



The role of attitude toward chatbots and privacy concern on the relationship between attitude toward mobile advertising and behavioral intent to use chatbots

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Abstract

Chatbots are technological tools equipped with artificial intelligence that allow companies to interact with their consumers. Through their computers or mobile devices, consumers can use this technology to search for information, make purchases or request after-sales services. This study aims to identify the role of attitude toward chatbots and privacy concern in the relationship between attitude toward mobile advertising and behavioral intent to use chatbots. After reviewing the literature, the study proposes a moderated mediation model. Through a survey, the study shows that attitude toward mobile advertising does not have a direct effect on the behavioral intent to use chatbot, but is rather mediated by one's attitude toward chatbots. In fact, the interactivity is unidirectional in the case of mobile advertising (from the company to the consumer), but bidirectional in the case of chatbots (in which consumers have an active role in communication). In line with these assumptions, the data analysis shows that internet privacy concerns only negatively moderate the relationship between attitude toward chatbots and behavioral intent to use this technology. These results can be useful for companies and researchers in terms of developing and testing new digital marketing strategies. The paper concludes with a discussion of the results' theoretical and managerial implications.

Keywords Chatbot · Attitude toward mobile advertising · Attitude toward chatbots · Internet privacy concern · Behavioral intent to use chatbots

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1 Introduction

The growing diffusion of Artificial Intelligence (AI)—understood as a set of information systems based on technologies and devices with the ability to complete tasks typically related to human intelligence—has opened new opportunities for studies of consumer behavior. For instance, scholars can use AI to better understand the decision-making chain and develop new marketing strategies based on Big Data (Kumar et al., 2019; Sterne, 2017; Yang & Siau, 2018). Similarly, the use of Business Intelligence and Analytics (BI&A) can create competitive advantages for organizations through the improvement of individual commercial activities (Xu et al., 2017) and the management of customer relationships (Nam et al., 2018). In general, the propagation of digitalized tools (e.g., smartphones) facilitates new ways for companies to manage their marketing activities (Verhoef et al., 2015).

Undoubtedly, the rise of the Internet and digitalization have changed the way people interact with each other and with companies, creating involvement (Klopfenstein et al., 2017). In particular, the growth of wireless networks and mobile devices has led to the development of mobile electronic commerce (m-commerce) (Ngai & Gunasekaran, 2007; Wu & Wang, 2005) and the greater growth of social commerce. Now effectively omnipresent in the market, m-commerce allows users to search for product information, compare prices, read comments and reviews, access personalized and geo-localized services, and make purchases at any time and place (Balasubraman et al., 2002; Barnes & Scornavacca, 2004; Pavlou et al., 2007). Social commerce, meanwhile, is a subset of electronic commerce (e-commerce) that uses social media to support the exchange of user-generated content and thereby improve the online shopping experience (Marsden, 2010). From a business perspective, these channels offer important opportunities to expand commercial activities (Pavlou et al., 2007) by exploiting the personalization, timeliness, location and contextuality of the user experience. In short, companies can use m-marketing to improve customers' relationship with a brand, whether through text messages, mobile advertising, mobile content (generated by users), and m-commerce (Watson et al., 2013).

The growth of mobile tools in managerial practice has been accompanied by an evolving research base, focused on topics such as: mobile marketing (Shankar & Balasubramanian, 2009; Venkatesh et al., 2012), mobile advertising and promotions (Andrews et al., 2015; Bart et al., 2014; Fong et al., 2015), and mobile shopping (Shankar et al., 2016). However, there are still relatively few studies on mobile shopping—and more specifically, on consumer adoption of mobile technologies (Hew, 2017). Furthermore, the growth of m-commerce has bolstered the number of mobile applications (apps), particularly ones dealing with messaging (Dacko, 2017; Garg & Telang, 2013), but few studies have explored the impact of such apps on the behavioral intent to use the technology (Dacko, 2017; de Cosmo & Piper, 2020; Garg & Telang, 2013).

With communication apps, customers and companies can interact via text messages: a universally understood method of communication underpinned by a

familiar interface. This new form of communication between businesses and consumers (called conversational commerce) relies on the integration of messaging apps and e-commerce. To that end, it is supported by intelligent AI-exploiting technologies, such as chatbots, personal assistants, Bluetooth beacon technologies and other interfaces of the Internet of Things (IoT). Ultimately, these technologies can transform the customer experience by offering convenience, customization and decision support (Sestino et al., 2020; Willems et al., 2017).

This paper specifically focuses on the chatbot: an electronic conversation agent that uses AI to automate the interaction between a company and customers (Mott et al., 2004). This technology allows customers to interact with the brand using their favorite messaging apps. Chatbots use natural language to communicate with users and encourage customer involvement (Griol et al., 2013). To that end, they can respond with messages, recommendations, updates, or links/buttons that offer a call to action, such as purchasing a product (Rowley, 2000; Smith, 2002).

Although chatbots have existed for a while in the field of information technology, their introduction into the commercial sphere is more recent. In fact, the well-known instant messaging platform Messenger first demonstrated chatbots' potential as a marketing tool in 2016. There have been recent studies on the functional characteristics of voice assistants (Hoy, 2018); on the effectiveness of chatbots based on accuracy, consistency and repeatability of recommendations (Sadeddin et al., 2007); on how their adoption relates to consumers' social roles (Schweitzer et al., 2019); on consumers' attitudes toward technology (Moriuchi, 2019), and on chatbots' applications for marketing (Kumar et al., 2016). However, these studies have not led to a deep understanding of consumers' judgment and behavior with regard to using brand-related mobile messaging chatbots (Mari, 2019).

Without referring to specific technologies, some studies have talked about the direct effect of attitudes toward mobile advertising on the behavioral intent to use technology for communication purposes. For example, elderly appear to have favorable attitudes toward Internet sites with a high advertising rate (Danaher et al., 2006), generally frequenting them more often and for more time than sites with less advertising content. However, as demonstrated by Kaasinen (2003), the quality of information on a company's website influence customer' brand perceptions. Scholars have not completely studied the role of consumers' attitudes toward technology in the relationship between attitudes toward mobile advertising and intention to use—and whether the specific technology used to communicate (such as a chatbot) plays an important part. In particular, no studies relate the intention to use chatbots with people's attitudes toward both chatbots and mobile advertising. Likewise, despite ample discussion about the importance of privacy as a deterrent to using the Internet and e-commerce (Tsai et al., 2011), no research has yet analyzed the effect of privacy concerns on the use of chatbots.

For this reason, it is important to understand the factors that push consumers to use such tools. In this regard, one might be inclined to draw on research on mobile advertising, which does exert positive effects on consumer attitudes and buying behavior (Bart et al., 2014; Barwise & Strong, 2002; Luo et al., 2014; Tsang et al., 2004). However, such ads often cannot be avoided, as they are embedded in other content within a website or app. On the contrary, a chatbot is more interactive,

allowing users to send (sometimes personal) information and receive responses accordingly. In fact, the interactivity is unidirectional in the case of mobile advertising (from the company to the consumer), but bidirectional in the case of chatbots (in which consumers have an active role in communication). The higher level of interactivity might differently shape the intention to use—especially if users perceive a higher vulnerability resulting from the improper use of their data (Smith & Cooper-Martin, 1997). Consequently, it is likely that the attitude toward mobile advertising does not have a direct impact on the behavioral intent to use chatbots, but is mediated by the attitude toward chatbots.

Against this background, the present research offers a quantitative study that assesses whether (1) consumers' attitude toward chatbots affects their intention to use this technology; (2) the attitude toward mobile advertising has a direct or indirect effect on the intention to use chatbots, and (3) consumer' privacy concerns specifically deter the intention to use chatbots. The data were collected through a survey and fed into a mediation and moderation analysis model. The paper concludes with a discussion of the findings and their implications for new digital marketing strategies that incorporate chatbots. For the purpose of future research, we highlight the need to investigate other determinants of the intent to use chatbots, such as: utilitarian and hedonic shopping value; the involvement of the tool in every phase of the purchasing process (or customer journey), or the degree of personalization and perceived control.

2 Theoretical background and hypotheses

2.1 Attitude toward mobile advertising and chatbots

Mobile marketing (or m-marketing) can be defined as the dialogue between a company and its customers that takes place via personal mobile devices. Its aim is to create a measurable reaction or change in attitude toward the brand, product or service (Leppäniemi & Karjaluoto, 2005; Virtanen & Raulas, 2004). Often, scholars interchangeably use the terms mobile marketing, mobile advertising, wireless marketing, and mobile commerce (Leppäniemi & Karjaluoto, 2005). However, the sending of advertising material to consumers' mobile devices is a practice of m-marketing that assumes a specific connotation in the field of advertising. Therefore, in this specific context, we will use the term mobile advertising (or m-advertising) (Tsang et al., 2004) to distinguish it from other mobile marketing practices.

In general, much of the existing research on m-advertising (Rohm et al., 2012) has tried to link consumers' attitudes toward mobile advertising with the factors that drive technology acceptance (Grant & O'Donohoe, 2007; Karjaluoto & Alatalo, 2007; Sultan et al., 2009; Watson et al., 2013). For instance, Fishbein (1967, p. 53) defines attitude as an attachment and action-oriented tendency toward some object or idea, or as an emotional precursor to behavior (and later, evaluation). Consequently, one's attitude toward mobile advertising is considered a cognitive indicator of the advertising's effectiveness and, by extension, a determinant of behavior (Ling et al., 2010; Mackenzie & Lutz, 1989; Mehta, 2000).

In this regard, much research has sought to identify the factors that underlie effective mobile advertising. Beyond the characteristics of the advertised products (Bart et al., 2014), other key factors include the technological characteristics of the mobile media and the reference market; the environmental context in which the communication takes place, and consumers' personal characteristics. For the first factor, people's purchasing choices—and even decision to communicate with the company via a mobile device—are influenced by the screen size and predominant colors, as well as the privacy and mobile communication regulations in the reference market (Grewal et al., 2016; Guido et al., 2017). The effectiveness of m-advertising is also significantly impacted by environmental factors (Mort & Drennan, 2005). These factors could include user mobility (Ghose & Han, 2011), geographic location (Molitor et al., 2020), the time at which a promotional message is received (Luo et al., 2014), crowding (Andrews et al., 2015), and weather conditions (Molitor et al., 2020). Other factors that determine effectiveness are the utility and value of perceived advertising (Siau & Shen, 2003), the degree of relevance and personalization, and trust in e-tailers and Internet technology (Gao & Su, 2020; Ha & Stoel, 2009; Merisavo et al., 2006; Persaud & Azhar, 2012; Watson et al., 2013).

However, when considering the literature about people's acceptance of new intelligent technologies (Vijayarathy, 2004), some scholars argue that a favorable attitude toward using intelligent technology is an antecedent of the intention to use it (Zarouali et al., 2018). This attitude is a response to the technology's autonomous ability to offer personalized digital services (Vassinen, 2018). Indeed, intelligent agents are computational systems with a dynamic learning capacity: Through data analysis, they memorize preferences and then propose interactions that match consumers' behavioral profile (Ricotta, 2020). Therefore, the artificial intelligence activated by a chatbot develops autonomous actions in order to create value for consumers and businesses. Through chatbots, companies can increase consumers' centrality in marketing actions, more than other advertising tools that do not use artificial intelligence (for example, SMS, pop-ups) and are based on one-way communication (i.e., consumers do not need to be an active participant in the information exchange). Marketing messages can reach the recipient regardless of their will and attitude. Instead, the bidirectionality of communication offered by chatbots facilitates personalization and personalization strategies because it is able to obtain detailed information on the recipients (Wind & Rangaswamy, 2001). Furthermore, this bidirectionality implies a consumer's propensity to communicate, which may arise from a favorable attitude toward mobile advertising. Consequently, it may be reasonable to assume that people's attitude toward mobile advertising does not directly influence the intention to use chatbots, but is indirectly impactful via their attitude toward chatbots. Therefore:

H1. Attitude toward mobile advertising does not affect the behavioral intent to use chatbots.

H2. Attitude toward chatbots positively mediates the relationship between attitude toward mobile advertising and behavioral intent to use chatbots.

2.2 The consumers' privacy in mobile communications

Thanks to new technologies, companies can customize the relationship with their customers and collect information on their characteristics and preferences (Blattberg & Deighton, 1991; Kucuk & Krishnamurthy, 2007). For example, companies can use mobile devices to identify consumers' geographical position and track their movements (Scharl et al., 2005; Varshney & Vetter, 2002). As a result, companies can tailor their services, product offerings, or advertising actions based on consumers' geographical location (known as location-based marketing or LBM) (Küpper, 2005). In addition, many mobile apps require consumers to disclose personal information, such as their date of birth, which can then be leveraged to send birthday greetings that invite consumers to shop. That said, such technologies have significantly increased consumers' concerns about privacy (Gutierrez et al., 2019; Martínez-Román et al., 2020). Consumers have begun to perceive companies' marketing actions as intrusive and fear the potential abuse of their provided information, such as unauthorized secondary use, improper access, and errors (Hallam & Zanella, 2017).

In general, information privacy is usually defined as consumers' willingness to preserve and control their personal data (Bélanger & Crossler, 2011). Usually, the protection of consumer privacy is divided into three distinct levels: (1) collection of personal data; (2) control of information; and (3) knowledge of the laws relating to privacy and the processing of personal data (Malhotra et al., 2004; Smith et al., 1996). Several empirical studies of customer data management have addressed how consumers disclose personal information (Moon, 2000; White, 2004) and begin to trust firms and their data management processes (Bart et al., 2005; Schlosser et al., 2006). Previous research confirms that violating these rules and compromising data integrity, and thereby failing to protect privacy, has negative effects on consumer behavior (Dinev & Hart, 2006; Tsai et al., 2011). For example, Eastlick et al. (2006) demonstrated that privacy issues negatively affect consumers' purchase intentions. Similarly, Grewal et al. (2016) found that privacy moderates the degree of purchase intention generated by a mobile advertising campaign. Consumers, fearing that their personal data may be misused, tend to limit the use of online sales channels that require the entry of this information.

Following this research stream, it can be hypothesized that privacy moderates the effect of people's attitude toward chatbots on the intention to use this technology. This concern is related to how companies use personal data (Hill et al., 2015), especially with smart devices such as chatbots. However, when companies send advertising messages (e.g., SMS, MMS), they do not collect detailed personal information about customers, who are assuming a passive role in the communication and, therefore, do not perceive a high privacy risk. Therefore, privacy does not negatively moderate the effect of the attitude toward mobile advertising on the intention to use chatbots. Formally:

H3. Internet privacy concerns have a moderation effect on the relationship between attitude toward chatbots and the behavioral intent to use chatbots.

H4. Internet privacy concerns do not have a moderation effect on the relationship between attitude toward mobile advertising and the behavioral intent to use chatbots.

3 Method

3.1 Sampling and measurement

To test the model in Fig. 1 and verify the hypotheses, we constructed a structured questionnaire using the measurement scales adapted from prior studies, which have demonstrated validity and reliability. The survey was distributed to a sample of 900 participants. Trained interviewers intercepted respondents on the campus of an Italian University and in the nearby city center, for four weeks, from 10 a.m. to 6 p.m. The interviewers worked to ensure that the sample was balanced in terms of gender and age (Sudman, 1980). To help minimize bias, we followed the steps recommended by Podsakoff et al. (2003). In order to reduce evaluation apprehension and protect respondent anonymity, the questionnaire assured participants that their responses would remain anonymous and that there were no right or wrong answers (Podsakoff et al., 2003).

Respondents could complete the questionnaire in paper form or they could opt to receive a link to the electronic survey on online platform SurveyMonkey, to be completed at a time of their choosing. In order to ensure that all respondents understood the technological tool being researched, they were first shown a video lasting 1 min and 35 s that simulated a chatbot-driven communication episode.

The questionnaire was divided into two parts. In the first part, respondents answered questions regarding socio-demographic data (e.g., age and gender). In the second part, respondents were presented with the measurement scales in the reverse order of the model logic. In particular, the survey featured: (1) a 2-item scale measuring behavioral intent to use chatbots (Fishbein & Ajzen, 1975); (2) a 3-item scale measuring attitude toward chatbots (adapted from Davis et al., 1989); (3) a 6-item

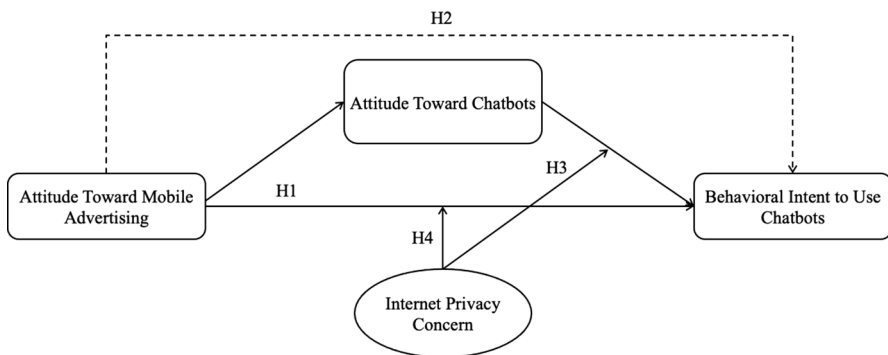


Fig. 1 The proposed model

scale measuring attitude toward mobile advertising (Ling et al., 2010); and (4) a 3-item scale measuring their Internet privacy concern (Dinev & Hart, 2006). All items (which can be found in the Appendix) were rated using 5-point Likert scales ranging from 1 (completely disagree) to 5 (completely agree). Lastly, the questionnaire featured an attention control check (“If you read this question, answer 5”).

Fifty-four respondents were excluded from the analysis for failing the attention check. Thus, a total of $N=846$ questionnaires were considered. The sample comprised 323 males (38.2%) and 523 females (61.8%), their age normally distributed between 13 and 76 years ($M=29.21$; $DS=11.96$).

3.2 Data analysis

The first step involved evaluating the assumption of multivariate normality (Cain et al., 2017). Using SPSS, we applied Mardia’s test for the multivariate skewness and kurtosis (DeCarlo, 1997; Mardia, 1970). As a second step, we evaluated the internal consistency (reliability and validity) of each scale by means of Cronbach’s α coefficient (Nunnally, 1978). As third step, we sought to derive a unidimensional value for each scale, as is usual in the literature (Diamantopoulos et al., 2012); thus, we averaged the responses of the items for each construct. As final step, we performed a moderated mediation analysis using the PROCESS macro in SPSS (Hayes, 2018; Model 15). In this way, we estimated the partial, direct and indirect effects between variables, as well as the moderator effect of Internet privacy concern.

4 Results of the moderated mediation analysis

4.1 Multivariate normality, reliability and validity

The results of the Mardia’s test showed a Mardia’s multivariate skewness of $b=0.09$ ($p=0.002$) and a Mardia’s multivariate kurtosis of $b=25.67$ ($p=0.012$). From this we can assume that the data data featured multivariate normality (Cain et al., 2017).

All scales exhibited adequate internal consistency. The Cronbach’s α coefficient results were higher than the recommended level of 0.70 (Nunnally, 1978), meaning that the scales were reliable (attitude toward mobile advertising $\alpha=0.80$; attitude toward chatbots $\alpha=0.87$; behavioral intent to use chatbots $\alpha=0.91$; Internet privacy concern $\alpha=0.93$).

The analysis suggests a robust convergent validity of the measurement model (Fornell & Larcker, 1981; Hair et al., 1998). In fact, all Construct Reliability coefficients (CR) were higher than 0.70, Average Variance Extracted (AVE) indices were higher than 0.50 (Table 1), and CR were higher than the AVE. Finally, the square root of the AVE of each measure was higher than its correlation coefficients with other constructs included in the model, thus confirming discriminant validity (Fornell & Larcker, 1981).

Table 1 Discriminant validity matrix, AVE, CR, and Cronbach's α

Variables	ATMA	ATC	BI	IPC	CR	AVE	Cronbach's α
ATMA	<i>0.75</i>				0.79	0.56	0.80
ATC	0.21	<i>0.74</i>			0.85	0.55	0.87
BI	0.11	0.29	<i>0.73</i>		0.70	0.53	0.91
IPC	0.22	0.17	0.14	<i>0.80</i>	0.84	0.63	0.93

N=846; ATMA=Attitude toward mobile advertising; ATC=Attitude toward chatbots; BI=Behavioral intent to use chatbots; IPC=Internet privacy concern; CR=Construct Reliability coefficients; AVE=Average Variance Extracted; The square root of AVE for each variable is reported in italics along the diagonal

Table 2 Direct effect of attitude toward mobile advertising on behavioral intent to use chatbots and partial effects

Pathway	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>	<i>R</i> ²
ATMA → BI	0.123	0.084	1.464	0.144	0.563
ATMA → ATC	0.667	0.032	20.861	0.000	0.340
ATC → BI	0.390	0.077	5.071	0.000	0.563

N=846; ATMA=Attitude toward mobile advertising; ATC=Attitude toward chatbots; BI=Behavioral intent to use chatbots

Table 3 Indirect effect with the moderator of Internet privacy concern (at 16th, 50th, and 84th percentile) on the pathway

Pathway	Values of IPC	<i>B</i>	<i>SE</i>	LLCI	ULCI	<i>p</i>
ATMA → ATC → BI	2.000	0.350	0.046	0.266	0.448	<0.05
	3.333	0.410	0.030	0.352	0.471	<0.05
	5.000	0.484	0.044	0.399	0.568	<0.05

N=846; ATMA=Attitude toward mobile advertising; ATC=Attitude toward chatbots; BI=Behavioral intent to use chatbots; IPC=Internet privacy concern

4.2 Mediation and moderation analysis

Evidence from the model estimation showed an index of moderated mediation of 0.045 (*SE* = 0.22; *CI*: 0.002 to 0.086). Table 2 presents the direct and partial effects. As expected in H1, consumers' attitude toward mobile advertising did not directly affect the behavioral intent to use the chatbot (*p* = 0.144). However, both partial effects were significant. In particular, attitude toward mobile advertising positively affected attitude toward chatbots (*B* = 0.667, *SE* = 0.032; *t* = 20.861, *p* < 0.001; *R*² = 0.340), while attitude toward chatbots positively and directly affected the behavioral intent to use chatbots (*B* = 0.390, *SE* = 0.077; *t* = 5.071, *p* < 0.001; *R*² = 0.563). Consequently, the results indicate a significant role of the mediator, confirming H2. In fact, the indirect effect was positively significant (Table 3). Specifically, at a level of the 50th percentile value of the moderator, the

Table 4 Moderation effects of Internet privacy concern on direct and partial effects

Pathway			<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
<i>ATMA</i>	→	<i>BI</i>	−0.009	0.023	−0.404	0.686
<i>ATC</i>	→	<i>BI</i>	−0.067	0.021	3.167	0.002

N = 846; $R^2 = .563$; *ATMA* = Attitude toward mobile advertising; *ATC* = Attitude toward chatbots; *BI* = Behavioral intent to use chatbots; *IPC* = Internet privacy concern

indirect effect was $B = 0.410$, $SE = 0.030$; *CI*: 0.352 to 0.471. Notably, this effect grew with an increasing moderator value.

Finally (Table 4), as hypothesized in H3 and H4, Internet privacy concern only negatively moderated the partial effect of attitude toward chatbots on the behavioral variable ($B = -0.067$, $SE = 0.021$; $t = 3.167$, $p = 0.002$; $R^2 = 0.563$), but not the direct effect from attitude toward mobile advertising ($p = 0.686$). Despite their high attitude toward chatbots, consumers' concern for privacy seems to deter their intent to use this technology. The result of the privacy concern moderation on the relationship between attitude toward mobile advertising and behavioral intent to use chatbots was in line with the previous one, which confirmed the non-significance of this relationship.

5 Discussion

Through a structured questionnaire, this study assessed the antecedents of the intention to use chatbots, such as people's attitudes toward mobile advertising and chatbots themselves. A moderated mediation analysis confirmed that one's attitude toward chatbots mediates the relationship between one's attitude toward mobile advertising and the behavioral intention to use chatbots. Said intention is therefore not directly influenced by a person's attitude toward mobile advertising. Additionally, a person's Internet privacy concerns negatively moderate the relationship between one's attitude toward chatbots and the behavioral intention to use said chatbots.

The results affirm that consumers' use of chatbots strongly depends on their level of applied attention toward the digital world. However, a generally positive attitude toward mobile advertising (e.g., SMS, MMS, beacon Bluetooth) is not enough to guarantee that people will interact with chatbots for commercial purposes. The intent to use chatbots for purchases is influenced by a positive attitude toward chatbots, often enabled by apps, which activates greater interaction with the AI through more personalized content.

Studies on m-advertising tell us that content is a valuable incentive in mobile messaging (Varshney, 2003). Just as the quality of information on a company's website has a direct influence on customer brand perceptions (Kaasinen, 2003), the information or content provided via mobile devices must also show qualitative characteristics such as relevance, timeliness, and utility for the consumer (Siau & Shen, 2003). In particular, relevance concerns the value that the

consumer receives from marketing communication which, in turn, can depend on the position and timeliness of the contents (Mort & Drennan, 2005). But digital assistance means personalized digital services for consumers, as well as convenience and decision support (Vassinen, 2018).

The chatbot provides more personalized content than mobile advertising and creates a positive attitude that has an effect on intentions. In fact, chatbots provide the company with insights and useful information to improve marketing decisions. Chatbots employ machine learning to interpret the context and are able to identify numerous cause-effect relationships that can be used for predictive purposes (Kumar et al., 2016). Thanks to their AI, chatbots can improve the implementation of personalization and customization strategies.

While leveraging mobile technology to foster perceptions of utility and simplicity is important, companies also need to develop content that aligns with personalization and customization strategies. While personalization is mainly individual-oriented and initiated by a system (Adomavicius & Tuzhilin, 2005; Peppers & Rogers, 1997; Vesanen & Raulas, 2006), it can also be addressed to several people (known as mass-personalization). Customization (also called web-customization, explicit personalization or adaptability), meanwhile, is an activity that customers initiate when configuring websites and mobile applications (Fan & Poole, 2006). Wind and Rangaswamy (2001) coined the term customization to capture a buyer-centric marketing that combines mass customization with personalized marketing. Chung et al. (2016) spoke of adaptive customization as a product developed so that users can customize a baseline version themselves. Because chatbots are optimized for mobile devices and perfectly integrated into the mobile user experience, they represent an opportunity to interact with customers at every stage of the purchase process. Chatbot messaging creates the basis for greater customer involvement thanks to an automated conversation with a machine that uses human language, prompts customers to generate content (through questions), and applies brand- and customer-appropriate content (through automated responses profiled on the basis of the information previously collected from users). Through chatbots, organizations could leverage transaction data and customer profiles to develop predictive models that improve customers' commitment and loyalty (Larivière et al., 2013), and thereby foster a long-term relationship.

In conclusion, the intention to use chatbots is activated by the personalized content sent to customers, and selected by them and adapted to the specific needs at that time. From this, consumers developed a positive attitude toward mobile advertising that then boosted their attitude toward chatbots.

Furthermore, the results of our study highlight how consumers' privacy concerns can threaten their intention to use chatbots for commercial purposes. This concern is not so much linked to the invasiveness of advertising, as is the case for spam (Leppäniemi & Karjaluoto, 2005), but more to the way companies use personal data (Hill et al., 2015), especially with smart devices like chatbots. This justifies the results of our research, namely that the concern for privacy affects the relationship between attitude toward chatbots and intentions to use them, and not between attitude toward mobile advertising and intentions to use chatbots.

However, companies can better protect consumer privacy by adopting authorization-based m-commerce, sometimes called permission marketing (Barwise & Strong, 2002; Watson et al., 2013). Unlike with traditional advertising, which consumers cannot largely control, authorization-based advertising only distributes content to the mobile devices of individuals who have explicitly opted to receive the message. In this way, consumers exert some control over the messages sent to them (Kumar et al., 2014) and can express their preferences about message content (e.g., personalization, timing, location) (Stewart & Pavlou, 2002).

Of course, consumers' desire to grant authorization or participate in interactions will be determined by trust in the e-tailer (e.g., Grant & O'Donohoe, 2007). Both personal and institutional trust influence consumers' decisions to authorize the use of their data for marketing purposes (Jayawardhena et al., 2009). Indeed, trust plays an important role in virtual relationships (Coppola et al., 2004) and smart-technology interactions (Li et al., 2008); in the same vein, it could reduce privacy problems related to chatbots. A recent study of the health sector analyzed the determinants of trust in the relationship between humans and intelligent agents, such as chatbots, by comparing this relationship with that between humans and humans (Wang & Siau, 2018). Among these determinants, consumers' personality contributes to building trust in e-commerce (Bansal et al., 2016). In this regard, in order to increase trust and reduce privacy concerns, companies should seek to improve the linguistic interactions with chatbots by better simulating natural human interactions (Wang & Siau, 2018). Companies can further build trust and loyalty by offering customer control options. Additionally, some researchers have devised privacy bots (PriBot) that act as automated privacy advisory agents, answering questions with relevant information or performing relevant actions, which work to reduce consumer uncertainty (Harkous et al., 2016). The challenge will be to recognize and transmit emotions, rather than just basic information, so as to engage users and help them achieve their purchase objectives (Basheer & Ibrahim, 2010). In this scenario, the adaptive intelligence of chatbots will play a fundamental role in generating new commercial value and accelerating time-to-market.

6 Implications, future research and conclusion

This study is the first to correlate people's intention to use chatbots with their attitudes toward chatbots themselves and mobile advertising more broadly. This paper demonstrates how consumers' intention to use chatbots for purchases mainly depends on their positive attitude toward chatbots. People's attitude toward mobile advertising, despite being an antecedent of said intention, is mediated by their attitude toward chatbots (which are notably equipped with AI). Thus, mobile advertising alone is not able to trigger a behavioral intention to use chatbots. Spurring the use of chatbots requires more than simply investing in mobile advertising; it is necessary to invest in creating an interactive relationship with, for example, apps through AI. The growth of messaging apps in recent years has prompted a higher number of users and more user involvement (Klopfenstein et al., 2017), leading companies to invest in chatbots that can converse intelligently with customers in

order to transform a mobile experience into a purchase intention. These robotic conversational agents—increasingly embedded in many messaging systems—leverage people’s familiarity with messaging apps. Called conversational commerce, this new form of communication between businesses and consumers is only effective when companies develop adequately personalized content and distribute it to customers at the right time and in the right place (Willems et al., 2017). In this regard, companies can use chatbot apps to create personalized content that promotes the brand while also giving the mobile phone a “sustainable utility” capable of retaining the consumer (Chiem et al., 2010). From a business perspective, this channel offers important opportunities to expand commercial activities, through greater personalization (Karat et al., 2002), and more intimate and timely messages.

While many companies are adopting this new intelligent technology, few are using chatbots to interact with customers in a personalized way. Fostering favorable perceptions of digital mobile advertising is insufficient for creating a positive attitude toward chatbots; instead, it is necessary to invest in personalizing the content of chatbots’ messages. From an entrepreneurial standpoint, the personalization of content becomes effective when one invests in a content platform that balances intellectual property, data access, customer relationships and earning opportunities. In particular, it is necessary to create an alignment between the business model and customers based on data that are able to optimize digital interactions. Additionally, companies need to improve the depth and breadth of the information transmitted by chatbots, which can reduce consumers’ search costs and improve the shopping experience. Some empirical research has found that shopping robots do not always provide additional information that is of a satisfactory quality (Sadeddin et al., 2007). Considering that the chatbot should provide a service at all stages of the purchase process, companies should strive to incorporate supplementary information regarding the shipping and delivery times, the flexible payment options, product return policies, product reviews and display, etc.

Just as importantly, firms need to invest in reducing the privacy concerns that accompany chatbots. These problems pertain specifically to chatbots and not to the use of mobile advertising more generally, which tends to be a one-way means of communication. One way to promote trust by bolstering the Natural Language Processing (NLP) systems that define the interaction between humans and robots. Robots with more developed “personalities” may result in better interactions. The design of this personality should be based on the bot’s purpose, audience, and activities. For instance, some research has shown that chatbots with a female voice are more effective than male ones due to the broader perception that women are more friendly (Priscilla et al., 2018). Of course, the personality of a chatbot should align with the personality of the brand.

In addition to gender, it would be equally important to use other discriminating variables to analyze how various consumer groups perceive a chatbot’s personality. For example, one could incorporate age as a socio-demographic variable in order to evolve the model. Indeed, a limitation of this research is that we treated age as a control variable and could not analyze the model’s effectiveness in terms of age subgroups. To illustrate, the elderly have a unique relationship with technology that could shape their reactions to chatbots (Guido et al., 2018). To promote appropriate

marketing actions, marketers and managers should understand how aging relates to people's perceptions of technology and concerns over privacy. Moreover, future research could analyze possible cognitive differences between generations and evaluate the impact on behavioral variables, such as the intention to use technology and the consequent purchase intentions.

Another limitation is that the study did not explore the intent to use chatbots in a specific market for a specific brand. It is likely that the results might vary depending on the product category analyzed.

In addition, future research could carry out an in-depth analysis of other determinants of people's attitude and intent to use chatbots, such as: the utilitarian and hedonic shopping value; the involvement of the tool in every phase of the purchasing process (or customer journey), or the degree of personalization and perceived control. Finally, to complete the theoretical and applicative framework, future scholars could investigate the relationship between the use of branded chatbots and actual consumer purchases.

Appendix

Scales and items used in the questionnaire

Behavior Intent to use chatbot (Fishbein & Ajzen, 1975)

I intent to use mobile messenger chatbots in the near future.

I believe my interest in messenger chatbots will increase in the future.

Attitude toward chatbots (Davis et al., 1989)

Using messenger chatbots seems a good idea.

Messenger chatbots makes online shopping more interesting.

Using a messenger chatbot seems fun.

Attitude toward mobile advertisement (Ling et al. 2010)

I consider mobile advertising is useful as it promotes the latest products.

Through mobile advertising I got to know more innovative ideas.

I refer to mobile advertising because it allows me to enjoy the best deal out of the competing products advertised.

I support mobile advertising because it is where creativity is highly appreciated.

I support mobile advertising because it plays an important part in my buying decision.

My general opinion of mobile advertising is positive.

Internet privacy concern (Dinev & Hart, 2006)

I am concerned that the information I submit via messenger chatbots could be misused.

I am concerned about submitting information via messenger chatbots, because of what others might do with it.

I am concerned about submitting information via messenger chatbots, because it could be used in a way I did not foresee

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