# CHATBOT AESTHETIC AND ANTHROPOMORPHIC DESIGN CUES EFFECTS ON CUSTOMER PURCHASE INTENTION

INTRODUCTION

The ways in which emergent technologies are changing the worldwide are manifold. The resulting transformations, due to such technologies, are widespread. Recent advancements in artificial intelligence encourage more and more firms to use chatbots for service delivery and incorporate them into the frontline (van Doorn et al., 2017). Chatbots, are increasingly replacing human service agents on websites, social media, and messaging services. In fact, the market for chatbots and related technologies is forecasted to exceed $1.34 billion by 2024 (Wiggers 2018). In the field of digital commerce, a succession of transformations has seen the emergence of new shopping models that have changed online purchasing methods. Accordingly, online tools such as live chat services and chatbot functionalities have grown in importance. Giving some numbers, 50% (more than a half) of total online shoppers prefer to buy through chatbot and 63% of consumers prefer to communicate with brands of business through chatbot at the same time. Chatbots are becoming increasingly influential in day-to-day life. These programs have been developed to assist a range of industries, from simple banking transactions to retail customer service enquiries. Nowadays, e-commerce and marketplaces more in general has increased, becoming a mainstream distribution channel. Recognizing the potential of these sorts of AI-based autonomous agents, firms are adopting them at an extremely rapid pace. Organizations therefore need to be careful in their design and deployment of these technology artifacts, to ensure that the experience that customers have is both effective and enjoyable. Although many features warrant attention, one particularly important aspect to consider is the extent to which autonomous agents (and specifically chatbots) are designed with social interaction, and specifically anthropomorphism, in mind (Wilson et al. 2017). Indeed, there is a need to better understand the impact of chatbot design features on user acceptance, considering how they can affect purchase

intention attitude. This development brings to an important aspect is represented by the chatbot interface design. In particular, for what concerns how they looks like. Also, we can refer to the bound between these chatbot aesthetic characteristics and anthropomorphic features.

Figure 1. (Color online) Google Trends Global Interest in the Term "Chatbot"
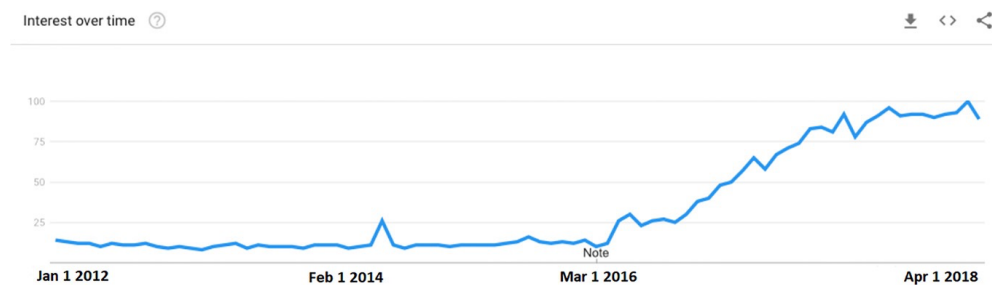
Going beyond with the simple chatbot user acceptance field of study, research needs to delve into other dimensions of consumers' experience with chatbots, including the quality of interaction with them, problem-solving capabilities, entertainment, and personalization levels. The field of chatbot anthropomorphism has been widely studied, but at the same times its academic research presents limitations. Considering anthropomorphic traits of the chatbot, including simple features such as naming (i.e., "Alexa"), language style, and the degree of embodiment, along with the specific customer contexts in which the interactions are likely to occur. The same occurs for chatbots pure aesthetic design features implications of consumers behavioral attitudes. The literature comprehensively treating how to design for chatbots is somewhat limited. Indeed, little has been studied to date about the effect this may have on the intention to purchase. To move beyond, we can see a lack in research that studies non only text-based interactions with virtual assistants, there is the need of works that should include images, videos, and their integration with text. Adding these features to a simulation about the experience of chatting and to control for content effects, thereby identifying the effects of different levels of message contingency. (E. Goa, S. Shyam Sundarb, 2019). Therefore, research also indicates that consumer experiences can be improved by chatbots that are able to imitate human dialogues (Rhim et al.). Understanding the impact of chatbot features in

consumers' attitudes and satisfaction, and ultimately in behavioral outcomes, considering purchase intention, remains a fertile area for further research. My attention is particularly grabbed into understanding at which level the message interactivity in chatbot based conversation bounded with anthropomorphic cues can influence the purchase intention or not. The theoretical frameworks proposed by previous research further enriches the literature on the effect of anthropomorphic chatbots on consumer behavior and avails theoretical and practical guides for designing chatbots and conducting smart retail innovation activities. Given the theoretical complexity of individuals' psychological, attitudinal, and behavioral responses to the agent as discovered in that study, it suggests that there is the need to implement live-chatting function using chat agents to help mitigate users' negative evaluations or experiences due to high expectations. Also, the usage of a live chat is needed to test the effect of Chabot stimuli on consumers to simulate the experience of chatting and to control for content effects, thereby identifying the effects of different levels of message contingency.

THE APPROACH OF THIS THESIS TO STUDY THE AFOREMENTIONED RESEARCH GAPS

To conduct my experiment, I will use two prototypes of live chats applied in retail industry, a footwear brand for women and men. I will also follow a survey-based research approach and specifically investigating how anthropomorphic design cues are able to affect consumers' purchase intention. The intention is to contribute to the chatbot design body of knowledge by investigating how different design features influence people attitudes to prefer buying or not a particular service/item. Indeed, the scope of the research is to demonstrate the effect of anthropomorphic visual elements in a multidimensional way, comparing chatbot aesthetic features and anthropomorphistic one's effect on consumers. To test the virtual agent features effects and to make the experiment more realistic as possible, I designed two chatbot prototypes that will be randomly given to my sample before asking customers questions about their impressions by a survey. I have incorporated into the live-chats different intensity of message interactivity and human-like appearance elements; One chatbot incorporates the first and another the contrary.

LITERATURE REVIEW

What is a Chatbot and how it can be useful in retailing industry

The existing literature defines a chatbot as a computer program, ''which simulates human language employing a text-based dialogue system" (Zumstein & Hundertmark, 2017). Hence, a chatbot is a computer program designed to simulate human conversation. As an example, in online customer service, chatbots can generate automatic responses to questions sent through social media channels or emails. Concerning how users respond to the chatbot's inquiries, Hill et al. found that users communicate with chatbots using shorter messages and a less rich vocabulary compared to conversations with another human, while Corti & Gillespie, found that people are less willing to repair misunderstandings with chatbots compared to humans. In the future, companies will be able to use mostly AI bots, which in some cases - work just as well as human salespeople, to make initial contact with prospective consumers. Considering virtual assistants in commerce field, Chatbot commerce (hereinafter also referred to as conversational commerce) describes the use of natural language technologies on several platforms for commercial purposes. In chatbot commerce consumers can communicate and purchase products directly through a human-like mobile messenger platform (Hair, J., Black, W., Babin, B., & Anderson, R., 2010). Conversational agents can be programmed with the objective of identifying consumer needs and refining offers based on choices and preferences. They facilitate sales, ordering, and delivery processes for the business and the consumer (Feine, J., Gnewuch, U., Morana, S., & Maedche, A., 2019). Moreover, organizations are interested in purchase intentions in order to predict future sales of existing and/or new products and services. Data about purchase intentions can help organizations in their marketing decisions related to product demand, market segmentation and promotional strategies (Tsiotsou, 2006). Consequently, online purchase intention is seen as a key factor that can predict the effectiveness of online stimuli (e.g., chatbot appearance) (Amaro & Duarte, 2015; Lu, Fan, & Zhou, 2016). In contrast to the brick-and-mortar store, the transmission of digital customer data can categorize visit types that differ in

terms of likelihood to purchase. The digital environment is an opportunity to identify shopper motivations and analyze responses to promotional activities. The ability to collect consumer data enables e-commerce marketers to target likely shoppers and design more effective, tailored marketing measures (Molla, A., & Licker, P., 2001). Online customer experience can be considered a major subject for e-retailers in the shopping environment, as the number of touchpoints between customer and company has increased significantly. The virtual CE can be described as an individual, multidimensional, psychological reaction to an online platform. Customers perform cognitive and affective conditioning on incoming sensory information from a series of text-based and visual stimuli on a website, all of which then create an impression in the human's brain (Bleier, A., Harmeling, C. M., & Palmatier, R., 2019). In this research, chatbot appearance (human or static appearance) is used as key factor in trying to demonstrate if the aesthetic characteristics of a chatbot can have a direct and positive relationship with purchase intention while a costumer is interaction with a Virtual Assistant. Although, In the online environment, chatbots as a retailer's front-end service innovation product, which directly or indirectly interacts with customers, are among the main avenues by which consumers perceive the innovative capabilities of retailers. Moreover, this innovative technology and function offer a unique and innovative experience.

Chatbot Attributes

1. Anthropomorphism

Chatbot aesthetic attributes – perceived enjoyment

Theoretically, the characteristics of chatbots can impact retailer experiential innovativeness, thereby influencing the behavioral intentions of the consumers. Studies of new technologies have found consumer attitude to be a valuable out-come variable after interacting with a conversational agent (Hayes, A. F. (2018). Also, the influence of technological devices on enjoyment has been evaluated several times. However, hedonic aspects (e.g., enjoyment) have been revealed to be more important than instrumental properties (e.g., practicability) in e-commerce (Chung, M., Ko, E., Joung, H., & Kim, S.,2020). Intensified intrinsic pleasure or joy are factors that generate positive customer attitudes toward online shopping (Knijnenburg, B. P., & Willemsen, M. C., 2016). Research indicates that perceived enjoyment is associated with attitudes in the e-commerce environment (Chung, M., Ko, E., Joung, H., & Kim, S.,2020).

Chatbot aesthetic attributes – Human-like appearance

Araujo mentioned that human-like chatbots might affect consumers' attitudes, satisfaction and sensitive attachment to the business and its online appearance. (Araujo, T., 2018). Humanized agents can boost online purchases by eliciting higher levels of empathy and expertise compared to chatbots, which lack human-like cues (MacKinnon, D. P., Fairchild, A. J., & Fritz, M. S., (2007). Overall, customer experience is affirmatively related to customer satisfaction in e-commerce. Thus, customer satisfaction in chatbot commerce can be achieved if the dimensions of customer experience are properly integrated into the technology (Venkatesh, V., Morris, M., Davis, G., & Davis, F., 2003). Nevertheless, Sheehan et al. (Spears, N., & Singh, S., 2004) stated that the discrepancy between expectations and experience is a major cause of customer dissatisfaction. Users of highly human-like

digital agents expect them to have human cognition. This may result in consumers first overestimating the capabilities of these technologies and then being disappointed when the reality does not match their expectations (Spears, N., & Singh, S., 2004).

What makes a chat agent human-like – identity cues

During the last half-century, scholars and designers have dedicated considerable effort to make intelligent chat agents more like humans. The easiest way to enhance the humanness of chat agents might be the use of human figures. Human visual (anthropomorphic) cues of agents can be richly suggestive and can shape social perceptions, due to mindlessness, priming and over-attribution (Kim, 2010; Lee & Oh, 2015). Human like visual cues is likely to trigger "humanness" heuristics (Sundar, 2008), leading users to treat chat agents, such as chatbots, as human and act socially towards them (Baylor & Kim, 2003; Gong & Nass, 2007; Kim & Sundar, 2012; Nowak, 2004). Considering that we can track the most significant attributes that can trigger this effect in consumers. First, the use of human names or identities is another easy way to enhance the humanness of chat agents. This would be an effective enhancement because of our tendency to perceive things by their labels. Cognitive psychologists have emphasized the importance of category-based perceptions activated by the social labels (or identity cues) as- signed to individuals or objects, arguing that individuals tend to use major attributes attached to labels to minimize cognitive effort when making judgments or in forming impressions of others. If an agent is presumed to be a chatbot, then users are more likely to evaluate the quality of the agent's performance based on their preexisting perceptions of chatbots or machines. Human identity cues, on the other hand, will predispose users to evaluate the quality of the agent's performance based on their expectations of humans. So, if an agent is presumed to be a chatbot, then users are more likely to evaluate the quality of the agent's performance based on their preexisting perceptions of chatbots or machines. Human identity cues, on the other hand, will predispose users to evaluate the quality of the agent's performance based on their expectations of humans.

What makes a chat agent human-like – Message Interactivity

Scientists therefore have invested much effort into designing discourse that have human-like characteristics (Ghose & Barua, 2013). A key characteristic of human communication is "contingency" in responses. In other words, responses exchanged in a human dialogue are interconnected with each other (Sundar, Bellur, Oh, Jia, & Kim, 2016). This means that a response is contingent upon the preceding message as well those preceding it, in a threaded conversation (Rafaeli, 1988). In the literature on human-computer interaction, such contingency is referred to as "message interactivity" (Sundar, 2009). Therefore, message interactivity in a chat context can be conceptualized as the level of contingency (or interdependent threadiness) in message exchanges. For example, when two individuals are having a conversation, if one not only acknowledges the other's message but also shows an awareness of previous conversations when responding to the message in a back-and-forth fashion, then the conversation follows an extended thread and is considered fully interactive or responsive (Rafaeli, 1988). Such message-interactivity would make an online chat agent appear "human-like" because it mimics the contingency found in message exchanges between human interactants (Rafaeli, 1988). At the same time, Conversational cues include word or phrase choice and the way in which a narrator describes himself or herself and others can increase the human- like nature of an agent's verbal behavior (Sheehan, B., Jin, H. S., & Gottlieb, U., 2020). **(fig. 1).** We can also say that Last, Sundar et al. (2016) have documented that the message interactivity occurring through live-chatting fosters positive attitudes and increases behavioral intentions to return to a given website, by way of imbuing users with perceptions of contingency. Therefore, people are more likely to perceive the chat pattern as a dialogue, which is a core characteristic of human-to-human communication. Therefore, it would allow an online chat agent to appear to have a "human-like voice."

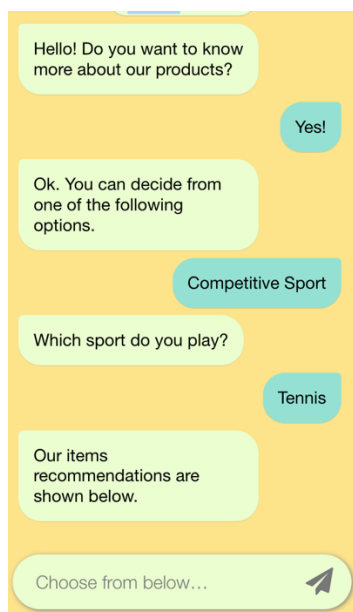Fig. 1 - High message interactivity

Fig. 2 - Low message interactivity

Anthropomorphism

Anthropomorphism refers to the attribution of a human form, human characteristics, or human behavior to nonhuman things such as robots, computers, and animals. Hiroshi Ishiguro, for example, develops androids that, for a short period, are indistinguishable from human beings. His highly anthropomorphic androids struggle with the so-called 'uncanny valley', a theory that states that as a robot is made more humanlike in its appearance and movements, the emotional response from a human being to the robot becomes increasingly positive and empathic

What makes a chat agent human-like – Anthropomorphic visual cues

Highly anthropomorphic visual cues (fig. 3) could increase the awareness or salience of the "other person" than low anthropomorphic visual cues (fig. 4) because the presence of a human figure attached to a chat agent itself can be suggestive of the existence of the "other person" in the interaction. Indeed, Kim and Sundar (2012) found that participants in human-like agent conditions show greater feelings of interacting with others. Cyr, Head, Larios, and Pan (2009) also identified that adding human images convey the feelings of human contact. The anthropomorphic visual cues of an online chat agent are also expected to increase perceived homophily, which is defined as "the amount of similarity two people perceive themselves as having" (Rocca & McCroskey, 1999, p. 309), since human-like figure of the agent is likely to be perceived as being more like the user than a simple text expression figure. To enhance the presence of anthropomorphic visual cues, another distinctive element is represented by the usage of ''emoticons'' and ''graphic interchange formats'' (gif) into the conversation pattern. Those symbols are used to express emotions, transmit them, and highlight the human presence. (fig. 5)
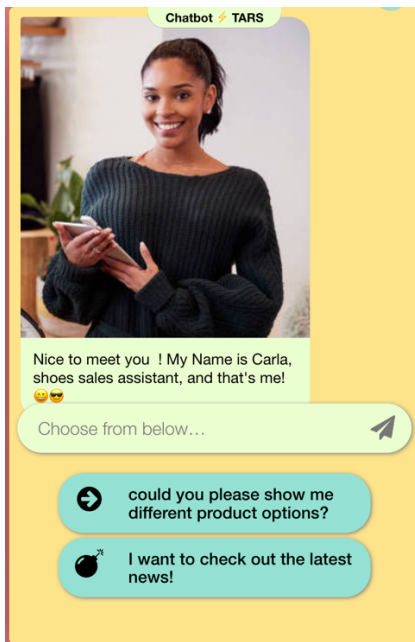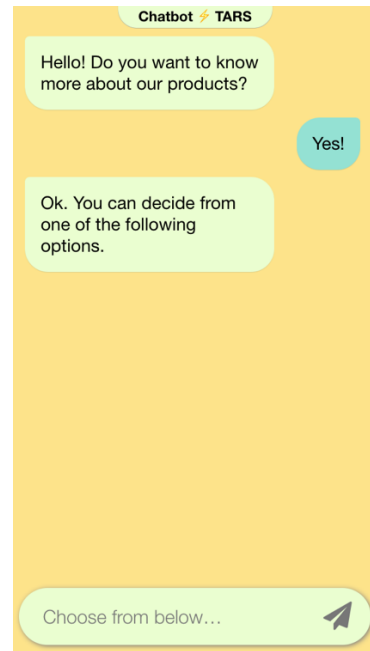
Fig. 3 – High Anthropomorphic visual cues
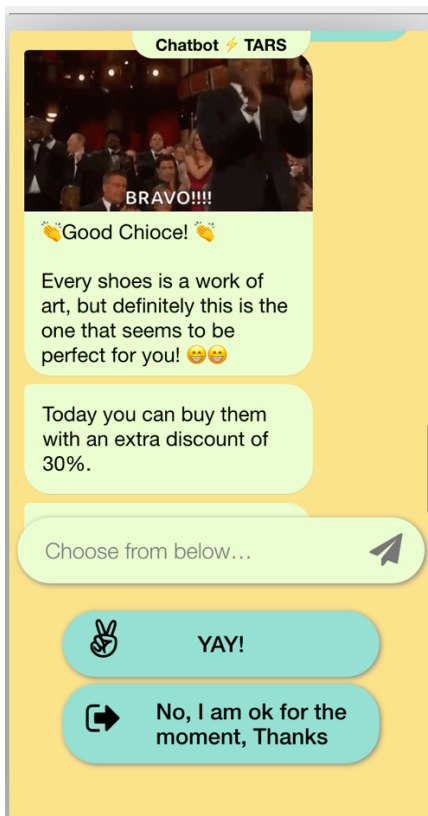

Fig. 4 - Low Anthropomorphic visual cues

Fig. 5

RESEARCH QUESTION & HYPOTHESIS

Considering what emerged in the previous paragraphs, the variables that I tested in my experiment, will be related to the **anthropomorphic design** cues of a chatbot. I considered doing an experiment in which I designed a chatbot prototype created in accordance with the level at which a conversational agent can be interactive (Message interactivity) and create a Human like conversation (Human-like appearance), whose description has been provided in the literature review. Those variables have been inserted into a prototype to demonstrate if the anthropomorphic design is able to influence or not the consumer purchase intention. As previously said, to understand the usage of a live chat is needed to test the effect of Chabot stimuli on consumers to simulate the experience of chatting, so the live chat designed, will be interactive giving so the possibility to the respondent to ask questions and answer at the same time. By the way, the research question designed is: **Does the usage of chatbot with high message interactivity and Human Like Appearance, in a conversational agent, is able to significantly affect the user's purchase intention?**

To answer the RQ, I established, a conceptual model (Figure 6).

So, by this way, we can establish the following hypothesis:

H1: Chatbot Message interactivity positive impact purchase intention

H2: The relationship between Message interactivity and Purchase intention is moderated by Chatbot Human-like Appearance.

Starting with chatbot interactivity (IV), the prototype simulates and processes human-machine conversation allowing humans to interact with a Virtual Assistant through their digital devices, giving the illusion that they were communicating with a real person. This interaction pattern is almost characterized by proper empathy and a real interaction between bot and user. The chatbot interactivity has been tested on 2 levels, a prototype will contain a high level of interactivity and the other a low

one (**Appendix 1**). The experiment land has been characterized also by the <u>humanlike appearance of</u> <u>the chatbot</u> moderator (M). It is the one that influences the form and strength of a relationship between the IV and DV. It is expected to increase social presence and perceived anthropomorphism, offering the user information about whether the agent is a real human, or a chatbot may elicit machine vs. human heuristics that can be related to anthropomorphic perceptions. (**Figure 6**). The manipulation of the IV and the M described should highlight effects on consumers' purchase intention (DV).
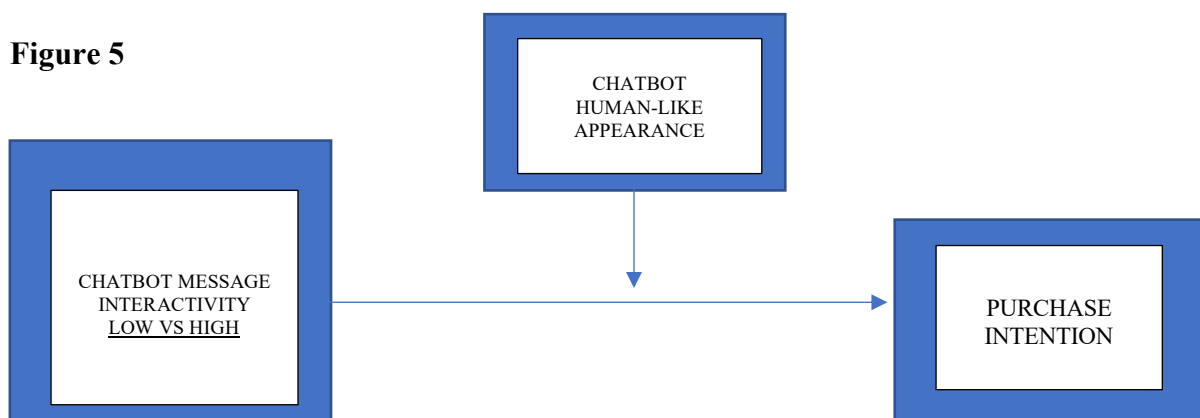
Figure 5

Figure 6 – Human Like Appearance – Chatbot Prototype Characteristics

This table contains all the elements contained into chatbot prototype that remind to anthropomorphism, interaction, informal cues and empathy ones.

Human Like Appearence characteristics - in the chatbot prototype designed			
Type of Item	**Anthrop. Cue**	**Example**	**'Carla''**
Identity	Visual representation	Images, avatars	
Identity	Demographic information	Name, Gender, Etnicity	Carla, Woman, Shoes Sales assistant
Visual	Emoticons and Gif	Symbols used to express emotions	
Visual	Social Dialogue	Greeting rituals, anecdotes, non-task related questions	'Nice to meet you, My name is Carla, shoes shop assistant, and that's me!'' '
Visual	Emotional Expressions	Apologies, congratulations, concerns	I will be there if you need some help'', "thanks for your trust!"
Conversational	Verbal Style	Self-references ("I") variability of syntax and words	'Every shoes is a work of art, but definitely this is the one that seems to be perfect for you". "there has been a pleasure bringing you here, enjoy!"
Conversational	Temporal cues and Reminders	Delayed responses to signal writing; sending reminders	'If you need help, do not hesitate to contact me!''

METHOD

1. The Prototype

This study wants to answer the research question by simulating the product research and pre-purchase scenario by the usage of conversational agent prototypes. The main task of the subjects involved is about asking questions about footwear items to a virtual assistant. The experimental questionnaire has been divided mainly into two parts, so first, I asked to survey respondents to chat with the chatbot prototype then they will answer the items questions in relation to their impressions. In order, to test the impact of chatbot interactivity and human-like cues, this study sets up two dialog scenarios employing different communication styles. So, by a non-probabilistic conventional sampling, with a randomized condition of the 2 prototypes created, half of the respondents interacted with the chatbot that is characterized by a High level of message interactivity (N=22) (cfr. Link of the prototype #1 https://chatbot.hellotars.com/conv/27xroE) and the other half with the other prototype which contains low level of interactivity (N=25) (cfr. Link of the prototype #2 https://chatbot.hellotars.com/conv/5PVTCQ), with an equal distribution (N sample=57). This study sets up two dialog scenarios employing different design cues and communication styles (see fig. 3 and 4). Previous research employed screenshots of the conversations between customers and chatbots rather than real-time chats (Chung et al., 2020). Therefore, this study utilizes really live-chat, and a true conversation to avoid different types of biases that can occur. Considering the prototype structure, the models follow a human-machine dialogue flow. The chatbots designed implies a real assistant whose can communicate with the user, showing products, giving advice and extra information about shoes and shopping procedure (Appendix 1.A). Indeed, the Virtual agent flows has a structure that implies a question-answer formulation, giving also chances to the respondents of choosing different options and so creating diverse discussion patterns. The virtual agent will show a set of options from which choosing from. At the same time, all the flows that will take place will have the same conclusion. (Appendix 1.B – beginning - the flows – end of conversation).

2. Sample and Questionnaire

Primary data collection through online channels enabled the rapid collection of a relatively large amount of data, lent itself to automation, and increased response rates. The online questionnaire has been promulgated primarily through social media (Facebook, WhatsApp, Instagram and LinkedIn) with the employment of simple non-probabilistic sampling. For what concerns research participants demographics (N=57), comprised mainly Italians (96,4%), Colombians (1,7%) and Danishes (1,7%). The research sample ages ranged from 18 to 69 y/o (M=31,8), with 20 Males (35,1%), 33 Females (61,4%) and 2 respondents who didn't specify their gender (3,5%). (cfr. Figure 8 – Descriptive about respondents).

To conduct my study, I have used measurement scales that have been pre-validated and so already existing in literature. The participants indicated their level of agreement with all the items on a seven-point Likert scale, ranging from "1" meaning "strongly disagree" to "7" meaning "strongly agree."

In particular, the items, based on a pre-validated 7-point Likert scale are represented by message interactivity, chatbot human like appearance, and their correlation to purchase intention. (Figure 7). Considering the questions pattern, the participants answered to the questionnaire after chatbot experience conclusion, the queries have been related to their impression in relation to virtual agent characteristics perceptions. (Appendix 2.A – Questionnaire flow). The questions are provided after the prototype interaction flow ends, to collect respondents' thoughts and impressions after their prototype - experience. In particular, the questions considered are related to people perception about message interactivity, human-like appearance of the chatbot and their correlation with purchase intention.

Figure 7 – Items – Pre-validated scales

VARIABLE	ITEMS	SOURCES
IV - Message interactivity	The chatbot was really interactive Communicating with the chatbot was clear I feel like the chatbot was really communicating with me.	n.d., designed and validated by me
M - Human Like Appearance	I perceived that the chatbot I have interacted with was human being I perceived that the chatbot I have interacted with was sociable I perceived that the chatbot I have interacted with was alive I perceived that the chatbot I have interacted with was interactive The chatbot seems to create a human-like conversation I had the sensation to chat with a Human-being	Gefen and Straub 2004; Lee et al. 2006
DV - Purchase intention	I intend to recommend to use this chatbot to purchase products I am very likely to buy a pair of shoes I intend to buy a pair of shoes within 3 months I intend to buy a pair of shoes within 6 months	Lin and Lu 2011

ANALYSIS AND RESULTS

Ones concluded my questionnaire, I exported the data on SPSS software in order to analyze the insights collected. I firstly looked at descriptive statistics about my sample. (Figure 9 and 10)

Based on what is shown in the following figures, the higher frequencies of respondents ages between 25-30 y/o and specially they are Italian Females.

Figure 9 – Respondents statistical description (Age)
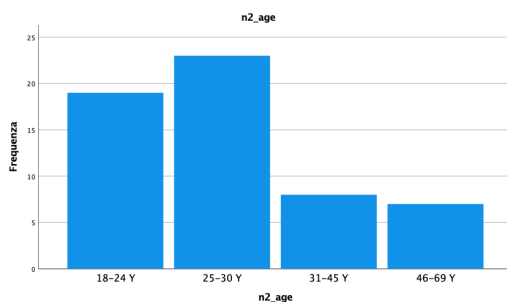
Figure 10 – **Respondents statistical description (Gender)**

What is your gender?

		Frequenza	Percentuale	Percentuale valida	Percentuale cumulativa
Valido	Male	20	35,1	35,1	35,1
	Female	35	61,4	61,4	96,5
	Prefer not to say	2	3,5	3,5	100,0
	Totale	57	100,0	100,0	

I continued analyzing the scales' reliability (even if they were already validated) because they have been adapted to my study. Considering figure 8, the validation check has been made through a reliability analysis conducted by testing the scales utilized through Cronbach Alpha. The scales related to main constructs are reliable as Alpha is >0.6 (Human-like Appearance – Purchase intention – Message interactivity). The test suggested that multi-items scales are measuring consistently. At the same time I have seen the correlation matrix of the items, which indicates an higher association between them. (**Appendix 3.A – Descriptive Statistics**)

Figure 8 – Scales validation – Reliability of IV – M – DV

Reliability Statistics – M			Reliability Statistics – DV			Reliability statistics – IV		
Alpha di Cronbach	Alpha di Cronbach basata su elementi standardizzati	N. di elementi	Alpha di Cronbach	Alpha di Cronbach basata su elementi standardizzati	N. di elementi	Alpha di Cronbach	Alpha di Cronbach basata su elementi standardizzati	N. di elementi
,935	,936	6	,883	,883	4	,888	,894	3

Going forward with the conceptual model developed, verify the hypothesis meant testing if there is a significant impact of chatbot message interactivity (IV) on purchase intention (DV) and verifying if there is a moderated effect of Human like appearance, among the IV and the DV. Starting the random assignment of chatbot prototypes (Low vs High message Interactivity), respondents have been assigned only to one of the two conditions displaying between-subject design. At the same time, they displayed the same questions after chatbot simulator. So, I created new variables for Purchase intention (DV), and Message interactivity (IV) by making the mean of the items used to measure it in the Qualtrics survey. In order to test the effect that Message interactivity has on Purchase intention I ran a simple linear regression analysis. Moreover, I decided to use this model as the dependent variable is metric, I also investigated an effect type relationship and indeed, there is only one independent variable (Message Interactivity). The hypothesis tests if chatbot message interactivity impact the purchase intention, the estimated regression equation is:

$$Purchase\ intention\ (PurchaseIntention_{DV}) = \beta 0 + \beta 1 * Message\ interactivity$$

The results have shown that by the increasing of message interactivity for 1 unit, Purchase intention increases for 0,68, there is a positive and significant effect that chatbot message interactivity has on purchase intention (p>|t|<0,05 Reject Null Hypothesis). So, we can say that my first hypothesis is verified. (Tables Appendix 3.B).

Then I ran again the regression analysis, inserting IV, moderator (Human-like Appearance) and DV. The hypothesis tests if chatbot message interactivity impact the purchase intention, this relationship is moderated by Human Like Appearance (M). The estimated regression equation is:

$Purchase\ intention\ (PurchaseIntention_{DV})$

$$= \beta0 + \ \beta1 * Message\ interactivity\ (IV) + \beta2 * Humanlike\ Appearance\ (M)$$

$$+ \ \beta3\ (IV * M)$$

Given the results (tables Appendix 3.B), first considering the model fit, 0,46% of the Variance is explained, so statistically one parameter is different from zero. Also, there is a positive and significant effect that Human like appearance have DV and IV.

So, chatbot Humanlike appearance is a moderating effect between Message interactivity and Purchase intention. Moreover, when the human-like appearance increases in a Chabot interface, the effect of message interactivity on purchase intention is Higher.

DISCUSSION

Contributions

This research examined the effect of chatbot message interactivity and its human like appearance on consumers' behavioral intention, considering in particular purchase intention. By analyzing message interactivity through a chatbot prototype we have been able to demonstrate that, in retail sector, when a user chats with a virtual conversational agent (chatbot), this interaction can lead people to a behavioral intention if the chatbot respects a certain type of criteria. The study findings have been able to confirm the significant positive impact of chatbot message interactivity on users' purchase intention when consumers perceive that the chatbot features and conversation seems to be human-like, in terms of visual design and conversational flow. Also, we can say that by the research just conducted, it can be able to support the strong relationship between anthropomorphism and AI, as it plays an important role in people perceptions, in the online setting. Then, we can say to have gained a confirmation about the significant perception of human-like interaction between a human-being and a chatbot and how it indirectly influences consumers to make purchases via them.

My research can be consistent with previous studies showing that when products and services are exposed to anthropomorphism, consumers are more likely to perceive them positively and make purchases (Aggarwal and McGill, 2012).

Managerial Implications

This study investigated chatbot attributes importance in e-commerce contexts, that must be considered. So, there is a set of managerial implications for practioners and especially companies wishing to promote a positive modern shopping experience, gaining a competitive advantage. By the results analysis we can also say that firms can disrupt human-like and high interactive chatbot implementation to improve users' purchase intention, in the online setting through chatbot implementation. More in general, the study can help marketers in the retail sector with their decisions about the use and design of conversational tools on their online platforms. Not only, I showed that chatbot technology is an effective way to reach customers, but also how the application needs to be designed to attract them, in part. Specifically, retailers could start a process by which the usage chatbots can aspirate to become a main sales distribution channel. Chatbots used in retail should lead to enjoyment, inspire trust, and generate a good attitude toward the application. In this way, customers can be attracted to the e-store through pleasant experiences. (Klein, Martinez, 2022). Retailers aiming to create positive consumer impressions should be empathic and build a lasting social bond and engage with chatbot conversations that include small talk, sympathetic feedback, emoticons, or images to create anthropomorphism and consequently increase customer satisfaction (Blut, M., Wang, C., Wünderlich, N. V., & Brock, C., 2021). Higher levels of customer satisfaction usually bring to the retailers' main goal – enhanced purchase intentions (MacKinnon, D. P., Fairchild, A. J., & Fritz, M. S., 2007).

Further Research Directions

I can acknowledge the following issues concerning the study limitations. First, the sample selected is characterized by a low number of respondents (N=57), to have a more correct distribution, the study should have been conducted with a minimum number of participant equal to 150. At the same time, demographics showed that maybe this study can't be reliable for people outside of Italy, as the 96,5% of respondents are Italians, with an average age of 31 y/o. In accordance with this last data, further studies should include a wider nationality distribution with an analysis that can be extended to younger generations (16-20 y/o), these elements would be crucial to deeply understand the diverse effects of the variables studied in terms of familiarity (confidence with technology) and culture. Given the retail industry selected to create the chatbot prototype (footwear), within also to the fact that the majority part of literature considers mainly food industry, tourism, and fashion ones. Another important step would be done by the analysis of the chatbot interactivity in the context of home furniture industry, real estate or moreover bricolage tools retailers, to expose different target of users to the same conditions.

APPENDIX 1 – chatbot flows and interfaces

prototype 1 - High message Interactivity

access link: https://chatbot.hellotars.com/conv/27xroE/)
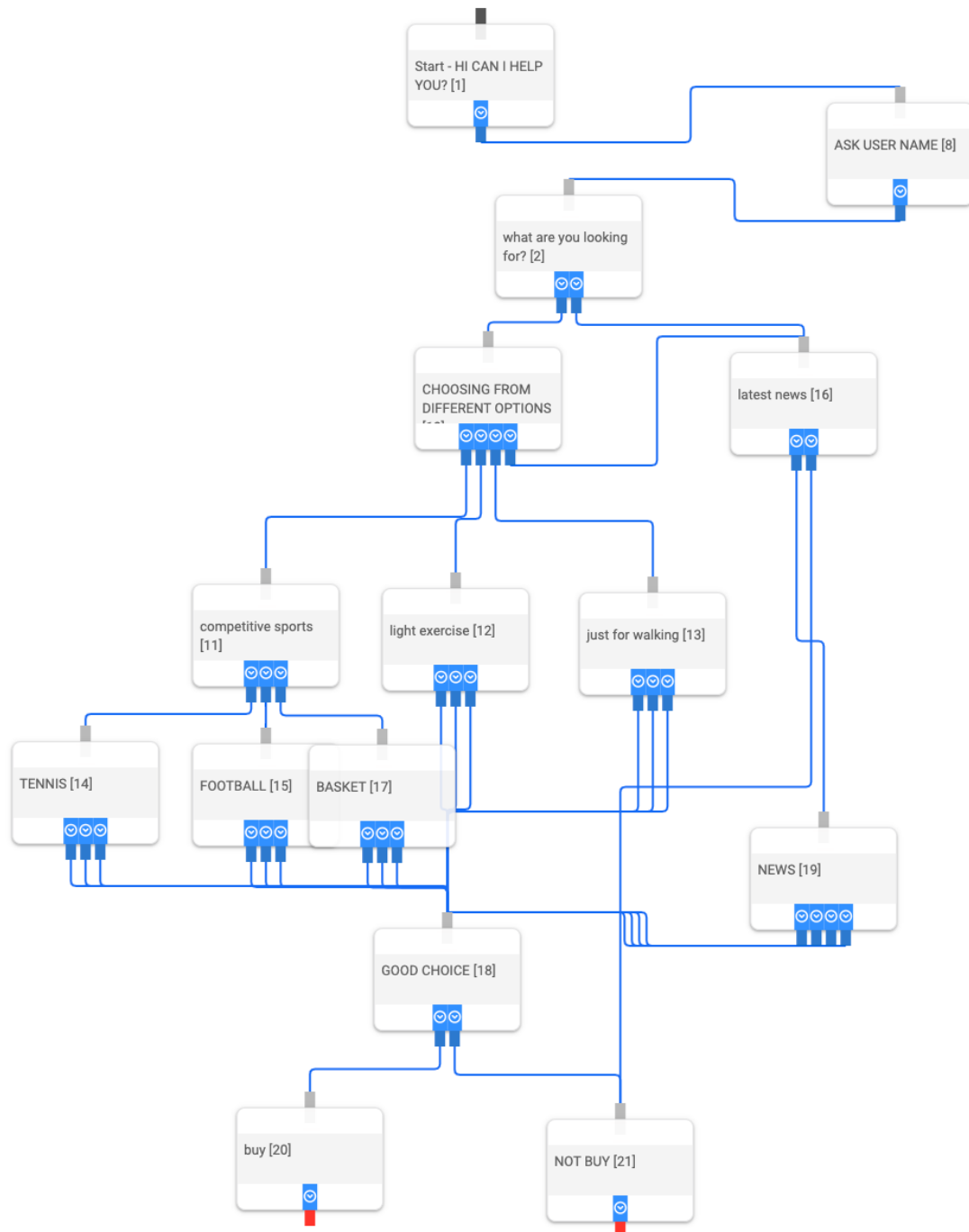
prototype 2 - Low message interactivity

access link: https://chatbot.hellotars.com/conv/5PVTCQ
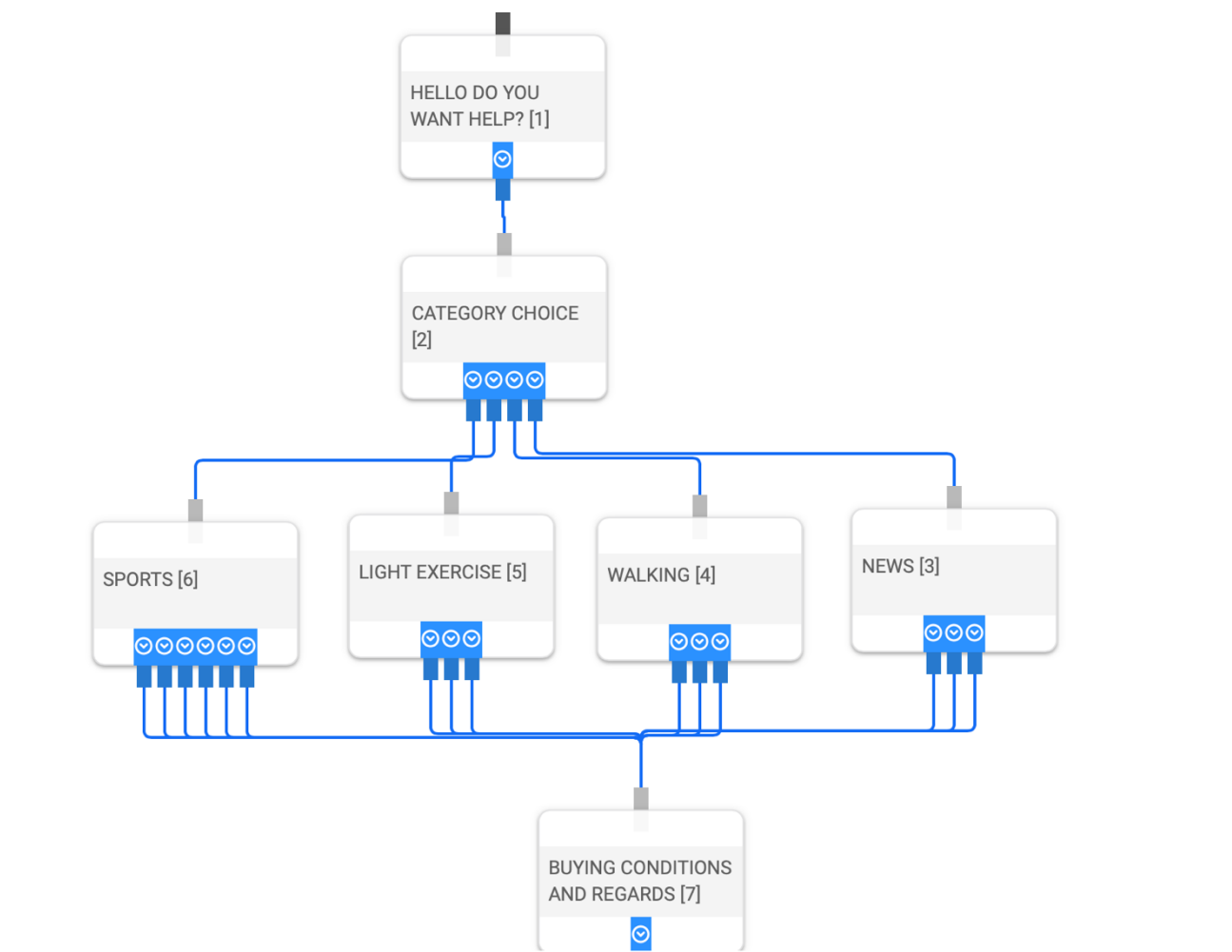
N.B.
The prototypes will expire at the end of September. To maintain them visible I have posted 2 flows examples on Linkedin, available at the following links:

High interactivity https://www.linkedin.com/posts/giulia-bonomi-950680178_hello-everyone-i-want-to-show-you-my-work-activity-6979123464443957248-Omyy?utm_source=share&utm_medium=member_desktop

Low Interactivity https://www.linkedin.com/posts/giulia-bonomi-950680178_hello-everyone-i-want-to-show-you-my-work-activity-6979126713045659649-cqEa?utm_source=share&utm_medium=member_desktop

APPENDIX 2.A – QUESTIONNAIRE MAIN STRUCTURE

Introduction

Hi everyone! My name is Giulia and thank you for participating to my study! Your contribution will be precious.

I am conducting research for my Master Thesis in Performance Marketing about commercial agents (chatbot), in retail Industry, considering in particular footwear sector.

the questionnaire is completely anonymous and at the same time It doesn't contain wrong or right answers.

You can display the questions in English or Italian, by the up right menu.

Click on the light blu button to move forward.

Q2 RANDOMIZED CONDITION

Q2.A High interactivity Prototype

Now I ask you to copy and paste this link on a new web window

https://chatbot.hellotars.com/conv/27xroE/

Through it, You will find a virtual assistant which I would ask you to chat with only for a few seconds. The virtual assistant is representative of a footwear brand.

You can interact and ask questions about the products.

After, I kindly ask you to come back on the survey, there will be a very short series of questions.

thank you!

Q2.B Low interactivity Prototype

Now I ask you to copy and paste this link on a new web window

https://chatbot.hellotars.com/conv/5PVTCQ
 (…)

CHATBOT INTERACTION

1. QUESTIONS/ITEMS

2. DEMOGRAPHICS

THE END

APPENDIX 3.A – DESCRIPTIVE STATISTICS

Respondents' statistical description (Age)

Respondents' statistical description (Gender)

What is your gender?

		Frequenza	Percentuale	Percentuale valida	Percentuale cumulativa
Valido	Male	20	35,1	35,1	35,1
	Female	35	61,4	61,4	96,5
	Prefer not to say	2	3,5	3,5	100,0
	Totale	57	100,0	100,0	

Respondents' Nationality Distribution

What is your Nationality?

		Frequenza	Percentuale	Percentuale valida	Percentuale cumulativa
Valido	Colombian	1	1,8	1,8	1,8
	Danish	1	1,8	1,8	3,5
	Italian	55	96,5	96,5	100,0
	Totale	57	100,0	100,0	

What is your Nationality?
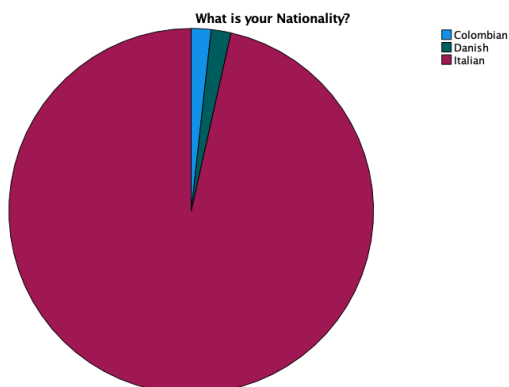
APPENDIX 3.B – SCALES RELIABILITY

Reliability and Correlation between Items for IV (Message Interactivity)

Reliability statistics – IV

Alpha di Cronbach	Alpha di Cronbach basata su elementi standardizzati	N. di elementi
,888	,894	3

Matrice di correlazione tra gli elementi

	Considering the interaction just have with the chatbot. Now, you can Answer the following questions, rating your opinion from 1 to 7 – Communicating with the chatbot was clear	The chatbot was really interactive – Strongly Disagree: Strongly Agree	I feel like the chatbot was really communicating with me. – Strongly Disagree: Strongly Agree
Considering the interaction just have with the chatbot. Now, you can Answer the following questions, rating your opinion from 1 to 7 – Communicating with the chatbot was clear	1,000	,720	,733
The chatbot was really interactive – Strongly Disagree:Strongly Agree	,720	1,000	,759
I feel like the chatbot was really communicating with me. – Strongly Disagree: Strongly Agree	,733	,759	1,000

Reliability and Correlation between Items for Moderator (Human-like Appearance)

Reliability Statistics – M

Alpha di Cronbach	Alpha di Cronbach basata su elementi standardizzati	N. di elementi
,935	,936	6

Matrice di correlazione tra gli elementi

	I perceive that the chatbot I have interacted with, is: – Human-being	I perceive that the chatbot I have interacted with, is: – Sociable	I perceive that the chatbot I have interacted with, is: – Alive	I perceive that the chatbot I have interacted with, is: – Interactive	The chatbot seems to create a human-like conversation – Strongly Disagree: Strongly Agree	I had the sensation to chat with a Human-being – Strongly Disagree: Strongly Agree
I perceive that the chatbot I have interacted with, is: – Human-being	1,000	,746	,823	,603	,669	,805
I perceive that the chatbot I have interacted with, is: – Sociable	,746	1,000	,712	,761	,666	,703
I perceive that the chatbot I have interacted with, is: – Alive	,823	,712	1,000	,668	,628	,698
I perceive that the chatbot I have interacted with, is: – Interactive	,603	,761	,668	1,000	,658	,605
The chatbot seems to create a human-like conversation – Strongly Disagree:Strongly Agree	,669	,666	,628	,658	1,000	,871
I had the sensation to chat with a Human-being – Strongly Disagree:Strongly Agree	,805	,703	,698	,605	,871	1,000

Reliability and Correlation between items for DV (purchase intention)

Reliability Statistics – DV

Alpha di Cronbach	Alpha di Cronbach basata su elementi standardizzati	N. di elementi
,883	,883	4

Matrice di correlazione tra gli elementi

	I am very likely to buy a pair of shoes – Strongly Disagree: Strongly Agree	I intend to buy a pair of shoes within 3 months – Strongly Disagree: Strongly Agree	I intend to buy a pair of shoes within 6 months – Strongly Disagree: Strongly Agree	I intend to recommend to use this chatbot to purchase products – Strongly Disagree: Strongly Agree
I am very likely to buy a pair of shoes – Strongly Disagree:Strongly Agree	1,000	,691	,692	,669
I intend to buy a pair of shoes within 3 months – Strongly Disagree: Strongly Agree	,691	1,000	,745	,551
I intend to buy a pair of shoes within 6 months – Strongly Disagree: Strongly Agree	,692	,745	1,000	,580
I intend to recommend to use this chatbot to purchase products – Strongly Disagree: Strongly Agree	,669	,551	,580	1,000

APPENDIX 3.C – LINEAR REGRESSION ANALYSIS

Regression analysis between Message Interactivity and Purchase Intention

Variabili immesse/rimosse[a]

Modello	Variabili immesse	Variabili rimosse	Metodo
1	messageinter activity_IV[b]	.	Inserisci

a. Variabile dipendente: PurchaseIntention_DV

b. Sono state immesse tutte le variabili richieste.

Riepilogo del modello

Modello	R	R-quadrato	R-quadrato adattato	Errore std. della stima
1	,662[a]	,438	,428	1,34508

a. Predittori: (costante), messageinteractivity_IV

ANOVA[a]

Modello		Somma dei quadrati	gl	Media quadratica	F	Sign.
1	Regressione	77,545	1	77,545	42,860	<,001[b]
	Residuo	99,508	55	1,809		
	Totale	177,053	56			

a. Variabile dipendente: PurchaseIntention_DV

b. Predittori: (costante), messageinteractivity_IV

Coefficienti[a]

Modello		Coefficienti non standardizzati		Coefficienti standardizzati	t	Sign.	Statistiche di collinearità	
		B	Errore standard	Beta			Tolleranza	VIF
1	(Costante)	2,176	,670		3,249	,002		
	messageinteractivity_IV	,684	,104	,662	6,547	<,001	1,000	1,000

a. Variabile dipendente: PurchaseIntention_DV

Regression analysis between Message Interactivity and Purchase Intention within Human-like appearance (M)

Riepilogo del modello

Modello	R	R-quadrato	R-quadrato adattato	Errore std. della stima
1	,689[a]	,474	,455	1,31314

a. Predittori: (costante), M_HUMAN_APPEARANCE, messageinteractivity_IV

ANOVA[a]

Modello		Somma dei quadrati	gl	Media quadratica	F	Sign.
1	Regressione	83,938	2	41,969	24,339	<,001[b]
	Residuo	93,115	54	1,724		
	Totale	177,053	56			

a. Variabile dipendente: PurchaseIntention_DV

b. Predittori: (costante), M_HUMAN_APPEARANCE, messageinteractivity_IV

Coefficienti[a]

Modello		Coefficienti non standardizzati		Coefficienti standardizzati	t	Sign.	Statistiche di collinearità	
		B	Errore standard	Beta			Tolleranza	VIF
1	(Costante)	1,969	,663		2,971	,004		
	messageinteractivity_IV	,465	,153	,450	3,041	,004	,445	2,246
	M_HUMAN_APPEARANCE	,294	,153	,285	1,926	,059	,445	2,246

a. Variabile dipendente: PurchaseIntention_DV

Diagnostiche di collinearità[a]

Modello	Dimensione	Autovalore	Indice contenuti	Proporzioni varianza		
				(Costante)	messageinteractivity_IV	M_HUMAN_APPEARANCE
1	1	2,930	1,000	,01	,00	,00
	2	,050	7,624	,87	,03	,26
	3	,020	12,111	,13	,96	,74

a. Variabile dipendente: PurchaseIntention_DV

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