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To cite this article: Svetlana Bialkova (2023): How to Optimise Interaction with Chatbots? Key Parameters Emerging from Actual Application, International Journal of Human-Computer Interaction, DOI: [10.1080/10447318.2023.2219963](https://doi.org/10.1080/10447318.2023.2219963)

To link to this article: <https://doi.org/10.1080/10447318.2023.2219963>



Published online: 08 Jun 2023.



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How to Optimise Interaction with Chatbots? Key Parameters Emerging from Actual Application

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ABSTRACT

Consumers' resistance towards chatbot agency questions the quality of human-computer interaction, and thus, invites further investigation on factors determining chatbot efficiency. Current study addresses the above challenges by providing understanding on functionality and enjoyment, emerging as crucial drivers of satisfaction. Consumers who have used chatbots at least once in their daily life were invited to complete a survey, evaluating the interaction with the bot. The results are clear in showing that information quality, accuracy and competence are pivotal for chatbot functionality. Personal care and social presence enhanced interactivity perception and the enjoyment of the chatbot use. These factors might however turn into barriers when not met, as reported by consumers in low satisfaction group. Current findings provide valuable insights for developing and implementing chatbot applications to satisfy the user demand for enjoyable and functional interaction, through enhanced information quality, competence, personal care and social presence.

KEYWORDS

AI; Chatbots; enjoyment; functionality; interactivity; satisfaction

1. Introduction

Despite the increased implementation of chatbots (software applications for on-line chat conversation via text or text-to-speech) in Marketing and everyday context, the technology is still experiencing shortages and being not always accepted by consumers. Chatbots have been incorporated by various companies as e-service agents to substitute the direct contact with a live human agent (Lee & Choi, 2017), to facilitate the customer services (Chung et al., 2020), to better manage customer relationship (Libai et al., 2020). The aim of all these applications is to provide enhanced customer experiences.

A question arises hereby: whether chatbots currently available at the market offer such enhanced experience, to appropriately meet consumer needs and demands? It turns out that consumers are resistant, questioning the technology readiness (Flavián et al., 2022) and usefulness (Xie et al., 2022). Although the necessity of high quality and easy to use chatbots has been recognised, the technology is still at its infancy, encountering several challenges (Bialkova, 2021; 2022). Part of the challenge reflects the need to understand the factors determining the quality and ease of use perception. Not surprisingly then, several lab studies addressed quality of chatbots (Ben Mimoun et al., 2017; Chung et al., 2020; Lou et al., 2022) and the ease of use (Meyer-Waarden et al., 2020). It was reported that quality and ease of use shape the attitudes towards chatbots, and thus, the intention to use in the future. Recent study, exploring consumer opinion about chatbots currently available at the market,

confirmed the role of quality and ease of use on attitudes formation (Bialkova, 2022). The study further showed that both, cognitive (e.g., functionality, interactivity) and affective (e.g., enjoyment) components are crucial for quality and ease of use perception.

Although there is no doubt that functional chatbots will lead to more enjoyable interaction, it is still puzzling what actually determines functionality, interactivity and enjoyment. The current paper addresses this issue, aiming to provide the much-needed understanding on chatbot efficiency. Such understanding is especially relevant taken that majority of the previous work mainly focussed at investigating consumer experience with chatbots mock-ups, and thus, could lack understanding on actual consumer evaluation when it comes to chatbots currently available at the market. To cover this shortage, the present work explores the opinion of consumers who have used a chatbot at least once in their daily life. A further contribution of the current work is the holistic framework encompassing factors driving cognitive (e.g., functionality) and affective (e.g., enjoyment) aspects of interaction with chatbot, usually addressed as separate entities in previous studies. Present research is of great benefit for consumer scientists as well as human-computer interaction specialists who should join efforts to optimise chatbots, reconsidering the development and implementation of applications that appropriately meet the consumer needs.

In the following, we first present the theoretical framework and parameters emerging from literature as crucial drivers of consumer opinion towards chatbots. Then the

empirical part is presented, followed by report of the results and discussion on key outcomes.

2. Theoretical background

Consumers satisfied with chatbot agency appear to be those who find the chatbot to be of good quality (Chung et al., 2020). Quality chatbots provided good functionality and thus enjoyable interaction (Bialkova, 2021, 2022). The crucial question we address hereby is: what parameters drive functionality? A further question we ask is: whether same (or different) parameters determine interactivity and enjoyment?

2.1. Factors driving chatbot functionality

Functionality invites further exploration in the chatbot context (Lee & Cho, 2020), although it was suggested in the end-user system evaluation a long time ago by the Technology Acceptance Model, TAM (Davis et al., 2003). Enhanced functionality (Bialkova, 2021), was acknowledged to improve chatbot quality perception, and thus the e-agency. Quality itself was reported to reflect the system (e.g., how skilful the chatbot is) and the information provided (for an overview see Trivedi, 2019). Taken the importance of the above-mentioned factors, we have a close look at these.

Information quality measures the semantic success of the technology (Delone & McLean, 2003). It was reported that the information provided by chatbots should be timely, sufficient, relevant (Trivedi, 2019). The researcher further acknowledged that information quality modulates consumer experience, and thus brand love. What is much more interesting in the present context is whether and how information quality shapes the functionality perception. A further question we address is: whether there is a relation between information quality and the chatbot response? In particular, we are interested to know how accurate (Chung et al., 2020; Cheng & Jiang, 2022; Davis et al., 1989), skilful (Spitzberg, 2006; Trivedi, 2019), competent (Edwards et al., 2014; Yagoda & Gillan, 2012) the system is. While previous work addressed these parameters in separate studies in different contexts, hereby we encompass all, looking closely in the perspective of chatbots, and thus, providing a holistic framework.

Accuracy reflects the precision of the system as well-known from the usability literature. In the context of chatbots, precision of the marketing information provided was hypothesised to load on accuracy (Cheng & Jiang, 2022). Although there are various definitions and scales to measure accuracy, crucial to determine communication with service agents to be accurate is when being timely, adequate and complete. By contrast, lack of accuracy was recognised as possible pitfall, leading to problems in communication with a robot (Yagoda & Gillan, 2012).

Competence is another factor closely related to accuracy we hypothesise to further load on functionality perception. Competence is contextual and complex (for an overview see Spitzberg, 2006). It reflects knowledge and skills translated into the mediated context, as acknowledged in the usability literature. From service marketing literature, it is well known

that the customer service agent needs to be competent, i.e., having skills and knowledge to appropriately perform the service (Parasuraman et al., 1988). Concerning e-service, again, different scales have been used to address competence (e.g., Edwards et al., 2014; Yagoda & Gillan, 2012). Researchers, however, agree that competence (e.g., competent, skilful) is crucial in the evaluation of system performance.

In the chatbot context, competence was associated with meeting needs, and thus reflecting usefulness of the agent (Meyer-Waarden et al., 2020). Note, however, the authors have not been able to substantiate statistically the relationship between chatbot competence and its usefulness. Such outcome is especially puzzling taken other researchers claimed that accuracy of communication and competence of online service agents significantly influence customer satisfaction (Chung et al., 2020). Plausible explanation of the discrepancy between previous studies could be the different scales used. Another explanation could be that consumers have not been satisfied with the agent performance. But this is a serious argument to closely investigate what exactly determines chatbots functionality evaluation.

Based on the above theoretical notions, we hypothesise that:

H1. Chatbot functionality perception depends on

H1a. Information quality

H1b. Accuracy

H1c. Competence.

We are interested to further know whether the parameters hypothesised to modulate functionality also load on enjoyment. Or there are other factors that should be considered, especially taken that functionality reflects cognitive components, while enjoyment is associated with affective, emotional response.

2.2. Factors determining enjoyment when interacting with chatbot(s)

Enjoyment is important in consumer experience evaluation and brand advocacy (Bialkova, 2021). It was reported to modify the perception of system ease of use (Venkatesh, 2000), and thus being explored in various tech systems from online, digital, to Augmented and Virtual reality platforms. In the chatbot context, enjoyment emerged as a mediator between user satisfaction and intention to use (Lee & Choi, 2017), recommendation adherence and attitudes (Bialkova, 2022). Enjoyment was found to interplay with chatbot quality perception and ease of use (Bialkova, 2023). The study, however, acknowledged that consumer intention to rely on AI (functions) might be reduced if experience is not enjoyable.

Therefore, a crucial question we address hereby is: what factors determine enjoyment? Enjoyment is often associated with happiness (Ekman, 2016), being one of the core affects (Russell, 2003) constructing emotions. Previous work already questioned the role of emotions in chatbot efficiency, mainly

investigated in line with the incorporation of anthropomorphic features. Although enjoyment was reported to modulate recommendation adherence, no evidence was provided for perceived anthropomorphism on the affective response, neither anthropomorphic effect on attitudes and satisfaction with the company (Araujo, 2018). A plausible explanation for such findings could be the way chatbot might be judged. It was reported that the interaction with chatbot might be evaluated in a different way than the one with human agent (Lou et al., 2022). Another reason could be a low anthropomorphism of the chatbot agent used. Not surprisingly then, a recent study reported even mediating effect of fear of negative evaluation transferred through fear of rejection (Ali et al., 2023).

We have to note therefore, anthropomorphic/human-like characteristics were shown to shape the way chatbots are perceived (Miao et al., 2022) and how users interact with the bots (de Sa Siqueira et al., 2023; Kang & Kang, 2023). Miao et al. (2022) further associated the purchase intent and the avatar usage intent with the affective response (i.e., entertainment), as well as with social response (e.g., social presence, personalisation). Personalisation, we assume is strongly related to personal care, and personal care we believe correlates with social ability of a chatbot.

Personal care requiring human touch (e.g., personal attention, seeking understanding, empathy) could enhance consumer satisfaction, as well acknowledged in service marketing literature (Parasuraman et al., 2005; Zeithaml et al., 2002). The authors further noted the need for personalisation which might advance the service provided. In the chatbot context, service agent offering customers individual attention was reported to lead to better interaction, customisation, and thus direct effect on consumer-brand relationship (Cheng & Jiang, 2022).

Social presence is achieved through interaction with others (Hess et al., 2009), or via mediated environment (Tu, 2000; Witmer & Singer, 1998). Social presence was acknowledged to enhance satisfaction (He et al., 2012), as well as attitudes and consumer purchase behaviour (Dahl et al., 2001). In the service marketing, social presence was recognised to play a role in agent and service evaluation. Perceived social presence of web site had a positive influence on trust, enjoyment and loyalty (Cyr et al., 2007). In the chatbot context, social presence was hypothesised in relation to anthropomorphism (Jin & Youn, 2023) and to reflect the sense of human contact, warmth, or sociability (Ben Mimoun et al., 2017). It was reported to enhance user perception of trust and the intention to engage with the agent (Tsai et al., 2021), as well as the attitudes towards the chatbot (de Sa Siqueira et al., 2023). Based on the above mentioned, we assume:

H2. Enjoyment with chatbot performance depends on

H2a. Personal care

H2b. Social presence.

We have to also note hereby that attractive avatar was found to be an effective sales agent at moderate levels of product involvement (Holzwarth et al., 2006). By contrast, at high levels of product involvement, expert avatar was

effective sales agent. Put differently, both cognitive and affective components seem to modulate the way chatbot performance is perceived. Recent work supported the notion that affective (e.g., enjoyment) and cognitive (e.g., functionality, interactivity) components interplay, and thus enhance the chatbot evaluation (Bialkova, 2022, 2023). Therefore, in the current paper we also look at interactivity.

Interactivity associated with the extent to which users can manipulate the system technology, was recognised to modulate ease of use and quality perception of a chatbot (Bialkova, 2021). Good interaction with (e-)agent and/or salesperson predetermines the formation of positive attitudes towards the brand, as well-known from marketing classics. A recent study also reported that good interactivity shapes positive attitudes towards chatbots and intention to use in the future (Bialkova, 2022, 2023). We have to point out that incorporating various methodological approaches, earlier studies addressed what determines the interactivity of e-agents and chatbots (e.g., Ben Mimoun et al., 2017; Chaves & Gerosa, 2021; Holzwarth et al., 2006). However, the outcomes are ambiguous, often contradictory, and thus calling further investigation. The current paper encompasses this exploration. In particular, we address whether and how the parameters hypothesised above for functionality (e.g., information quality, accuracy, competence), and for enjoyment (personal care, social presence) impact interactivity.

The above hypotheses are tested in empirical study, as described in detail in the Method section.

3. Method

3.1. Participants

A convenient sample of EU consumers was approached to complete a survey online. 40 people (17 men) took part in. The youngest was 21, and the oldest was 45 years old. All have experienced a chatbot before: 30% at least once, 47% more than 5 times, and the rest between 3 and 5 times. All respondents have used a chatbot to contact customer services. 27% of the respondents also used a chatbot when doing a purchase. The top three industries where chatbots were used by our respondents emerged to be tourism & travel, fashion, telecommunication (see Figure 1).

3.2. Procedure and instrument

The study was approved by the ethics committee of the home university accordingly (reference 21/LBS/031). After a short introduction and a consent form provided, the questions were presented. Respondents were asked to report their satisfaction based on the experience they had with the chatbots used before. They had to evaluate functionality, interactivity and enjoyment concerning the chatbots used. Factors hypothesised to load on the above-mentioned parameters were also addressed, namely: information quality, accuracy, competence, personal care and social presence (see Table 1 for a summary of constructs used).

Construct functionality encompassed three items (e.g., Chatbots are functional), based on Bialkova (2021). Interactivity scale included three items (e.g., I felt I could interact with the chatbot) adapted from Lessiter and colleagues (2001), and validated in the context of chatbots (Bialkova, 2021, 2022). Enjoyment encompassed five items (e.g., sad/joyful) based on Russell (2003), and validated in the context of chatbots (Bialkova, 2021, 2022). Construct information quality had four items (e.g., The chatbot agent provided the necessary information), adapted from Trivedi (2019). Accuracy and competence were self-developed constructs, based on compilation from previous scales and pilots from our lab. Accuracy encompassed three items (e.g., The chatbot was accurate), and competence had three items (e.g., The chatbot was competent). Personal care consisted of three items (e.g., The chatbot provided individual attention) adapted from Cheng and Jiang (2022). Social presence had five items (e.g., I felt a sense of human contact in the agent), based on Ben Mimoun and colleagues (2017). Enjoyment was measured on semantic differential scale (1–7). All other constructs were evaluated by Likert scales (1 = strongly disagree, 7 = strongly agree).

In addition, we asked our respondents what is the likelihood to use a chatbot in the future (three items based on Bialkova, 2021) and whether they prefer to use a chatbot or a human agent in the future (four items based on Bialkova, 2021). At the end, sociodemographics were addressed, e.g., age, gender, education.

3.3. Analytical procedure

First, reliability check was run. All scales used demonstrated a high reliability, all Cronbach's $\alpha > .70$. Then *T*-tests were

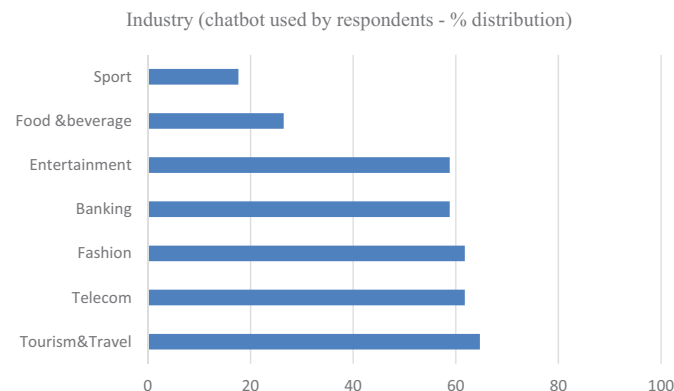


Figure 1. Industries where chatbots were used by our respondents.

run to probe whether response differs between male and female respondents. Such difference was not reported (all p 's $> .1$). ANOVAs probed whether there is a difference in response with respect to previous use (1–2 vs. 3–5 vs. > 5 times). Such difference was not reported (all p 's > 0.1), only for information quality being at the margin ($p = 0.081$).

For construct satisfaction, a Cut point value was applied, whereby cases lower than or equal to 4 are assigned to one group (low satisfaction), and values above the cut point to another group (high satisfaction). The high satisfaction group encompassed 15 respondents. *T*-tests were run to check whether there is a difference in the response depending on participants' satisfaction (low vs. high satisfaction group respectively).

Correlation analyses were run to further explore possible relationship between factors under investigation. Separate analyses were run for low and high satisfaction group.

4. Results

4.1. Comparative analyses

The results from the *T*-tests were clear in showing that there is no difference in response between male and female respondents concerning the parameters under exploration. No deference in response was reported as a function of previous use (frequency).

What is much more interesting in the present context, respondents who were highly satisfied provided more positive response, in comparison to respondents in low satisfaction group, as reported from the *T*-tests (Figure 2 provides details on parameters under investigation). The difference in response between high and low satisfaction group was highly significant for functionality, interactivity, information quality, accuracy and competence (all p 's < 0.001). *T*-test for enjoyment, personal care, and social presence also reported significant difference in response between high and low satisfaction group (all p 's < 0.05).

4.2. Correlation analyses

Taken the significant difference in response as a function of satisfaction (low vs. high), the correlation analyses were run separately for respondents in low and high satisfaction group, respectively. In the following, we report these results

Table 1. Summary of the constructs used, sources, and reliability check.

Construct	Measuring scale	Cronbach's α
Functionality	4 items: e.g., "Chatbots are functional" based on Bialkova (2021; 2022)	.91
Interactivity	3 items: e.g., "I felt I could interact with the chatbot", validated for chatbot context by Bialkova (2021; 2022)	.84
Enjoyment	5 items: e.g., "The interaction with chatbot(s) is sad/joyful", based on Russell (2003), validated for chatbot context by Bialkova (2021; 2022)	.93
Information quality	4 items: e.g., "The chatbot agent provided the necessary information", adapted from Trivedi (2019)	.77
Accuracy	3 items: e.g., "The chatbot was accurate", self-developed	.89
Competence	3 items: e.g., "The chatbot was competent", self-developed	.83
Personal care	3 items: e.g., "The chatbot provided individual attention" adapted from Cheng and Jiang (2022)	.70
Social presence	5 items: e.g., "I felt a sense of human contact in the agent", based on Ben Mimoun et al. (2017)	.89
Satisfaction	5 items: e.g., "The chatbot did a good job", adapted from Chung et al. (2020)	.93

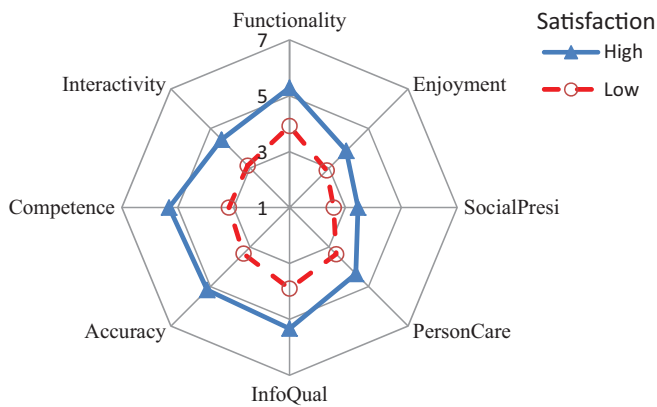


Figure 2. Parameters under investigation for low (red dashed line) and highly (blue solid line) satisfied group.

Table 2. Pearson correlation for chatbot evaluation, highly satisfied group.

	1	2	3	4	5	6	7	8
1. Functionality		.69*	.55	.70**	.80***	.82***	.53	.64*
2. Interactivity			.84***	.65*	.53	.82***	.88***	.77**
3. Enjoyment				.49	.48	.74**	.66*	.58*
4. Information quality					.79**	.81***	.62*	.40
5. Accuracy						.79**	.39	.27
6. Competence							.68*	.64*
7. Personal care								.74**
8. Social presence								

NB. *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$.

separately, paying attention to the correlations substantiated statistically.

4.2.1. High satisfaction group

Results from the correlation analyses are clear in showing that functionality positively correlates with interactivity ($r = .69$, $p < 0.05$), see Table 2. Information quality ($r = .70$, $p < 0.01$), accuracy ($r = .80$, $p < 0.001$), and competence ($r = .82$, $p < 0.001$) interplayed with functionality. Social presence seems to also play a role in functionality perception ($r = .64$, $p < 0.05$).

Interactivity correlated with information quality ($r = .65$, $p < 0.05$) and competence ($r = .82$, $p < 0.001$). There was a strong and a positive correlation between interactivity and enjoyment ($r = .84$, $p < 0.001$). Enjoyment correlated with competence ($r = .74$, $p < 0.01$), personal care ($r = .66$, $p < 0.05$), and social presence ($r = .58$, $p < 0.05$). Interactivity also correlated with personal care ($r = .88$, $p < 0.001$) and social presence ($r = .77$, $p < 0.005$).

There was a strong and a positive correlation between information quality and accuracy ($r = .79$, $p < 0.005$), and with competence ($r = .81$, $p < 0.001$). Accuracy further correlated with competence ($r = .79$, $p < 0.005$). Competence correlated with personal care ($r = .68$, $p < 0.05$), and with social presence ($r = .64$, $p < 0.05$). There was a strong and a positive correlation between personal care and social presence ($r = .74$, $p < 0.01$).

4.2.2. Low satisfaction group

Results for the low satisfaction group followed some of the tendencies observed for the high satisfaction group.

Table 3. Pearson correlation for chatbot evaluation, low satisfied group.

	1	2	3	4	5	6	7	8
1. Functionality		.58*	.29	.55*	.45*	.32	.39	.06
2. Interactivity			.26	.40	.59*	.40	.72***	.25
3. Enjoyment				.32	.50*	.61**	.19	.49*
4. Information quality					.26	.29	.50*	.19
5. Accuracy						.76***	.52*	.48*
6. Competence							.38	.49*
7. Personal care								.43*
8. Social presence								

NB. *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$.

However, there were some differences in comparison to the response given by participants in high satisfaction group.

Functionality positively correlated with interactivity ($r = .58$, $p < 0.05$), information quality ($r = .55$, $p < 0.05$), and accuracy ($r = .45$, $p < 0.05$), see Table 3.

Interactivity correlated with accuracy ($r = .59$, $p < 0.05$) and personal care ($r = .72$, $p < 0.001$). Enjoyment correlated with competence ($r = .61$, $p < 0.01$), accuracy ($r = .50$, $p < 0.05$), and social presence ($r = .49$, $p < 0.05$).

Information quality correlated with personal care ($r = .50$, $p < 0.05$). Accuracy correlated with competence ($r = .76$, $p < 0.001$), personal care ($r = .52$, $p < 0.05$), and social presence ($r = .48$, $p < 0.05$). Again, competence correlated with social presence ($r = .49$, $p < 0.05$), and social presence correlated with personal care ($r = .43$, $p < 0.05$). Note, however, the lower correlation coefficients, in comparison to the high satisfaction group.

5. Discussion

The aim of the present work was to provide the much-needed understanding on chatbot efficiency, and thus advice on how to optimise the interaction with them. In particular, we addressed potential factors determining functionality, interactivity and enjoyment. Such understanding is especially relevant taken the shortage in literature, although the recognised demand for functional chatbots leading to more enjoyable interactions, and thus lifted satisfaction. Note also, majority of earlier studies mainly focussed at testing consumer experience with chatbots mock-ups, and thus, lacking understanding on chatbots currently available at the market, and the actual consumer evaluation. In this respect, the present paper brings new insights, exploring the opinion of consumers who have used a chatbot at least once in their daily life. Another major contribution of the current work is the investigation of both, cognitive (e.g., functionality) and affective (e.g., enjoyment) aspects of interaction with chatbots. While in previous studies these aspects were addressed separately, hereby we encompass them in a holistic framework, as discussed in details below.

5.1. Drivers of chatbot functionality

Functionality correlated with information quality (H1a – accepted) and accuracy (H1b – accepted), for both, high and low satisfaction group (see Table 4 for a summary of hypotheses tested, and Figure 3 for the graphical representation of the outcomes). These findings are crucial for

understanding the chatbot functionality, emerging as key parameter to lift quality and ease of use (Bialkova, 2021, Bialkova, 2022).

Information quality loaded positively on functionality. Taken the association of information quality with the semantic success of the technology (Delone & McLean, 2003), we could say that our respondents evaluated the chatbot functionality as successful, offering good quality information. Furthermore, they have acknowledged that the information provided by chatbots was timely, necessary, sufficient. This outcome is in line with earlier work suggesting that good information quality modulates consumer experience, and thus brand love (Trivedi, 2019). Hereby, we advanced the understanding of chatbot experience evaluation, namely demonstrating that information quality shapes chatbot functionality perception.

We have been able to further show a relation between information quality and accuracy, information quality and competence. Note, however, these effects were substantiated only for the high satisfaction group (see Table 2), but not for the low satisfaction group (see Table 3). Present outcomes are very important. Accuracy and competence of chatbot have been evaluated positively by respondents reporting high satisfaction. By contrast, respondents reporting low satisfaction seem to do not find the chatbot used to be accurate, neither competent.

Current findings are especially relevant given the discrepancy in previous scales concerning accuracy (Davis et al., 1989; Yagoda & Gillan, 2012) and competence (Edwards et al., 2014; Spitzberg, 2006) in the system evaluation. In the chatbot context, above parameters have also been addressed separately (Cheng & Jiang, 2022; Chung et al., 2020; Trivedi, 2019). Hereby, we have been able to encompass all, showing the relationship between these parameters. Furthermore, based on the results obtained, we could claim that accuracy

and competence are indicators for the level of satisfaction. If not met these could turn into barriers, as reported by consumers in low satisfaction group.

Accuracy associated with the precision of the system, was reported to significantly correlate with functionality. This effect was better pronounced for the high satisfaction group. Such finding is in line with previous work suggesting that the precision of the provided marketing information shapes accuracy (Cheng & Jiang, 2022). We have been able to further report that communication with service agents is evaluated to be accurate when being timely, adequate and complete. Concerning the low satisfaction group (i.e. accuracy was evaluated to be low), the result seems to cohere with earlier work recognising that lack of accuracy could be a pitfall, when communicating with robots (Yagoda & Gillan, 2012).

Competence reflecting knowledge and skills of the chatbot, correlated with the functionality. Note, however, this effect was substantiated statistically only for highly satisfied consumers (see Table 2). For the low satisfaction group, such effect was not observed (see Table 3). Thus, we could say that **H1c** is partially supported.

Above finding is very important for the understanding of chatbot functionality and consumer satisfaction, especially taken the complexity in competence definition and metrics (e.g., Spitzberg, 2006; Yagoda & Gillan, 2012). Although there is no doubt that customer service agent should be competent, as recognised by service marketing literature (e.g., Parasuraman et al., 1988), in reality the chatbot might not be equipped with skills and knowledge to appropriately perform the service. Hereby we indeed observe such result. There was a different response from low and high satisfaction group. Highly satisfied consumers evaluated relatively high the accuracy and competence of the chatbot used. By contrast, consumers in low satisfaction group reported relatively low accuracy and competence (see Figure 2). This is a crucial finding inviting reconsideration on the way chatbot provides accurate and competent service.

Although researchers agreed that e-agency competence is pivotal in the evaluation of system performance (e.g., Edwards et al., 2014; Yagoda & Gillan, 2012), often studies have not been able to report competence in the chatbot performance. Moreover, consumers did not report usefulness of

Table 4. Summary of the hypotheses tested.

Hypotheses	High satisfaction group	Low satisfaction group
H1. Chatbot functionality perception depends on		
H1a. Information quality	Accepted	Accepted
H1b. Accuracy	Accepted	Accepted
H1c. Competence	Accepted	Rejected
H2. Enjoyment with chatbot performance depends on		
H2a. Personal care	Accepted	Rejected
H2b. Social presence	Accepted	Accepted

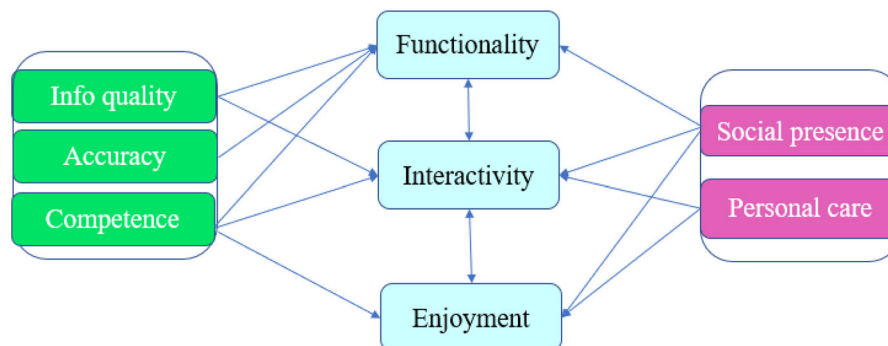


Figure 3. Conceptual model on chatbot interactivity determinants.

the agent (Meyer-Waarden et al., 2020). At least, the authors have not been able to substantiate statistically a relationship between chatbot competence and its usefulness. Such puzzling outcome could be due to low satisfaction. While recent study hypothesised that accuracy of communication and competence of online service agents influence customer satisfaction (Chung et al., 2020), in reality, consumers might not be satisfied with the chatbot. Hereby we have been able to further show that accuracy and competence of a chatbot are critical drivers for its functionality. In this respect, the current study sheds light on how to improve functionality, recognised as key determinant of satisfaction.

Satisfaction is important as satisfied consumers demonstrated positive attitudes towards a chatbot (Bialkova, 2021), and thus intention to use it in the future (Bialkova, 2022). Consumers satisfied with chatbots as shopping assistants reported positive experience and developed loyalty towards the brand delivering such services (Bialkova, 2023; Klaus & Zaichkowsky, 2020) as well as trust in e-agency and willingness to purchase (Tsai et al., 2021). In other words, we could say that accuracy and competence reflect consumer immediate response, as well as have long-term influence shaping the customer-brand relationships.

5.2. Determinants of enjoyment with chatbot

Enjoyment correlated with social presence (H2b - accepted). Concerning personal care, it had a positive effect on enjoyment, but this effect was substantiated statistically only for highly satisfied consumers (see Table 2), not for respondents reporting low satisfaction (see Table 3). Thus, we could say that H2a could be partially accepted.

Enjoyment is a core affect forming emotions (Russell, 2003), often associated with happiness (Ekman, 2016). It has been explored in various systems, taken its importance in consumer experience evaluation and brand advocacy (Bialkova, 2021). Previous studies already acknowledged the mediating role of enjoyment for user satisfaction, intention to use a chatbot (Lee & Choi, 2017), as well as in attitudes formation and recommendation adherence (Bialkova, 2022). Although it was reported that enjoyment enhances chatbot quality perception and ease of use (Bialkova, 2023), it turns out that consumer intention to rely on AI (functions) might be reduced if experience is not enjoyable.

As already mentioned, enjoyment was explored before in the chatbot context looking at anthropomorphic features. Surprisingly, however, some studies have not been able to show influence of the perceived anthropomorphism on the affective response, neither anthropomorphic effect on attitudes and satisfaction with the company (Araujo, 2018). Other studies even reported a negative effect and chatbot rejection (Ali et al., 2023). Low anthropomorphism of the chatbot agent could be a reason. Hereby we have been able to further show that low human touch (i.e., personalisation, care) does not load on enjoyment. By contrast, high personal care was crucial to perceive the chatbot performance as being enjoyable.

Personal care was recognised in service marketing as a crucial factor shaping consumer satisfaction (Parasuraman et al., 2005; Zeithaml et al., 2002). Although it was acknowledged the need for personalisation in order to advance the service provided, in reality chatbots might not necessarily provide such personal care. Hereby we have been able to show that consumers enjoyment is not sensitive if chatbot performance lacks personal care (see Table 3, low satisfaction group).

Social presence enhanced enjoyment evaluation, for both, low and highly satisfied consumers (see Table 4). Associated with the sense of human contact and sociability (Ben Mimoun et al., 2017), social presence was already shown to modulate the perception of trust and intention to engage with the agent (Tsai et al., 2021). It has been acknowledged that social presence shapes satisfaction (He et al., 2012), attitude and purchase behaviour (Dahl et al., 2001), as well as enjoyment and loyalty (Cyr et al., 2007). Note, however, that the above-mentioned studies were in different contexts.

For the chatbot context, social presence was mainly explored in line with the bot anthropomorphism (for overview see Miao et al., 2022). A recent work also looked at the (human-like) mistakes that bots may make, and thus how social presence affect attitudes (de Sa Siqueira et al., 2023). Our study takes a step further, exploring how the social presence shapes chatbot efficiency and user evaluation. Zooming-in into details, we have been able to demonstrate that social presence determines not only enjoyment (e.g., emotional aspect), but also chatbot functionality (cognitive aspect). Competent and personal caring chatbots were perceived to have good social presence, as reported by highly satisfied consumers (see Table 2). These effects were also observed for low satisfaction group (see Table 3), although with smaller magnitude, in comparison to highly satisfied consumers.

We have to also mention hereby that enjoyment correlated with competence, and this effect was substantiated for both, low and high satisfaction group. While highly satisfied consumers found the chatbot to be competent, respondents reporting low satisfaction did not find the chatbot to be competent. Current finding is of great importance. While competence is usually associated with cognitive aspects as knowledge and skills (e.g., Edwards et al., 2014; Spitzberg, 2006; Yagoda & Gillan, 2012), hereby it also modulated the affective response, i.e., enjoyment of chatbot interaction. Put differently, to lift consumers enjoyment when interacting with chatbot, the e-agent should be competent and capable of meeting consumer needs.

5.3. Determinants of interactivity with chatbot

As part of the design, we have been able to show that enjoyment correlates positively with interactivity. Note, however, this effect was substantiated statistically only for respondents reporting high satisfaction (see Table 2). By contrast, respondents reporting low satisfaction perhaps did not experience enjoyable interaction, as the effect was not reliable (see Table 3). Above outcomes bring extra value to

advance the understanding of chatbot interactivity and how it could be optimised.

Interactivity is associated with the extent to which users can manipulate the system technology, as recognised in the usability literature. From retail and service marketing, it is well acknowledged that good interaction with the sales persona and/or service agent leads to positive attitudes towards the brand, and lift the intention to purchase. Not surprisingly then, interactivity was extensively explored in earlier studies in the e-agency (e.g., Ben Mimoun et al., 2017; Chaves & Gerosa, 2021; Holzwarth et al., 2006). While previous outcomes are dispersed, and sometimes contradictory, hereby, we have been able to bring in a single framework interactivity, functionality and enjoyment.

From one side, parameters emerging to be crucial for enjoyment (e.g., personal care, social presence) impact interactivity. There was a positive correlation between interactivity and personal care perception. This finding coheres with previous work reporting that service agent offering customers individual attention enhanced interactivity, customisation, and thus, the consumer-brand relationship (Cheng & Jiang, 2022).

From other side, factors enhancing functionality (e.g., information quality, accuracy, competence) also correlated with interactivity. Despite that some of the effects were better pronounced for the high satisfaction group (see Table 2), marginally or not observed in the low satisfaction group (see Table 3), interactivity strongly correlated with functionality for all respondents hereby. This is a very important outcome, especially taken that chatbot interactivity determines its ease of use and quality perception (Bialkova, 2021, 2022). Furthermore, the higher the interactivity was perceived to be, the more positive attitudes towards chatbots were and intention to use it in the future (Bialkova, 2023).

Although we did not have specific hypotheses concerning interactivity, the very rich design allowed us to explore in detail and obtain crucial results about chatbot efficiency. Interactivity interplayed with functionality as well as with enjoyment. We have to mention, however, enjoyment seems to not be sensitive to interactivity for the low satisfaction group. One could argue that respondents did not have good interaction with the chatbot agent, and thus, did not enjoy its service. Another explanation could be that consumers did not enjoy the chatbot performance, and thus, did not interact with the chatbot at all. To discover which of the above is the case, further investigation is invited.

6. Limitations and future research

The convenient sample encompassed 40 participants. Although psychographic characteristics showed a wide age range, chatbot use, etc., it is worth replicating the study inviting more participants, and further randomising the sample. Another research avenue could be to invite participants across the globe. Currently, only EU consumers provided their opinion. It would be interesting to see the chatbot spread and thus to compare user experience cross cultures.

One might argue that participants answering based on their own previous experience of using chatbots could preclude common basis (for example access to the same chatbots) upon which their provided feedback can be evaluated. We agree that previous studies reported data concerning the use of one and the same chatbot, but this does not necessarily mean generalisation. In fact, the current study presents generalisation across the chatbots currently used at the market. However, further research could look whether the patterns observed hereby are comparable, and therefore could be generalised when using chatbots across different sectors/industries, e.g., fashion vs. telecommunication.

Another avenue for research could be when testing mock-ups of chatbots by specific brand(s). Such replicability is especially relevant taken that current results are based on the actual user experience, in real-life settings. Thus, present methodology could be translated to controlled lab experimentation. Incorporating our methodology could help to not just prevent low satisfaction mock-ups (as reported in earlier studies by various researchers), but rather to optimise chatbots ready to be launched onto the market, to appropriately meet the user demand.

7. Conclusions

Current study aimed to explore potential factors determining functionality, interactivity and enjoyment, emerging as crucial drivers of chatbot quality and ease of use perception. A survey was addressed to EU consumers who have used a chatbot at least once in their daylily life. This is one of the contributions of the present paper. While, earlier studies mainly focussed at exploring consumer experience with chatbots mock-ups, they might lack understanding on chatbots currently available at the market, and the actual user evaluation.

Another major contribution of the current work is the investigation of both, cognitive (e.g., functionality) and affective (e.g., enjoyment) aspects of interaction with chatbots. In previous studies these aspects were mainly addressed in separate research. Hereby we encompassed functionality, enjoyment and interactivity determinants in a holistic framework.

Results are clear in showing that: (1) Functionality correlated with information quality. (2) Accuracy further enhanced chatbot functionality. (3) Competence also shaped functionality, but this effect was only observed for highly satisfied consumers. (4) Information quality correlated with accuracy and competence. Again, this effect was substantiated only for highly satisfied consumer. (5) Enjoyment correlated with social presence. (6) Enjoyment correlated also with personal care, but the effect was pronounced only for respondents in high satisfaction group. (7) There was a strong correlation between personal care and social presence. (8) There was a strong correlation between interactivity and functionality. (9) Interactivity correlated with enjoyment, but only for highly satisfied consumers. (10) Current findings are of great importance to bring better understanding on chatbot efficiency evaluation in terms of

both, cognitive (e.g., functionality) and affective (e.g., enjoyment) aspects.

Note, however, some of the effects reported above have not been observed for respondents reporting low satisfaction. This is a crucial outcome, inviting joint effort by marketers and computer experts to optimise chatbots by designing functional AI applications providing enjoyable interaction, and thus high consumer satisfaction. Parameters emerging hereby to be crucial in chatbot functionality and enjoyment perception could be taken into account in the development of such high tech chatbots that appropriately meet user needs for efficient e-agency.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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