailers should ensure the quality of the products delivered is identical to that shown on different channels (Herhausen et al. 2015). Companies should thus take this quality profile into account and establish an effective supply chain to accommodate omni-channel requirements for high-quality services across various channels.

The results also indicate that perceived inconsistency is a significant determinant and has a direct negative influence on omni-channel use intention. Therefore, retailer managers should implement appropriate omni-channel strategies to ensure the homogeneity of the retailing touchpoints (Huré et al. 2017). In other words, they need to ensure the products (i.e., prices, ranges, and descriptions) and services on different channels are consistent and identical. Meanwhile, companies should enable consumers to move easily across channels (physical store, web shop, mobile app, and social media) without any barriers (Huré et al. 2017). For instance, information such as consumers' purchase preference should be transferred fluidly through different channels without the need to re-provide when switching channels. In keeping with the latest literature (Xu and Zhang 2017; Zhang and Zhao 2019), as more and more traditional grocers consider providing consistent and seamless omni-channel services, we believe this factor will decrease in importance in the coming years.

Our research has some limitations and calls for future studies. First, the participants were dominated by urban respondents (95.86%). Future research could collect samples from rural areas to investigate how the differences in geographic locations affect consumers' intention to use omni-channel shopping. Second, the survey method does not allow for in-depth investigation. Interviews could be conducted in future research to obtain a more in-depth understanding of consumers' actual perceptions. Third, since we carried out this research in China with the context of the grocery sector, replicating this study in other countries and industries could offer a richer insight into the understanding of consumers' intention to use omni-channel integration services. Finally, as the pandemic has presented its impact on omni-

channel shopping practices, future study may conduct another round of survey after COVID-19 to compare the difference between consumers' intention to use before and after the pandemic.

This study is one of the first studies exploring the factors affecting individual-level omni-channel use intention using a Chinese grocer as the study context. Therefore, the research has both theoretical contributions and managerial implications. From the theoretical perspective, this study extends the explanatory power of the UTAUT2 model to the omni-channel context. From the managerial perspective, the identified factors that drive the consumer's use intention of omni-channel shopping can offer insights for companies to develop appropriate strategies and measures targeting these factors, thereby providing consumers with a pleasurable, consistent, and seamless shopping experience across various channels.

7 References

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