CONVERSATIONAL COMMERCE IN CONTEXT

AN EXPERIMENTAL STUDY OF HOW ONLINE ENVIRONMENTS AFFECT THE CHATBOT SERVICE ENCOUNTER

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Abstract:

The purpose of this study is to investigate the environmental effect on customer satisfaction in the context of a chatbot service encounter. Our study is focused on two distinct environments within the realm of conversational commerce: a website and a social media platform. By using a quantitative method, we collected data from 333 validated participants. Participants were measured based on their perceptions of the following variables: ease of use, quality, trust and humanness of the chatbot in the service encounter. The result from our study suggests that chatbot service encounters through the website environment significantly enhanced perceptions for all our values except perceived ease of use. These findings challenge industry assumptions favouring social media environments for conversational commerce. This study contributes to the growing research field of chatbots and conversational commerce, highlighting the importance of considering environmental effects on perceptions in chatbot service encounters to enhance satisfaction levels.

Keywords:

Chatbot, Environmental Effects, Online Customer Behaviour, User Experience, Conversational Commerce, Social Media, Ease of Use, Quality, Trust, Humanness

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Definitions

Environmental effects: The impact of external factors, like digital platforms, on user experiences and perceptions.

Chatbots: Computer programs that simulate human conversation to interact with users, commonly found on websites and messaging apps.

Perceived quality: Users' subjective judgment of a product or service's excellence.

Perceived ease of use: Users' subjective assessment of how effortless a product or system is to use.

Perceived humanness: Users' perception of a chatbot's human-like qualities.

Perceived trust: Users' subjective confidence in the reliability and credibility of a product or service.

Facebook Messenger: A messaging platform by Facebook for sending text, voice, and multimedia messages.

ZARA Website: ZARA's online platform for browsing and purchasing clothing and accessories collections.

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1. Introduction

The service encounter stems from the direct interaction between a consumer and the service provider. However, rapid technological advancements have affected the service encounter industry. As retail stores evolved from the physical stores and human service encounters to complete remote shopping experiences, this development has caused a reintroduction of the service encounter as we knew it. The human-to-human interaction is becoming a thing of the past, and the most prominent topic in discussions about customer experience and service encounters is the notion of conversational commerce (Zendesk, 2024).

Conversational commerce is a system with commerce agents or chatbots with human-like attributions with availability to orchestrate the customer service encounter in an online environment, often referred to as the future of commerce (Lim et al., 2022). However, while various important attributes to the actual chatbot are constantly being established and documented, the surrounding environment's effect on the overall satisfaction is of low presence in research. Industry applicants of conversational commerce argue that social media is the best place to deploy the chatbot. Theories about the surrounding environment's effect on a human-to-human service encounter both support and disregard what could be seen as an industry assumption but there is no certainty that this will transfer to the chatbot scenario. The primary objective of this study is to determine if the choice of environment's surroundings have a significant effect on conversational commerce experience.

1.1. Background

During the COVID-19 pandemic 2019, people all over the world needed to adapt to the remote living situation, entailing that various task went from physical to online. The pandemic worked as a catalyst for technical acceptance, with the public interacting with online functions such as mobile food deliveries and online shopping (Lim, 2021). We could further see this trend in the 40% increase in e-commerce revenue in Sweden between 2019 and 2020 (Postnord, 2024). The interest of e-commerce has continued increasing after the pandemic with e-commerce users rising by 37% between 2021 and

2024 (Statista, 2024). The greater market revenue and the increase of people to serve could further showcase the possible reason for the surge of conversational commerce and the development of service encounter chatbots.

With the e-commerce population at its peak, it is essential where the chatbot should interact with these customers. An interviewed CEO of a chatbot development company, expressed is thoughts regarding placement of chatbot:

> "The social media apps are established and well designed. By integrating our conversational commerce with an app like Facebook Messenger, we utilize a platform which we know a vast majority enjoy. It is also the platform where you communicate with your friends which have spillover effects on your view of the chatbot." - (CEO of a company developing chatbots)

This further supports the industry assumption that integrating a chatbot into a familiar social media platform/ environment may enhance customer perception due to the platform's established user base. This context potentially influences how customers perceive the chatbot, possibly due to factors like confirmation bias (Kahneman, 2011) and the affect-as-information heuristic (Forgas, 1995), where previous positive experiences shape current evaluations. However, theoretical perspectives suggest that deploying a chatbot on a company's website might not necessarily yield inferior outcomes. According to Expectation Disconfirmation Theory (Oliver, 1980), lower expectations associated with a website could lead to higher satisfaction if those expectations are exceeded. Additionally, Germelmann et al. (2020) discuss the concept of congruity, which could make a website environment more acceptable as it aligns well with the customer's existing perceptions of the brand.

Therefore, the optimal environment for a chatbot service encounter is not solely determined by the platform's inherent characteristics but also by the impact of these characteristics on customer perceptions and expectations.

1.2. Problem area and research gap

Although extensive research has been conducted regarding the environmental effects on the service encounter, in both physical and online contexts, there is a lack in studies regarding the environmental effects on the chatbot service encounter i.e. the future of commerce. The studies speaking about chatbot service encounters connected to the environment, have mostly spoken about the design effects or visual cues regarding an avatar or text rather than the context of a whole environment. The few similar studies have investigated a single environment and its affective states connected to the brand of the social media platform (Zarouali et al., 2018) and a conference paper investigated the difference in user experience between a chatbot in a social media environment and a regular website (Poirier et al., 2018). Neither of these studies had generalizable results to if a change of environment affects the chatbot experience. Hence, vast information is available regarding important variables in a chatbot service encounter and possible transferable environmental effect theories, while research about the surrounding environment's effects on a chatbot service encounter is scarce. Thus, there remains uncertainty about how and if an environment could affect perceptions about a chatbot service encounter.

1.3. Purpose and research question

As the future is soon here, it is essential for companies to give its conversational commerce tool the best possible conditions to prevail in a competitive market. Thus, it is important to understand the factors involved in every decision, without assumptions. This study’s primary aim is to establish whether the environment of a website or social media platform affects the chatbot service encounter differently and provide the growing market potential insight in current customer perceptions. Hence, the main research question is:

How does changes in the surrounding environment affect the customer satisfaction of a chatbot service encounter?

1.4. Delimitations

The collection of empirical data was limited to Sweden. This decision was made both due to the favourable conditions presented regarding increasing presence in e-commerce, and the strong presence of Norstat in Sweden.

To perform the environmental manipulation and the survey design, further limitations were needed. Firstly, the addressed topic in the encounter was online clothing shopping, which was chosen based on the interviewed company as well as high relatability. Secondly, two specific environments (ZARA and Facebook Messenger) representative of the market and preferences from the preparatory study were chosen for the comparison. We wanted the sample to be familiar with the brands due to the possible implications based on theory, ex Forgas (1995). Lastly, questions were needed to be limited to ensure as successful manipulation as possible, while this was handled carefully the visual reliability such as Cronbach Alpha of this study decreased.

There were several interesting approaches on the variables of environmental effect, which could have been investigated and compared. But since no similar studies were found, we prioritized testing if there was a difference in customer satisfaction and the important functional variables between the environments. For the study, it meant that we assumed that the affective states were captured in the independent variable. Finally, Norstat had standardized survey evaluations, meaning that we couldn't affect those questions.

1.5. Expected contributions

The aim of this study is to contribute to the general continuously growing knowledge about artificial intelligence through the investigation of conversational commerce and the possible environmental effects on increased satisfaction. The practical application of the hypothesis results can hopefully open new perspectives for the industry, regarding environmental choice's effects and the environment's interplay with the perceived factors. Hopefully creating productive discussions about industry assumptions. Furthermore, by connecting previous marketing and psychology research to this unexplored chatbot service encounter with the addition of our results, we want to bring

new insight to the field and be a factor in implementations of new frameworks. This entails seeing patterns and innovative solutions that can be adapted to our advanced future. As the practical applications could be crucial for the streamlining of the conversational commerce systems, which is both a growing and highly competitive market, we hope our insight ensures the best possible service encounter for the customers which in turn through higher satisfaction can provide companies with increased revenue. Social media platform providers as well as website developers could also take part of the insights, since the study aims to showcase differences between the two environments and identify possible development areas.

2. Theoretical framework

To examine the possible impact of the environment in a chatbot service encounter, research was gathered on previous theory in the field, both older and newer studies were used to create depth. This section contains our starting point of S-O-R and more detailed studies regarding functions important to chatbots. Hypotheses are also presented as well as our additional theory. The conducted research has mainly been provided by the databases HHS library and Scopus, where peer-reviewed and number of quotations are regarded. The following keywords were used;

*Environmental effects *Service encounter *Chatbots *Ease of use *Quality *Trust *Anthropomorphism

2.1. Stimulus-organism-response model

In 1974, Mehrabian and Russell introduced the S-O-R model to analyse consumer reactions to environmental stimuli. This model comprises three components: Stimuli (S), Organism (O), and Response (R). Stimuli: External factors such as physical, informational, social, or situational elements that impact individuals. Organism: How individuals internalize and process these stimuli, influenced by their personal traits, attitudes, beliefs, emotions, and past experiences. Response: The observable actions, reactions, or emotions resulting from the interaction between the stimuli and the organism. The S-O-R model has been widely validated in studies on consumer behaviour. For example, Errajaa et al. (2022) used the model in a retail context to examine how in-store social atmospherics, like crowd density and employee interactions, affect customer satisfaction, revisit intentions, and word-of-mouth promotion. Their study confirmed the model's relevance, showing that social factors influenced internal reactions, leading to satisfaction and increased word-of-mouth and revisit intentions. Similarly, Chan et al. (2017) applied the S-O-R model in online retail, identifying stimuli that influence impulse shopping behaviours. Their study aimed to clarify the interactions among these elements, enhancing our understanding of digital consumer impulsivity.

In our research, the S-O-R model is crucial for examining whether environmental features and platform associations (stimuli) influence users' perceptions of the service encounter (organism), ultimately affecting their satisfaction (response).

2.1.1. Affect Infusion Model

Building upon this, the affect infusion model (AIM) developed by Joseph Forgas (1995) theorizes how emotions are affecting the cognitive decision-making process in which consumers act upon when making consumer decisions. Just like the S-O-R model, the AIM goes beyond the rational aspects of decision-making, focusing specifically on the affective states that are affecting human behaviour. The AIM focuses on how these affective states can infuse cognitive processes regarding memory, attention, reasoning or perception. According to the AIM affective states can affect these processes, both direct and indirect, changing how individuals interpret information and ultimately affect their decision-making.

The affect infusion model has also been used in studies through various domains as well as being revised and further developed. In Lowry et al. (2014) the authors adapt the AIM model to develop the ATIM model which they use to explain and predict how and when cognition, through perceived website performance (PWP), and positive emotion (PE) each influence Web vendor trust. In our study, this becomes interesting as we want to identify if the affective state of being on one platform compared to another will have a positive impact on the perceived quality of the performance.

2.2. Environment

2.2.1. Environmental effects on customer experience

Prior research has highlighted the significant impact of the physical environment on both customers and employees in service settings, as examined by Bitner (1992). Bitner suggests that the physical environment is crucial in shaping service encounters, directly influencing the behaviour of both customers and staff. According to Bitner, a service

encounter encompasses three primary components: physical characteristics, social characteristics, and symbolic characteristics of the environment.

The physical characteristics involve the store's design, layout, and functionality for customers. Social characteristics relate to staff behaviour and customer interactions within the store. Symbolic characteristics refer to the implicit or explicit messages conveyed through physical items, such as signs, artifacts, or symbols strategically placed throughout the space.

Bitner argues that these components interact to influence customer and employee behaviour based on their appearance. For customers, a pleasant environment, where employees are calm and attentive, can enhance satisfaction and loyalty, while a stressful, impersonal environment may decrease customer satisfaction. For employees, positive aspects of these components can boost productivity and engagement, whereas negative aspects may lead to high stress levels and resignations. By understanding and effectively managing these elements, businesses can create environments that promote positive interactions, leading to improved experiences for both customers and employees.

Building on Bitner's foundational research, subsequent studies have reinforced the notion of the environment's significant influences customer satisfaction. Effendy (2019) found that store environments affect customer mood, purchasing behaviours, and overall satisfaction. Experiments by Spies et al. (1997) also support this, demonstrating the positive correlation between pleasant environment in stores and customer satisfaction.

2.2.2. Application to the online environment

As researchers have explored the physical environment's effect on customer experiences, it is evident that factors such as design, layout, ambiance, and employee behaviour play crucial roles. However, with the shift towards digitalization, replicating the in-store experience online presents unique challenges. Unlike physical stores, the online context lacks sensory elements like smell, taste, and touch, traditionally influential in the physical environment (Bitner, 1990). Consequently, retailers must rely heavily on visual perceptions to engage customers in the digital space (Koufaris, 2002).

Despite these differences, the S-O-R model's emphasis on external stimuli affecting customers remains relevant online. Like physical stores, websites possess attributes that function as signals, designed to elicit positive responses from customers. Prior research indicates that website quality, particularly visual appeal, significantly influences consumers' perceptions of product quality, independent of the intrinsic product attributes displayed on the website (Wells et al., 2011). Just as physical stores use furnishings and decor, websites utilize design components such as visual design, intuitive layouts, and search facilities, significantly impacting users' perceptions of quality, overall satisfaction (Yang et al., 2005) and enhances customer engagement (Sukendia & Harianto, 2021).

Furthermore, trust is crucial for building and maintaining strong customer relationships. Prior studies have emphasized the importance of visual appeal to positively influence trust (Pengnate & Sarathy, 2017), especially in western countries (Ganguly et al., 2010). Additionally, graphical icons, colours, images, and animations serve as symbolic elements that enhance trust. However, individual personality traits significantly correlate with trust levels, complicating the aspect of building trust (Masele & Matama, 2020). Consequently, website design features become increasingly important, serving as cognitive cues that shape new users' trust perceptions (Pengnate & Sarathy, 2017).

Moreover, new factors have emerged as significant in the online context, previously less critical in physical environments, with ease of use being a notable example. ‘Ease of use’ is defined as “the degree to which a person believes that using a particular system would be free of effort” (Davis, 1989; Davis et al., 1989). Besides affecting trust, prior research suggest that website design also influences ease of use. Pengnate & Sarathy (2017) highlight the impact of visual appeal on ease of use, noting that colour temperature negatively correlates with perceived ease of use. Websites must also consider functional design aspects, such as layout design (Oyibo & Vassileva, 2020). The concept of website design can be divided into aesthetic formality and aesthetic appeal. Aesthetic formality refers to functional design, layout, etc., while aesthetic appeal pertains to colours and images. Liu et al. (2016) found that a homepage's aesthetic design significantly affects users’ emotional experiences and perceived ease of use. Their model suggests that only aesthetic formality directly impacts ease of use,

contrasting with Oyibo & Vassileva (2020), who developed a model suggesting that aesthetic formality is more associated with hedonic attributes.

Casey & Poropat (2014) categorize design elements into classical and expressive aesthetics. Classical aesthetics, encompassing balance, unity, orderliness, cleanliness, and proportion, are rooted in traditional design and are associated with pleasing qualities. Expressive aesthetics involve subjective judgments of creativity and uniqueness, emphasizing design originality and complexity. Their importance varies by context; expressive aesthetics are more valued in less serious settings like gaming websites, while classical aesthetics are crucial in contexts where accuracy and efficiency are key. In their study, they found a non-significant link between classical aesthetics and perceived ease of use. These findings imply that users nowadays expect a certain level of aesthetics, thus expressive aesthetics is required to enhance users' evaluations.

2.2.3. Environmental effect on chatbots

As indicated, the environment significantly influences perceptions across various dimensions. This may extend to chatbots as well. Previous research has investigated the role of design cues and text in shaping perceptions of chatbots but has often overlooked the influence of the surrounding environment, especially in the realm of anthropomorphism (Arujo, 2018; Söderlund & Oikarinen, 2021; Verhagen et al., 2014). Anthropomorphism involves humans attributing human-like qualities to non-human entities (Haslam et al., 2008). Studies highlight the potential impact of the environment on perceived humanness. Aggarwal & McGill (2007) and Epley (2018) note the associative nature of the human brain, and that it could categorize a non-human object as human in response to associative stimuli. This suggests that environments featuring elements consistent with human schemas could influence the perception of humanness in non-human objects. Another relevant theory for our study is the Expectation Disconfirmation Theory (Oliver, 1980). According to this theory, high expectations of an experience can result in negative satisfaction if those expectations are not met. Applied to our study, if the expectation of humanness in non-human objects is high but unmet, it is likely to lead to poorer evaluations.

2.3. Online service encounter

The service encounter, commonly referred to as "the moment of truth," involves complex interactions between customers and a company across various communication channels. One of the foundational definitions was provided by Schotack (1985), who described it as "a period during which a consumer directly interacts with a service." This description captures not only direct face-to-face interactions with service employees but also other forms of engagements (Hall, 2014). This concept has been further adapted to the digital age. In Heinonen (2008) she defined the online service encounter as "remote customer-company interactions via the Internet or email", a definition that we adopt in our analysis of online service encounters.

2.3.1. Differences between online and physical service encounter

Interactions within service encounters, regardless of the channel, are pivotal in shaping customers' overall perceptions of a company and its offerings. Positive encounters can enhance customer satisfaction and reinforce favourable brand perceptions (Wu & Liang, 2009), while negative experiences can diminish satisfaction and harm brand perceptions (Söderlund & Oikarinen, 2018).

With the digitization of service encounters, some factors from the physical setting have become less influential online, while others remain crucial, and new factors have emerged. For instance, the physical attractiveness of service personnel, which positively influences customer satisfaction in physical service encounters (Li et al., 2019), is less relevant online where face-to-face interactions are less frequent.

Perceived quality has been shown to significantly influence physical service encounters across various industries through cross-sectional studies, field experiments, and laboratory experiments. Findings consistently indicate that perceived service quality not only enhances customer satisfaction but also positively affects consumer behaviours and intentions, beneficial for the company (Cronin et al., 2000; Van Dat & Nhat Minh, 2020; Boulding et al., 1993; Kumar & Polonsky, 2019). Similarly, the quality of online service encounters is critical for success, often outweighing low pricing or mere web presence (Zeithaml et al., 2002). Since its impact on customer satisfaction and

behaviours, research suggest that improvements in service quality should start with defining customer needs and preferences and understanding the quality dimensions they value (Jun et al., 2004).

Kumar & Polonsky (2019) also highlight trust as a crucial factor in physical service encounters, enhancing customers' perceived credibility of the company, which is essential for building trust. The concepts of placed trust and trust as a response have been explored, where placed trust refers to initial trust before interaction, and trust as a response develops through ongoing interactions. Findings suggest that considering these concepts can enhance trust levels, crucial for customer satisfaction (Vaux Halliday, 2003). Trust is equally important in online service encounters. Virtual service agents, acting as physical salespersons, can assist online shoppers. However, unlike physical stores, customers must trust virtual agents before using them, influenced by their familiarity with the technology behind these agents. Establishing trust is vital for gaining a competitive advantage in an environment where customers can easily switch providers (Sherrie et al., 2004).

A key difference between online and physical service encounters is the lack of direct physical interaction with the store, staff, and products. In online settings, customer experience is mediated through a web interface, a two-dimensional graphical display that lacks face-to-face communication. Consequently, new factors become important, such as ease of use. Research shows that perceived ease of use, where customers can easily and quickly navigate the purchasing process, correlates with higher satisfaction levels (Massad et al., 2006). Enhancing perceptions of ease of use reduces the time needed to learn and navigate the interface, making interactions smoother. This highlights the importance of considering ease of use to improve overall user experience and build confidence in the website (Flavián et al., 2006).

2.4. Chatbot service encounters

AI-generated chatbots have gained popularity as companies aim to replicate the nuanced dynamics of offline customer service in an online setting (Chung et al., 2020). However, the performance of AI-driven chatbots often falls short of customer expectations,

leading to decreased engagement and compliance with chatbot prompts (Adam et al., 2021).

Researchers have identified essential attributes that chatbots must possess to improve customer satisfaction. As digitalization has shifted the importance of various factors in service encounters, the introduction of AI in place of human agents mirrors these changes. Key factors such as ease of use, quality, and trust, which are critical in online service encounters, remain crucial in interactions with chatbots.

Findings from prior research indicate that customers value chatbots for their usefulness, particularly their ability to perform accurately and meet customer needs, especially in transaction-related scenarios (Meyer-Waarden et al., 2020). The importance of quality is further emphasized by studies suggesting that, to drive customer satisfaction, chatbot service encounters must be perceived as providing quality communication (Chung et al., 2020). Applying the S-O-R model to chatbot interactions reveals that chatbot quality can prompt positive or negative emotional reactions, leading to positive evaluations and behavioural intentions, such as enhanced customer satisfaction and positive word-of-mouth (Shahzad et al., 2024).

Trust is central for chatbot service encounters, being essential for customer acceptance of chatbot recommendations and strongly linked to their perception of the chatbot's usefulness. This notion is reinforced by findings from Shahzad et al., (2024), which reveal that trust in chatbot services positively influences customer engagement with the company and overall satisfaction. The S-O-R model also show that design elements, including visible and non-verbal cues, can act as trust signals (stimuli) to enhance trust in chatbot interactions (Sonntag et al., 2023).

Moreover, ease of use is crucial in predicting customer satisfaction and willingness to engage with chatbots. The ease of use of chatbots reduce the cognitive effort required from customers, making interactions more intuitive and increase satisfaction. However, overly simplistic chatbots may decrease satisfaction, highlighting the need to balance simplicity with quality functionalities (Ashfaq, 2020). Studies also show that perceived ease of use positively affects the perceived usefulness of chatbots, leading to a more favourable attitude toward them (Silva et al., 2023).

Additionally, as service encounters increasingly involve AI rather than humans, anthropomorphism has emerged as a significant factor. Research demonstrates that anthropomorphism enhances customer perceptions, evaluations, and relationships with chatbots. Anthropomorphized products can evoke positive emotional responses, making brands seem more sociable (Blut et al., 2021). Customer perception of chatbots is crucial, as research shows that customers tend to spend more time when interacting with chatbots than with human agents (Hill et al., 2015). Enhancing overall satisfaction can be achieved through text manipulations that convey emotions from the chatbot (Söderlund & Oikarinen, 2021).

2.5. Hypotheses

The prior research presented forms the theoretical foundation of this study. Multiple hypotheses are formulated based on this foundation to address our research question. Due to the uncertainty regarding the environment's effect on the chatbot service encounter and which environment that may be more favourable, the hypotheses presented are open and two-sided in connection to the two different environments.

2.5.1. Environmental effect on perceived ease of use

The significant influence of ease of use has risen as service encounters have transitioned into the digital space. Ease of use proves essential by enhancing user satisfaction by making the service encounter quicker and easier to navigate through (Massad et al., 2006; Flavián et al., 2006). We also understand that ease of use is fundamental in the domain of chatbots, enhancing customer satisfaction and influencing behavioural intentions by reducing cognitive effort required during interactions (Ashfaq, 2020; Silva et al., 2023). Prior studies further suggest that we can influence the perceived ease of use through visual appeals and functional design (Pengnate & Sarathy, 2017; Oyibo & Vassileva, 2020; Liu et al., 2016). Thus, we propose the following hypothesis:

H1	The environment will significantly affect the perceived *ease of use* in the chatbot service encounter.

2.5.2. Environmental effect on perceived quality

Although service encounters have evolved into various forms, prior research shows that quality remains a crucial factor in creating successful service experiences. In physical service encounters, customers' perceived quality positively enhances satisfaction and influences consumer behaviours and intentions (Cronin et al., 2000; Van Dat & Nhat Minh, 2020; Boulding et al., 1993; Kumar & Polonsky, 2019). The importance of quality extends to online service encounters, proving essential for their success (Zeithaml et al., 2002). Additionally, perceived quality remains vital in chatbot interactions, enhancing customer satisfaction and influencing customer behaviour intentions (Meyer-Waarden et al., 2020; Chung et al., 2020; Shahzad et al., 2024). Furthermore, prior research has demonstrated that environmental aspects, such as visual design, layout, and search facilities, can influence customers' perception of quality (Wells et al., 2011; Yang et al., 2005; Sukendia & Harianto, 2021). Thus, we propose the following hypothesis:

H2	The environment will significantly affect the perceived *quality* in the chatbot service encounter.

2.5.3. Environmental effect on perceived trust

Similar to above, prior research shows that trust remains a crucial factor through the evolving forms of service encounters in order to enhance customer satisfactions. In physical service encounters, customers' perceived trust in the service encounter enhances customer satisfaction and positively affects consumer behaviour and intentions (Kumar & Polonsky, 2019; Vaux Halliday, 2003). The importance of trust also pertains to online service encounters, proving essential for their success due to the need for customers to trust virtual agents before engaging with them, which is critical for gaining a competitive edge (Sherrie et al., 2004). Moreover, trust has maintained its importance in the realm of chatbots, where it is essential for customer acceptance of chatbot recommendations and is strongly linked to customer engagement and satisfaction (Shahzad et al., 2024; Sonntag et al., 2023). Furthermore, prior research has shown that environmental aspects, such as website design, layout, and social design

features, significantly influence customers' trust perception (Ganguly et al., 2010). Additionally, symbolic elements such as graphical icons, colours, images, and animations enhance trust, though individual personality traits also play a significant role (Masele & Matama, 2020). Consequently, website design features become increasingly important as cognitive cues shaping new users' trust perceptions (Pengnate & Sarathy, 2017). Thus, we propose the following hypothesis:

H3	The environment will significantly affect the perceived *trust* in the chatbot service encounter.

2.5.4. Environmental effect on perceived humanness

With the rise of human-robot service encounters, anthropomorphism has emerged as a crucial factor in enhancing satisfaction in these interactions. By anthropomorphizing chatbots, customers' emotional responses can be triggered, which influences their perception of the brand (Blut et al., 2021) and overall satisfaction (Söderlund & Oikarinen, 2021). Previous research has explored the role of design cues and text in shaping perceptions of chatbots but has often neglected the impact of the surrounding environment, particularly in the context of anthropomorphism (Arujo, 2018; Söderlund & Oikarinen, 2021; Verhagen et al., 2014). According to the affect infusion model, different environments can induce various affective states in customers. Studies indicate that humans are predisposed to anthropomorphize non-human objects based on human schemas (Aggarwal and McGill, 2007; Epley, 2018). This suggests that the chatbot environment will influence customers' perception of the chatbot's humanness, leading to the following hypothesis:

H4	The environment will significantly affect the perceived *humanness* in the chatbot service encounter.

2.5.5. Perceptions effect on overall satisfaction

Prior research suggests a positive influence on customer satisfaction from the following variables: quality (Meyer-Waarden et al., 2020; Chung et al., 2020; Shahzad et al., 2024), trust (Shahzad et al., 2024; Sonntag et al., 2023), ease of use (Ashfaq, 2020; Silva et al., 2023), and humanness (Blut et al., 2021; Söderlund & Oikarinen, 2021). Based on the reasoning in sections 2.4.1 to 2.4.4, we believe these variables will positively influence customer satisfaction in this context as well. Therefore, we hypothesize that:

H5 **a:** Perceived *ease of use*
b: Perceived *trust*
c: Perceived *quality*
d: Perceived *humanness*
… will have a positive effect on the overall satisfaction in the chatbot service encounter.

2.5.6. Environmental effect on overall satisfaction

Finally, based on the reasoning outlined in the hypotheses above, the environment is expected to influence customers' perceptions of the chatbot service encounter, thereby affecting their overall satisfaction. Therefore, we hypothesize that:

H6 The environment will significantly affect the overall satisfaction in the chatbot service encounter.

2.6. Additional theory

After completing the main study, we revisited prior research to identify a framework that could further explain the differing results observed in the two environments, as the outcomes were entirely contrary to the industry assumption (see section 1.1).

2.6.1. (In)congruity

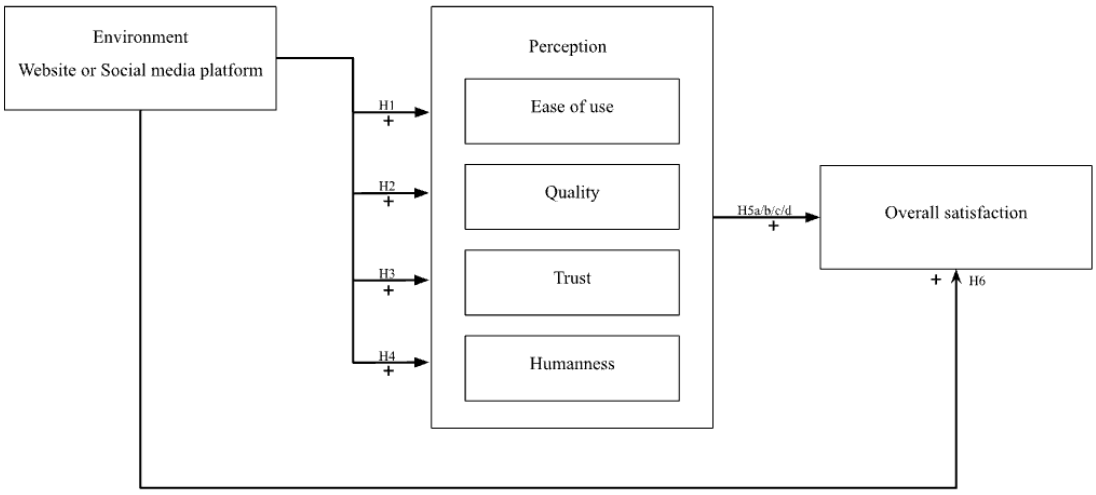
As this study has noted, research indicates that the environment significantly impacts perceived satisfaction in service encounters, whether physical, online, or via chatbots. In marketing, the concepts of congruity (alignment with the existing theme) and incongruity (unexpected deviation from norms) are crucial terms when investigating consumers' attitude towards services in connection to their environment/context. These concepts could play an important role in how the environment of a website, compared to a social media messaging platform, affects the customer's attitude of the experience.

Prior research has investigated these concepts, for instance Germelmann et al. (2020), who looked at ad-context congruence, which refers to the alignment between the advertised item and the theme of the media where the advertisement was placed. Conversely, incongruity refers to the unexpectedness and deviation from standard norms, which could make the experience more memorable. (Heckler and Childers, 1992; Mohanty and Ratneshwar, 2015). While some studies favour congruity for best end results (Belanche et al., 2021; Germelmann et al., 2020), others highlight the benefits of incongruity (Lee & Mason, 1999; Huang, 2020; Jurca & Madlberger, 2015). Hence, it is hypothesized that perceived levels of (in)congruity differ in chatbot service encounters across environments, with shopping experiences and non-human interactions deviating more from social media norms than websites:

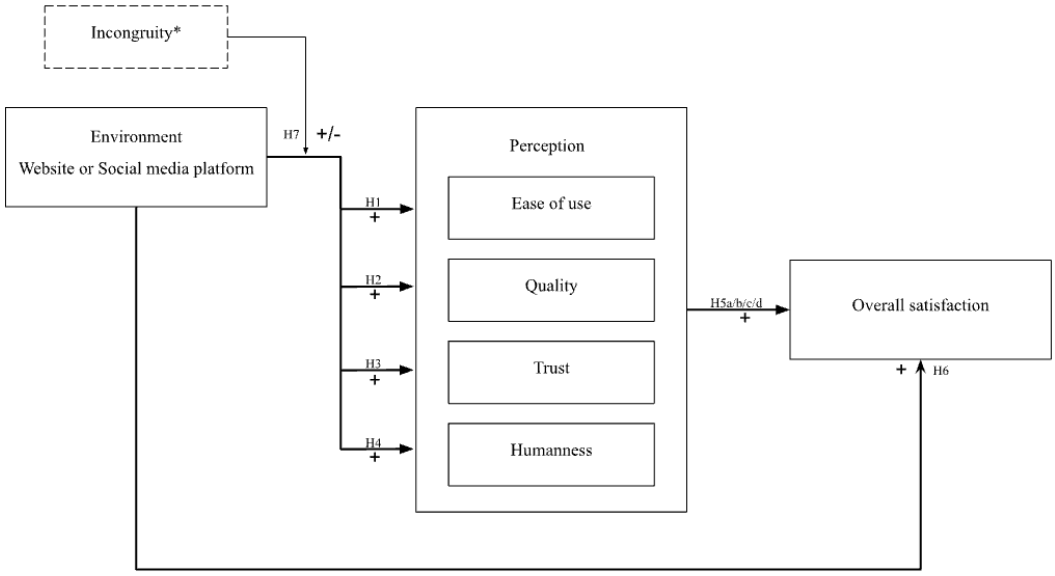
H7	A chatbot service encounter will be perceived (more)less (in)congruent on a social media platform

2.7. Visualization of hypotheses

2.7.1. Conceptual model



2.7.2. Conceptual model with additional theory



**Post-study hypothesis, addressed with a different sample, presented in results separated from the main study*

3. Methodology

In this section, we detail the scientific approach adopted for our research, including the preliminary and main study. Methodology for data collection, design, and analysis, as well as the reliability and validity of the study is presented.

3.1. Scientific approach

In this study, we adopted an objective ontological and a positivist epistemological framework. This approach asserts that social reality exists independently of social actors and that it can be quantified and empirically measured, facilitating a precise analysis of data (Bell et al., 2019). To extend this reasoning, we employed a deductive approach, formulating hypotheses grounded in theoretical foundations intended to be either accepted or rejected.

Given the study's objective to generate insights into the relationship between the environment and chatbot service encounters, a quantitative study design was chosen. Data was collected using an experimental approach with a cross-sectional design to evaluate the effects of various environments. This quantitative design allows for statistical testing, facilitating broader and more transferable conclusions. Additionally, key studies on individuals' perceptions of chatbots have predominantly employed quantitative methodologies.

Alternative approaches, such as qualitative or mixed methods, could provide valuable insights into the topic. These methods would explain the reasoning behind individuals' choices in different environments, offering a richer understanding of the potential differences and underlying motivations related to environmental effects. However, while these approaches would generate more nuanced results, they would also be more diverse and harder to generalize. This consideration underpins our decision to choose a quantitative method, which allows for greater generalizability and statistical precision (Bell et al., 2019).

3.2. Industry interview

Before determining the key research question in the field of conversational commerce with chatbots, we conducted an industry interview with an anonymous CEO of a company developing chatbots, as referenced in this study. The interview aimed to understand the market landscape and identify potential research gaps, which it successfully did. Since the insights were instrumental in identifying the research gap concerning environmental effects on conversational commerce with chatbots but did not contribute directly to our main study, they are not included in the results.

3.3. Preparatory studies

Prior to our main study, we conducted two preliminary studies to ensure question quality, the possibility of manipulation and market preferences of different platforms.

Initially, we undertook a preparatory study to understand the landscape of participant preferences. Through a Qualtrics questionnaire, we gathered insights from 50 respondents regarding their favoured clothing brands and social media platforms. This initial step aimed to mitigate any potential extreme general biases stemming from negative perceptions towards specific company websites or social media channels. Since we aimed to compare environments that reflect the growing trend of chatbot conversational commerce (see 1.1) rather than using fictitious settings, this step was crucial.

Subsequently, we conducted a secondary preparatory study, presenting a streamlined version of our main experiment. Using Qualtrics, we gathered 53 valid responses from our network. The goal of this second study was to evaluate the effectiveness of the manipulation and assess the questionnaire's quality. Participants were placed in one of two controlled environments through randomization, each simulating the same chatbot service encounter scenario but differing in environment as in our main study. The chatbot scenarios were illustrated through a series of images. After these interactions, participants completed a questionnaire to provide feedback on their perceptions and experiences during the service encounters. Additionally, verbal feedback was discussed with a sample of participants following the questionnaire.

3.3.1. Insights from preparatory studies

The initial preparatory study revealed consumer preferences for various messaging platforms and online shopping websites, with Facebook Messenger and ZARA's website scoring the highest in their respective categories. Consequently, these two platforms were selected for further use in our study.

The secondary preparatory study indicated that the manipulation was effective, suggesting that the environment of the chatbot service encounter influenced participant responses. However, it was found that the gallery of pictures sometimes caused participants to "speeding" through the scenario, leading to the omission of important information in the simulated chatbot service encounter (Baker et al., 2010). While the overall evaluation of the study's quality was positive, verbal feedback from participants highlighted that the study was too lengthy. We incorporated these insights when designing the main study.

3.4. Main study

In our main study, we collaborated with Norstat, one of Europe's largest data collection firms. The core components of our study entailed background information, an experience with a chatbot in a given environment and a self-completion evaluation questionnaire of the experience. Exposure scenarios were the same except for the environment surrounding the chat.

It is important to note that no personal data was collected in this study, and all procedures adhered to GDPR regulations. No GDPR-related questions were included in the main study, as all participants had previously consented to GDPR compliance through their agreement with Norstat.

3.4.1. Sampling and distribution

Norstat facilitated the recruitment of 502 panel respondents from various regions across Sweden. The responses were collected between April 12th and April 15th. The panel was a diverse sample with different age groups, genders and familiarness with the platforms (Appendix A). The common denominator of the whole sample is that

everyone is familiar with online shopping as well as comfortable with conducting the test in English.

Out of the 502 respondents utilized, 169 were filtered out due to rigorous monitoring of their activity during the test (see 3.5.1). This approach was undertaken to ensure that the results accurately reflected those who actively immersed themselves in the service encounter experience.

3.4.2. Study design

Before moving into the environmental manipulation, we screened participants by asking questions to exclude those uncomfortable with conducting the test in English or lacking online shopping experience. Standardized Norstat demographic questions were also asked. Then participants' equipment and attentiveness were checked through a test video. The study began with a standardized introduction, briefly explaining that the research was investigating their attitude towards a chatbot conversation. Subsequently, the manipulation phase began, with participants randomized assigned to different conditions by Norstat's system, beyond our control and their knowledge. This resulted in a double-blind study, which suggested that neither participants nor researchers knew which treatment or intervention participants receive until data collection is complete.

3.4.3. Environmental manipulation

Firstly, they were introduced to a choice of what they like to wear, female or male clothes which the scenario then got adapted to. They were then introduced to a scenario that was identical in both studies, except for specifying which of the two platforms they ended up on (see Appendix B). After reading the text they were informed to start a video, where their chatbot experience took place. The adoption of video format instead of picture gallery was done because of the feedback on the pre-study, regarding speeding.

Depending on the assigned experimental group, participants engaged in the service encounter either through a chatbox on ZARA's Website or a chat on Facebook Messenger. While the service encounter itself remained consistent, the manipulation

was in the surrounding environment, represented by the communication platform utilized.

To create a realistic experience, we crafted one conversation layout from ZARA's actual chatbox on their website, where regular customer service representatives assist their customers (ZARA, 2024). Subsequently, we utilized Canva to manipulate the text, emulating the AI chatbots that are currently being developed and launched in markets across Europe. Canva was also employed to replicate the chat features as if they had been implemented on ZARA's profile of Facebook Messenger. To further enhance the authenticity of the service encounter, we incorporated images of clothing items available on the ZARA's website, representing both male and female labelled clothes, which would change depending on the participants previous choice of preference (see Appendix B). The fact that ZARA as a brand is present in both manipulations, prevents the possibility of brand bias. Whereas the brand bias towards the website as well as Facebook Messenger is essential for the manipulation of the environment since it entails different emotional values.

Furthermore, we present the chatbot service encounter in video format to enhance the realism of the experience for our participants. This format aimed to simulate the feeling of being actively engaged in a live environment, where participants could perceive themselves typing and receiving responses in real-time, rather than relying solely on static images. Additionally, we carefully considered the timing between message exchanges to ensure a more authentic and immersive experience.

3.4.4. Questionnaire and measurements

The questions and scales used in the questionnaire (see Appendix C) were constructed based on prior research, with different levels of modification. The vast field of effective variables in the field, led to that we needed to delimit ourselves in different ways. With the purpose of the study in mind, variables connected to emotional states such as arousal and pleasure (S-O-R) were not included as variables rather something we acknowledged is a part of the independent variable environment.

The primary independent variable of the study is the environment which we test through manipulation of environmental design on the layout of the chatbot service encounter.

On the contrary, the main dependent variable is overall satisfaction, which is dependent in all hypotheses. The other variables are perceived ease of use, perceived quality, perceived trust and perceived humanness is regarded both as dependent in H1-H4, and independent in H5.

The items and scales of these variables were handled somewhat differently. Firstly, all variables were not measured through multiple questions, which enables Cronbach' alpha calculation and validation. This choice was mainly done because of the insight for the secondary preparatory study regarding the length of the overall study, which reduced attentiveness and had respondents experiencing fatigue (Bell et al., 2019). Since we were not able to decrease the scenario i.e. the environmental manipulation, the questionnaire needed to be more efficient. Churchill (1979) method of multiple items measuring where used for overall satisfaction, perceived quality and perceived humanness, which we deemed to be the most abstract. Perceived trust and perceived ease of use were deemed to be concrete enough by our judgment and further indicated in the evaluation of the pre-study. If an item is easily and uniformly imaginable, it could in instances be better than multiple items (Rossiter, 2002; Bergqvist & Rossiter, 2007). Notably, the internal reliability is not measurable for these questions which could limit overall reliability.

Furthermore, not all items were conducted according to a 7-Likert scale, the variable humanness were based through two questions based on 1-10 ordinal scale. The decision to break the pattern of evaluation was based on two notions. Firstly, breaking the pattern is suggested to counteract habitual responses like "straightlining" (Baker et al., 2010). Secondly, many in the field of humanness research have used scales larger than 1-7 possibly pointing at better sensitivity capture (Aggarwal & McGill, 2007; Söderlund, 2020; Söderlund & Oikarinen, 2021). Besides the variables, demographic questions also differed from the 1-7 Likert scale. A breakdown of each variable and respective adapted research is presented in Table 1.

Table 1: Measurement adoption

Variable	Description
Overall satisfaction	Measures participants' overall satisfaction with the chatbot service encounter as a whole. This was assessed by using the three Fornell's (1992) items. The items were purposely placed directly after the experience, to ensure independence from the other questions.
Perceived humanness	Concerns the perceived humanness attributed to the chatbot during the service encounter. It was measured using two items on a 1-10 scale inspired by Aggarwal & McGill (2007), Söderlund (2020), Söderlund & Oikarinen, (2021).
Perceived ease of use	Assesses how easy participants perceive the overall service chatbot encounter Measured using one general slightly modified item inspired by Davis (1989) and Davis et al., (1989).
Perceived quality	Reflects the level of standard that participants attribute to the overall chatbot service encounter. This was measured using two slightly modified items inspired from Bao et al., (2011) and Brandy & Conin (2001).
Perceived trust	Examines participants' trust in the chatbot during the service encounter. This was measured using a single item which was decided by comparing versions of those found in Corritore et al., (2007), Castro et al., (2023) and Toader et al., (2019).
Demographics & familiarity	The variables involved in the study were age, gender & familiarity to the online shopping as well as the manipulated environment.

3.5. Data analysis

3.5.1. Screening of data

The initial phase of our data analysis involved verifying the validity of responses. We utilized several methods to identify inattentive participants. Norstat, our data collection partner, implemented control checks to prevent "speeding" and "straightlining" of respondents enhancing study validity, as highlighted by Baker et al. (2010).

Furthermore, we incorporated four control questions to capture attentiveness. The first ensured participants had functioning video equipment and were attentive to the content. The second assessed familiarity with online shopping, excluding those without prior experience to ensure that the participants had the possibility to immerse themselves in the scenario. The final two questions tested specific recall of the scenario and the study environment (either the ZARA Website or Facebook Messenger), acting as "trap questions" to confirm accurate exposure recollection. As Jones et al. (2015) suggest, enhance research validity. Participants failing these were excluded, leaving 333 valid responses for analysis.

3.5.2. Statistical analysis

The data analysis was conducted by first sorting and screening invalid values in Microsoft Excel. Subsequently, the data was imported into the statistical software R, where various tests were performed including independent sample t-tests, assumption checks, and parallel mediation models.

Before proceeding with hypothesis-related tests, it was essential to verify several assumptions. For the independent sample t-test with Welch's method, the requirements included the independence of observations and the assumption of normality, which was justified by the Central Limit Theorem (Kwak & Kim, 2017; Higgins & White, 2008). For Hayes' PROCESS Model 4, the assumptions encompassed normality, linearity, homoscedasticity, and the absence of multicollinearity (Hayes, 2013). All assumptions were met except for homoscedasticity, which was addressed by incorporating bootstrap methods and robust error estimates (hc=4) to correct for heteroskedasticity. All tests are detailed in Appendix D.

The statistical analysis encompassed a variety of methods, initiated once the assumptions were validated. Descriptive statistics and independent two-sample t-tests via Welch's method were used to address hypotheses H1-H4. The tests were two-sided, and the difference was accepted if the results were significant with a threshold of $p<0,05$, as suggested by the vast majority of business researchers (Bell et al., 2019). Additionally, PROCESS Model 4, a parallel mediation model, was applied to evaluate hypotheses H5a-d. This model evaluates several pathways in a robust manner

(Hayes, 2013; Zhao et al., 2010). Firstly, it examines the direct effects of the independent variable (IV) on the dependent variable (DV) and analyses the IV's impact on multiple mediators (M). It then also investigates how these mediators subsequently influence the IV. Finally, it assesses any potential indirect effects that the IV may have on the DV. Showcasing the interconnections between the model's variables. The parallel mediation model was based on a 95% confidence interval and 10,000 bootstraps. The statistical significance of the model was assessed using p-values and confidence intervals. According to Preacher & Hayes (2008), if zero does not lie between the lower limit confidence interval (LLCI) and the upper limit confidence interval (ULCI), the value is considered statistically significant.

3.6. Reliability and validity

In this study, reliability and validity were ensured at every stage according to Bell et al. (2019), alongside fostering respondent engagement. With the intention of fostering qualitative responses as well as high credibility of the results.

3.6.1. Reliability

Reliability determines the consistency of measurements, specifically the extent to which a measured value reflects the true value (Bell et al., 2019). To assess the internal reliability of measures, we employed Cronbach’s alpha where applicable. The accepted threshold for Cronbach’s alpha varies among studies; however, we adhered to the commonly suggested benchmark of 0.8 (Bell et al., 2019). For the variables overall satisfaction, perceived quality, and perceived humanness, multiple measurements were taken, and Cronbach’s alpha was calculated (see Table 2). Given the acceptable internal consistency, these items were averaged together for use in the statistical analysis.

Table 2: Cronbach's alpha of the indexed variables

Variable	Cronbach's alpha	N	Nr items
Overall satisfaction	0,9	333	3
Perceived quality	0,81	333	2
Perceived humanness	0,89	333	2

3.6.2. Validity

Validity determines the extent to which a measurement accurately reflects the concept it is intended to measure (Bell et al., 2019). In our study, all questions were developed based on established theories and previous measurements to enhance construct and content validity (refer to Table 1). Modifications were made but approached with caution to avoid adversely affecting construct validity. The pre-studies conducted provided a level of face validity, as we engaged with multiple respondents to discuss and assess the quality of the measures. Notably Rossiter (2002), discarded this as a real validity measure, either way it helped us to increase insights regarding question formulations which point at a higher content validity. As detailed in Section 3.5.1, multiple control tests were conducted to ensure the validity of the responses, drawing on methodologies from Baker et al., (2010) and Jones et al., (2015).

3.6.3. Survey evaluation

The final part of the survey involved a standardized Norstat questionnaire regarding evaluation of satisfaction, design, quality and length. 94,6 % were pleased with the survey, 91 % found it well designed and 97,4 % thought the length was appropriate. These points successfully share the fact that the study is well designed and stimulating, further increasing validity. (See details Appendix E)

3.7. Post-study

After we conducted our main study, we saw further value to explore a potential explanation to the different effects of the two environments, especially since our result went against the industry assumption (section 1.1). The post-study was designed to investigate the variable (in)congruity, which concerns which level object follows the norm. The survey design consisted of an introduction of the purpose, two comparative snapshots from the chatbot service encounter stimulated in the main study representing the website and messenger environment. Three same items were asked for each environment on a 7-Likert scale adapted for the multiple-item Germelmann et al., (2020), suggesting content validity. The sample of the post-study were 32 respondents gathered from our personal network and Qualtrics was utilized for the questionnaire.

Gathered data was tested in a paired t-test to distinguish any difference between the two environments perceived (in)congruity. Acceptable significance level was <0,05. The data is relatively small and separated from the main study, rather having a purpose as a minor explanation and a further investigation point for future research.

4. Results

In this section, we present the results of our data analysis from the main study. A comprehensive summary of the hypotheses and their corresponding outcomes is detailed in Appendix F.

4.1. Descriptive statistics

The analysis included 333 validated responses. Of these, 46.2% of the participants were exposed to the Facebook Messenger stimulation, while 53.8% interacted with the ZARA website stimulation. The participant group was balanced between males and females. Notably, 54.1% of respondents fell within the 31-45 age range, with the remainder of the sample divided between the ages of 17-24 and 25-30. Recorded frequencies also examined the participants' familiarity with online shopping, Facebook Messenger, and ZARA's website. All respondents had shopped online at least once, with the majority shopping online more than once a month. Regarding platform familiarity, 75.3% of those exposed to the Facebook Messenger simulation reported using Facebook Messenger very often. Conversely, 45.8% of the sample exposed to ZARA's website had never visited the website before, and most of the remaining respondents visited it very rarely. A detailed summary of the demographics is provided in Appendix A. Our descriptive statistics include the means and standard deviations for each group, along with independent samples t-tests. These tests provide a comparative analysis of our two groups, essential for addressing our hypotheses. This information is presented in Table 3.

Table 3: Comparative Summary of Means, Standard Deviations, and Independent Samples T-Test

	Messenger		Website		Independent samples t-test	
Variable	Mean	SD	Mean	SD	t value	p value
Overall satisfaction	5,02	1,33	5,34	1,27	-2,24	0.0256*
Perceived humanness	4,14	2,37	4,87	2,29	-2,85	0,00471**
Perceived ease of use	5,38	1,29	5,51	1,35	-0,90	0,3688
Perceived quality	4,98	1,25	5,69	1,43	-4,84	< 0,001***
Perceived trust	4,38	1,58	4,85	1,34	-2,95	0,003889**

Note: N = 333. *p < .05, **p < .01, ***p < .001.

4.2. Hypothesis testing

4.2.1. H1-H4: Environments effect on the chatbot's perceived functioning

Hypotheses H1 through H4 were evaluated using independent samples t-tests, with the results detailed in Table 3. Empirical support was established for all variables except ease of use, indicating significant differences between the environments. These findings suggest that perceived quality, trust, and humanness are significantly influenced by the environment. Given the negative t-values and higher means associated with the website, it can be concluded that the website's environment is preferred for these variables. Overall, there is significant empirical support for Hypotheses H2 to H4, while Hypothesis H1 is not supported.

4.2.2. H5 a-d: Environment mediating effect on overall satisfaction

To test Hypotheses H5a through H5d, we employed Hayes' PROCESS Model 4 within R-studio. Our mediation analysis was structured with environment as the independent variable (X), overall satisfaction as the dependent variable (Y), and included mediators the mediators ease of use (M1), quality (M2), trust (M3), and humanness (M4). The

environment variable was coded with Facebook Messenger as X=1 and ZARA Website as X=2. All variables except environment were converted to a Z-scale, since humanness is constructed with a 1-10 scale, the conversion enables comparability. To enhance the robustness of our tests, the PROCESS analysis was conducted with 10,000 bootstrap samples with a standard confidence interval of 95%. As outlined in section 3.5.2, all model assumptions were met, in line with Hayes' (2013) recommendations (details provided in Appendix D).

The initial step involved controlling for the environment's mediating effects on each variable. The regression results, detailed in Table 4, mirror the findings from the independent samples t-tests. While the path-coefficients indicate a positive effect for each test, only quality (M2), trust (M3), and humanness (M4) are significantly affected by the environment. Conversely, ease of use (M1) shows no significant impact.

Table 4: Hayes' PROCESS Parallel Mediation Model

Mediating effects of environment					
Outcome variable	R-squared	F(HC4)	Path coefficient	SE(HC4)	p
Perceived ease of use	0,0024	0,8100	0,0986	0,1096	0,3688
Perceived quality	0,0648	23,4094	0,5099	0,1054	<0,001***
Perceived trust	0,0263	8,7215	0,3248	0,1100	0,0034**
Perceived humanness	0,024	8,0975	0,3103	0,1090	0,0047**
Summary of the overall model	R-squared	F(HC4)	p	df1	df2
Overall satisfaction (Y)	0,6663	97,3478	<0,001***	5	327

Mediating effects on overall satisfaction	Path coefficient	SE(HC4)	p	LLCI	ULCI
Perceived ease of use (M1)	0,1444	0,0659	0,0292*	0,0147	0,2740
Perceived quality (M2)	0,4819	0,0756	<0,001***	0,3331	0,6307
Perceived trust (M3)	0,2485	0,0572	<0,001***	0,1360	0,3611
Perceived humanness (M4)	0,0879	0,0385	0,0230*	0,0122	0,1637

Effects of environment	Path coefficient	SE(HC4)	p	LLCI	ULCI
Direct effect	-0,1222	0,0725	0,0926	-0,2648	0,0203
Indirect effect					
Total	0,3680*	0,0934	-	0,1873	0,5535
Perceived ease of use (M1)	0,0142	0,0188	-	-0,0164	0,0581
Perceived quality (M2)	0,2457*	0,0640	-	0,1313	0,3803
Perceived trust (M3)	0,0807*	0,0330	-	0,0236	0,1510
Perceived humanness (M4)	0,0273*	0,0157	-	0,0027	0,0640

Note: N = 333. *p < .05, **p < .01, ***p < .001.

LLCI and ULCI: Lower and upper levels of confidence intervals.

The mediating effects of the variables were analysed using the parallel mediation model (Hayes' PROCESS Model 4). The results provide empirical support for the significant effects of ease of use, quality, trust, and humanness on overall satisfaction, thus supporting Hypotheses H5a-d. These relationships are illustrated in Figure 1 and further

detailed in Table 4. However, the absence of a significant mediating effect from the platform on ease of use suggests that it may not serve as a valid mediator. Additionally, the analyses revealed that the environment had no significant direct effect on overall satisfaction, and the indirect effects of ease of use were not significant, as indicated in Table 3.

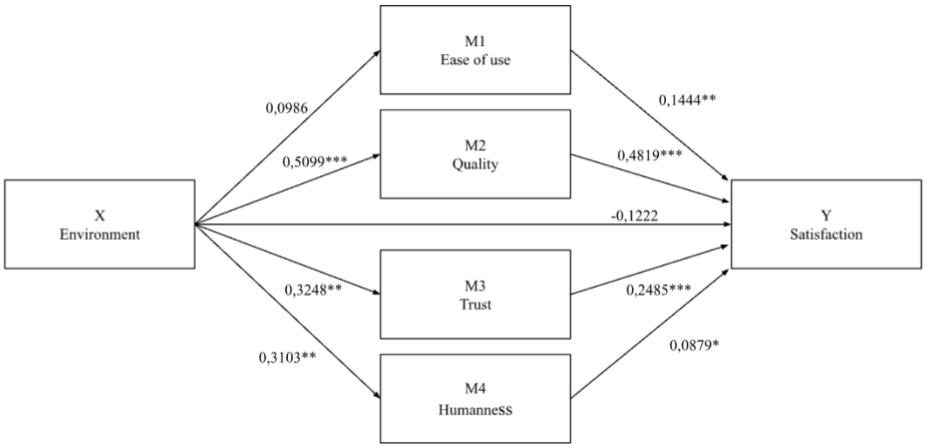


Figure 1: Hayes' PROCESS Parallel Mediation Model

Note: N = 333. *p < .05, **p < .01, ***p < .001.

4.2.3. H6: Environment effects on overall satisfaction

To test H6 an independent sample t-test was conducted which is presented in Table 3. The results empirically support that the environment significantly influences overall satisfaction of a chatbot service encounter. Notably, the negative t-value indicates that participants who interacted with the chatbot on ZARA's website reported higher satisfaction compared to those who interacted with the chatbot on Facebook Messenger.

4.3. Additional results from post-study

4.3.1. H7: Incongruity

Hypotheses H7 were evaluated using pair t-tests, with the results detailed in Table 5. Significant empirical support was established for the fact that there indeed is a

difference in perceived incongruence between the two environments. Given the significant negative t-values and the lower means associated with the Facebook Messenger, it can be concluded that a shopping experience with a chatbot is considered more incongruent in the social media environment. Hypothesis H7 is thus supported.

Table 5: (In)congruity t-test

	Messenger		Website		Paired t-test	
Variable	Mean	SD	Mean	SD	t value	p value
Fit between experience and environment	3,53	1,72	5,91	1,00	-7,50	<0,001***
Compatibility with preferred shopping	3,53	1,74	5,50	1,57	-4,56	<0,001***
Conflict between experience and environment*	5,16	1,44	3,09	1,96	4,93	<0,001***

Note: N = 32. *p < .05, **p < .01, ***p < .001.

**Reversed variable*

5. Discussion

5.1. Perceived ease of use

Our study concludes that environmental differences between social media and website environments does not significantly influence perceived ease of use in chatbot service encounters (Table 3). This finding contrasts with Pengnate & Sarathy (2017), who suggested that visual appeal influences perceived ease of use, and Liu et al. (2016), who pointed to aesthetic formality as a sole influencer. Instead, our results align with Oyibo & Vassileva (2020), suggesting that layout design elements are more associated with hedonic attributes like perceived aesthetics and enjoyment rather than utilitarian attributes like ease of use. Given that both environments typically use cool colour schemes, as recommended, this element does not affect perceived ease of use in our scenario. Another explanation for the lack of significance is provided by Casey & Poropat (2014), who found a non-significant relationship between classical aesthetics and positive state effects enhancing perceived ease of use. As classical aesthetics have become the norm, users may expect a certain level of visual quality, suggesting a need for more expressive aesthetics to enhance perceived ease of use.

5.2. Perceived quality

Our study reveals a significant positive effect of the environment on perceived quality, with this variable showing the highest significance among those measured. This finding aligns with the results of Wells et al., (2011), where the S-O-R (Stimulus-Organism-Response) model was used to illustrate how online environments influence perceptions of quality. Consistent with our findings, Wells et al. noted that website quality, strongly influenced by visual appeal, significantly impacts perceived quality. Similarly, Sukendia & Harianto (2021) emphasize the role of website design in affecting the perceived quality of e-services, echoing Yang et al., (2005), who found that website design influences perceived quality.

5.3. Perceived trust

Our results indicate a significant impact of the environment on perceived trust, in line with theories suggesting that the environment significantly affects trust. The similarity in information and navigation design between social media and website environments supports the notion that visual design significantly affects trust in Western contexts (Ganguly et al., 2010). Our findings align with Pengnate & Sarathy (2017) and Masele & Matama (2020), who also found that visual appeal significantly influences trust. A possible explanation for the stronger effect in website environments could be the perceived professionalism of websites (Masele & Matama, 2020). Chatbots on social media may be perceived as less customizable and thus less trustworthy. Additionally, the association between chatbot developers and the company may enhance trust transfer from existing trust in the company to the website environment (Sherrie et al., 2004).

5.4. Perceived Humanness

Our results show that environmental differences significantly affect perceived humanness, with stronger perceived humanness in chatbots on websites. This finding is surprising, given industry assumptions that chatbots on social media are perceived as more human due to anthropomorphization influenced by human interaction schemas (Aggarwal & McGill, 2007; Epley, 2018). Our results suggest that this effect is not significant enough to produce an outcome. A possible explanation is the Expectancy Disconfirmation Theory (Oliver, 1980), which posits that users have higher expectations for humanness in social media interactions. If these expectations are unmet, perceptions are negatively affected. Our theories suggest that attributes and qualities enhancing chatbot humanness are applicable in both environments (Söderlund & Oikairnen, 2021; Verhagen et al., 2014; Haslam et al., 2008).

5.5. Customer Satisfaction Based on Perceptions

Our results indicate a significant effect of the environment on perceived quality, trust, and humanness but not on perceived ease of use. The results suggest a significant positive mediating effect between perceived quality, trust, and perceived humanness. Ease of use becomes less critical in this scenario. The negative but not significant direct

effect of the environment on customer satisfaction suggests mediation through other variables.

Perceived quality significantly impacts customer satisfaction, aligning with theories emphasizing the importance of chatbot usefulness (Meyer-Waarden et al., 2020). Our findings are consistent with theories stressing the importance of perceived quality in driving customer satisfaction (Shahzad et al., 2024).

Trust also shows a significant mediating effect on satisfaction, consistent with theories suggesting that positive trust influences enhance satisfaction in chatbot encounters (Shahzad et al., 2024). The S-O-R model demonstrates how trust signals lead to increased customer satisfaction (Sonntag et al., 2023).

Finally, perceived humanness significantly impacts satisfaction, aligning with research indicating that anthropomorphized chatbots evoke positive emotional responses, enhancing satisfaction through emotional text manipulations (Blut et al., 2021; Söderlund & Oikarinen, 2021).

5.6. Overall Satisfaction

Our research supports a significant difference in satisfaction between chatbot encounters on social media and websites, with a preference for website environments. Using the S-O-R model, we demonstrate how different environmental stimuli affect perceptions of quality, trust, and humanness, key components of customer satisfaction. Ease of use is not significant, possibly due to its limited impact during chatbot encounters. The Affect Infusion Model and the concept of affect as information explain why social media is perceived as preferable for chatbots. The Expectation Disconfirmation Model suggests that website environments achieve greater satisfaction due to meeting or exceeding user expectations. Our post-test explored the impact of congruity and incongruity, revealing a significant difference between social media and website environments. Chatbot encounters in social media were perceived as negatively incongruent, while those on websites were viewed as positively congruent.

6. Conclusion and implications

As shown in previous literature and theory from physical and online contexts, the environment does indeed influence overall satisfaction in a chatbot service encounter. The study also establishes that the environment affects all the chosen important variables except ease of use, due to possible reasoning found in section 5.3. In connection to the environment all the variables acted as significant mediators on satisfaction except ease of use which was discarded as a mediator but showed significant effect on the environment.

Furthermore, our study found that the social media platform, Facebook Messenger, scored lower on all accounts, except the fact that it had a higher familiarity, indicating different stimulus in the contexts (Forgas, 1995; Mehrabian & Russell, 1974). Connecting back to introduction this means that we discard the industry assumption of social media platforms being the preferable environment. While the study did not establish the purpose of explaining the differences, we believe that two main reasons to the prefer website is explained by incongruity which our post-study tested (Germelmann et al., 2020) and Expectation Disconfirmation Theory (Oliver, 1980), where Facebook Messenger has both higher expectations as a well-known established messaging channel and was based on the result more incongruent.

6.1. Implications

Our theoretical framework suggests the topic of environmental effects in a chatbot service encounter is greatly connected with environmental effects on the physical and online human service encounter. One of the most significant positive implications is the enhanced customer satisfaction found when chatbots are deployed on websites. This study clearly indicates that, integrating the chatbot service encounter into the website environment significantly increase overall customer satisfaction, compared to the integrating it into a social media platform. These findings imply that the chatbot service encounters can be optimized to maximize customer satisfaction by integrating it to

website environments, demonstrating the importance of choosing the right platform for chatbot deployment.

Another key finding is the improvement in perceived quality and trust within website environments. Consumers that engage with chatbots on websites see these exchanges as having higher quality and being more trustworthy. Using these findings, marketers should concentrate on website improvements that highlight these characteristics to strengthen client interactions and increase customer satisfaction.

Subsequently, this study emphasizes how strategically placing chatbots may lead to increased revenue. As previous theories suggest, creating a stronger sense of our indirect variables correlates with company beneficial consumer behaviours (Cronin et al., 2000; Van Dat & Nhat Minh, 2020; Boulding et al., 1993; Kumar & Polonsky, 2019; Errajaa et al., 2022; Vaux Halliday, 2003; Shahzad et al., 2024; Sonntag et al., 2023). Businesses may therefore be able to increase revenue by concentrating on website-based chatbot interactions that enhance the customer experiences. This underscores the financial benefits of strategically placing chatbots, making a strong case for investing in website improvements.

These findings challenge the industry assumption that social media platforms provide the ideal setting for chatbot interactions our findings concluded that the industry assumption is incorrect, as websites outperformed in all aspects. This study offers valuable insights for businesses and marketers to reevaluate their deployment strategy, suggesting that website-based chatbot service encounter lead to improved customer satisfaction rates and more effective customer engagement. This implication opens new opportunities to improve their digital customer service strategies and establish stronger market positions. However, despite websites being superior, it is crucial to consider customer segmentation and its connection to the platforms. Additionally, the importance of deviating from the norm and the potential impact of disconfirmed expectations should be considered.

Our theoretical framework further suggests that, while most previous research is correct, we emphasize that the environmental impact of ease of use does not become apparent if the baseline standard is too high across both environments. However, with the transition into human-robot interaction, companies must consider humanness in the current state

of development of chatbots. This framework not only builds on previous research but also enhances the relevance of the limited existing studies. By doing so, it underscores the relationship between the environment and its impact on chatbot service encounters, offering new insights and potential areas for further exploration.

7. Limitations and future research

The study was conducted with a large sample which consisted of various individuals, who also had been subject to multiple control tests which make this group very valid. However, due to the importance of having results which goes in lines with an affective manipulation meant loss of deepening questions for validity and reliability of the study. Future research should account for this when developing studies within conversational commerce, and if possible, make an interactive study with an actual chatbot.

Regarding the choice of environmental manipulation and companies, it was done well with a pre-study and interview confirming the relevance of selected companies. Even if both scenarios imitate exactly the same journey generalization, there needs to be caution while generalizing these results since they are still connected to the brands. We suggest that future research should be done in a similar way but with other market leaders building upon this theory and confirm the environmental effect on chatbot service encounters.

Lastly, before starting the research of conversational commerce, we decided to compare environments as a whole rather than the affections created by the environment which later influence the hedonic variables. Since there was a great uncertainty of which and if the environment could have an effect, we focused on the actual environments and the important variables in a chatbot service encounter. This limited us to having a strong and clear answer regarding differences but less information about the reason for the differences. Out of curiosity since the difference went against the industry assumption, we did a post-study with a small sample, which showed a higher incongruence on Facebook Messenger. Future studies connected to this should further investigate incongruity and its effect and conduct a test explaining the various affective states in a comparative study between website and social media platforms.

8. Appendices

8.1. Appendix A: Demographics

Descriptive analysis

Sorting	Facebook Messenger n=154		Website n=179		Total N=333
	n	%	n	%	
Gender					
Male	78	50,6%	87	48,6%	49,5%
Female	76	49,4%	92	51,4%	50,5%
Non-binary	0	0,0%	0	0,0%	0,0%
Age					
17-24	36	23,4%	42	23,5%	23,4%
25-30	37	24,0%	38	21,2%	22,5%
31-45	81	52,6%	99	55,3%	54,1%
Frequency of shopping online					
Every day	0	0,0%	1	0,6%	0,3%
More than once a week	6	3,9%	14	7,8%	6,0%
Once a week	23	14,9%	26	14,5%	14,7%
More than once a month	52	33,8%	61	34,1%	33,9%
Once a month	32	20,8%	39	21,8%	21,3%
Less than once a month	41	26,6%	38	21,2%	23,7%
Never	0	0,0%	0	0,0%	0,0%
Frequency of useing Facebook Messenger/ZARA Website					
Every day	82	53,2%	0	0,0%	
More than once a week	34	22,1%	5	2,8%	
Once a week	10	6,5%	6	3,4%	
More than once a month	4	2,6%	11	6,1%	
Once a month	6	3,9%	17	9,5%	
Less than once a month	7	4,5%	58	32,4%	
Never	11	7,1%	82	45,8%	

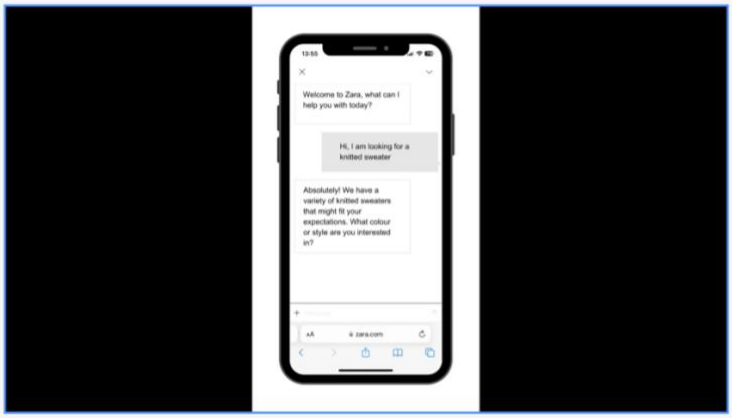
8.2. Appendix B: Environmental manipulation

The following happens:

It's Sunday and you are sitting comfortably and scrolling on your favorite social media platform when an ad pops-up from the clothing brand ZARA with a link to their AI shopping assistant.
You recall the fact that you wanted to buy a knitted sweater and you proceed to click on the ad. When you click on the ad, ZARA's website is launched where you have received a chat from ZARA in the bottom right corner.

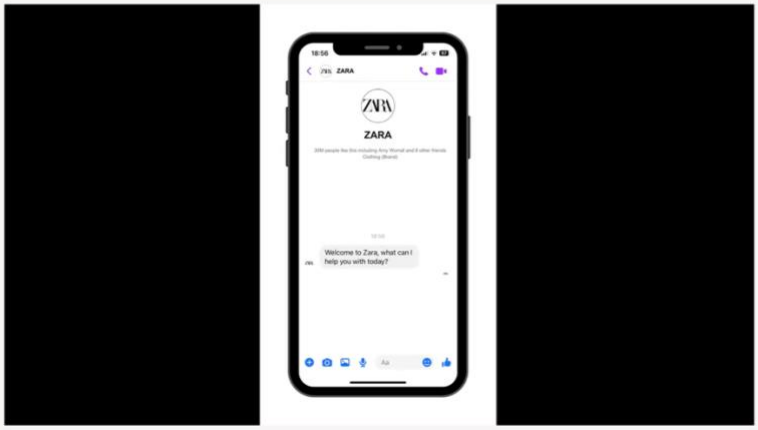
You click on the chat, where you've been greeted by the AI shopping assistant, offering to help you find what you are looking for.

The following conversation is between you and the assistant:

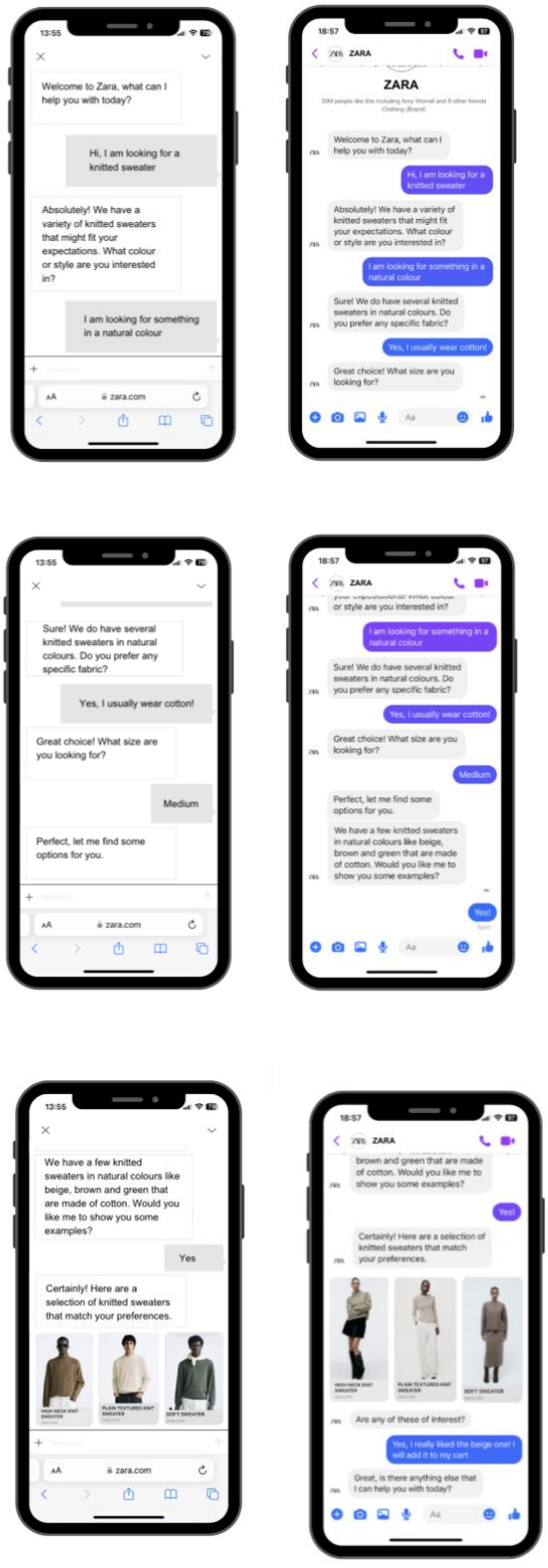


The following happens:
It's Sunday and you are sitting comfortably and scrolling on your favorite social media platform when an ad pops-up from the clothing brand ZARA with a link to their AI shopping assistant.
You recall the fact that you wanted to buy a knitted sweater and you proceed to click on the ad. When you click on the ad, Facebook Messenger is launched where you have received a chat from ZARA at the top of your conversations. You click on the message where you've been greeted by the AI shopping assistant, offering to help you find what you are looking for.

The following conversation is between you and the assistant:



8.2.1. Figure 2: Website vs Facebook Messenger



8.3. Appendix C: Questionnaire

Questions	Scale
[Check question 1]	
Which fabric and size did you prefer in the conversation with the shopping assistant?	3 alternatives - one is right
[Overall satisfaction]	
How satisfied are you with the provided service?	Very dissatisfied (1) - Very satisfied (7)
To what extent does this service meet your expectations?	Very dissatisfied (1) – Very satisfied (7)
Imagine the perfect online shopping assistance, how near or far was this experience from meeting that ideal?	Very dissatisfied (1) – Very satisfied (7)
[Perceived humanness]	
To what extent did you feel that this conversation was held with a chatbot or a human?	(Chatbot) 1-10 (Human)
On a scale from 1 to 10, where would you place the shopping assistant in your conversation?	(Definitely a chatbot) 1-10 (Definitely a human)
[Perceived ease of use]	
How easy did you perceive the chat experience to be?	Very difficult (1) - Very easy (7)
[Perceived quality]	
How would you describe the quality of the chatbot?	Very bad (1) - Very good (7
How would you describe the quality from pop-up to purchase?	Very bad (1) - Very good (7)
[Perceived trust]	
Do you trust that the chatbot gave you accurate recommendations?	Distrust completely (1) - Trust completely (7)
[Check question 2]	
At which platform did you communicate with the shopping assistant?	4 alternatives - one is right

8.4. Appendix D: Assumptions tests

Table 6: CLT & VIF

Tests				
Central Limit Theorem				
"As the sample size increases towards infinity, the distribution of their sample means will approach a normal distribution with the respective population mean and variance, regardless of the shape of the original distribution from which the data are drawn. This principle holds for our sample size of 333."				
VIF test*				
Environment	Ease of use	Quality	Trust	Humanness
1,109822	2,035087	3,334943	1,967052	1,26765

*VIF test shows absence of multicollinearity since all values are <5 (James et al., 2013)

Figure 2: Normality of the model (Q-Q plot)

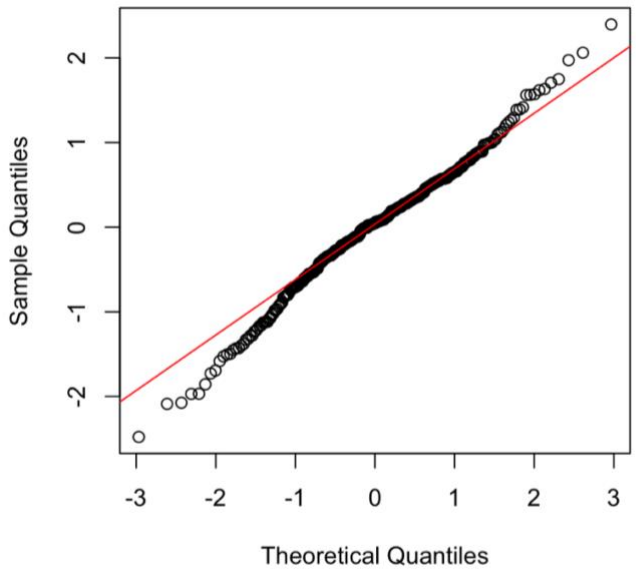
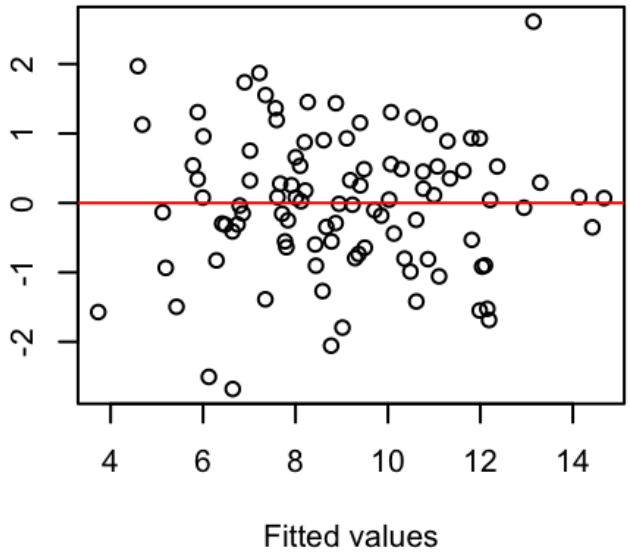


Figure 3: heteroskedasticity & linearity visuals (Residuals vs Fitted values)



8.5. Appendix E: Main study survey evaluation

Question	1	2	3	4	5	Mean	SD
How pleased were you with the survey	1,8%	3,6%	15,3%	25,5%	53,8%	4,26	0,97
How meaningful did you think the topic of the survey was	4,5%	4,2%	18,6%	21,0%	51,7%	4,11	1,13
How pleased were you with the length of the survey	0,6%	1,8%	14,4%	21,6%	61,6%	4,42	0,84
How pleased were you with the design of the study	3,6%	5,4%	14,7%	24,6%	51,7%	4,15	1,09

8.6. Appendix F: Hypotheses summary

	Hypothesis	Results
H1	The environment will significantly affect the perceived *ease of use* in the chatbot service encounter.	Not supported
H2	The environment will significantly affect the perceived quality in the chatbot service encounter.	Supported
H3	The environment will significantly affect the perceived trust in the chatbot service encounter.	Supported
H4	The environment will significantly affect the perceived humanness in the chatbot service encounter.	Supported
H5	**a:** Perceived *ease of use*	Supported
	b: Perceived *quality*	Supported
	c: Perceived *trust*	Supported
	d: Perceived *humanness*	Supported
	… will have a positive effect on the overall satisfaction of the chatbot	
H6:	Environment will have a positive effect on overall satisfaction of the experience	Supported
ARH7:	A chatbot service encounter will be perceived (more)less (in)congruent on a social media platform	Supported

*ARH7 is an additional research question separated from the main sample

8.7. Disclosure of AI-tools use

8.7.1. What AI tools have been used and how?

The use of AI tools has helped us increase the language in our study. Furthermore, it has helped us in dealing with the coding to build our model and interpret the results more efficiently. Additionally, AI tools have streamlined data analysis, allowing for quicker identification of trends and patterns, thus enhancing the overall accuracy of our findings.

8.7.2. In what ways have these tools contributed to increasing the quality of the thesis?

By increasing the thesis's linguistic coherence, clarity, and structure, these AI techniques have greatly improved its quality and ensured a more polished and expert presentation. They helped with coding assignments, which made it easier to construct and analyse the study's model, and they also helped with editing and condensing long paragraphs to make the content brief and understandable.

8.7.3. What potential risks were found using AI and what measures were taken to reduce these risks?

Several hazards were brought to light by the study's incorporation of AI techniques, including the possibility of conformation bias in the data and models. With this in mind foremost original ideas and data were presented to the AI, since they are areas were we have greater control. ALL information from the AI was handled with great care and caution.

8.7.4. What are the insights gained from using AI tools in the thesis writing process?

AI tools improved the efficiency of data analysis, allowing more time for in-depth analysis. The experience highlighted AI’s potential to complement human skills, emphasizing the value of integrating technology with traditional research methods.

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