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RESEARCH PAPER

"It's on its way": Chatbots applied for online food delivery services, social or task-oriented interaction style?

Roberta De Cicco [a,b], Susana Cristina Lima da Costa e Silva [c], and Francesca Romana Alparone [a]

[a]Department of Neuroscience, Imaging and Clinical Sciences, University of Chieti-Pescara, Chieti, Italy; [b]CAST, Center for Advanced Studies and Technology, University of Chieti-Pescara, Chieti, Italy; [c]Católica Porto Business School, Universidade Católica Portuguesa, Porto, Portugal

ABSTRACT

Research has yet to explore the spread of chatbots into the foodservice delivery sector and its impact on the customer's experience, especially in a moment when the Internet seems to be the tool to meet needs associated with being physically apart. In order to fill this gap, the present study addresses the implications that chatbots' interaction styles have for younger consumers using this channel for conversational online food delivery (OFD) services. Specifically, this study provides theoretical and practical insights into whether the conversational design of chatbots can influence social, affective, and behavioral intent outcomes. The study adopts an experimental design to investigate the effects of a social- versus task-oriented interaction style chatbot on the level of social presence and trust (social outcomes), perceived enjoyment (affective outcome), and intention to use the conversational OFD service in the future (behavioral intent outcome). Findings from a sample of 171 participants show that the interaction with the chatbot set up with a social-oriented interaction style increased users' perception of social presence and perceived enjoyment, while it did not have any direct and significant effect on trust and intention to use. The study further supports the role of social presence, trust, and perceived enjoyment as mediators between the chatbot's interaction style and the intention to use the conversational OFD service.

KEYWORDS

Online food delivery service; chatbot; interaction style; social presence; trust; perceived enjoyment; intention to use

Introduction

Over the last decade, there has been a strong shift in consumers' preference toward Internet channels for online purchases and information gathering because such channels allow people to shop in the comfort of their own homes and at their own leisure (Jiang et al., 2013). Furthermore, in a context where businesses are compelled to make hard decisions with limited information (Ayittey et al., 2020), e-commerce seems to have expanded. The convenience of online purchases (in terms of overall evaluations or transactions) has

CONTACT Roberta De Cicco roberta.decicco@unich.it Dipartimento di Neuroscienze, Imaging e Scienze Cliniche, Università Degli Studi di Chieti, Chieti 66100, Italy

been shown to enhance customer satisfaction and encourage positive e-WOM (electronic word of mouth) (Duarte et al., 2018). This is also why many companies have responded to such preferences by increasingly adopting new channels and digital touchpoints with the aim of improving customers' experience (Reinartz et al., 2019).

The increased adoption of innovative touchpoints has become the norm in many sectors, and the online food delivery (OFD) industry is no exception. Thanks to recent technological innovations, the sector has been evolving in such a way that innovativeness and technology usage have turned out to be key factors for diversifying food services (Furunes & Mkono, 2019) and gaining competitive advantage (Rodgers, 2007). Due to digitalization and the adoption of a multichannel strategy, companies operating in the food delivery sector have started providing innovative services in order to be competitive in such evolving market. As a result, consumers can now order a pizza or a meal through OFD websites or apps that let the order be delivered directly to their homes (E. Kim et al., 2018). Service intermediaries provide ordering and delivery services with the twofold aim of helping restaurants reach more customers and offering customers the widest choice possible – "whatever, whenever and wherever they want to eat."[1] Some examples of this kind of service include Food Panda, JustEat and Delivery.com (Yeo et al., 2017). This availability of OFD service technology is helping the industry to increase productivity, enhance customer relationships (Kimes, 2011) and extend the market (Yeo et al., 2017).

In the last couple of years, however, recommendation systems in the form of apps or website-based ordering services have started to be replaced by conversational chat-based systems called "chatbots" (an example is the Italian food delivery chatbot called Alfonsino[2]). Chatbots are programs that autonomously communicate through natural language to engage in a conversation with the users, allowing the users to ask questions or issue commands in their everyday language and to get the required product or service in a conversational style (Brandtzaeg & Følstad, 2018). Chatbots allow text and other types of media (including images and videos) to be exchanged via hosting platforms and messaging apps like Facebook Messenger (Araujo, 2018), with the aim of optimizing customer service by delivering interactive experiences through instant-automated personalized content available at any time and place (Nair et al., 2018). The adoption of chatbots for OFD services to take orders and address users' queries is still at an early stage, and insights from market research are scarce. However, according to Outgrow.co., 80% of businesses operating in the food industry are expected to have some sort of chatbot automation by 2020.[3]

Research in human–computer interaction (HCI) suggests that interactive experiences are generally considered to be better than static information delivery, such as a list of frequently asked questions (FAQs), so it comes as

no surprise that companies are starting to leverage chatbots as a way of managing basic communication tasks (Go & Sundar, 2019). Given their interactive nature since they were first launched in early 2016, chatbots have been extensively used for a wide range of purposes across different sectors, facilitated by a shift in the communication landscape. The younger generation, in particular, seems to keener on engaging in shorter messaging exchanges (e.g., text/voice message) rather than opting for longer, direct forms of communication (e.g., phone call) (Lokman & Ameedeen, 2018). Some predictions suggest that, from the users' perspective, chatbots will change the way people interact with data, while, from a business perspective, they will reduce service providers' motivation to invest in apps, prioritizing instead chatbots as a channel for reaching out to users (Brandtzaeg & Følstad, 2018). With this in mind, practitioners are devoting increasing attention to how consumers experience transactions with companies through chatbots. Current research in this field mainly focuses on the motivations that drive people to use chatbots (Brandtzaeg & Følstad, 2018), on the users' perceptions (Araujo, 2018; Chung et al., 2018; Gnewuch et al., 2018) and on the communicative features of the interactions (Corti & Gillespie, 2016; Hill et al., 2015).

In the food service industry, although a few researchers have addressed consumer experiences with OFD services (Yeo et al., 2017), to the best of our knowledge, no study has yet focused on conversational OFD service. The application of modern technologies in food service brings new opportunities (e.g., innovative services) but also challenges (e.g., meeting customer expectations and preferences), and some questions remain yet unanswered: What happens when OFD services occur through such technology? How is the conversational OFD service perceived?

When compared to webpages or apps, conversational interfaces like chatbots foster a more intimate interaction with users. Because of this more intimate relationship, a deeper understanding of users' social, affective, and behavioral outcomes related to the interaction with the chatbot is required (Brandtzaeg & Følstad, 2018). Because language and personality are at the heart of a successful implementation of an engaging customer experience with conversational interfaces (Go & Sundar, 2019), we believe, in line with Chattaraman et al. (2019), that the design of the interaction style employed by the chatbot represents a core challenge for companies as it should be consistent with customers' expectations and preferences, which differ according to customers' needs. From these premises, this study complements past literature on the interaction style of chatbots (Chattaraman et al., 2019) with extensive information on whether the interaction style employed (i.e., social-oriented versus task-oriented) increases younger consumers' social outcomes in terms of social presence and trust, affective outcomes with respect to perceived enjoyment, and behavioral intent outcomes in terms of intention to use the conversational OFD service.

Literature review and hypotheses development

For companies operating in the OFD sector, chatbots are a means to provide customers with the benefit of interactive experiences when information seeking (Go & Sundar, 2019). This is particularly true for companies that address younger generations, who have been the first to immerse themselves totally in interactivity and to be highly motivated to establish an interactive relationship with products, companies, and brands (Figueiredo et al., 2019). Furthermore, driven by the increased demand for food delivery service during COVID-19, a current trend in the sector is that of restaurants employing chatbot interactivity for table bookings, customer orders, and menu item suggestions, primarily to avoid uncomfortable and riskier face-to-face encounters inside the restaurant. Indeed, chatbots placed on Facebook Messenger are a more interactive, affordable, and easy way to offer this kind of service compared to apps or websites. Many agencies (e.g., Foodbot[4]) are riding this wave by specifically selling chatbots to restaurants or offering them the possibility to easily build their own chatbots that allow customers to interactively book tables and place orders. This suggests that chatbots will probably constitute a bigger slice of restaurant industry technologies over the coming years.

According to social response theory (Nass & Moon, 2000), which is a widely used theoretical basis for the design and evaluation of IT artifacts with human-like characteristics (Qiu & Benbasat, 2009), humans, though unaware of doing so, interact with computers and media as they usually do with other people. According to Nass and Moon (2000), humans seem to have evolved to be socially oriented, and this orientation is further enhanced when interacting with technologies, such as chatbots, which can be installed with human-like social cues. Indeed, social response theory suggests that consumers' online engagement can be enhanced through the use of certain anthropomorphic esthetic and social cues (Pérez-Vega et al., 2018).

As reported by Chattaraman et al. (2019), a few studies have analyzed the dialogs of conversational systems like chatbots. Researchers have found that most statements addressed by chatbots to the general public are socially oriented in the form of greetings and personal remarks (Gustafson & Bell, 2000). Similarly, in a more specific context such as a museum setting, it has been revealed that a consistent number of user-initiated interactions with conversational agents involve social dialogue functions (Robinson et al., 2008). These insights suggest that, just as is the case in other contexts, customers in the OFD sector might be positively affected by social cues while interacting with an artificial agent.

Research has further proposed that social cues conveyed through chatbots should better align with the mental orientation of high task-competency users, who possess the competencies to easily meet functional goals without needing

particular assistance and who are rather interested on the social value of the interaction (Chattaraman et al., 2019). In line with this, a social-oriented interaction style, achieving socioemotional goals through informal language, greetings and small talk, should be more effective for high task-competency users (e.g., younger consumers) in terms of social outcomes (e.g., trust) compared to a task-oriented interaction style where the language is formal and only involves on-task dialogue to achieve functional goals (Chattaraman et al., 2019).

Being chatbots embedded in messenger platforms (e.g., Facebook Messenger) where the exchange of messages is at the core of the interaction, the design of the proper conversation, in terms of aligning human-like and social cues to the target audience, is at the heart of a successful implementation of chatbots. As the conversational abilities of chatbots rapidly improve (Zhang et al., 2018), we believe the social, affective, and behavioral intent outcomes that chatbots arouse through their communication are an interesting issue to address, especially with regard to younger consumers who, according to the US Census Bureau, are going to represent the major slice of companies' customers over the coming years.

Chatbot interaction style and social outcomes (social presence and trust)

The communication style of service providers has been in the spotlight in the service industry as it has been widely found to play a crucial role in successful service delivery (I. Kim et al., 2011). The effects of the communication style applied in human–chatbot interactions in terms of social outcomes constitute a pivotal aspect, especially if we consider that chatbots assume the role of ambassadors for the brand and the company (Trivedi, 2019). In line with this, the interactions are an important element that companies need to carefully design, especially when it comes to the communicative strategy they adopt in their digital touchpoints. This applies particularly to chatbots, which, as a conversational interface, rely hugely on verbal communication. Furthermore, as chatbots often request and handle user data, the interaction should help users to perceive a sense of safety and trust while interacting with the artificial agent (Looije et al., 2010).

Trust is generally considered an important factor for the adoption of new technologies, especially those that, in addition to requiring disclosure of personal information (Komiak & Benbasat, 2006), involve payment processes, such as e-commerce (Gefen & Straub, 2004). Trust represents the expectation that the other party will not behave opportunistically by taking advantage of the situation (Gefen et al., 2003). Competence, benevolence, and integrity, which are part of human trust, equally apply to virtual agents (Chattaraman et al., 2019). Furthermore, as the research of Przegalinska et al. (2019) and major developments in "botics" indicate, there are new dimensions of trust to

consider in human–chatbot interaction: honesty and transparency, predictability, and control and benevolence.

Trust should be even more salient in the online environment, especially in chatbot commerce settings, than it is in traditional commerce because of both the paucity of rules regulating e-commerce and the novelty of the technology (Gefen & Straub, 2004). Research suggests that online trust seems to be created predominantly within the context of a social environment and can be increased through social interactions. Chen et al. (2010) reported users' preference for a more extraverted (social) agent over the introverted (task-specific) agent in terms of competence and credibility, while in a study involving older people, those who had more Internet competency were found to perceive higher trust in the digital assistant with the social-oriented interaction style compared to the task-oriented interaction style (Chattaraman et al., 2019).

With regard to social outcomes in the digital environment, a construct that plays a preponderant role in positively shaping consumers' perceptions toward the interface and its usage – especially for online purchase – is social presence (Hassanein & Head, 2007). According to Short et al. (1976), social presence represents the degree of salience of the other person in the interaction. Previous research using social presence theory has mainly been conducted to explore the lack of human warmth and to understand how to increase it in the online environment (Shen, 2012). Studies in this field have shown that personalization and recommendation positively influence perception of social presence (Gefen & Straub, 2004). Sundar et al. (2015) found that higher message interactivity in a chatting context heightens a feeling of the other's presence, while Park and Cameron (2014) confirmed the link between communication style and a higher level of social presence in blogs. Research on information systems has demonstrated that communication style moderates the effects of friendliness and expertise on social presence: a social-oriented interaction style, through which feelings of sociable and sensitive human contact are infused, elicits a higher level of social presence compared to a task-oriented communication style (Verhagen et al., 2014). A similar result was reported in a recent study where the conversational cues of online chat agents were found to facilitate a feeling of interacting with other people even without physical co-presence (Go & Sundar, 2019).

Consistent with the above-discussed proposals with regard to the possible social outcomes relating to chatbots, we hypothesize that:

H1. Participants interacting with the social-oriented interaction style chatbot will perceive higher levels of social presence in the OFD service compared to participants interacting with the task- oriented interaction style chatbot.

H2. Participants interacting with the social-oriented interaction style chatbot will perceive higher levels of trust in the OFD service compared to participants interacting with the task-oriented interaction style chatbot.

Chatbot interaction style and affective outcomes (perceived enjoyment)

In the digital environment, when consumers start an interaction within a service delivery process (e.g., website, app), they tend to be strongly attracted by the affective content (of visual, textual, and auditory sources), as these kinds of components induce a more positive emotional response (I. Kim et al., 2011). On this premise, the present study further examines the affective outcomes elicited by the usage of an OFD service leveraged by chatbots in terms of perceived enjoyment.

In the online context, perceived enjoyment is a positive emotion that represents an important component of the social benefits customers acquire in the communication process. From a technology adoption perspective, perceived enjoyment refers to the extent to which the activity of interacting with the system is perceived to be enjoyable in its own right aside from the utilitarian value (Davis et al., 1992). From this perspective, the relationship between social interactions and perceived enjoyment in online activities has been empirically assessed (e.g., Shen, 2012). In traditional retailing environments, salesperson characteristics influence customers' emotions and fun while shopping (Lombard & Ditton, 1997); likewise, a positive effect of social cues has been identified in online shopping environments, where socially rich descriptions and pictures are found to positively impact the perceived enjoyment in navigating a commercial website (Hassanein & Head, 2007). Similarly, Qiu and Benbasat (2009) found that people's enjoyment was greater when interacting with the product recommendation agent that carried more social cues. In relation to an artificial shopping robot assisting consumers in a simulated purchase task, participants perceived higher enjoyment when the robot provided social conversations (Iwamura et al., 2011).

Generally, research suggests that users consider not only what a message is but also how it is delivered (S. Kim et al., 2019), and the same applies to questions and how they are posed. In a study investigating chatbots as a survey method, the authors found that a casual conversation style produced higher enjoyment compared to a formal conversational style, confirming that interactions in the form of interactive conversations convert more mechanical work into social interaction, increasing user engagement and enjoyment (S. Kim et al., 2019). Based on this consideration of perceived enjoyment as a possible affective outcome, we propose the following hypothesis:

H3. Participants interacting with the social-oriented interaction style chatbot will perceive higher levels of perceived enjoyment compared to participants interacting with the task-oriented interaction style chatbot.

Chatbot interaction style and behavioral intent outcomes (intention to use the OFD service)

Technology is changing how services are designed, developed, and delivered. Building successful OFD services leveraged by chatbots unquestionably requires knowledge of the factors that can affect behavioral outcomes in the use of these conversational services.

Intention to use is based on behavioral intention, which is defined, according to the social psychology literature, as "the strength of one's intention to perform a specified behavior" (Fishbein & Ajzen, 1975, p. 288). This construct has been widely proven to have a strong and positive effect on actual behavior in many studies based on technologies acceptance models (Nysveen et al., 2005). Similarly, intention to use has been examined in relation to shopping agents. Researchers have found users had a greater intention to use a shopping physical robot when it engaged in social-oriented conversations with customers during the simulated purchase (Iwamura et al., 2011). According to Keeling et al. (2010), a social-oriented communication entailing verbal and non-verbal elements that personalize, socialize, and establish relationships with customers directly contributes to patronage intentions. Chattaraman et al. (2019) have reported that for older users with high Internet competency, a digital assistant adopting a social-oriented interaction style leads to higher behavioral intent outcomes (in terms of patronage intention for e-tail sites) than does a digital assistant adopting a task-oriented interaction style.

Taken together, the above literature highlights how a social-oriented interaction may be more effective than a task-oriented interaction in encouraging future behavioral intent, especially for users with higher digital literacy, such as the younger generations. On this premise, we propose the following hypothesis:

H4. Participants interacting with the social-oriented interaction style chatbot will have a higher intention to use the OFD service compared to participants interacting with the task-oriented interaction style chatbot.

Social presence, trust and perceived enjoyment mediate the effect of the interaction style on the intention to use the OFD service

Research exploring the relevance of chatbots for service encounters suggests that chatbots' distinctive characteristics and features influence how consumers perceive the company itself and the overall service (Araujo, 2018). With this in mind, this study aims to disentangle the mechanisms linking the human–chatbot conversation design to the consumers' behavioral outcomes in relation to the service. To this extent, we address the role of our constructs of interest, social presence, perceived enjoyment, and trust as possible mediators of the effect of chatbot interaction style on intention to use the OFD service.

Social presence, perceived enjoyment, and trust have been extensively examined in IT to explain technology usage intentions (Chemingui & Ben Lallouna, 2013). Empirical studies show that perceived social presence positively impacts both enjoyment and trust (Cyr et al., 2007; Hassanein & Head, 2007). Indeed, when users experience a higher degree of social presence, they are more likely to escape from the real world and enter an arousing, pleasurable mental state (i.e., enjoyment) (Gao et al., 2017). Similarly, social presence induces more transparency in a less trustworthy environment (Lu et al., 2016) by reducing the perceived social distance between buyers and sellers. Various studies focusing on the online environment confirm the positive effect of social presence on trust and perceived enjoyment in contexts such as social network sites (Gao et al., 2017) and online stores (Ogonowski et al., 2014).

Notably, a number of researchers also found important relations between enjoyment and trust, and intention to use. On the one hand, trusting the other party leads to a positive behavioral intention (Aydin & Özer, 2005) by decreasing hesitation, giving power of control over the transaction (Pavlou, 2003), and ultimately improving the satisfaction with the relationship (E Silva et al., 2012). In this respect, trust has been found to positively influence consumers' intention to use e-commerce (Suh & Han, 2003), mobile banking (Zhou, 2011) and wearable commerce (Gu et al., 2016). On the other hand, research has found empirical support for hedonic motivation as a direct driver of self-service technology adoption (Curran & Meuter, 2007), instant messaging use (Lin & Bhattacherjee, 2008), intention to use m-commerce (Chong, 2013), and mobile payment (Zhou, 2013). Furthermore, a positive relationship between enjoyment and usage intention was found for chatbots in the context of travel and tourism (Rouibah et al., 2016).

Since the knowledge of the mechanisms underlying the relation between the interaction style of the chatbot and intention to use the OFD service is still largely unknown, we believe it is worth examining the role of the variables that, according to the literature on HCI (Hassanein & Head, 2007) and technology adoption (Shen, 2012), are most likely to play a mediating role in this relationship. Hence, we propose the following hypothesis:

H5. Social presence, trust and perceived enjoyment mediate the effect of chatbot interaction style on the intention to use the OFD service.

Research method

Design, participants, and experimental procedure

This study adopted a single factor between participants' design in which the interaction style of the chatbot was manipulated at two levels (social-oriented

versus task-oriented). To implement the treatments, two different chatbots were created with Chatfuel (an online platform to create chatbots) using the Italian language. Data collection was carried out throughout the first six months of 2019 and the study was completed by the end of the same year. In Figure 1, the examples of the interaction with the chatbot (social-oriented versus task-oriented) with captions are displayed.

Experiments embedded in online surveys are increasingly employed to assess the effects of different media features, since they reach a larger audience than traditional lab experiments. For this reason, we created an online survey with Qualtrics and shared the link to the web-based survey on social media. An essential requirement to participate was having a Facebook Messenger account (which was necessary in order to interact with the chatbot). Following the ethical standards of the 1964 Declaration of Helsinki, participants were informed of the right to refuse to participate in the study or to withdraw consent to participate at any time without negative consequences. After participants gave their explicit consent, they were instructed to try the new OFD service with the aim of ordering any food it presented. To create an experience as close as possible to reality, participants were free to choose from a broad menu that comprehensively included the main dishes usually offered by the restaurants in the city. After interacting with the chatbot and having accomplished the task, participants answered questions about their perceptions of their experience with the OFD service. The questionnaire consisted of a first part that contained statements measuring the main constructs and a second part designed to acquire demographic insights. A total of 171 participants took part in this study, which corresponded to around 85 subjects per group (64 men and 107 women) aged 19–34 years (M = 22.4, SD = 2.7). Overall, the sample consisted of a young cohort, including Generation Z (aged 19–21) and Millennials (aged 22–34). Such a sample was preferred because young consumers represent the future of our society in terms of the future workforce, decision-makers, and consumers (Shapoval et al., 2018).

As expected, respondents reported daily use of messaging apps; only 2.1% of all respondents indicated very little use of messaging apps. Participants were asked if they had ever used an OFD service, and 67.8% of them declared that they had already experienced OFD services. They were also asked whether they had previous experience with chatbot interaction; overall, only 22.4% of participants had already experienced chatbot interaction.

Stimuli

Social- and task-oriented interaction styles were manipulated according to previous studies (e.g., Chattaraman et al., 2019). In the social-oriented interaction style condition, the chatbot was set up to interact with the participants using informal language. In addition to providing a functional guide and

Figure 1. Examples of interaction with the chatbot.

information, the chatbot maintained an informal conversation through small talk, exclamatory feedback and visual kinesic paralanguage that used animated images (GIFs) and emoticons (Luangrath et al., 2017). For the task-oriented interaction style condition, the chatbot was limited to providing a formal guide to help users perform the task; no social features, GIFs or emoticons were set up.

Before carrying out the main experiment, we performed a separate pretest to confirm the effectiveness of the agent interaction style manipulation through the API-engaging personality measure, following Chattaraman et al. (2019). We randomly assigned 78 students (38 men and 40 females, M_{age} = 20.3; SD_{age} = 1.1) to one of the two conditions. The extent to which the interaction with the chatbot was perceived as social-oriented or task-oriented was measured by asking participants how much they thought the chatbot was expressive, enthusiastic, entertaining, and friendly on a seven-item Likert scale (1 = "*strongly disagree*"; 7 = "*strongly agree*"). The responses were averaged to create a single index. As expected, findings revealed that the chatbot was perceived to have a significantly more engaging personality ($t(51) = 6.31$, $p < .001$) when the interaction style was social-oriented ($M = 6.00$, $SD = .91$) than when it was task-oriented ($M = 4.11$, $SD = .92$).

Measures

Previous research was reviewed to ensure that a comprehensive list of measures was included, with minor changes in wording. For all the measures, participants were asked to indicate the extent to which they agreed with the statement on a seven-point Likert scale (1 = "*strongly disagree*"; 7 = "*strongly agree*").

Social presence was taken from Gefen and Straub (2004) (five items, $M = 4.20$; $SD = 1.56$; Cronbach's alpha = .94) by asking participants the degree to which they thought the OFD service was delivering *human contact, personalness, sociability, human warmth*, and *human sensitivity*. The measures for perceived enjoyment were adapted from Van der Heijden (2003) (four items, $M = 4.61$; $SD = 1.47$; Cronbach's alpha = .89) by asking participants the degree to which they thought the OFD service was *enjoyable, exciting, pleasant*, and *entertaining*. Trust was assessed according to Pengnate and Sarathy (2017) by asking participants the extent to which they thought the OFD service *keeps its promises and commitments, keeps customers' best interests in mind, does not do anything to take advantage of its customers* and *is trustworthy* (four items, $M = 5.21$; $SD = 1.14$; Cronbach's alpha = .88). Although the original scale was not specifically designed for chatbots, the four items cover all three dimensions identified by Przegalinska et al. (2019), namely predictability (the first and fourth items), control and benevolence (the second item) and transparency and honesty (the third item).

Intention to use the OFD service (single item, "*I intend to use the online food delivery service in the future*", $M = 5.26$; $SD = 1.63$) was measured according to Bergkvist and Rossiter (2007) who believe that there is no difference in the predictive validity of the multiple-item and single-item measures and suggest that, for constructs consisting of a concrete singular object, single-item measures should be used.

Results

Preliminary analysis

First, we performed a confound check to examine the distribution of generational cohorts (Millennials and Generation Z) in the two interaction style conditions. A Chi-squared test of independence revealed that the relation between "generational cohorts' belonging" and communication style conditions was not significant ($\chi 2$ (13, 171) = 15.63, $p = .269$). Thus, the difference in the distribution of participants in terms of generational cohorts between the two conditions was not statistically significant.

Next, we performed a correlational analysis to examine the relationship among the key variables. As shown in Table 1, social presence was positively associated with trust and perceived enjoyment, which in turn were positively related to the intention to use the OFD service.

Hypotheses tests

To test the hypotheses, a series of analysis of variance was conducted with SPSS (version 22) to compare the effects of interaction style on social presence, perceived enjoyment, trust, and intention to use. Past experience with chatbots was included as a control. The mean comparisons with relative error bars for all dependent variables are displayed in Figure 2.

In line with H1, a significant difference in social presence was found between participants who interacted with the chatbot in the task-oriented interaction style condition ($M = 3.79$, $SD = 1.70$) and those who interacted with the chatbot in the social-oriented interaction style condition ($M = 4.47$, $SD = 1.44$) ($F(1,170) = 7.764$, $p < .01$, $\eta = .04$).

Table 1. Correlations among the key variables.

	1		2		3		4
1. Social presence	–						
2. Perceived enjoyment	0.738	***	–				
3. Trust	0.490	***	0.473	***	–		
4. Intention to use the service	0.372	***	0.470	***	0.452	***	–

* $p < .05$, ** $p < .01$, *** $p < .001$

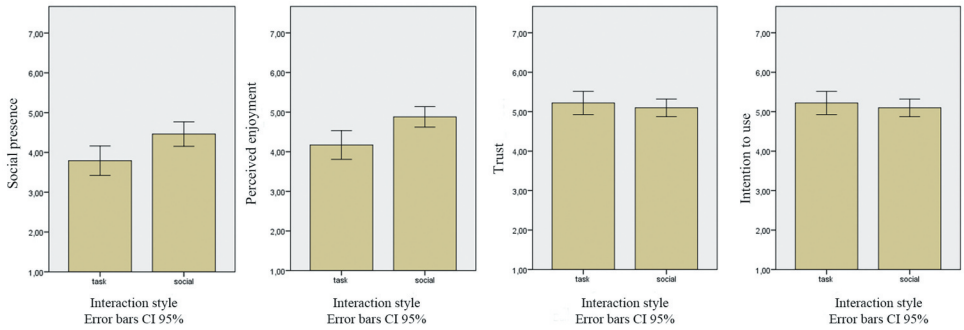

Figure 2. Mean comparisons with error bar for all the dependent variables.

The effect of interaction style on trust was not significant, and no differences were found between the social-oriented interaction style (M = 5.09, SD = 1.04) and the task-oriented interaction style (M = 5.22, SD = 1.36) in terms of trust (F(1,170) = .460, p = . 50). Thus, H2 was not supported.

In line with H3, a significant difference in perceived enjoyment was found between participants who interacted with the chatbot in the task-oriented interaction style condition (M = 4.17, SD = 1.67) and those who interacted with the chatbot in the social-oriented interaction style condition (M = 4.87, SD = 1.21) (F(1,170) = 9.727, p < . 01, η = .06).

The effect of interaction style on intention to use was not significant, and no differences were found between the social-oriented interaction style (M = 5.11, SD = 1.04) and task-oriented interaction style (M = 5.20, SD = 1.65) in terms of intention to use (F(1,170) = .131, p = . 72). Therefore, H4 was not supported.

Next, to investigate the role of social presence, trust and perceived enjoyment as mediators between the communication style and the behavioral intent outcome, a mediation analysis was conducted using Hayes's (2017) PROCESS macro. PROCESS is a versatile modeling tool for mediation analysis, and it is widely applied in behavioral research (Fan et al., 2018; Hanks & Mattila, 2016). This method employs an observed variables OLS regression path analysis and allows for the estimation of the direct and indirect effects of multiple mediators. Model 81 of the macro was used with the interaction style included as the predictor (coded with task-oriented style set as 1 and social-oriented style set as 2), social presence as the first mediator, predicting perceived enjoyment and trust as the parallel mediators, and intention to use as the dependent variable. We used 5,000 bootstrap samples; bias-corrected bootstrap confidence at the 95% interval was reported. Past experience with chatbots was included as a control. The results of the analysis show a significant mediation model, and the overall equation was significant (R^2 = .31, F(5, 164) = 14.477, p < .001). Direct and indirect effects are presented in Table 2.

No significant direct effect between the interaction style and the intention to use was found (b = −.16, boot SE = .11, t = −1.41 p = .16, 95% BCBCI [−.3909,

Table 2. Direct and indirect effects.

	b (SE)	Lower 95% BCBCI	Upper 95% BCBCI
Direct effects			
Social presence → Perceived enjoyment	.67*** (.05)	.5762	.7712
Social presence → Trust	.39*** (.05)	.2927	.4944
Social presence → Intention to use	-.03 (.10)	-.2422	.1712
Perceived enjoyment → Intention to use	.44*** (.11)	.2154	.6572
Trust → Intention to use	.39*** (.11)	.1803	.6077
Indirect effects			
Interaction style → Social presence → Intention to use	-.01 (.04)	-.0920	.0594
Interaction style → Perceived enjoyment → Intention to use	.05 (.04)	-.0136	.1352
Interaction style → Trust → Intention to use	-.08 (.04)	-.1601	.0159
Int. style → Social presence → P. enjoyment → Intention to use	.10 (.05)*	.0242	.2030
Int. style → Social presence → Trust → Intention to use	.05 (.04)*	.0126	.1098

Interaction style: social vs. task

N = 171.

Note. Past experience with chatbots was considered as control variable. Unstandardized *b* coefficients (with *boot SE* between parentheses). BCBCI = bias corrected 5,000 bootstrap confidence intervals. *** $p < .001$; ** $p < .01$; * $p < .05$.

.0640]), while the indirect effect of the interaction style on intention to use the OFD service through the hypothesized causal chain was significant. Interaction style had a positive impact on social presence (b = .34, boot SE = .12, t = 2.79 p < .05, 95% BCBCI [.0988, .5789]). On the one hand, social presence positively affected perceived enjoyment (b = .67, boot SE = .05, t = 13.63 p < .001, 95% BCBCI [.5762, .7712]) and trust (b = .39, boot SE = .05, t = 7.70 p < .001, 95% BCBCI [.2927, .4944]). On the other hand, intention to use the OFD service was positively affected by perceived enjoyment (b = .44, boot SE = .11, t = 3.90 p < .001, 95% BCBCI [.2154, .6572]) and trust (b = .39, boot SE = .11, t = 3.64 p < .001, 95% BCBCI [.1803, .6077]). Table 3 summarizes the testing and results of all the hypotheses.

Discussion

With the increased availability of innovative technologies, there is an urgent need to understand how food service operations could benefit from new technologies and enhance their effectiveness in various business areas, such as marketing, recruitment, customer service, and overall operations (Di Pietro et al., 2012). Several studies suggest that not only food itself, but also e-service represents a relevant component for restaurants, especially for those offering OFD services (Suhartanto et al., 2019).

Recent technological developments have enabled artificial intelligence (AI) to provide e-service agents that help companies improve services and build positive customer relationships (Chung et al., 2018). Despite this, the academic literature needs to pay further attention to technologies leveraged by AI in the food service industry (Ruiz-Molina et al., 2014). Research on the application of chatbots for food service purposes is still at an introductory stage and further investigation is needed to ensure that the technology is not misaligned in such a way that it fails to meet customers' needs. In light of this, the present study contributes to the literature on OFD and chatbots, extending knowledge on the effects of chatbots' interaction style on young consumers' perceptions of

Table 3. Hypotheses results.

Hypothesis	Findings
H1. Interaction style → social presence	Supported. Social-oriented interaction style leads to higher levels of social presence in the OFD service.
H2. Interaction style → trust	Not supported. Differences in terms of trust between the two conditions are not significant.
H3. Interaction style → perceived enjoyment	Supported. Social-oriented interaction style leads to higher levels of perceived enjoyment in the OFD service.
H4. Interaction style → intention to use	Not supported. Differences in terms of intention to use between the two conditions are not significant.
H5. Social presence, perceived enjoyment ant trust mediated the relation between Interaction style and intention to use	Supported. Social presence, perceived enjoyment and trust fully mediate the relation between the interaction style and intention to use.

the OFD service. The results of the experimental study, carried out using a chatbot resembling the same interface used in real-life consumer interactions, provide original findings on the potential benefits that a chatbot can offer to younger consumers in terms of positive social and affective outcomes. The study shows that a chatbot that conveys feelings of sociable and sensitive contact via a social-oriented interaction style elicits a higher level of social presence and perceived enjoyment than does a chatbot that uses a task-oriented communication style (Go & Sundar, 2019; S. Kim et al., 2019; Shen, 2012; Verhagen et al., 2014).

Hence, our results indicate that the conversational cues of online chat agents can facilitate affective outcomes in terms of fun and social outcomes similar to those generated by interacting with other people, even without physical co-presence (i.e., social presence). Unexpectedly, the same significant direct effect was not found for trust and intention to use, as no differences were recorded either for trust or for behavioral intent between participants interacting with the social-oriented chatbot or those interacting with the task-oriented chatbot. The lack of significance relative to chatbot interaction style and its direct effect on trust and behavioral intention might reasonably be ascribed to the intrinsic characteristics of the experimental design, which is unlikely to detect the full range of possible contexts in which subjects could more easily evaluate intentional behavior toward the service. Indeed, the causal relationship between chatbots and intention to behave in a certain way is better operationalized where trust can be leveraged and/or manipulated. In the setting adopted in this study, the user was unable to evaluate other relevant factors strongly affecting trust (e.g., whether the order was processed in a timely way). Our results suggest that the interaction style is unlikely to directly lead to any credible assessment regarding whether this would enhance trust and motivate consumers to use a chatbot for OFD service in the future.

Interestingly, the examination of the causal chain through the mediation model linking the interaction style of the chatbot with the intention to use the OFD service suggests valuable insights regarding the indirect effects. On the one hand, the results provide further support to findings in previous studies investigating how social presence, conveyed through socially rich descriptions and pictures, positively and directly impacts both perceived enjoyment and trust (Hassanein & Head, 2007). On the other hand, in line with the mediation analysis results, social presence represents a prominent construct for the development of trust and enjoyment. The analysis shows that the positive impact of social presence on perceived enjoyment and trust is of particular interest when it comes to considering the intention to adopt and use the service. However, it is also possible that other factors further contribute to explain the causal link between chatbot interaction style and perceptions of trust, and behavioral intention toward the OFD. In line with prior studies (Kauffman & Walden, 2001; Komiak & Benbasat, 2006), both perceived

enjoyment and trust were found to be important mediators. Perceived enjoyment, in particular, was found to have a slightly higher effect than trust on intention to use.

It is worth noting, based on insights on how the COVID-19 pandemic has impacted OFD platforms in recent months,[5] that the use of both OFD services and chatbots (the World Health Organization itself launched a Facebook Messenger chatbot offering instant and accurate information about COVID-19[6]) are likely to have been affected by the pandemic, and it is reasonable to suppose that usage has been increasing over the last few months. However, since the present study focuses on a conversational cue (i.e., interaction style) and how this affects users' perceptions depending on their personal orientation, the effect of this cue should not be related to the number of users adopting this touchpoint, but rather to more individual characteristics and preferences that, once detected, allow companies to set up a more appropriate and profitable interaction with their actual and potential customers.

Implications

The results of our study have implications for both human–chatbot interaction and OFD services. Although some studies have started exploring the role of chatbots in different domains (Chattaraman et al., 2019; Jung et al., 2018), OFD services provided through chatbots remain unexplored to the best of our knowledge. Given this, our study offers remarkable insights for those companies operating in the food delivery industry who wish to embrace modern interactive technologies to target their younger customers. A good example of this is the investment of Burger King and PlayStation in a video game food delivery service in Spain (Burger Clan), where orders are made while pro gamers battle on PlayStation.[7] Indeed, at a time when companies are investing a great deal of time and money in chatbots, further attention should be directed to understanding how consumers' perception of the services differ depending on the interaction style of the chatbot. In cases where users are playing a game, interrupting the game to experience a complex, boring, or unpleasant ordering system would probably be the worst thing that could happen. In such cases, ordering in a socially pleasurable way, without stopping the flow of fun perceived while gaming, should particularly be appreciated by some consumers.

Our results indicate that conversational-based techniques applied to social cues, such as small talk, exclamatory feedback, and visual kinesic paralanguage (GIFs and emoticons), convey positive social outcomes that help the user to perceive "the other" being present while interacting, even though it is not (i.e., social presence); moreover, these techniques enhance affective outcomes, such as a feeling of enjoyment. Our results suggest that future research should investigate new means to leverage confidence and trustworthiness, which

most likely play a preponderant role in users' behavioral intention, in such conversational services.

A valuable implication of our findings is that the overall experience with the OFD conversational service seems, at least in part, to depend on how a chatbot is designed. The study suggests that ordering assistants that converse in natural language to interpret and place orders might be well accepted by young customers. This is particularly true when social conversational cues are applied so that chatbots transmit a human warmth and personality to a younger and more digitally proficient audience. In this respect, our study highlights that it is not just a matter of adopting chatbots to increase the touchpoints offered in the OFD segment; rather, it is essential to know how to properly communicate with the target audience and turn them into profitable customers through chatbots. Hence, chatbots should be designed according to an appropriate content and communication strategy, depending on the target users' characteristics and preferences.

Limitations and future research

In conclusion, we discuss some limitations that might call for further research on the topic. First, participants took part in a fictitious task that involved a simulated purchase; future studies could gather companies' real behavioral data to verify whether intention truly leads to actual usage behavior. Furthermore, as this study concerns a chat-based bot, it would be interesting to verify whether the same results apply to conversational speech-based assistants (e.g., smart speakers such as Google Home) or to more realistic human embodiment in virtual presence (e.g., an artificial human appearing in a virtual reality environment).

Our sample consisted of a young cohort who differ from other groups of users in their experience and use of technology. The multifaceted nature of young people's online experiences makes the results of the current study somewhat specific to them. Future studies should compare different samples who vary in their digital literacy, and researchers should consider users' preferences in markets where OFD services are still at a lower adoption stage so that they can further analyze whether chatbots increase OFD use and purchases compared to other systems (apps).

Algorithms based on machine learning (e.g., combining data about users' demographic information and shopping history) may be applied to identify the users' needs and personality. Such features could represent a key element in the development of chatbots' capability to understand the users' intent, to process natural language, and to draft suggestions based on consumers' tastes and preferences. Finally, new and interesting insights could be yielded by investigating different levels of engagement with the products involved in

the transaction, either in terms of monetary expense or different impressions due to the brand (e.g., emotional connections).

Finally, we believe further research should be conducted to assess whether chatbots could be fruitfully implemented in other settings, such as service recovery (e.g., a chatbot that acts as the first contact with customers in the complaint cycle). Such settings could represent a determinant in increasing the likelihood of (re)using chatbots.

Notes

1. https://www.justeatplc.com/about-us/our-business
2. https://alfonsino.delivery/
3. https://www.code-brew.com/pdf/FOOD-INDUSTRY-REPORT-INSIGHTS.pdf
4. https://foodbot.ai/
5. https://www.citivelocity.com/citigps/how-covid-19-is-impacting-online-food-delivery-platforms/
6. https://www.who.int/news-room/feature-stories/detail/who-launches-a-chatbot-powered-facebook-messenger-to-combat-covid-19-misinformation
7. https://www.adweek.com/creativity/burger-king-is-launching-a-video-game-delivery-service-in-spain-we-went-there-to-test-it/[Accessed 2/3/2020].

ORCID

Roberta De Cicco http://orcid.org/0000-0001-7835-2274
Susana Cristina Lima da Costa e Silva http://orcid.org/0000-0001-7979-3944
Francesca Romana Alparone http://orcid.org/0000-0001-9994-6629

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