Chatbot Commerce: Hype or Revolution?

Min Chung Han[1]
Kean University
Youjeong Kim
New York Institute of Technology

ABSTRACT
Are chatbots merely hype, or are they a revolution in technology driven marketing? There has been a lack of academic investigation into the question of consumers' perspective on e-commerce via chatbots, despite several attempts by businesses to incorporate chatbots into their e-commerce platforms. This study attempts to shed light on factors that influence mobile users' purchase intention via chatbot commerce, based on the motivation, opportunity, and ability (MOA) model. This study observed that mobile users' hedonic, social motivation and ability to use chatbots positively influences their intention to use chatbot commerce. Interestingly, mobile users' opportunity to use chatbots had no significant relationship with their purchase intention. Further research findings regarding gender difference and managerial implications are discussed.

Keywords*: Chatbots, Conversational commerce, Chatbot commerce, MOA model, Purchase intention*
JEL*: M30*

[1] Corresponding author contact: mihan@kean.edu

1. INTRODUCTION

Companies have recently been buzzing about chatbots as a new marketing platform to improve their business through prompt customer service, better marketing, and more sales.

Chatbots are computer programs that mimic human conversation via textual and auditory methods to carry out certain tasks, such as online reservations (Shawar & Atwell, 2007; Rawlins, 2016). Chatbots understand customers' written or spoken questions and formulate answers in a human-like manner. Although chatbots have been around since the 1960s, they have risen in popularity due to advanced artificial intelligence (AI) technology and the rapid growth of mobile Internet access.

In this digital age, consumers' demand for instant gratification has risen exponentially, whether through one-day shipping or live chats with customer service staff. To respond quickly to consumers' needs and desires, many companies have employed chatbots. This technology provides answers for consumers' queries instantly, eliminating the need to place them on hold. Chatbots can assist consumers to make a reservation, or to place or receive an order, thus minimizing the need for additional human staff.

There have been several noteworthy examples of chatbot implementation in online commerce. The world's largest hotel chain, Marriot International, employs chatbots for checking room availability as well as reserving a room or changing a reservation (Schick, 2017). Makeup product retailer Sephora's chatbot helps consumers book a makeover appointment and provides a lipstick color match to expedite purchase (O'Shea, 2016). A startup insurance company, Next Insurance, launched a chatbot for small businesses to quote and buy insurance (Brown, 2017).

While businesses eagerly anticipate jump starting online commerce through chatbots, consumers seem less keen on communicating with machines to purchase products. Users of Alexa, one of the most popular voice-activated chatbots, seldom utilize it for shopping, although there are 50 million Alexa users in the world. Only about 100,000 people have used Alexa more than once for shopping (Coldwey, 2018). As chatbot commerce performance did not exceed initial expectations, some people quickly labeled chatbots as "hype" (Anand, 2018; Forbes, 2018). Nevertheless, there is still optimistic data for future usage of chatbots in online commerce. One million Alexa users have ordered items through conversations with Alexa, although many of them did not continue shopping with it (Anand, 2018). In addition, 73% of consumers prefer live chat to phone calls or emails regarding customer service satisfaction (Asli, 2018). So, are chatbots merely hype or a revolution in technology driven marketing? There has been lack of investigation into consumers' perspective on e-commerce via chatbots, despite several attempts by businesses to incorporate chatbots into their e-commerce platforms.

This study aims to shed light on chatbots in the buying process by investigating what factors drive consumers' intention to use them to purchase products. It attempts to answer the following questions based on the motivation, opportunity, and ability (MOA) model: will consumers use chatbots to purchase items if they are capable and motivated when an opportunity is given?

This study has a threefold purpose: 1) to understand consumers' willingness to use chatbots for purchasing products; 2) to apprehend motivational, habitual, and conditional factors that influence users' intention to use chatbots with gender as moderator; and 3) to suggest the managerial implications for marketing practitioners who want to incorporate chatbots for their businesses.

The following section introduces the concept of conversational commerce and chatbot commerce, as well as the theoretical foundation for the MOA model to examine their impact on chatbot usage intention. The third section describes the research model, based on MOA, and presents hypotheses. Section 4 discusses research methodology. Results are then presented, followed by a discussion of research findings and practical implications for

marketing practitioners. Finally, research limitations are discussed, and future research is proposed.

2. THEORETICAL BACKGROUND

2.1 Conversational Commerce

Chatbots or human-like virtual agents are currently one of the most talked about artificial intelligence (AI) technology among businesses. The main idea is that consumers converse with computer programs to achieve their goals, e.g., finding information about products or services and eventually purchasing them through chatbots, not humans.

Voice-based virtual agents such as Amazon's Alexa, Google Assistant, and Apple's Siri are at the forefront of this trend. Consumers are familiar with these agents due to their human-like names and massive TV commercial airtime. Several news reports (Earl, 2017; Truong, 2016) about how children ordered toys and cookies off Alexa accidently or deliberately without parents' permission also piqued consumers' interest. Following voice-based virtual agents, thousands of text-based chatbots have been introduced in many types of businesses. In 2016, Facebook CEO Mark Zuckerberg announced that Facebook Messenger would incorporate chatbots, and that consumers could make purchases through them (Guynn, 2016). Thousands of companies followed suit, and as of 2018 there were over 300,000 active chatbots on Facebook Messenger. Consumers can order food, book taxis, and check account transactions by simply texting to bots (Kim, 2018).

As e-commerce via conversation with human-like virtual agents receives more attention, the new platform of online commerce has been coined "conversational commerce," i.e., online commerce conducted through text, voice, and other natural language technology interacting with businesses, brands, and services (Messina, 2015). While the term "conversational commerce" is widely used among professionals in the tech and marketing field, there is no specific term that defines online commerce through text-based chatbots. To differentiate commerce through text-based messenger chatbots from voice-activated bots (e.g., Alexa), we define *chatbot commerce* as e-commerce conducted via text to purchase products, with the entire transaction taking place within the chatbot conversation. Chatbot commerce is a subset of conversational commerce and enables a consumer to message back and forth to get the needed information and complete the purchase.

2.2 MOA Model

As human behavior is immensely complex, marketing scholars and researchers have suggested different theories to understand how consumers make decisions to change their behavior. The MOA model has been discussed in the context of consumer behavior to explain how consumers act on outside stimuli and internal driving forces. The MOA model argues that when consumers are motivated and have opportunity and ability, they will change their behavior or perform the desired behavior (Barta & Ray, 1986; MacInnis & Jaworski, 1989; MacInnis, Moorman, & Jaworski, 1991; Ölander & Thøgersen, 1995).

Barta and Ray (1986) first introduced motivation, opportunity, and ability factors in consumer behavior to explain situational effects of advertising repetition. MacInnis and Jaworski (1989) proposed the MOA framework and suggested that motivation, opportunity, and ability are the antecedents for consumers' responses to advertisements and brand attitudes. MacInnis, Moorman, and Jaworski (1991) further developed the model and found that MOA played a role in the relationship among executional cues and communication outcomes.

In the context of the MOA model, motivation refers to consumers' desire, readiness, and willingness (Curry & Moutinho, 1993; MacInnis et al., 1991). Barta and Ray (1986) defined motivation as "involvement," i.e., the feeling of a recipient toward the advertisement message of whether it is important to them. MacInnis and Jaworski (1989) saw motivation

as "desire" to process brand information in the advertisement. Previous research claimed that online shopping can be predicted by consumers' motivation (Chen, 2012; Joines, Scherer, & Scheufele, 2003).

Opportunity regarding the MOA model was defined as the extent of distractions and limited exposure (MacInnis et al., 1991; MacInnis&Jaworski, 1989). Lack of opportunity such as distractions would prohibit information processing of the advertisement. In addition, limited exposure to information with an inability to control the pace was found to result in limited information processing. Ojo, Arasanmi, Raman, and Tan (2012) argued that given opportunity was one of the most significant predictors for internet usage.

Ability in the MOA model was defined as knowledge, familiarity, skills, or proficiencies so that high ability can enable high information processing (Batra & Ray, 1986; MacInnis et al., 1991; MacInnis & Jaworski, 1989). Lack of ability would limit consumers' capacity to interpret information and influence business owners' e-commerce adoption (Rahayua & Day, 2015). Ölanderand and Thøgersen (1995) saw ability more as a combination of habit and task knowledge.

Several researchers adopted the MOA model to understand and explain consumers' decision-making in their behavior change in various fields. The earlier studies of MOA clearly demonstrated that advertisement effectiveness is associated with situations where consumers' motivation, opportunity, and ability all coexist (Barta & Ray, 1986; ManInnis & Jaworski, 1989; MacInnis et al., 1991; Curry & Moutinho, 1993). It also has been used in the field of communication to explain consumer-to-consumer know-how exchange (Gruen, Osmonbekov, & Czaplewski, 2005) and effective communication by public relations messages (Hallahan, 2000). In the hospitality field, the MOA model was used to explain travelers' intentions to revisit hotel social media sites (Leung & Bai, 2013), engagement in a local community festival (Jepson, Clarke,&Ragsdell, 2013), intention to travel on cruises (Hung & Petrick, 2012), and determining factors for intention to use social media to organize holiday travel (Parra-López, Gutiérrez-Taño, Díaz-Armas, & Bulchand-Gidumal, 2012). With respect to environmental issues, the MOA model was claimed to be effective at explaining intention to participate in recycling programs (Thøgersen, 1994), waste handling and recycling (Ölander & Thøgersen, 1995), and the purchase of eco-labeled products (Thøgersen, 2000). The MOA model was also adapted in organizational behavior studies to explain employees' knowledge sharing intentions (Reinholt, Pedersen, & Foss, 2011; Siemsen, Roth, & Balasubrimanian, 2008) and corporations' knowledge and learning (Turner & Pennington, 2015).

The MOA model has also been embraced in technology adoption to explain consumers' decisions to accept and adapt to new technology and innovation. For instance, physicians and patients' adoption of electronic medical/health records were influenced by physicians and patients' motivation, opportunity and ability (Angst & Argawal, 2009; Govindaraju, Hadining, & Chandra, 2013).

The aforementioned research suggests that the MOA model is a succinct framework for examination of factors that influence consumers' adoption of new technology and innovation, as well as purchase intention via e-commerce. Given that chatbot commerce is a subset of e-commerce and is a new technology, this study applied the MOA model to explore online consumers' intention to use chatbots for purchasing products.

3. RESEARCH MODEL AND HYPOTHESES

Prior research has shown that consumers' motivation is strongly associated with their behavioral intention to search and buy through online commerce, i.e. higher motivation leads to higher intention to accept e-commerce, or purchase items via e-commerce (Chiu, Wang, Fang, & Huang, 2014; Han & Kim, 2017; Joines, Scherer, & Scheufele, 2003).

Consumers opt for online shopping for various benefits, hence diverse motivations. Multiple studies have claimed that consumers accept and adopt online commerce for utilitarian aspects, hedonic motives, and social benefits.

Shoppers care about buying products conveniently and effectively, regardless of time and location. Several studies have consistently identified convenience, including time savings, as one of the primary motivations for participating in online shopping. Online shopping provides the unprecedented convenience of shopping anywhere and anytime, as well as easy price comparison (Korgaonkar & Wolin, 1999; Rohm & Swaminathan, 2004). This leads to online consumers valuing convenience more as they shop online frequently (Li et al., 1999). Furthermore, consumers' belief that using a particular system enhances work performance positively related to their adoption of the system (Davis, 1989; Yen, Wu, Cheng, & Huang, 2010). Many scholars have found that consumer motivation for utilitarian values such as time saving (Anderson, Knight, Pookulangara, & Josiam, 2014) positively influenced purchase intention and information search intention (Jiang, Yang, & Jun, 2013; To, Liao, & Lin, 2007).

Research also has shown that recreational shoppers enjoy shopping as an entertaining experience and spend more time shopping rather than treating it as a chore (Bellenger, 1980). Ryu, Han, and Jang (2010) discovered that hedonic value positively influences consumer behavioral intentions as well as customer satisfaction. Hedonic value also was confirmed to influence repeated purchase intention (Chiu et al., 2014). Childers, Carr, Peck, and Carson (2001) found that shopping enjoyment was a significant attitude predictor of online retail shopping.

Prior consumer research also agrees that social interaction affects online consumers' shopping attitudes such as adoption of online commerce to purchase products (Joines et al., 2003; Korgaonkar & Wolin, 1999). Shopping has long been a social activity to interact with sales associates or fellow shoppers to some extent (Godes et al., 2005). While e-commerce lacks physical human interaction, there have been continuous efforts to incorporate social interactions into e-commerce. Direct communication with sellers through instant messenger increased online shoppers' perception of social presence, and it led to seller trust (Lu, Fan, & Zhou, 2016).

Since chatbot commerce is a subset of online commerce, it is therefore reasonable to assume that online consumers' motivation will positively influence behavioral intention of using chatbots. Thus, we propose the following hypothesis:

> H1: Mobile users' utilitarian (H1a), hedonic (H1b), and social (H1c) motivation will positively influence their chatbot commerce purchase intention.

Opportunity is defined as circumstances that facilitate people's participation; opportunity occurs when supportive framework provides for participation (Bahaire & Elliot-White, 1999). Constraints and limitations often prohibit people from achieving desired behavior, and they miss opportunities as a result. Hung and Petrick (2012) discovered that travel constraints influence travel intentions. That is, the higher the level of travel constraints a person experiences, the less likely a person is to travel. Rogers and Anastasiadou (2011) viewed opportunities as antecedents of community involvement in local festivals. Meanwhile, several scholars identified that a higher level of involvement is associated with greater interest and a more positive attitude toward products and brands (Celsi & Olson, 1988; Lee, Hu, & Toh, 2000). This could be interpreted as higher opportunity being related to attitude toward products through involvement. Based on previous literature, it could be argued that online users with higher opportunity to use chatbots would show higher intention of using them for purchasing products. Hence, the authors posit:

H2: Mobile users' given opportunities will positively influence their chatbot commerce purchase intention.

Ability refers to a person's belief or conviction about his or her capability to perform the intended behavior successfully (Ajzen, 2002; Bandura, 1991). Prior studies provided support for the positive relationship between ability and users' behavior intention. Hsu and Chiu (2004) found that a person's confidence in using the World Wide Web (WWW) has a positive influence on his or her intention to use e-service, as well as actual e-service usage. As e-commerce continues to grow, several studies show that people's ability is strongly associated with their e-commerce adoption and intention to use (Bhattacherjee, 2000; Eastin, 2002). In addition, researchers found that self-confidence is related to individuals' intention to seek health information online (Rains, 2008) and the amount of health information they seek (Lee, Hwang, Hawkins, & Pingree, 2008). Based on the above literature, we propose:

H3: Mobile users' ability to use chatbots will positively influence their chatbot commerce purchase intention.

Several researchers have identified that gender plays a role in people's online behavior, including online shopping motivation and purchase intention (Ulbrich, Christensen, & Stankus, 2011; Seock & Bailey, 2008). Men are more likely to use the internet for shopping, while women are more likely to use it for browsing information and communicating with friends (Jackson, Ervin, Gardner, & Schmitt, 2001). Men value ease of purchasing through online shopping more than women, while female shoppers value usefulness of online shopping more than male shoppers (Chiu et al., 2005). Female shoppers also value the utility of online shopping less than their male counterparts (Hasan, 2010).

Researchers have also found that male and female internet users showed different attitudes toward acceptance of technologies. Men showed generally higher intention to use e-learning than women; women were more influenced by self-efficacy and men were significantly influenced by the usefulness (Ong & Lai, 2006). When teachers' computer acceptance was measured, the perception of ease of use influenced women's intention more than men's (Yuen & Ma, 2002). As chatbots are a new technology and chatbot commerce is a subset of e-commerce, we posit the below hypothesis:

H4: The influence of mobile users' motivation, opportunity and ability toward their chatbot commerce purchase intention will be moderated by gender.

4. RESEARCH METHODOLOGY

4.1 Procedure

In this study, the authors created a two-minute chatbot introductory video that was shown to the participants at the beginning of the survey. The participants were required to watch the video, which contains a definition of chatbots and their diverse usage as information providers and online shopping assistants. The video featured several companies' chatbots that are available on mobile Facebook Messenger. One example features a conversation between mobile messenger users and a chatbot demonstrating the process of ordering pizza without calling the store. Participants were then asked to answer the survey questionnaire. The first part of the survey measured their motivation, opportunity, and ability. In the second part, participants were asked to disclose their previous experience with chatbots, if any, along with demographic information.

4.2 Measures

Measures were adapted from previous literature. All items were measured in a 7-point Likert scale, with 1 being "strongly disagree" to 7 being "strongly agree." In the first part of survey, subjects were required to watch an introductory video about chatbots. Then, participants were asked to answer a survey questionnaire to assess their motivation, ability, and opportunity for using chatbots to purchase products. Participants' motivation was measured in three parts, i.e., utilitarian motivation, hedonic motivation, and social motivation.

To assess utilitarian motivation, this study adapted seven items from Cheng, Lam, and Yeung (2006) and Rohm and Swaminathan (2004). For example, "Chatbots would make it easier for me to carry out my tasks" and "Chatbots are a convenient way to shop and get information" are measured as part of seven items. Hedonic motivation was measured by four items adapted from Mikalef, Giannakos, and Pateli (2013). For example, "Using chatbots is fun" and "Using chatbots is enjoyable" are part of the measures. In addition, four items adapted from Lee, Peng, Jin, and Yan (2006) and Skalski and Tamborini (2005) were used to measure social interaction motivation such as "Using chatbots makes me feel as if I interacted with someone." Regarding opportunity, four items were adapted from Parra-López, Gutiérrez-Taño, Díaz-Armas, and Bulchand-Gidumal (2012); for example, "I have access to the technology needed to access chatbots." Three items to measure ability were adapted from Papacharissi and Rubin (2000). One of the items was "I am confident that I could use chatbots for getting information or purchasing products."

This study conducted a reliability test to examine internal consistency. Cronbach's α coefficients analysis applied to all measurement items. Utilitarian motivation (α=.936), hedonic motivation (α=.966), and social motivation (α=.959) all showed Cronbach's α higher than 0.8 (α>.8), which is considered as good (George & Mallery, 2003). Opportunity (α=.853) and ability (α=.843) also showed Cronbach's α higher than 0.8 (α>.8). Thus all the items used in this study met the reliability requirements.

4.3 Participants

The sample for this study (Table 1) comprises 190 college students in the northeastern United States. Participants (male=43.5%; female=56.5%) were provided to complete a survey between Aug. 1, 2018, and Dec. 22, 2018. Subjects' ages ranged from 17 to 50 (*M*=23.79). Based on the survey of 2017, the most common mobile communication preference of Internet users in the United States is texting. All age groups between 18 and 54 revealed that they prefer text over voice communication except the age group over 55. The age group over 55 preferred voice communication ("Mobile communication preference," 2017). Because this study's chatbot is based on text communication, we deem the subject sample (age ranged from 17 to 50) to be representative of potential chatbot users in the United States.

5. RESULT

To test the aforementioned hypotheses, structural equation modeling (SEM) was conducted by using Amos 23.0 to process two-step statistical analysis. First, a confirmatory factor analysis (CFA) was conducted to determine the fitness of the measurement model in the study. Then, the structural model was evaluated to test proposed research hypotheses.

5.1 Measurement Models

Confirmatory factor analysis was conducted to test the measurement model. The result (Table 1) shows that all indices exceeded the recommended acceptable value.

Table 1. Model Fit Indices

	$\chi 2$/df	GFI	AGFI	CFI	NFI	IFI	RMSEA
Criterion	<2	≥0.90	≥0.90	≥0.90	≥0.90	≥0.90	<0.05
Values	1.149	0.941	0.906	0.963	0.968	0.995	0.028

Normed chi-square ($\chi 2$/df) with a value of 1.149 was well within the acceptable range of 2 as recommended by Tabachnick, Fidell and Ullman (2007). Goodness of fit (GFI) value was 0.941, adjusted goodness of fit (AGFI) was 0.906, comparative fit index (CFI) was 0.963, normed fit index (NFI) was 0.968, and incremental fit index (IFI) was 0.995. All of these indices were within the recommended vale of 0.90 or above (Hair, Black, Babin, & Anderson, 2010). Root mean square error of approximation (RMSEA) was 0.028, which is less than the recommended cut-off level of 0.08 (Hair et al., 2010).

After evaluating model fit construct reliability (CR) and average variance extracted (AVE) were calculated for convergent validity and discriminant validity. The construct reliabilities for the all constructs were in the acceptable range of 0.743 to 0.921 except one construct being 0.658. Although a commonly acceptable threshold value for construct reliability is 0.7, close to 0.7 has been considered acceptable (Hair et al, 2010). AVE ranged from 0.594 to 0.796, all surpassing the suggested minimum limit of 0.50 (Fornell & Larcker, 1981). For discriminant validity, the square roots of the AVE for each construct were all higher than the square of inter-construct correlation values signifying adequate discriminant validity. Taken together, both convergent validity and discriminant validity were established (Table 2).

Table 2. Discriminant Validity

Construct	Correlation coefficient					
	1	2	3	4	5	6
Utilitarian Motivation	1.00					
Hedonic Motivation	0.665	1.00				
Social Motivation	0.380	0.685	1.00			
Opportunity	-0.016	-0.143	-0.295	1.00		
Ability	0.531	0.528	0.331	0.019	1.00	
Purchase Intention	0.551	0.779	0.691	-0.192	0.622	1.00
CR	0.893	0.921	0.885	0.658	0.784	0.743
AVE	0.736	0.796	0.793	0.657	0.645	0.594

5.2 Hypotheses Testing

For testing Hypothesis 1 through Hypothesis 4, Structural Equation Modeling (SEM) was conducted using AMOS 22.0 to examine the effect of online users' motivation, opportunity, and ability regarding intention to use chatbots for purchasing products. Hypothesis 1 assumed

that mobile users' utilitarian, hedonic, and social motivations will positively influence their intention to seek information and purchase products by communicating with chatbots.

The results (Table 3) show that the structural model indicates satisfactory model fit with Normed chi-square ($\chi 2/df$) with a value of 1.204, well within the acceptable range of 2 (Tabachnick, Fidell, &Ullman (2007). All model fit indices produced an acceptable range of results (GIF=0.945, AGFI=0.908, CFI=0.994, NFI=0.971, IFI=0.995 and RMSEA=0.032).

It was found that mobile users' hedonic motivation significantly influences their intention of purchasing products (p=.000) in chatbot commerce. Social motivation also demonstrated significant influence on product purchase intention (p=.000) in chatbot commerce. Interestingly, the result revealed that mobile users' utilitarian motivation did not indicate any significant effect on intention to purchase products (p=.951). Hence, Hypothesis 1b and Hypothesis 1c are supported while Hypothesis 1a is not supported.

This study expected that mobile users' given opportunities will positively influence their intention to seek information and purchase products. The result demonstrated that when mobile users are given opportunities to use chatbots, the opportunity did not show any significant effect on their intention to use chatbots for product purchasing (p=.291). Thus, Hypothesis 2 is not supported.

Table 3. Hypotheses Results

Hypotheses	Estimates	S.E.	C.R.	*p*	Support
H1a	0.004	0.078	0.060	0.951	Not Supported
H1b	0.404	0.092	4.362	0.000	Supported
H1c	0.251	0.062	4.015	0.000	Supported
H2	-0.070	0.066	-1.054	0.291	Not Supported
H3	0.368	0.080	4.597	0.000	Supported
Model fit indices	$\chi 2/df$= 1.204; GIF=0.945; AGFI=0.908; CFI=0.994; NFI=0.971; IFI=0.995; RMSEA=0.032				

Hypothesis 3 assumed that mobile users' ability to use chatbots will positively influence their behavior intention of purchasing products in chatbot commerce. The result from Table 4 confirmed that mobile users' capability to use chatbots significantly affects their intention to use chatbots to purchase products (p=.000). Therefore, Hypothesis 3 is supported.

Table 4. Gender Moderating Effect

	Male	Female
	C.R.(*p*-value)	C.R.(*p*-value)
H1a	-1.014(0.310)	-0.055(0.956)
H1b	4.983(0.000)	0.700(0.483)
H1c	2.090(0.036)	3.444(0.000)
H2	-0.029(0.976)	-1.788(0.078)
H3	1.164(0.244)	4.200(0.000)

Hypothesis 4 assumed that the influence of mobile users' motivation, opportunity and ability toward their purchase intention in chatbot commerce will be moderated by gender. The result (Table 3) shows that the effects of motivation, opportunity and ability on mobile users' purchase intention in chatbot commerce were different for males and females (p=0.000). Male mobile users' purchase intention in chatbot commerce was influenced by hedonic and social motivation, while female users' chatbot commerce purchase intention was influenced by

social motivation and ability. As gender played a moderating role in mobile users' purchase intention, H4 is supported.

6. DISCUSSION

This study attempts to reveal factors that influence mobile users' behavioral intention to use chatbots in the buying process. Because businesses have made several attempts to incorporate chatbots into customer service and e-commerce, this study examined what factors influence mobile users' intention to use chatbots for purchasing products. Specifically, this research investigated whether mobile users' motivation, opportunity, and ability influence their willingness to use chatbots for this purpose.

First, this research found that mobile users' utilitarian motivations did not influence their intention to purchase products via chatbots, contrary to Hypothesis 1a. Although extant research of online commerce claimed utilitarian motivation to be a strong predictor of purchase intention (Chiu et al., 2014; Childers et al., 2001; To et al., 2007), several researchers also found that utilitarian motivation of consumers did not influence their desired behavioral intention (Anderson, Knight, Pookulangara, & Josiam, 2014; Pöyry, Parvinen, & Malmivaara, 2013). In other words, this utilitarian aspect contributes to browsing information about the desired behavior, but it does not contribute to performing the desired behavior. This finding could be indicative of the rapidly changing Internet technology environment in which consumers are highly connected (Anderson et al., 2014). Hence, it could be interpreted that utilitarian aspects such as time saving and convenience no longer influence consumers' purchase intention, as these aspects are expected to be guaranteed for most online consumers.

Second, this study observed that mobile users' hedonic motivation positively influences their intention to use chatbots for purchasing products. These results are consistent with the findings of Davis, Lang, and Diego (2014), which revealed strong relationships between hedonic motivation and online shopping intention.

Third, we discovered that mobile users' social motivation strongly influences their intention to purchase products via chatbots, as we presumed in Hypotheses 1c. The results reported herein support the prior researchers' contention that social elements influence consumers' impulsive shopping intention toward luxury products (Nwankwo, Hamelin, & Khaled, 2014), teenagers' purchase behavior in social virtual worlds (MäNtymäKi & Salo, 2011), and social media users' purchasing intention in online shopping (Lu, Fan, & Zhou, 2016).

Fourth, and most interestingly, this research observed that mobile users' given opportunity to use chatbots had no significant relationship with their behavioral intention to purchase products via chatbot, despite our expectations. This finding is in accordance with the notion of Gruen et al. (2005) that opportunity does not have a significant effect on information sharing intention online, thus suggesting that opportunity plays a minor role in the Internet context. It was argued that opportunity to participate in online exchange is ongoing, once a minimum threshold of opportunity is provided; then opportunity no longer has an impact on exchange intention (Gruen et al., 2006). It is no surprise, then, that mobile users showed no significant intention when opportunity given is increased, as all smart phone users are basically given an opportunity to use chatbots.

Next, regarding Hypothesis 3, this study found that mobile users' ability to use chatbots significantly influenced their intention to use chatbots for information seeking and product purchasing. This finding is consistent with prior researchers' claim that an individual's belief in their own ability is a critical factor that influences satisfaction in an online learning system (Liaw, 2008), exercise intention, and physical activity (Sniehotta, Scholz, & Schwarzer, 2005) and purchase intention of online contents (Wang, Yeh, & Liao, 2013).

Last, this study demonstrated that males and females differ in motivation; male users were influenced by hedonic motivation whereas female users were influenced by ability to purchase in chatbot commerce. Although extant research of online commerce argued that hedonic value (e.g., enjoyment, playfulness) influences females more than men (Dholakia, 1999; Ha & Im, 2014; Wang & Wang, 2010), other researchers found conflicting findings that hedonic value influences men more strongly than women in the online setting (Lin, 2011; Wang, 2010), which is in line with this study result. Consistent with prior research that women's behavioral intention was more influenced by self-efficacy to use e-learning and computers than men (Ong & Lai, 2006; Yuen & Ma, 2002), the current result suggests that female users were influenced by their ability to use chatbot while male users were not.

7. IMPLICATIONS AND LIMITATIONS

This study offers valuable contributions to academia and industry practitioners. Regarding theoretical perspectives, there are limited studies on mobile users' behavioral intention to use chatbots. This research is one of the first attempts to investigate antecedents that influence mobile users' behavioral intention to employ this technology. It also provides empirical evidence on the use of MOA models in the mobile chatbot context.

With respect to managerial implications, this research will help marketers to understand what factors influence mobile users' intention to utilize chatbots, and under what circumstances. The result of this research shows that mobile users' hedonic motivation, social motivation, and ability are the main factors that influence their intention to use chatbots. Importantly, the study revealed that the hedonic factor plays a more important role for male consumers than female counterparts while female users were more influenced by ability, and both genders were influenced by social motivation. This implies that, when developing chatbot commerce, social interaction elements should be emphasized for both gender; if targeting male users, entertaining elements could be more effective, while frictionless, easy design and process would be more effective for female users.

No significant relationship was found between utilitarian motivation and purchase intention. This could be indicative of an already well-established Internet consumer environment. Because they are already given convenience and efficiency via other tools such as mobile apps and Internet web pages, approaching potential chatbot users with a utilitarian focus might not be effective.

Opportunity had no impact on purchase intention and information-seeking intention via chatbots. As stated, because most mobile users own smart phones and may use chatbots if they wish, opportunity no longer has strong influence on intention to use this technology.

Thus, marketers may introduce messenger chatbots as entertaining and sociable online "buddies" to spend free time with, rather than solely focusing on practical applications such as e-commerce agents or customer service providers, to increase intention to accept chatbot commerce.

Like any other research, this study has some limitations. For one, it employed a rather small student sample. Although we deemed that the sample's age range meets the majority of text users' age, it is difficult to generalize the result nationwide.

Additionally, this study provided Facebook messenger chatbots as an exemplar of mobile chatbots. Despite the fact that Facebook messenger is one of the most popular instant messengers, it may have affected participants' responses, depending on their perception of Facebook messenger.

Finally, this study focused on motivation, opportunity, and ability on intention to use chatbots. However, other factors could be considered that influence mobile users' behavioral intention, such as perceived benefit or perceived risk. Future research should address these study limitations and explore other factors that drive mobile users to employ chatbots.

REFERENCES

Ajzen, I. (2002). Perceived behavioral control, self-efficacy, locus of control, and the theory of planned behavior 1. *Journal of applied social psychology*, *32*(4), 665-683.

Anand, P. (2018, August 06). The Reality Behind Voice Shopping Hype. Retrieved December 26, 2018, from https://www.theinformation.com/articles/the-reality-behind-voice-shopping-hype

Anderson, K. C., Knight, D. K., Pookulangara, S., &Josiam, B. (2014). Influence of hedonic and utilitarian motivations on retailer loyalty and purchase intention: a facebook perspective. *Journal of Retailing and Consumer Services*, *21*(5), 773-779.

Angst, C. M., &Agarwal, R. (2009). Adoption of electronic health records in the presence of privacy concerns: The elaboration likelihood model and individual persuasion. *MIS quarterly*, *33*(2), 339-370.

Asli, A. (2018, June 06). How Facebook Messenger Bots Are Revolutionizing Business. Retrieved December 26, 2018, from https://www.forbes.com/sites/forbestechcouncil/2018/06/06/how-facebook-messenger-bots-are-revolutionizing-business/#3df755137f5e

Bahaire, T., & Elliott-White, M. (1999). Community participation in tourism planning and development in the historic city of York, England. *Current Issues in Tourism*, *2*(2-3), 243-276.

Bandura, A. (1991). Social cognitive theory of self-regulation. *Organizational behavior and human decision processes*, *50*(2), 248-287.

Barta, R., & Ray, M. L. (1986). Situational effects of advertising repetition: The moderating influence of motivation, ability, and opportunity to respond. *Journal of Consumer research*, *12*(4), 432-445.

Bellenger, D. N. (1980). Profiling the recreational shopper. *Journal of retailing*, *56*(3), 77-92.

Bhattacherjee, A. (2000). Acceptance of e-commerce services: the case of electronic brokerages. *IEEE Transactions on systems, man, and cybernetics-Part A: Systems and humans*, *30*(4), 411-420.

Brown, E. (2017, March 21). Next Insurance launches Facebook Messenger chatbot to replace the insurance agent. Retrieved August 08, 2018, from https://www.zdnet.com/article/next-insurance-launches-facebook-messenger-chatbot-to-replace-the-insurance-agent/

Celsi, R. L., & Olson, J. C. (1988). The role of involvement in attention and comprehension processes. *Journal of consumer research*, *15*(2), 210-224.

Chen, C. P. (2012). Online group buying behavior in CC2B e-commerce: Understanding consumer motivations. *Journal of Internet Commerce*, *11*(3), 254-270.

Cheng, T. E., Lam, D. Y., &Yeung, A. C. (2006). Adoption of internet banking: an empirical study in Hong Kong. *Decision support systems*, *42*(3), 1558-1572.

Childers, T. L., Carr, C. L., Peck, J., & Carson, S. (2001). Hedonic and utilitarian motivations for online retail shopping behavior. *Journal of retailing*, *77*(4), 511-535.

Chiu, C. M., Wang, E. T., Fang, Y. H., & Huang, H. Y. (2014). Understanding customers' repeat purchase intentions in B2C e-commerce: the roles of utilitarian value, hedonic value and perceived risk. *Information Systems Journal*, *24*(1), 85-114.

Chiu, Y. B., Lin, C. P., & Tang, L. L. (2005). Gender differs: assessing a model of online purchase intentions in e-tail service. *International journal of service industry management*.

Coldwey, D. (2018, August 07). Analysis: Few people buy things via Alexa. Retrieved August 13, 2018, from http://www.msn.com/en-us/news/technology/analysis-few-people-buy-things-via-alexa/ar-BBLBsFN

Curry, B., &Moutinho, L. (1993). Neural networks in marketing: modelling consumer responses to advertising stimuli. *European Journal of Marketing*, *27*(7), 5-20.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS quarterly*, 319-340.

Davis, R., Lang, B., & San Diego, J. (2014). How gender affects the relationship between hedonic shopping motivation and purchase intentions?. *Journal of Consumer Behaviour*, *13*(1), 18-30.

Dholakia, R. R. (1999). Going shopping: key determinants of shopping behaviors and motivations. *International Journal of Retail & Distribution Management*, *27*(4), 154-165.

Earl, J. (2017, January 05). 6-year-old orders $160 dollhouse, 4 pounds of cookies with Amazon's Echo Dot. Retrieved December 26, 2018, from https://www.cbsnews.com/news/6-year-old-brooke-neitzel-orders-dollhouse-cookies-with-amazon-echo-dot-alexa/

Eastin, M. S. (2002). Diffusion of e-commerce: an analysis of the adoption of four e-commerce activities. *Telematics and informatics*, *19*(3), 251-267.

Forbes (2018, February 12). Why Didn't Chatbots Live Up To Their Hype? Retrieved December 26, 2018, from https://www.forbes.com/sites/quora/2018/02/12/why-didnt-chatbots-live-up-to-their-hype/#4f178a67614a

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of marketing research*, *18*(1), 39-50.

Godes, D., Mayzlin, D., Chen, Y., Das, S., Dellarocas, C., Pfeiffer, B., ...&Verlegh, P. (2005). The firm's management of social interactions. *Marketing letters*, *16*(3-4), 415-428.

Govindaraju, R., Hadining, A. F., & Chandra, D. R. (2013, March). Physicians' adoption of electronic medical records: model development using Ability–Motivation-Opportunity Framework. In *Information and Communication Technology-EurAsia Conference* (pp. 41-49). Springer, Berlin, Heidelberg.

Gruen, T. W., Osmonbekov, T., & Czaplewski, A. J. (2005). How e-communities extend the concept of exchange in marketing: An application of the motivation, opportunity, ability (MOA) theory. *Marketing Theory*, *5*(1), 33-49.

Gruen, T. W., Osmonbekov, T., & Czaplewski, A. J. (2006).eWOM: The impact of customer-to-customer online know-how exchange on customer value and loyalty. *Journal of Business research*, *59*(4), 449-456.

Guynn, J. (2016, April 12). Zuckerberg's Facebook Messenger launches 'chat bots' platform. Retrieved December 26, 2018, from https://www.usatoday.com/story/tech/news/2016/04/12/facebook-messenger-f8-chat-bots/82919056/

Ha, Y., & Im, H. (2014). Determinants of mobile coupon service adoption: assessment of gender difference. *International Journal of Retail & Distribution Management*.

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). Multivariate data analysis: International version. *New Jersey, Pearson*.

Hallahan, K. (2000). Enhancing motivation, ability, and opportunity to process public relations messages. *Public Relations Review*, *26*(4), 463-480.

Han, M.C., & Kim, Y. (2017) Social media commerce: Town square to market square. *Pan-pacific journal of business research*, 8 (1), 29-46.

Hasan, B. (2010). Exploring gender differences in online shopping attitude. *Computers in Human Behavior*, *26*(4), 597-601.

Hsu, M. H., & Chiu, C. M. (2004).Internet self-efficacy and electronic service acceptance. *Decision support systems*, *38*(3), 369-381.

Hung, K., &Petrick, J. F. (2012).Testing the effects of congruity, travel constraints, and self-efficacy on travel intentions: An alternative decision-making model. *Tourism Management*, *33*(4), 855-867.

Jackson, L. A., Ervin, K. S., Gardner, P. D., & Schmitt, N. (2001). Gender and the Internet: Women communicating and men searching. *Sex roles*, *44*(5-6), 363-379.

Jepson, A., Clarke, A., &Ragsdell, G. (2013).Applying the motivation-opportunity-ability (MOA) model to reveal factors that influence inclusive engagement within local community festivals: The case of UtcaZene 2012. *International Journal of Event and Festival Management*, *4*(3), 186-205.

Jiang, L., Yang, Z., & Jun, M. (2013).Measuring consumer perceptions of online shopping convenience. *Journal of Service Management*, *24*(2), 191-214.

Joines, J. L., Scherer, C. W., & Scheufele, D. A. (2003).Exploring motivations for consumer Web use and their implications for e-commerce. *Journal of consumer marketing*, *20*(2), 90-108.

Kim, L. (2018, May 23). 9 Great Examples of How Brands are Using Chatbots. Retrieved December 26, 2018, from https://www.socialmediatoday.com/news/9-great-examples-of-how-brands-are-using-chatbots/524138/

Korgaonkar, P. K., &Wolin, L. D. (1999).A multivariate analysis of web usage. *Journal of advertising research*, *39*, 53-68.

Lee, E., Hu, M. Y., &Toh, R. S. (2000). Are consumer survey results distorted? Systematic impact of behavioral frequency and duration on survey response errors.*Journal of Marketing Research*, *37*(1), 125-133.

Lee, S. Y., Hwang, H., Hawkins, R., &Pingree, S. (2008). Interplay of negative emotion and health self-efficacy on the use of health information and its outcomes. *Communication Research*, *35*(3), 358-381.

Lee, K. M., Peng, W., Jin, S. A., & Yan, C. (2006). Can robots manifest personality?: An empirical test of personality recognition, social responses, and social presence in human–robot interaction. *Journal of communication*, *56*(4), 754-772.

Leung, X. Y., &Bai, B. (2013). How motivation, opportunity, and ability impact travelers' social media involvement and revisit intention. *Journal of Travel & Tourism Marketing*, *30*(1-2), 58-77.

Li, H., Kuo, C., & Rusell, M. G. (1999).The impact of perceived channel utilities, shopping orientations, and demographics on the consumer's online buying behavior. *Journal of Computer-Mediated Communication*, *5*(2), JCMC521.

Liaw, S. S. (2008). Investigating students' perceived satisfaction, behavioral intention, and effectiveness of e-learning: A case study of the Blackboard system. *Computers & education*, *51*(2), 864-873.

Lu, B., Fan, W., & Zhou, M. (2016). Social presence, trust, and social commerce purchase intention: An empirical research. *Computers in Human Behavior*, *56*, 225-237.

MäNtymäKi, M., &Salo, J. (2011). Teenagers in social virtual worlds: Continuous use and purchasing behavior in Habbo Hotel. *Computers in Human Behavior*, *27*(6), 2088-2097.

MacInnis, D. J., &Jaworski, B. J. (1989). Information processing from advertisements:Toward an integrative framework. *The Journal of marketing*, 1-23.

MacInnis, D. J., Moorman, C., &Jaworski, B. J. (1991). Enhancing and measuring consumers' motivation, opportunity, and ability to process brand information from ads. *The Journal of Marketing*, 32-53.

Messina, C. (2015, January 16). Conversational commerce. Retrieved December 26, 2018, from https://medium.com/chris-messina/conversational-commerce-92e0bccfc3ff

Mikalef, P., Giannakos, M., &Pateli, A. (2013).Shopping and word-of-mouth intentions on social media. *Journal of theoretical and applied electronic commerce research*, *8*(1), 17-34.

Nwankwo, S., Hamelin, N., & Khaled, M. (2014). Consumer values, motivation and purchase intention for luxury goods. *Journal of retailing and consumer services*, *21*(5), 735-744.

Ojo, A. O., Arasanmi, C. N., Raman, M., & Tan, C. N. L. (2019). Ability, motivation, opportunity and sociodemographic determinants of Internet usage in Malaysia. *Information Development*, *35*(5), 819-830.

Ölander, F., & Thøgersen, J. (1995). Understanding of consumer behaviour as a prerequisite for environmental protection. *Journal of consumer policy*, *18*(4), 345-385.

Ong, C. S., & Lai, J. Y. (2006). Gender differences in perceptions and relationships among dominants of e-learning acceptance. *Computers in human behavior*, *22*(5), 816-829.

O'Shea, D. (2016, November 03). Sephora brings more beauty bot tools to Facebook Messenger. Retrieved August 08, 2018, from https://www.retaildive.com/news/sephora-brings-more-beauty-bot-tools-to-facebook-messenger/429652/

Papacharissi, Z., & Rubin, A. M. (2000).Predictors of Internet use.*Journal of broadcasting & electronic media*, *44*(2), 175-196.

Parra-López, E., Gutiérrez-Taño, D., Diaz-Armas, R. J., &Bulchand-Gidumal, J. (2012). Travellers 2.0: Motivation, opportunity and ability to use social media. *Social media in travel, tourism and hospitality: Theory, practice and cases*, 171-187.

Pöyry, E., Parvinen, P., &Malmivaara, T. (2013). Can we get from liking to buying? Behavioral differences in hedonic and utilitarian Facebook usage. *Electronic Commerce Research and Applications*, *12*(4), 224-235.

Rahayu, R., & Day, J. (2015). Determinant factors of e-commerce adoption by SMEs in developing country: evidence from Indonesia. *Procedia-Social and Behavioral Sciences*, *195*, 142-150.

Rains, S. A. (2008).Seeking health information in the information age: The role of Internet self-efficacy. *Western Journal of Communication*, *72*(1), 1-18.

Rawlins, L. K. (2016, April 13). Facebook chat bots to replace call centres. *iTWeb*. Retrieved August 08, 2018, from http://www.itweb.co.za/index.php?option=com_content&view=article&id=151438

Reinholt, M. I. A., Pedersen, T., & Foss, N. J. (2011). Why a central network position isn't enough: The role of motivation and ability for knowledge sharing in employee networks. *Academy of Management Journal*, *54*(6), 1277-1297.

Rogers, P., &Anastasiadou, C. (2011). Community involvement in festivals: Exploring ways of increasing local participation. *Event Management*, *15*(4), 387-399.

Rohm, A. J., &Swaminathan, V. (2004). A typology of online shoppers based on shopping motivations. *Journal of business research*, *57*(7), 748-757.

Ryu, K., Han, H., & Jang, S. (2010). Relationships among hedonic and utilitarian values, satisfaction and behavioral intentions in the fast-casual restaurant industry. *International Journal of Contemporary Hospitality Management*, *22*(3), 416-432.

Schick, S. (2017, November 08). Marriott makes more room for chatbots to enhance guest experiences. Retrieved August 08, 2018, from https://www.mobilemarketer.com/news/marriott-makes-more-room-for-chatbots-to-enhance-guest-experiences/510117/

Seock, Y. K., & Bailey, L. R. (2008). The influence of college students' shopping orientations and gender differences on online information searches and purchase behaviors. *International Journal of Consumer Studies*, *32*(2), 113-121

Shawar, B. A., & Atwell, E. (2007). Chat bots: are they really useful? *LDV Forum*, *22*(1), 29-49.

Siemsen, E., Roth, A. V., &Balasubramanian, S. (2008). How motivation, opportunity, and ability drive knowledge sharing: The constraining-factor model. *Journal of Operations Management*, *26*(3), 426-445.

Skalski, P., & Tamborini, R. (2005). Vividness, social presence, and persuasion: Reconsidering the influence of modality on attitude formation. In *Information Systems Division of the International Communication Association at its 55th Annual Conference in New York, NY*.

Sniehotta, F. F., Scholz, U., &Schwarzer, R. (2005). Bridging the intention–behaviour gap: Planning, self-efficacy, and action control in the adoption and maintenance of physical exercise. *Psychology & Health*, *20*(2), 143-160.

Tabachnick, B. G., Fidell, L. S., & Ullman, J. B. (2007). *Using multivariate statistics* (Vol. 5). Boston, MA: Pearson.

Thøgersen, J. (1994). A model of recycling behaviour, with evidence from Danish source separation programmes. *International Journal of Research in Marketing*, *11*(2), 145-163.

Thøgersen, J. (2000). Psychological determinants of paying attention to eco-labels in purchase decisions: Model development and multinational validation. *Journal of Consumer Policy*, *23*(3), 285-313.

To, P. L., Liao, C., & Lin, T. H. (2007).Shopping motivations on Internet: A study based on utilitarian and hedonic value. *Technovation*, *27*(12), 774-787.

Truong, A. (2016, June 12). Amazon Echo owners are finding unexpected items like "big fart" on their shopping lists. Retrieved December 26, 2018, from https://qz.com/704616/amazon-echo-owners-are-finding-unexpected-items-like-big-fart-on-their-shopping-lists/

Turner, T., & Pennington, W. W. (2015). Organizational networks and the process of corporate entrepreneurship: how the motivation, opportunity, and ability to act affect firm knowledge, learning, and innovation. *Small Business Economics*, *45*(2), 447-463.

Ulbrich, F., Christensen, T., &Stankus, L. (2011). Gender-specific on-line shopping preferences. *Electronic Commerce Research*, *11*(2), 181-199.

U.S. mobile communication preference by age 2017 | Statistic.(2017, August). Retrieved December 26, 2018, from https://www.statista.com/statistics/740374/mobile-communication-preference-usa-age/

Wang, Y. S., Yeh, C. H., & Liao, Y. W. (2013). What drives purchase intention in the context of online content services? The moderating role of ethical self-efficacy for online piracy. *International Journal of Information Management*, *33*(1), 199-208.

Wang, H. Y., & Wang, S. H. (2010). User acceptance of mobile internet based on the unified theory of acceptance and use of technology: Investigating the determinants and gender differences. *Social Behavior and Personality: an international journal*, *38*(3), 415-426.

Yen, D. C., Wu, C. S., Cheng, F. F., & Huang, Y. W. (2010). Determinants of users' intention to adopt wireless technology: An empirical study by integrating TTF with TAM. *Computers in Human Behavior*, *26*(5), 906-915.

Yuen, A. H., & Ma, W. W. (2002). Gender differences in teacher computer acceptance. *Journal of technology and Teacher Education*, *10*(3), 365-382.