Chatting with a brand spokes-character

A quantitative study on the effects of using brand spokes-characters as virtual chatbot agents

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Abstract:

This study investigates the consequences of using brand spokes-characters as chatbot agents in customer interactions. Through two studies, the effects of using a brand spokes-character to interact with consumers is compared to using a non-spokes-character chatbot agent. Study 1 investigates the effects during a good chatbot experience where the chatbot is able to understand and give appropriate answers. Study 2 investigates the effects in a poor chatbot experience where the chatbot is unable to give appropriate answers in the interaction. In the good chatbot experience, using a brand spokes-character leads to more favorable brand attitudes compared to using a non-spokes-character through increased anthropomorphizing, conceptual fluency, and brand fit. In the poor chatbot experience in study 2, no significant differences in brand attitude are found due to using a brand spokes-character compared to using a non-spokes-character. Bayesian tests for study 2 indicates that there was no difference in brand attitude between the two groups. Thus, brand spokes-characters are found to offer the opportunity for companies to create more favorable brand attitudes in the context of a good chatbot experience, while not supporting any significant difference in the context of a poor chatbot experience. Despite this, brand spokes-characters are not widely used in the chatbot context. The present study contributes by investigating previously unexplored aspects of chatbot design and finds support that brand spokes-characters should be utilized more in new technological contexts, such as chatbots.

Keywords:

Brand spokes-character, Chatbot, Virtual agent, Brand mascot, Brand attitude

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Definitions:

AI: Abbreviation of Artificial Intelligence. "The use of computerized machinery to emulate human capabilities" (Youn & Jin, 2021)

Anthropomorphism: "Attribution of human characteristics or behavior to a god, animal, or object" (Epley et al., 2007)

Avatar: Interactive digital entities with anthropomorphic appearance (Miao et al., 2021)

Attitudes: Attitudes represent a person's evaluation of an entity (Ajzen & Fishbein, 1977)

Brand: "A brand is a name, term, design, symbol, or any other feature that identifies one seller's goods or service as distinct from those of other sellers" (Jaworski et al., 2022)

Brand spokes-character: "Spokes-characters are animate beings or animated objects that are used to promote a product, service, or idea" (Phillips and Lee, 2005). A spokes-character must have a recognizable "character" or "persona" and is used consistently in connection with the company and its products (Callcott & Lee, 1995)

Chatbot: "Chatbots are interactive, virtual agents that engage in verbal interactions with humans" (Przegalinska et al., 2019)

Conceptual fluency: How readily a stimulus conveys meaning (Lee & Labroo, 2004)

Perceptual fluency: How easy it is to process a stimuli (Lee & Labroo, 2004)

Service encounter: "The dyadic interaction between a customer and a service provider" (Surprenant & Solomon, 1987)

1. Introduction

This paper investigates the effects of using brand spokes-characters in online chatbot service encounters. The introduction will start with a background on chatbots and brand spokes-characters and end with outlining the purpose and contributions of the thesis.

1.1. Background

In recent years, chatbots have emerged as a common tool for brands and companies to interact with, and serve their customers (Crolic et al., 2021). Service encounters, which have been dominated by human-to-human interactions between a human customer and human frontline employees, are now increasingly being replaced by automated robots interacting with humans (Larivière et al., 2017). One emergent and increasingly popular way to utilize AI is by using chatbots to transform customer service interactions (Murtarelli et al., 2021). Chatbots are conversational virtual agents which provides the user with different services using dialogue in natural language (Nordheim et al., 2019; Shumanov & Johnson, 2021). Although the technology can be traced back as early as 1966, it is more recent developments that have enabled the use of intelligent agent technology in the context of customer engagement to replace humans (Shumanov & Johnson, 2021) and the increased technological capabilities has led to more companies handling various service enquires through new channels such as online chats (Esmark Jones et al., 2022). Chatbots are predicted to be the fastest growing market in the customer service segment from 2019-2026 (Cheng & Jiang, 2021).

For the customers, chatbots have the potential to give help instantaneously and interactively. For the company, chatbots can cut costs while giving customers a better experience when the bot is able to provide a quality service (Rese et al., 2020). Chatbots can automize and aggregate human data to optimize, explore and understand customers and manage decision-making (Lepri et al., 2017; Murtarelli et al., 2021). In addition, the use of technology offers companies the opportunity to collect vast amounts of useful user data (Miao et al., 2021).

As the use of AI increases, so does the capability of AI. Rather than just handling mechanical repetitive requests, AI is increasingly able to perform analytical, intuitive, and empathetic thinking (Huang & Rust, 2018). Thus, using AI in more contexts such as customer service and retailing has become more possible and common (Pantano & Pizzi, 2020). Software is continuously improving in ability to mimic interactions between humans, and there are no signs that the development in capabilities is slowing down (Libai et al., 2020). Customer service encounters are an immensely important channel for reinforcing brands (Barlow & Stewart, 2004). Chatbot experiences can affect a range of brand responses, such as attitude toward the brand (Zarouali et al., 2018) and regardless of the environment, be it online or offline, offering high quality service can lead to range of positive outcomes for the brand, such as satisfaction, word of mouth and overall perception of the brand (McLean & Osei-Frimpong, 2019; Verhoef et al., 2009).

However, while the potential benefits are large and the use of chatbots is already widely spread, the end results are often lacking. Prior research shows that the customer satisfaction with chatbots compared to chatting to humans is often low and can lead to frustration, reflecting negatively back on the company (Shumanov & Johnson, 2021). Additionally, chatbots are often met with skepticism (Araujo, 2018). When technological solutions become an integral part of interactions with customers, it will become more difficult to create lasting bonds with customers, increasing the risk of customers switching between brands (Rafaeli et al., 2016). Technologies relating to frontline service have a lot of untapped potential in enabling more personalized and emotionally rich conversations in the future (ibid). As chatbots have an enormous potential to cut costs for companies while giving customers better and faster service, theorizing on, and testing what effects different types of chatbots have on customer company perceptions is of great importance.

Most modern chatbot interfaces are characterized by having conversational interfaces similar to human conversations (Murtarelli et al., 2021). Commonly, online virtual agents are presented with many humanlike attributes, such as using natural language and having a name and gender (Söderlund et al., 2021). So far, humans are often deemed more competent and warmer by customers (Lou et al., 2021). Making the chatbot being perceived as more humanlike has been shown to lead to favorable

customer and brand responses in most contexts (Crolic et al., 2021). As chatbots are becoming more widely used, and as these chatbots increasingly contain human aspects and used in service encounters, companies and AI developers are in need of understanding how the design and creation of chatbots impact customer perceptions (Araujo, 2018; Youn & Jin, 2021).

The practice of making brands humanlike has existed far longer than chatbots. For long, companies have attempted to make their brands seen as humanlike, for instance by making the product features visually resemble humans or with brand spokes-characters (Crolic et al., 2021). The use of spokes-characters in print advertising has increased more than ever before since the 1990s (Phillips et al., 2018). The technological developments of the internet have enabled marketing researchers to apply traditional models of marketing communication and persuasion in new technological contexts (Liao et al., 2011). The degree to which the chatbot virtual agent represents and is connected to the brand in practice varies from being completely generic objects to being more closely connected to the brand, such as through naming the chatbot agent something related to the brand. Brand spokes-characters have the potential to take this brand connection further, as these characters can become representations of the whole brand as entities themselves (Fournier, 1998).

In this paper, the effects of using a brand spokes-character as a chatbot agent will be compared to using a traditional chatbot agent that does not adhere to the definition and characteristics of a brand spokes-character, in this paper referred to as a non-spokes-character chatbot agent. Study 1 will compare a brand spokes-character to a non-spokes-character agent in the context of a good chatbot experience. Study 2 on the other hand, will evaluate the consequences in the context of a bad chatbot experience where the agent performs poorly.

1.2. Research gap

This paper suggests that using brand spokes-characters as chatbot agents will impact the brand attitude toward the company compared to using non-spokes-character chatbot agents that do not possess the identity and history associated with brand spokes-characters. Additionally, the theoretical mechanisms that might underpin these

relationships are investigated. To the best of the author's knowledge, this is previously unexplored in academia.

Prior researchers have pointed to the fact that more research is needed to examine different types of virtual agents in connection to humanness and customer evaluations (Yang et al., 2019). Academic research of customer perceptions and acceptance of chatbots is so far insufficient (Han, 2021) and there is a need for research to develop theories that give insight into the effects of humanness in marketing and how anthropomorphism affects behavior (Yang et al., 2019). As it is an emerging field, it is important to investigate variables that improve attitudes toward and in relation to the technology (De Cicco et al., 2020; Larivière et al., 2017). Little is known theoretically about the consumer perceptions of these interactions with chatbot agents, and how it impacts the evaluations toward the situation and organization (Laban & Araujo, 2020).

As the use of AI to emulate humans will impact consumer-brand relationships and have a large impact on business and marketing, exploration of the use of and effects of AI in a marketing context in needed (Rust, 2017; Youn & Jin, 2021). Even though the number of companies using chatbots for customer service is vast, research into how to use these for brand building and branding implications has so far been limited (Kull et al., 2021). Service encounters are changing due to the rapid technologic evolution (Larivière et al., 2017), with interactions between consumers and companies becoming increasingly technology dominant (Araujo, 2018). Use of artificial agents will undoubtedly increase, and deserve psychological investigation (Holtgraves et al., 2007). The technological developments of the internet have enabled marketing researchers to apply traditional models of marketing communication and persuasion in, such as brand spokes-characters in these new technological contexts (Liao et al., 2011). These new platforms can make the connection between customer and firm more connected and interactive and personalized (Appel et al., 2019). Although implementation of smart services such as chatbots is expected to have many financial benefits, one of the biggest obstacles is getting customers to accept and use the technologies (Wünderlich et al., 2012). As the chatbot market is predicted to be the fastest growing market between 2019-2026 in customer service segment, there is a big practical importance of researching the area (Cheng & Jiang, 2021).

Chatbots will get better and better. Chatbot interactions driven by AI has already gained the potential to rival or exceed the service humans can offer through chat, even if customers are still hesitant to commit fully to chatbot driven service still (Esmark Jones et al., 2022). Technologies relating to frontline service is becoming smarter and have a lot of untapped potential in becoming more human in emotions and cognition, enabling more personalizes and emotionally rich conversations in the future (Rafaeli et al., 2016). This makes humanizing potentially more and more effective and looking at ways to increase humanization is important (Crolic et al., 2021). As service encounters become increasingly tech-dominant rather than human-to-human driven (Larivière et al., 2017), it is critical to understand the potential for simple design cues of chatbots can influence perceptions of the company using the chatbot (Araujo, 2018). Most chatbot interfaces uses avatars to represent the virtual agent (Esmark Jones et al., 2022). These avatars are the first signal that the customer experience and help form an opinion of the chat agent (ibid). Therefore, the design of the avatar is critical, but the research of effective avatar design is limited (Miao et al., 2021). Avatar design is an area where the company have full flexibility in designing something that has direct impact on customer reaction (Duffy, 2003; Esmark Jones et al., 2022).

Thus, more studies are needed around guidelines and best practices for the use of chatbots in service and brand building, especially for how to foster personal connections with potential customers (Kull et al., 2021; Rafaeli et al., 2016). The research on the area surrounding chatbots in marketing literature has not kept up with the widespread use of chatbots, and chatbots risk detracting from emotional and social value created in consumer-brand interactions rather than contribute (Kull et al., 2021).

1.3. Purpose of the study

The purpose of the study is to investigate the consequences on brand attitude of using brand spokes-characters as virtual chatbot agents. Additionally, the theoretical mechanisms that might underlie this relationship will be explored and tested.

1.4. Delimitations

Chatbot virtual agents can be embodied or disembodied. Embodied virtual agents engage in dialogue in more ways than by using the language, such as by having expressive facial expression and movements, while disembodied virtual agents do not utilize any real time physical representation of the agent, except for static profile images (Araujo, 2018). Given that most chatbots are disembodied, in that they tend to not go further than a static image, the present study investigates the purpose in relation to disembodied conversational agents.

There are many potential ways that brands can increase the connection between the brand and a chatbot agent that represents the brand in online encounters. For instance, matching the agent with brand color schemes, naming the assistant something related to the brand name or making the appearance of the chatbot virtual agent similar to the company's products. In this study, the focus is on investigating the effect of using brand spokes-characters, which is an established way companies have used to promote a product or brand (Garretson & Niedrich, 2004), in an emerging field enabled by technological development.

Chatbots are used in many different circumstances, such as pre-sales assistance or post-sales support. The present study will only investigate chatbots in the context of pre-sales support.

2. Literature review & theoretical background

This section will cover previous literature and theoretical concepts related to the purpose of the study. Firstly, previous research on brand spokes-characters will be introduced. Secondly, a background of the dependent variable of the study, brand attitude, will be presented. Thereafter follows a theoretical background on anthropomorphism, conceptual fluency, and brand fit which are mechanisms which can explain the relationship between using brand spokes-characters as chatbot agents and brand attitude.

2.1. Brand spokes-characters

Brand characters are nonhuman objects used to promote products and brands that have been used for over 100 years (Garretson & Niedrich, 2004). There are varying forms of brand characters, and brand characters vary in appearance, with some being portrayed as human, others as animals or completely made-up objects (Hosany et al., 2013). Brand characters always share the feature of humanized personalities, that give the characters life which enables them to create emotional connections with customers (Garretson & Niedrich, 2004; Hosany et al., 2013). Brand characters are used to attract customers, create awareness, and convey attributes (Hosany et al., 2013, Keller, 2003). Through using characters, brand can create stronger identities and favorable associations (Fournier, 1998; Hosany et al., 2013). Brand characters can develop inferences about the brand through behaviors that are enacted at the behalf of the brand (Fournier, 1998). Having a trusted brand character can lead to more favorable brand evaluations, through conveying brand meaning and favorable associations to customers (Hosany et al., 2013).

Brand characters that have an identity are often referred to as brand spokes-characters (Hosany et al., 2013), which is the type of brand character of interest in this study. Spokes-characters are animated objects that are used consistently in conjunction with a company's products (Phillips & Gyoerick, 1999). Spokes-characters are created for the purpose of promoting a product or brand (Garretson & Niedrich, 2004). A spokes-character must have a recognizable "character" or "persona", that is easily perceived by

customers as well as be used consistently in conjunction with the products that it relates to (Callcott & Lee, 1995; Phillips et al., 2018). Spokes-characters are unique in providing opportunity for customers to identify with a specific persona (Callcott & Lee, 1995). A brand character is not a one-time figure, but rather has a background and storyline, with a personality and often origin and identity (Hosany et al., 2013). Strong spokes-characters such as the Michelin man or the M&M characters often closely associate with the brands, such as the Michelin man resembling a stack of tires (ibid).

Spokes-characters can be classified as belonging to one of three groups, namely animals (e.g., Tony the tiger), mythical beings (e.g., green giant) or product personifications (e.g., Mr. Peanut), and the degree of personification varies widely from very closely resembling humans to being inhuman (Callcott & Lee, 1995). Spokes-characters become almost as one with their product and brand through repeated exposure (ibid). Spokes-characters are one of four main types of endorsers that speak for an organization, together with celebrities, employees, and customers (Phillips et al., 2018).

The nostalgia connected with the characters and the expertise that the characters are perceived to possess can enhance brand responses such as trust and brand attitude (Garretson & Niedrich, 2004). Consumers can view spokes-characters as experts that can make valid claims and have knowledge of the product, as these characters are often portrayed making these claims in many campaigns (ibid). Other explaining factors for the impact brand characters can have on consumer-brand relationships are an increased brand integration, higher familiarity, credibility as well as innate character likeability (Mize & Kinney, 2007). Furthermore spokes-characters can make the brand a personalized entity and more of a relationship partner, due to animating the brand (Fournier, 1998; Mize & Kinney, 2007). Spokes-characters also increase likeability which can increase attitude toward the brand (Liao et al., 2011). Even if people know that the characters are not real, some treat them as if they were human beings (ibid).

The technological developments of the internet have enabled marketing researchers to apply traditional models of marketing communication, such as that of brand spokes-characters, in these new technological contexts (Liao et al., 2011). Using brand spokes-characters as a chatbot agent can naturally have many different consequences. Brand attitude is chosen as the dependent variable of interest in this study mainly as it has both

a high theoretical and practical value and has been used and can be put in relation to prior research relating to spokes-characters and virtual agents. To understand the potential effects on brand attitude, and to delve deeper into the reasons why brand attitude was deemed the most appropriate dependent variable in this study, the following section will give a background and theories relating to brand attitudes. Thereafter, the specific mechanisms which can explain the relationship between using brand spokes-characters as chatbot agents and brand attitude will be reviewed through a deep dive into theoretical concepts.

2.2. Brand attitude

As individuals are subjected to more and more choices due to an increasingly complex world, having a strong brand becomes increasingly important. A brand is one of the most valuable assets to organizations, but while creating a strong brand is of utmost importance, it is also a hard challenge for companies. Brand responses are about what customers think or feel about a brand, in response to marketing activity or other sources of information. Creating a brand entail creating mental structures linking unique associations to the brand in consumers memory, creating awareness and eliciting brand judgements and feelings. This building is done through all brand related contacts, such as for instance brand names, logos, or characters (such as those in the focus in this study). (Keller, 2003)

There are many affective reactions a customer can have related to the company and brand. Attitudes, compared to other affective responses such as emotions and moods are potentially stored for long periods of time (Bagozzi et al., 1999). Attitudes represent someone's general feeling of favorableness toward an object (Fishbein & Ajzen, 1975). When a person forms a belief toward an object, an attitude is automatically created based on an evaluation of the attributes of the object (ibid). Attitudes toward an object depends on the belief about the object as well as the evaluative responses stemming from those beliefs (ibid). Attitudes are a core part of theories about different kinds of relationships, and for brand relationships (MacInnis et al., 2015). Having a positive attitude to the brand is likely to be the fundamental basis of the relationship leading to desired effects such as higher purchase intentions (ibid). Due to the fundamental part

attitudes play both in theory about brand relationship and due to its practical importance, attitude is the dependent variable of interest in the present study. Therefore, brand attitudes will be used in this study to evaluate the effects on company perception.

To understand the consequences and mechanism involved of using brand spokes-characters and its effect on brand attitude as virtual agents, the following sections will look into the theoretical mechanisms that can be predicted to explain this relationship.

2.3. Anthropomorphism

Anthropomorphism explains how humans imbue virtual agents or other non-human objects with humanlike features and characteristics, motivations, intentions, and emotions (Epley et al., 2007). The concept of anthropomorphism is not exclusive to virtual agents, but can be anything with a perceived independence, such as animals, nature, and electronical devices (ibid). More than simply describing non-human objects behavior with human terms, anthropomorphized agents are viewed as if they possess the human descriptors (ibid). Perceiving virtual agents as human occur even if the observer is fully aware that they are interacting with a non-human, as humans are inclined to ascribe human features to non-humans (Söderlund & Oikarinen, 2021). Humans respond socially to computers despite knowing they are not human (Araujo, 2018).

Anthropomorphism entails attribution of more than just superficial human characteristics. It entails attributing a human mind to non-human entities (Przegalinska et al., 2019). This has long been seen as an automatic phycological process and chronic feature of human judgement, but there is also a neuroscientific explanation that our system of mirror neutrons mimics the same neural regions if a virtual agent performs an act, as if the person themselves performed the act (Epley et al., 2007). Furthermore, humans have built up schemes of human interactions during their lifetimes to make sense of other humans (Söderlund & Oikarinen, 2021). Humans are neurologically prepared, preconditioned and primed to interact with other humans, which makes human-human interactions easy to translate into human-nonhuman encounters (Karr-Wisniewski & Prietula, 2010; Söderlund & Oikarinen, 2021). When the virtual agent is similar to humans, in motion and morphology such as attributes and characteristics, there tends to be a higher degree of anthropomorphism (Epley et al., 2007). The degree

of anthropomorphism occurs on a spectrum from being shallow based on human schema, to deep based on mind attribution (Yang et al., 2019).

There are various accounts of antecedents of anthropomorphism. One such account is due to two basic motivations, namely, to explain and predict reactions and the motivation to connect with others, even agents (Epley et al., 2013). The tendency to ascribe human likeness to computer entities increases as the interface is made more natural (Holtgraves et al., 2007).

2.3.1. Chatbot virtual agents

Anthropomorphism has often been used in the context of virtual agents to help understand the consequences of imbuing these virtual agents with humanlike features in the eyes of the user. Virtual agents used to represent companies in online customer interactions are software systems, rather than embodied physical robots (Söderlund et al., 2022). Commonly, online virtual agents are presented with many humanlike attributes, such as a name and gender and use natural language (Söderlund et al., 2021). These human characteristics can create a perception that the virtual agent is in an affective state (ibid). Conversation bots are often viewed as if they have human-like personalities (Holtgraves et al., 2007). Seeing the virtual agent as human has a large impact on how those agents are treated, either as moral agents that deserve respect or as object, and on how people expect the virtual agent to act (Epley 2007). When chatbot is humanlike, consumers assume a degree of agency to the bot (Crolic et al., 2021). The anthropomorphized object is ascribed a rich and complex persona like a human being, with its own intentions, goals, feelings, and emotions. Humans therefore apply norms and criteria's and judge the anthropomorphized object as if it was a human (Yang et al., 2019). Virtual chatbot agents differ on many dimensions which impacts the level of anthropomorphism, such as level of formality, personality, and extraversion (Holtgraves et al., 2007).

Most chatbot interfaces uses avatars as the representation of the virtual agent (Esmark Jones et al.). Avatars are graphic representations that often are animated by computer technology that can be used as company representatives, such as shopping assistants (Holzwarth et al., 2006). These avatars can create more interpersonal shopping

experiences online and fulfil consumers desires for interpersonal connection (ibid). Avatars have the potential to humanize brands in scalable humanlike interaction, such as chatbots (Miao et al., 2021). Shopping online naturally has lower social elements, which avatars help address by bringing back some of that social presence (ibid). The advancement of computer technology has not only led to the increased use of chatbots, but also an increased use of avatars as the chatbot representative (ibid).

2.3.2. Anthropomorphized brands

Brands use many ways to anthropomorphize their brands, such as giving the brand or brand objects human names (Mr. Clean & Alexa), making the shape of the product look human (Such as smiling car fronts) to adding full brand spokes-characters and characters (Yang et al., 2019). The more the brand or objects come alive, the deeper the anthropomorphizing (ibid). The experience customers have with the brand, such as through a chatbot encounter, influence brand experience which lead to customer evaluations of the brand (Youn & Jin, 2021, Ramaseshan & Stein, 2014). Brands often encourage increased anthropomorphism of the brand by creating brand characters, with faces, names, and human emotions (Aggarwal & McGill, 2012). Brand spokes-characters create a complete anthropomorphism of the brand itself, attributing the brand with the human qualities, emotions, and thoughts of the brand character (Fournier, 1998). It is therefore argued that using a brand spokes-character chatbot agent will lead to a higher level of anthropomorphism compared to a non-spokes-character chatbot agent.

> **H1a:** Using a brand spokes-character compared to a non-spokes-character chatbot agent will increase the perceived level of anthropomorphism

2.3.3. Effects of anthropomorphism on brands

Imbuing virtual agents with social presence is especially important in the normally impersonal and cold context of e-commerce compared to offline encounters (Han, 2021). Perceived humanness of virtual agents has been shown to boost customer satisfaction, for instance due to humans being social creatures with positivity bias

toward other humans and toward similarity to oneself (Söderlund & Oikarinen, 2021). Humanlike features impact emotional responses to and quality of virtual agents in the service encounter (Laban & Araujo, 2020). Consumers have been shown to express a need for personal interaction and a human touch in these encounters as this is a core part of human nature (ibid). As chatbots are a format where brands can interact directly with customers, chatbots present many opportunities for brand building (Kull et al., 2021). As customers evaluate chatbot personality as if it was a human, they differentiate chatbot personalities after just a brief interaction (Holtgraves et al., 2007; Kull et al., 2021). Given the increase of using virtual agents and chatbots increasingly as a tool for companies' service encounters (Crolic et al., 2021; Larivière et al., 2017), chatbots can directly influence customers perception of the company. Customer brand interactions present a new avenue for brands to develop deep relationships with customers through interactive dialogues rather than static interactions (Cheng & Jiang, 2021; Huang & Rust, 2018).

Although making the chatbot more humanlike has been shown to lead to favorable customer and brand responses in most contexts (Crolic et al., 2021), there is also evidence of the contrary. Anthropomorphized agents have an increased accountability and expectancy of its actions as consumers assume a higher degree of agency (Crolic et al., 2021; de Visser et al., 2016; Gray et al., 2014). When the customer is angry and the chatbot is perceived as a bad experience, humanization can lead to negative satisfaction (Crolic et al., 2021). Anthropomorphism can also include a component of competition, where the anthropomorphized company is perceived to have agency to act in its own self-interest (Yang et al., 2019). Consumers, trying to have control over their own outcomes, might therefore try to protect themselves from competition from brands and their persuasion attempts (ibid). Still, as anthropomorphism has predominantly been shown to lead to favorable brand responses, it is predicted that higher level of perceived anthropomorphism will lead to higher brand attitude.

H1b: The effect of using a brand spokes-character as a chatbot agent on brand attitude is positively mediated by anthropomorphism.

2.4. Conceptual fluency

Conceptual fluency describes the ease to understand information, such as brand meaning (Sirianni et al., 2013). Brand meaning is about what the brand stands for and is characterized by in the mind of the consumer (Keller, 2003). Conceptual fluency is the ease with which the meaning behind the stimuli is understood (Brasel & Hagtvedt, 2015; Lee & Labroo, 2004). Employee to customer personal encounters have the potential to be more influential in conveying brand meaning compared to traditional mass-targeted marketing communications (Sirianni et al., 2013). When employees are more congruent, conceptual fluency is increased (ibid). When the behavior of service employees is more aligned with the brand positioning customer brand evaluations can therefore be improved (ibid). This higher alignment can be manifested through different elements of the employee's behavior and appearance in the interaction with customers. Higher alignment enables customers to easier process brand meaning more easily as it links the employee with the brand in the customer knowledge structure (ibid). Since virtual agents are anthropomorphized and seen as human in many ways, a similar reasoning could be applicable in a chatbot virtual agent context, in addition to human frontline employees. Having a brand character can lead to more favorable brand evaluations, through conveying brand meaning and favorable associations to customers (Hosany et al., 2013). Utilizing already established brand spokes-characters that are made to represent the brand will increase the congruency between the chatbot agent and the brand and is therefore likely to have a positive impact on conceptual fluency.

Congruity between stimuli also makes it easier to identify the meaning of stimuli in relation to existing semantic knowledge structures (Sirianni et al., 2013). Higher congruence between stimuli is easier to understand and process leading to higher conceptual fluency (Lee & Labroo, 2004). Conceptual fluency leads to more positive attitudes through reduced uncertainty. Even after a single exposure, brands, and the stimuli in itself are evaluated more positively due to conceptual fluency (ibid). Brand meaning is also processed more easily toward the brand (Lee & Labroo, 2004; Sirianni et al., 2013). Conceptual fluency has also been shown to be applicable in other contexts outside of human frontline employees, such as a higher fit between logo animation and the brand personality (Brasel & Hagtvedt, 2015).

Closer connection between the brand and the chatbot agent, due to using previously connected brand spokes-character entities, is likely to enhance conceptual fluency. Consequently, the brand may be experienced as more consistent, with more favorable brand attitude as a consequence.

H2a: Using a brand spokes-character compared to a non-spokes-character agent in chatbot conversation will lead to higher conceptual fluency between the brand and the chatbot agent

H2b: The effect of using a brand spokes-character as a chatbot agent on brand attitude is positively mediated by conceptual fluency between the brand and the chatbot agent

2.5. Brand fit

Customers base product and brand evaluations not only on information, but also how easy the information is to process, called perceptual fluency. Perceptual and conceptual fluency are distinct constructs with unique antecedents and consequences. Perceptual fluency is concerned with how easy it is to process a stimulus, while conceptual fluency is about how readily a stimulus convey meaning. (Lee & Labroo, 2004)

The effectiveness of an endorsement of a spokes-character depends on the match, or fit, between the endorser and the product (Mittelstaedt et al., 2000). The effectiveness lies in the synergistic relationship between the endorser and the product itself, and thus in the endorsement event (ibid). It has for instance been shown that celebrity brand endorsers are more effective if the customers perceive a strong relationship between the endorser persona and the brand, which among other things have shown to improve brand attitude (ibid). The “match-up” between the endorser in advertising and the product conveys information, over and above the information in question (Kamins, 1990). The “match-up” theory is mainly explained by social adaption theory and schema theory. The social adaption theory illustrates how customers will perceive the information as containing more merit if it is relevant and adapted to the environment. Schema theory entails that the information can more easily be integrated into existing

knowledge structures when there is a fit between objects (Wright, 2015). When endorser and product match, brand attitudes have therefore been explained and shown to be higher (Wright, 2015). Using more relevant spokes-characters can improve memory and brand evaluations (Garretson & Burton, 2005). Although the aforementioned studies compared spokes-character of varying relevance, it is here argued that a spokes-character by definition is more relevant to the brand than a non-spokes-character agent. Brand spokes-characters are connected to the brand through already repeated messages during typically long periods of time and become one with the brand (Callcott & Lee, 1995). Brand spokes-characters are therefore likely to be seen as having a higher fit with the company and brand, compared to a completely new entity as a chatbot agent.

> **H3a**: Using a brand spokes-character compared to a non-spokes-character agent in chatbot conversation will lead to higher fit between the brand and the chatbot agent

One stream of research that can help explain the effect that increased brand fit has on brand attitude is research on brand extensions. Brand extension literature explains that consumer attitudes toward using an established brand to enter new product categories is generally more favorable when there is a perception of fit between the old products related to the parent brand and the new product category that is ventured into (Aaker & Keller, 1990). If consumers experience a "fit" between the product classes, the affect can be transferred in between the objects (ibid). Applied to the chatbot context, this could mean that the chatbot experience might be more easily transferred onto the brand if there is a high fit between the chatbot agent and the brand. Leveraging the existing brand reduces the risk for the customer due to providing the comfort of familiarity (ibid). A successful leveraging of the brand relies on the assumption that the customer holds positive and favorable attitudes toward the brand in question (ibid).

Furthermore, there is evidence that an attitude toward an object becomes more favorable the more repeated exposures it gets, as ease of processing lead to more favorable attitudes toward products (Lee & Labroo, 2004). Favorable customer perceptions are expected, for instance due to consistency between brand cues (Brasel & Hagtvedt,

2015). The chatbot agent can serve as a brand cue as it can possess brand personality connotations as well as general agency (ibid). The fit between the brand cue, such as the agent, and other facets of the brand can influence the brand evaluation (ibid). Additionally, fit can in and of itself be a signaling factor that influences the consumer response toward the objects due to consumers questioning the company when objects are a low fit in relation to each other (Aaker & Keller, 1990).

A higher chatbot agent fit is thus predicted to lead to more favorable brand attitude both due to making the experience more favorable in itself, and through attributing more of this experience on the brand.

> **H3b**: The effect of using a brand spokes-character as a chatbot agent on brand attitude is positively mediated by the fit between the brand and the chatbot agent

2.6. The effect of spokes-characters on brand attitude

Through the three proposed mediators it is predicted that using a brand spokes-character will lead to more favorable brand attitudes. Brand spokes-character are predicted to lead to higher degree of anthropomorphism which in most contexts are presumed and have been shown to have positive consequences for virtual agents. Additionally, brand spokes-characters are predicted to lead to a higher perceived conceptual fluency as well as fit with the brand which have been shown to lead to more favorable evaluations, as discussed in the previous sections.

> **H4:** Using a brand spokes-character compared to a non-spokes-character in chatbot conversation will lead to a positive total effect on brand attitude

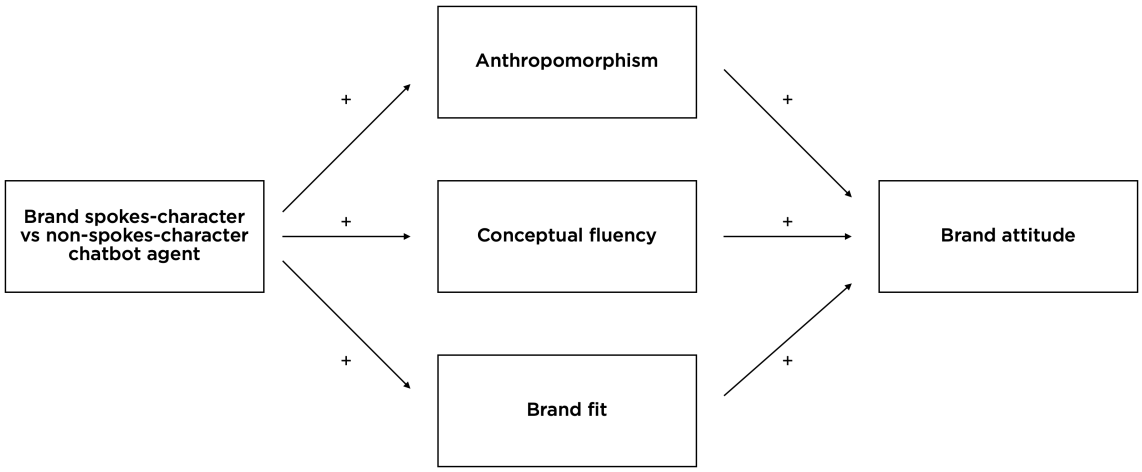
Real life interactions with chatbots can occur on a spectrum from terrible to great. The hypothesis and theoretical framework will therefore be tested in two different contexts. A good chatbot experience is tested in study 1 and a poor chatbot experience is tested in study 2. The theoretical framework will be the same in both studies. The theoretical model and hypothesis are thus summarized as follows:

2.7. Summary of hypothesis & theoretical model

Table 1. Summary of hypotheses

H1a	Using a brand spokes-character compared to a non-spokes-character chatbot agent will increase the perceived level of anthropomorphism
H1b	The effect of using a brand spokes-character as a chatbot agent on brand attitude is positively mediated by anthropomorphism.
H2a	Using a brand spokes-character compared to a non-spokes-character agent in chatbot conversation will lead to higher conceptual fluency between the brand and the chatbot agent
H2b	The effect of using a brand spokes-character as a chatbot agent on brand attitude is positively mediated by conceptual fluency between the brand and the chatbot agent
H3a	Using a brand spokes-character compared to a non-spokes-character agent in chatbot conversation will lead to higher fit between the brand and the chatbot agent
H3b	The effect of using a brand spokes-character as a chatbot agent on brand attitude is positively mediated by the fit between the brand and the chatbot agent
H4	Using a brand spokes-character compared to a non-spokes-character agent in chatbot conversation will lead to a positive total effect on brand attitude

Figure 1. Theoretical model



3. Method

The following section explains the approach and design of the study and also provides an examination of the data and its quality. Subsequent sections will dive deeper into the specific circumstances for study 1 and study 2 respectively.

3.1. Scientific approach

The study was constructed using a positivist deductive approach where hypotheses and a theoretical framework was subjected to empirical testing (Bell et al., 2019). This approach was chosen as there has already been studies on chatbots, virtual agents, and brand spokes-characters. Consequently, there is a lot of relevant theory to draw upon. This laid the foundation for the theoretical framework which was created in the previous section, and it is the theoretical framework that will subsequently be tested. As a theoretical framework is tested through observations, the approach is by definition deductive (Bell et al., 2019). An objectivist ontological view (ibid) was employed by observing and measuring the aspects of relevance relating to the theoretical framework. To contribute to this research area, a quantitative approach was selected to be able to collect generalizable (ibid) and more specific results, rather than having a more exploratory qualitative approach. An online survey experiment where the participants were first randomly allocated to groups with different treatments and subsequently compared was conducted, in line with the definition of experiments according to Söderlund (2018). Online data collection was deemed the most appropriate since an online situation was tested in the study, in line with earlier research (Bhattacherjee, 2002). Collecting data online is the most effective way to reach populations consisting of online users (ibid). The experiment will only be able to test a specific situation, which raises the question about generalizability in other contexts. This is mitigated by the fact that it is theories that are tested in the experiments, rather than effects specific to the specific context. The specific experimental setting is thus a way to be able to make general claims about theory (Söderlund, 2018).

There are several downsides to using an experimental deductive approach. One consideration is related to the fact that experiments are based on ideas and preconceptions that the experimenter already knows before the experiment (Söderlund,

2018). Compared to a qualitative study, less emphasis is thus on exploring and more on testing out causal effects based on a theoretical framework. As the research field related to virtual agents and brands already contain a lot of relevant research too draw on, it was concluded that an experimental approach was appropriate to test for specific causal links. Experiments are also limited in terms of which causal links can be investigated, and thus narrow due to restrictions in the experiment process (Söderlund, 2018). Again, as there is already prior research on the area, more focus is needed on testing these causal links previously unexplored in academia. An experimental study was thus appropriate for testing potentially important, but unexplored concepts and causal links. Two studies were conducted to be able to test the causal links in different situations, which makes the results relevant in a wider context.

A thorough literature review of prior research, both directly and indirectly related to the research area, was conducted using Scopus, Google Scholar, and the Stockholm school of Economics library service. A combination of journal articles and books were used to find and learn from previous research and theories.

3.2. Survey design

The study uses a one-way experimental survey design where two groups are compared. In one of the groups, the chatbot agent is manipulated to represent a brand spokes-character, and in the other group the chatbot agent does not fulfill the conditions of being a brand spokes-character, such as having a previously known identity, appearance and having been used consistently in conjunction with the brand and the company's products. The survey consisted of a scenario where the participants imagined that they were visiting a website to purchase tires for their car. Scenario experiments where the participant is playing a role, such as the role of a customer, is especially common for research on customer encounters with salespeople or service employees (Söderlund, 2018) which is similar to the situation portrayed in the present study. A problem with scenario role-play is that the imagination of an event is often not as strong as actually living the event (ibid). Yet, studies have shown that similar effects on psychological and behavioral phenomena of scenario events can be expected to be similar to real service settings, while giving much more control over the setting and treatment (Bateson & Hui,

1992; Söderlund, 2018). All participants are only subjected to one treatment, the change in chatbot agent avatar, which makes the survey design a between-subjects design, which is commonly utilized in marketing contexts (Söderlund, 2018).

The scenario consisted of a real brand, Michelin, which is a manufacturer of tires for motor vehicles. Many researchers have questioned the realism of experiments as they tend to be artificial situations and not connected to the real world outside of the experimental situation (Söderlund, 2018). The use of a real brand was chosen, partly to increase the realism of the scenario for the participants. More importantly, as the study aims to investigate the effects of using brand spokes-characters, it was inevitable to utilize a real brand where the brand spokes-character is already existing and known by consumers. As mentioned in the theoretical section, a spokes-character have to have been used consistently in conjunction with the brand to create an identity and recognized persona. This could not satisfactorily be satisfied by doing a made-up company and newly created made-up spokes-character. The Michelin man is one of the first personified spokes-characters (Callcott & Lee, 1995) and most well-known brand spoke-characters. Additionally, fabricating a whole new company would have made it hard to convey all the necessary information about the brand and the product. Prior familiarity about Michelin was collected and tested for correlation to control for previous knowledge. Additionally, as the participants were randomly allocated to one of the two groups, previously existing differences will be spread out randomly between the two groups (Söderlund, 2018). Randomizing the participants into groups removes any systemic bias (Thomke & Manzi, 2014). If the groups are randomly allocated, there is a minimal risk that the third variable inadvertently impacts the dependent variable (Aronson & Mills, 1959; Söderlund, 2018). The risk that the results are inadvertently impacted by the fact that participants will have different relationships to Michelin, the Michelin man, tires, or any factors is thus low. The benefit of using an existing brand is therefore argued to outweigh the potential drawbacks, in addition to being necessary due to the nature of the manipulation.

Tires were chosen for the scenario partly to be able to use The Michelin man, one of the first personified spokes-characters (Callcott & Lee, 1995). Additionally, it is a product that most people are familiar with and use into some degree, but at the same time a product where many people would need to look for help or more information to

understand which model and size to choose. These preconceptions of the product category were confirmed by asking the participants about their knowledge and behaviors relating to purchasing and using tires at the end of the surveys. Consequently, it is a product category where it would be reasonable and realistic for consumers to seek the advice from experts or as in this scenario, from a chatbot.

The degree to which the chatbot interface reflect a real-life situation could take many different forms, ranging from fully interactive open-text answer that the participants in the study can write themselves to noninteractive transcripts printed where the participants are instructed to imagine themselves in the scenario presented to them. The latter option was chosen as creating a chatbot interface where the participants could write freely would be difficult to construct and to ensure that the chatbot's responses were of high quality. Chatbot design in practice can take many different forms and designs. For this study, two aspects were of main importance. Firstly, the chatbot design should show a clear chatbot agent as the sender of the messages as this is the manipulation. A picture representing the agent was presented on the website as a chatbot agent prompting a chat, as well as next to all the messages sent by the agent. Secondly, the chatbot should portray open ended texts written by the user to facilitate an anthropomorphized experienced. Some chatbots function through the user clicking buttons with pre-mapped consequences, which limits the perception of talking to a humanized entity.

The design of the survey utilized the fact that Michelin is an existing brand with resources that can help make the survey more realistic. Parts of the Michelin website design was used and modified.

3.2.1. Treatment

The treatment entailed having one group subjected to a brand spokes-character chatbot agent and the other group subjected to a non-spokes-character chatbot agent. The already well-known brand spokes-character, the "Michelin Man" was used for the brand spokes-character group. The non-spokes-character chatbot agent, was represented by a robot with human features reminiscent of the human features of the Michelin man. The non-spokes-character avatar was heavily inspired by the actual chatbot avatar displayed

on the Michelin website rather than created from scratch, to ensure that the design of the robot matched the quality of objects created by Michelin themselves. Designing an avatar from scratch would introduce uncertainty regarding the perceived quality of the agent design. The chatbot agents and the full chatbot scenario can be seen in appendix 7.1.

When designing an experiment, it is important that as much as possible apart from the treatment factor is identical (Söderlund, 2018). Therefore, the chatbot scenarios were identical except for the design and name of the chatbot virtual agent. No functional differences existed between the two manipulations which makes it possible to isolate just the effect of changing the chatbot agent persona. The design of the robot was purposefully chosen to be as similar to the design of the brand spokes-character, so that the potential differences can be attributed to whether the chatbot agent used is a brand spokes-character or not. Of course, the appearance cannot be exactly identical as the difference in the agent avatar is the manipulation. However, as much as possible, the features not relating to one being a brand spokes-character was made the same. Facial expression and similar facial features were used in both manipulations and the same color schemes were selected for both agents. The names of the agents had to be made different as one of the manipulated agents has an already established name that the study purposefully want to reuse, “The Michelin man”. To keep all elements except the chatbot agent persona identical, a similar name was chosen for the non-spokes-character agent, Michel, which similarly to the Michelin man, is related to the brand name “Michelin”. The magnitude of the manipulation is relatively small. While there are benefits of creating large magnitude differences in the treatment, when the factors of interest only have modest magnitude in reality, this should be reflected in the experiment treatment (Söderlund, 2018). Therefore, only changes in the avatar were made, and the change was not exaggerated by for instance having one of the treatments writing in a different way to magnify the effect of the agent it was portraying.

A crucial aspect of experiments is that the participants are randomly allocated to the groups (Söderlund, 2018). The participants in this study were randomly allocated using randomization in Qualtrics, which was the software tool used to construct the survey. Additionally, to be able to make any claims about causal links, certain conditions must be fulfilled according to Söderlund (2018). Firstly, the treatment must precede the

reaction. The study design thus showed the treatment before any of the questions about the effects that were measured. Secondly, to make causal claims, the treatment factor should be the only cause of the reaction, which was met by keeping all other aspects of the study design identical between the groups. Lastly, the treatment and reaction must covary, which is tested for in the empirical data section through independent samples t-tests and mediation analysis. To ensure that the participants could not understand what the treatment variable was, deception by omission (Söderlund, 2018) was used by keeping the information about the study as generic as possible. Additionally, careful care was taken to ensure that the treatment, the agent avatar, followed the same design and look of the website in which it was presented in the survey scenario.

To ensure that the conclusions that are to be drawn from the empirical analysis are correct and appropriate, it is important to check that the relationship between the intended treatment variable and the cause variables (Söderlund, 2018). If the manipulation does not represent the intended independent variable, the confidence with which causal inferences can be made due to the experiment is reduced (Perdue & Summers, 1986). The treatment aims to simulate the difference in using brand spokes-characters from a non-spokes-character agent. The independent variable is observable and concrete, either it is a brand spokes-character, or it is not, which means it is relatively simple to confirm that the manipulation worked as intended (ibid). Additionally, there are also higher order latent variables associated with the use of the brand spokes-character compared to a non-spokes-character agent, for which it appropriate to perform manipulation checks as well (ibid). Measures designed to capture the connection between the chatbot agent and the brand was constructed to ensure that the manipulation actually led to a higher connection between the brand and chatbot agent for the spokes-character group. Specifically, the connection in appearance between the chatbot agent and the brand and the degree of similarities between the brand and chatbot agent was tested on a Likert-type scale with 7 answer alternatives. Manipulation checks can be done both before the main experiment, as well as in direct connection to the main study (Perdue & Summers, 1986; Söderlund, 2018). As the manipulation check can give the participants clue of what the experiment manipulation is (Perdue & Summers, 1986; Söderlund, 2018), the manipulation check was performed after the questions relating to the theoretical framework.

3.2.2. Structure of the questionnaire

A mix of semantic differential bipolar scales and a Likert type scale was used. The number of scale points chosen was 7, which is an uneven number chosen to give the participants the option to answer neutrally. All the theoretical variable measures are multiple-indicator scales. Although these are ordinal scales, they can be and normally is treated as interval scales when captured as multi-indicator scales (Bell et al., 2019). Using survey measures to capture the participants psychological reactions is not uncriticized. For instance, there have been claims that the reaction is born when the question is asked, rather than by the treatment (Feldman & Lynch, 1988; Söderlund, 2018) or participants answering untruthfully to present themselves in a more favorable light (Söderlund, 2018). Still, questionnaire items like this are the dominant quantitative method, partly as it is one of the few ways in which these reactions are accessible to the researcher (ibid).

The order of the questions is likely to have a considerable effect on the participants. The measurement of a variable can potentially impact the participants subsequent reactions (Söderlund, 2018). As the theoretical framework makes claim about the logical order of the effect, namely that the treatment leads to phycological mediating mechanisms which in turn leads to the dependent variable, the order of the questions will reflect that order of events. All questions unrelated to the theoretical framework, with the exception of attention checks, was asked about after the reactionary variables as this enables asking about the reactionary variables in closer proximity to the manipulation.

Throughout the survey, attention checks and instructional manipulation checks were used and designed to rule out any participants that were not paying full attention to the study. The first attention check instructed the participants to choose one number in a list of multiple numbers. Subsequent checks were constructed to ensure that the participants had looked at the manipulation, the chatbot prompt and transcript, and were purposefully restrictive to ensure that only participants who had viewed the manipulation carefully would be included in the data analysis. As an online service were used, where there are incitements to answer the studies quickly without reading carefully, it is useful to include instructional manipulation checks to ensure that all the participants in the final sample have taken part in the instructions of the study

(Söderlund, 2018). Following the recommendation of (ibid), details about the images and texts used in the treatment were asked about. Participants who had failed to understand the details thus failed the instructional manipulation check and were excluded as their reactions would be potentially meaningless to analyze (ibid). Specifically, the participants were asked to identify an image of the agent that they had seen, asked who they had chatted with, and asked whether they had chatted with a human or virtual agent, to ensure they had read the prompts and understood the context of the experiment. Furthermore, only participants who had spent more than 2,5 minutes on the study were included as any time shorter than that strongly suggests that the participant answered the questions without reading through the instructions and questions properly.

3.2.3. Measures

Anthropomorphism was measured using a tried and tested scale developed specifically for anthropomorphism in robots by Bartneck et al (2008). The users were asked to their impression of the chatbot on a 7-point bipolar adjective pairs, “Fake-Natural”, “Machinelike-Humanlike”, “Artificial-Lifelike” and “Communicating rigidly-Communicating elegantly”. The measure had high internal consistency, with a Cronbach’s alpha of 0,917 in study 1 and 0,881 in study 2.

Conceptual fluency was measured using a scale developed by Sirianni et al (2013) for measuring conceptual fluency for frontline employees using a 7-point Likert type scale. Although the scale was developed for frontline employees, the similarities between human frontline employees and chatbots are here argued to be considerable, as chatbots are replacing human frontline employees to fulfill the same role. The specific items asked were: “I have a clear understanding of what this brand stands for,” “It was easy for me to identify what this brand represents to customers,” and “It was easy for me to describe what this brand represents to customers.” (Sirianni et al., 2013). The measure had high internal consistency, with a Cronbach’s alpha of 0,949 in study 1 and 0,972 in study 2.

Brand fit was measured by measures developed by Spiggle et al (2012) for testing the fit of brand extensions. The participants were asked to rank how much they agreed with the

following statements using constructs on a Likert type scale: “The chatbot agent is a good fit with the Michelin brand”, “The chatbot agent is consistent with the Michelin brand image”, “The chatbot agent is representative of Michelin”. The measure had high internal consistency, with a Cronbach’s alpha of 0,893 in study 1 and 0,878 in study 2.

The dependent variable, brand attitude, was measured using multivariable bipolar adjective pairs inspired by the measures used by Yang (2021) in a similar context as this study, namely the customer evaluation to using AI in customer service. The participants were asked “What is your attitude toward the brand after chatting with the chatbot?” with bipolar adjective pairs “bad-good”, “negative-positive”, and “very unfavorable-very favorable”. The measure had high internal consistency, with a Cronbach’s alpha of 0,969 in study 1 and 0,978 in study 2.

In addition to the variables in the theoretical model, a general evaluation of the chatbot was measured to be able to compare the evaluation in the intended good chatbot experience in study 1 with the intended bad chatbot experience in study 2. Chatbot evaluation was measured using constructs on a Likert type scale inspired by Söderlund et al (2021). The participants were asked to rank their overall impression of the chatbot on bipolar adjective pairs “Poor-Good”, “Do not like-Like”, and “Negative impression-Positive impression”. The measure had high internal consistency, with a Cronbach’s alpha of 0,950 in study 1 and 0,951 in study 2.

3.3. Pilot study

Pilot studies are the best time to look for any issues with the experimental design, as it gives the opportunity to correct any mistakes before the main study (Perdue & Summers, 1986). Therefore, a pilot study was conducted with 69 participants. The purpose of the pilot study was mainly to ensure that the manipulation yielded the intended effect. To be able to conduct manipulation checks in the pilot study (ibid), the manipulation and experimental instruments were the same as in study 1. The pilot study confirmed that the manipulations yielded the intended effects in relation to manipulation check, namely that the spokes-character and non-spokes-character agents were correctly classified, and additionally, that the spokes-character was perceived as being more closely connected to the brand it represents ($t = 3.522$, $p<0,001$).

Additionally, the pilot study was used to ask a limited number of questions relating to the theoretical model and the participants knowledge about tires and Michelin to ensure that the product category and manipulation was appropriate. The pilot study confirmed that most participants were familiar with the brand Michelin. Only 2.4 % of participants were not at all familiar with the brand Michelin. On a scale of 1-7 ranging from not at all familiar to very familiar, the mean familiarity was 5.46 out of 7. Additionally, most participants would need to seek help to know which tire size to choose for their car.

3.4. Data collection and analysis

The responses were collected through an online self-completion questionnaire with closed answers to enable comparability of results (Bell et al., 2019). The questionnaire can be found in appendix 7.1.4. The responses were collected through Prolific, an online research panel. Online subject recruitments such as Prolific has been shown to deliver higher data quality than university subject pools and offer more diverse populations (Palan & Schitter, 2018). Compared to more general crowdsourcing platforms such as Amazon MTurk, Prolific is often superior for recruiting participants as it is purposefully built for sourcing participants for research (ibid). The participants were filtered using screeners to ensure that the respondents were evenly distributed between genders and to only include participants that own and use cars as well as have a driving license. This was done to ensure that the brand and product chosen to include in the manipulation to be understandable and relevant. The participants were in the United States and were therefore likely to fully understand the English language of the questionnaire. The average age of participants was 40.78 years in study 1 and 36.14 in study 2.

The data was analyzed statistically using SPSS version 28. Significant results are consistently throughout the survey reported as $p>0,05$ using two-sided p values. The primary data analysis consists of statistical t-test of significance of differences in means.

3.4.1. Mediation

Mediators explain the mechanisms through which the independent variable influences the dependent variable (Baron & Kenny, 1986). Using mediation variables to construct a theoretical framework has commonly been used in previous studies on service

encounters (Söderlund, 2018). A variable can be considered as a mediator when variations in the independent variables significantly account for variations in the mediator (path a), variations in the mediator significantly account for variations in the dependent variable (path b) and additionally that the relationship between the independent variable and dependent variable (path c) is no longer significant when the mediators are removed (Baron & Kenny, 1986). More recent studies have disputed the last criteria that path c should not be significant and rather claim that only the strength on of the mediation is of relevance for a particular mediator (Zhao et al., 2010). Following the recommendation of Zhao et al (2010) mediation analysis was conducted using the Bootstrap test implemented by Preacher and Hayes using a macro for SPSS. Compared to other methods, such as Sobel's z-test, the Preacher and Hayes bootstrap test is less likely to include 0 due to a less skewed sampling distribution, thus giving the Preacher and Hayes bootstrap test higher power (Zhao et al., 2010). The latest version at the time of writing, version 4.0, of the macro was used.

3.4.2. Reliability

Reliability refers to whether the measures are consistent (Bell et al., 2019). For psychological variables such as those tested in this study, this is usually considered by using multi-measures (Söderlund, 2018). This procedure was conducted for all of the psychological variables included in this study. Reliability is often broken up into the concepts of stability, internal reliability, and inter-rater reliability (Bell et al., 2019).

Testing for whether the measures used were stable over time was not performed by retesting the study at a later time with the same sample, in line most research, due to the complexity of such testing (Bell et al., 2019). Additionally, as the interest of the study was to evaluate attitudes, which tend to fluctuate over time, investigating the stability over time is not particularly relevant. However, all of the measures relating to the theoretical framework used are based on previously tested measures.

Similar to most contemporary research on psychological variables, multi-scale measures were used on all variables related to the theoretical framework. This increases the reliability as it creates several observations for the same variable (Söderlund, 2018). Internal reliability of the measures was investigated for each measure individually and

reported in relation to each measure in section 3.2.3. All measures reported had internal reliability above the generally used Cronbach's alpha cutoff of 0,8 (Bell et al., 2019) in both study 1 and study 2. The multi-scale measures were subsequently combined by averaging the measures.

Only closed-ended measures that were decided upon before the data collection were used which means no subjective judgment was used in the recording or classification of the data.

3.4.3. Validity

Validity refers to whether a measure measures what is intended to be measured (Bell et al., 2019). Validity consists of multiple aspects, often classified as measurement validity, internal validity, external validity, and ecological validity (ibid).

Measurement validity concerns whether the measure captures the concept of interest (Bell et al., 2019). The theoretical framework uses concepts previously linked together in previous research, and all the measures relating to the theoretical framework are based on prior measures tested in earlier research. Only small adjustments were made to the measures to fit this study, such as for instance changing robot to chatbot. Manipulation checks were included in both the pilot study and main studies to increase the chance of having a high measurement validity of the manipulations as the intended independent variables (Perdue & Summers, 1986).

In order for environmental scenario studies to have ecological validity, it is crucial that the environment is accurately portrayed by the scenario (Bateson & Hui, 1992). As the real-life scenario aimed to be portrayed in the study takes place in a similar digital context, the scenario approach was deemed appropriate. Additionally, many chatbot interfaces were studied to create an interface similar to how it would look in reality. When ecological validity of the environmental simulation is high, the experiment can be assumed to have a reasonable internal and external validity, and similar effects on psychological and behavioral phenomena of scenario events can be expected to occur in real service settings (ibid).

4. Study 1

Study 1 tests the theoretical framework and hypotheses in the context of a good chatbot experience where the chatbot is able to understand and give appropriate and helpful answers. The chat transcript can be seen in full in appendix 7.1.2. To ensure that both the questions and the answers were appropriate, inspiration was taken from using various tire size guides, including a guide for the specific Michelin tire used in the scenario. The participants were exposed to and instructed to look at a screenshot of the webpage where they had selected a tire but were unsure which tire size to choose for their car. They were instructed to look at a chatbot pop-up in the corner of a website screenshot where one of the two manipulation chatbot agents prompted the participant to click and start chatting with the virtual agent. The popup was designed to resemble a real life chatbot prompt. The prompts can be seen in full in appendix 7.1.1. Thereafter, the users were instructed to look at a transcript from a conversation with the chatbot and told to imagine that they were the ones chatting with the virtual agent. The transcript was designed to show a helpful bot experience and the manipulated chatbot agent was clearly displayed next to all the chatbot messages. The scenario was influenced by similar research (Crolic et al., 2021; Söderlund et al., 2021) as well as the real Michelin website and chatbot. As the scenario was about a tire purchase, correct and relevant answers that the chatbot agent could answer were looked up to ensure that the chatbot was perceived as helpful.

4.1. Sample

240 participants were recruited and spread across the two manipulation groups. 190 participants passed the attention and instructional manipulation checks, as well as the minimum duration demand, leaving 104 participants in the brand spokes-character manipulation and 86 participants in the non-spokes-character manipulation.

4.2. Data analysis

The manipulation checks were significant and confirmed that the participants understood the manipulation of the chatbot agent. Additionally, the higher order latent variables associated with the use of the brand spokes-character compared to a non-spokes-character agent, namely the perceived connection in appearance between the chatbot agent and the brand ($t=3.762$, $p<0,001$) and the degree of similarities between the brand and chatbot agent ($t=4.768$, $p<0.001$) was significantly higher for the brand spokes-character group. The mean perceived connection in appearance was 5.73 for the spokes-character agent and 5.01 for the non-spokes-character agent. The mean perceived degree of similarities was 5.82 for the spokes-character agent and 5.02 for the non-spokes-character agent.

4.2.1. Test of hypotheses

As there are two groups of participants and measures in multiple-indicator scales, which can be treated as interval scales (Bell et al., 2019), independent sample t-tests are conducted to statistically compare the differences in means. t-tests are recommended according to convention when means between two groups are compared (Söderlund, 2018). Descriptive statistics of the mean and standard deviation for each variable will be reported. Significance is determined on two-sided p-values equal to or below 0,05. As t-tests rely on the assumption of homogeneity of variances, Levene's test for equal variance were conducted for the theoretical variables tested. The assumption of equal variance was met for all theoretical variables as the p-value for testing of equal variance was above 0.05 for all variables.

Table 2. Levene's test for homogeneity of variances

Variable	Levene statistic	p
Anthropomorphism	0.00	0.77
Conceptual fluency	0.29	0.59
Brand fit	0.086	0.99
Brand attitude	0.526	0.47

The effect of brand spokes-character chatbot agents on anthropomorphism

Using the brand spokes-character chatbot agent led to significantly higher level of anthropomorphism compared to using the non-spokes-character chatbot agent, with a t-value of 2.011 and p=0.046<0,05. The spokes-character group average degree of anthropomorphism was 5.17 compared to 4.76 for the non-spokes-character group, on a 7-measure scale. This provides support for hypotheses 1a.

H1a: Using a brand spokes-character compared to a non-spokes-character chatbot agent will increase the perceived level of anthropomorphism **Supported**

The effect of brand spokes-character chatbot agents on conceptual fluency

Using brand spokes-character lead to significantly higher level of conceptual fluency compared to using the non-spokes-character chatbot agent, with a t-value of 2.547 and p=0.012<0,05. The spokes-character group average degree of anthropomorphism was 5.59 compared to 5.17 for the non-spokes-character group on a 7-measure scale. This provides support for hypotheses 2a.

H2a: Using a brand spokes-character compared to a non-spokes-character agent in chatbot conversation will lead to higher conceptual fluency between the brand and the chatbot agent **Supported**

The effect of brand spokes-character chatbot agents on brand fit

Using brand spokes-character lead to significantly higher level of brand fit compared to using the non-spokes-character chatbot agent, with a t-value of 2.039 and p=0.043<0,05. The spokes-character group mean degree of perceived brand fit was 6.12

compared to 5.87 for the non-spokes-character group, on a 7-measure scale. This provides support for hypotheses 3a.

> **H3a**: Using a brand spokes-character compared to a non-spokes-character agent in chatbot conversation will lead to higher fit between the brand and the chatbot agent
>
> **Supported**

The effect of brand spokes-character chatbot agents on brand attitude

Using brand spokes-character lead to significantly higher level of brand attitude compared to using the non-spokes-character chatbot agent, with a t-value of 2.006 and p=0.046<0,05. The spokes-character group mean brand attitude 6.07 compared to 5.77 for the non-spokes-character group, on a 7-measure scale. This provides support for hypotheses 4.

> **H4:** Using a brand spokes-character compared to a non-spokes-character in chatbot conversation will lead to a positive total effect on brand attitude
>
> **Supported**

Summary of t-tests

Table 3. t-tests in study 1

Manipulation	Spokes-character		Non-spokes-character			
	n=104		n=86			
Variable	$\bar{x}$	s	$\bar{x}$	s	p-value	t
Anthropomorphism *	5.17	1.37	4.76	1.38	0.046	2.011
Conceptual fluency *	5.59	1.14	5.17	1.15	0.012	2.547
Brand fit *	6.12	0.84	5.87	0.84	0.043	2.039
Brand attitude *	6.07	1.06	5.77	1.03	0.046	2.006

*Note: * Indicates significant* at $p < 0.05$

4.2.2. Testing for mediation

As the manipulation have significant effect on all of the theoretical potential mediators as well as the dependent variable, mediation will be investigated to see whether the higher brand attitude in the brand spokes-character group is due to the hypothesized mediators. Mediation analysis was performed using Hayes Process macro version 4.0. The macro for model 4 was used to test for indirect and direct effects of multiple mediators at the same time. The 3 mediators were thus included as parallel mediators. Bootstrap samples of 5.000 with a confidence interval of 95% was used for all mediation tests.

The mediation analysis shows a significant total effect (effect= 0,1531, SE= 0,0763, CI= 0.0026-0.3037) of the treatment on brand attitude as 0 is not included in the bootstrapped confidence interval, in line with the t-test on brand attitude. The direct effect (effect= 0,0001, SE= 0.0491, CI=-0,0968- 0,0971) are insignificant as the bootstrapped confidence interval contains 0. To test the indirect effects, the 3 theoretical mediators are tested for mediation. The mediation analysis shows support for mediation of all 3 theoretical variables as the bootstrapped confidence interval does not contain 0 for any of the mediators.

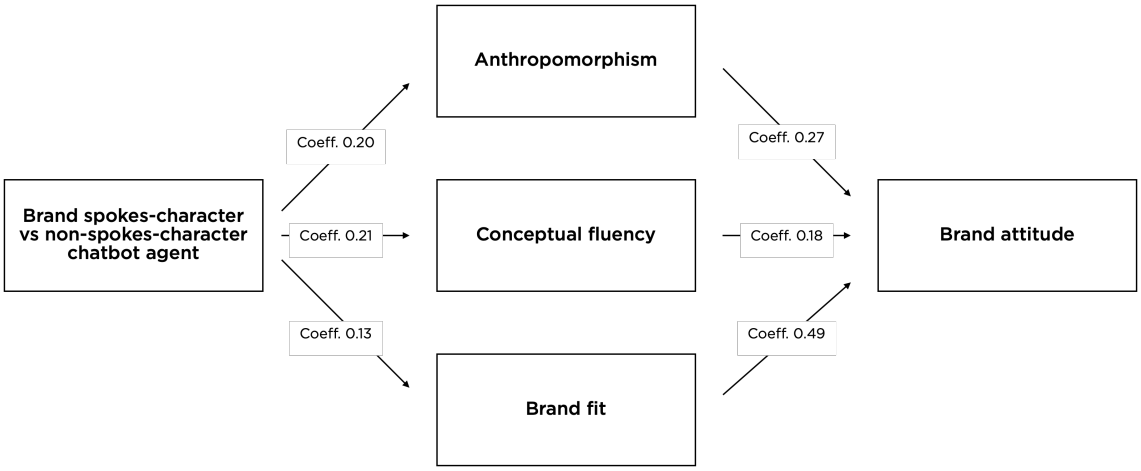
Table 4. Mediation analysis

Brand attitude	Effect	SE	LLCI	ULCI
Anthropomorphism	0.0536	0.0299	0,0010	0,2651
Conceptual Fluency	0.0382	0.0191	0,0063	0,0814
Brand Fit	0.0613	0.0297	0,0027	0,1195

As the direct effect is insignificant, and the indirect effects are all significant, there is an indirect-only mediation (Zhao et al., 2010). Thus, the effects of using brand spokes-character on all 3 mediators and dependent variable are supported in study 1. The correlations between the three mediation variables are all significant. The Pearson correlation coefficient between brand fit and conceptual fluency is 0.62. The Pearson correlation between brand fit and anthropomorphism is 0.52. The Pearson correlation

between conceptual fluency and anthropomorphism is 0.45. The path coefficients from the mediation analysis are reported in relation to the theoretical model below.

Figure 2. Theoretical model with path coefficients



4.2.3. Summary of hypotheses

Table 5. Summary of hypotheses testing in the good chatbot scenario

H1a	Using a brand spokes-character compared to a non-spokes-character chatbot agent will increase the perceived level of anthropomorphism	Supported
H1b	The effect of using a brand spokes-character as a chatbot agent on brand attitude is positively mediated by anthropomorphism.	Supported
H2a	Using a brand spokes-character compared to a non-spokes-character agent in chatbot conversation will lead to higher conceptual fluency between the brand and the chatbot agent	Supported
H2b	The effect of using a brand spokes-character as a chatbot agent on brand attitude is positively mediated by conceptual fluency between the brand and the chatbot agent	Supported
H3a	Using a brand spokes-character compared to a non-spokes-character agent in chatbot conversation will lead to higher fit between the brand and the chatbot agent	Supported
H3b	The effect of using a brand spokes-character as a chatbot agent on brand attitude is positively mediated by the fit between the brand and the chatbot agent	Supported
H4	Using a brand spokes-character compared to a non-spokes-character agent in chatbot conversation will lead to a positive total effect on brand attitude	Supported

4.2.4. Control for prior familiarity with the brand spokes-character

As was mentioned in the method section, an existing brand was used in the experimental scenario, Michelin. As the participants are randomly allocated to the group, prior familiarity and relationship to Michelin should be randomly distributed

between the group. However, the existing relationship is still interesting to investigate on an aggregated level to see the effects that might occur due to any previous relationships. The Pearson correlation between brand attitude and familiarity of the Michelin man before the study is 0.101 with a p-value of 0.17. The relationship between brand attitude and prior brand familiarity was thus small and insignificant.

4.2.5. Effect size

The statistical t-tests enables a statistical inference of whether there is cause and effect (Sawyer & Ball, 1981). To be able to gauge the magnitude of the effect, the effect size is calculated (Sawyer & Ball, 1981). Many experimenters are calling for effect size to complement hypothesis testing (Sawyer & Ball, 1981; Söderlund, 2018). Effect size will be tested using the most common test for experiments containing two groups that are statistically tested through t-test, Cohen's D (Söderlund, 2018). Cohen outlined cutoff points to assess the magnitude of an effect. An effect size of 0.20 indicates a small effect, 0.5 indicates a medium effect size and 0.8 a large effect size for independent sample t-test measures (Sawyer & Ball, 1981).

Table 6. Effect size study 1

Variable	Cohens d
Brand attitude	0.292
Anthropomorphism	0.293
Conceptual fluency	0.371
Brand fit	0.297

The effect magnitude of using a brand spokes-character compared to a non-spokes-character chatbot agent on both the mediators and dependent variable thus falls between small and medium in study 1.

4.3. Discussion

Study 1 provides support for the theoretical framework and hypotheses outlined in the theoretical section. The use of the brand spokes-character led to significantly more favorable brand attitude compared to using a non-spokes-character agent. Furthermore, the positive effect on brand attitude was mediated by all three of the mediators suggested in the theoretical framework, anthropomorphism, conceptual fluency, and brand fit. Additionally, the effect on brand attitude was only significant through the 3 mediators, not as a direct effect. This illustrated the importance of the outlined mediators to explain the relationship between using brand spokes-characters and brand attitude.

For researchers, this result provides support for some links previously explored as well as unexplored in prior research. In line with earlier research (e.g., Aggarwal & McGill 2012; Fournier, 1998; Liao et al., 2011), the fact that brand spokes-characters can lead to higher level of anthropomorphism was supported and extended to this new context of virtual chatbot agents. Additionally, the study supports the previously commonly suggested notion that increased anthropomorphizing of virtual agents can lead to more favorable customer responses (e.g., Jenneboer et al., 2022; Kull et al., 2021; Laban & Araujo, 2020; Söderlund & Oikarinen, 2021). The novel contribution of this study in relation anthropomorphism is mainly to illustrate the potential of utilizing brand spokes-characters in the new context of chatbot agents to draw advantage of the prior known theoretical mechanisms.

Study 1 also expands the applicability of the research on brand connection of human frontline employees in service encounters. In earlier research (such as Sirianni et al, 2013), conceptual fluency has mainly been studied in relation to human employees, as opposed to virtual agents tested in this study. It is here argued that the anthropomorphism occurring in relation to virtual agents would make the theoretical mechanism relevant in a wider context, namely virtual agents. Additionally, these virtual chatbot agents explicitly replace human frontline employees. This increases the importance of understanding if the effects previously understood related to human employees can be applied on anthropomorphized virtual agents and at the same time increases the likelihood that similar effects can potentially be expected. This argument

was indeed supported in the study as higher conceptual fluency perceived between the virtual agent and the brand significantly positively mediated the impact on brand attitude. The concept of conceptual fluency was thus found to also be applicable for virtual agents as opposed to only human employees as previously explored. Using the brand spokes-character could enable a higher understanding of information, such as brand meaning due to having higher alignment with the brand and previous and other communications from the brand.

In addition to conceptual fluency, fit between the brand the virtual agent sheds light on another important phycological mechanism more closely related to perceptual fluency. Higher alignment between the brand and the agent was shown to ease the processing of the chatbot experience, with higher brand attitude as a consequence. Research on brand extensions have to the author's knowledge previously not been used to understand the connection between virtual agents and brand. The study provides support that the same psychological mechanisms are in play when it comes to the relationship between brand and virtual agent as the relationship between a new brand extension and the brand. Both conceptual and perceptual fluency are thus important explanatory variables.

This study thus provides support for companies using brand spokes-characters in their online service encounters with customers. Still, it is rare to encounter brand spokes-characters used in this context today (The present author has never encountered a brand spokes-character as a chatbot agent). However, different levels of brand connections can be found in chatbot agents, for instance some virtual agents exhibiting more brand related features such as in the name, colors, or other visual attributes. The result of study 1 highlights the fact that brand spokes-characters should potentially be considered to be used in more contexts, such as those enabled by digitalization and the increasing importance of human-robot service encounters. While the results were significant, the effect size was small to medium. This is not surprising seeing as the manipulation is relatively modest in magnitude, with no functional differences in the conversation.

However, Study 1 only investigated the effects in a context where the chatbot was providing highly appropriate and competent answers, which does not always occur in practice due to variability in how the customer interacts with the chatbot. Study 2 looks into the same treatment differences in a context where the chatbot provides less

appropriate and helpful answers to the customer in the interaction to be able to draw conclusions as to whether not brand spokes-characters are always suitable to use in online service encounters.

5. Study 2

Study 2 tests the theoretical framework and hypotheses in the context of a poor chatbot interaction. Compared to study 1, the chatbot agent is not able to understand all of the questions or suggest appropriate answers or questions to move the knowledge of the customer forward. Thus, the transcript reflects an unhelpful chatbot experience. It will hereafter be referred to as the poor chatbot scenario. The aim of the poor scenario was not to be outrageously bad, but rather to represent the common situation where the chatbot is not able to provide a satisfactory performance. To ensure that the chatbot was not unrealistically bad, many chatbots were tested and provoked with questions that they had trouble answering. Inspiration was taken from these real chatbot conversations. Exactly like in study 1, the participants were exposed to and instructed to look at a screenshot of the webpage where they had selected a tire but were unsure which tire size to choose for their car. The measures and the manipulation are the same as in study 1 to facilitate direct comparison. The scenario design can be seen in appendix 7.1.1 and the full chatbot transcript in appendix 7.1.3.

5.1. Sample

Same as in the first study, 240 participants were recruited and spread across the two manipulation groups in study 2. 191 participants passed the attention and instructional manipulation checks, as well as the minimum duration demand, leaving 106 participants in the brand spokes-character manipulation and 85 participants in the non-spokes-character agent manipulation.

5.2. Data analysis

The manipulation checks were significant and confirmed that the participants understood the manipulation of the chatbot agent. The higher order latent variables associated with the use of the brand spokes-character compared to a non-spokes-character agent, namely the perceived connection in appearance between the chatbot agent and the brand ($t=5.043$, $p<0{,}001$) and the degree of similarities between the brand

and chatbot agent (t=4.641, p<0.001) was significantly higher for the brand spokes-character group. The mean perceived connection in appearance was 4.68 for the spokes-character agent and 3.38 for the non-spokes-character agent. The mean perceived degree of similarities was 4.11 for the spokes-character agent and 3.05 for the non-spokes-character agent.

5.2.1. Testing of hypotheses

As the same measures are used in study 2 as in study 1, the same statistical testing consisting of independent sample t-tests is conducted to statistically compare the differences in means. Additionally, descriptive statistics of the mean and standard deviation for each variable will be presented. Significance is determined on two-sided p-values under 0,05. The assumption of equal variance was met for all theoretical variables as the p-value was above 0.05 for all variables.

Table 7. Levene's test for homogeneity of variances

Variable	Levene statistic	p
Anthropomorphism	1.02	0.31
Conceptual fluency	0.04	0.85
Brand fit	3.62	0.06
Brand attitude	0.17	0.68

The effect of brand spokes-character chatbot agents on anthropomorphism

Using brand spokes-character compared to a non-spokes-character chatbot agent did not lead to a significant difference in level of anthropomorphism, with a t-value of 1.162 and p=0.29>0,05. The spokes-character group average degree of anthropomorphism was 1.80 compared to 1.98 for the non-spokes-character group, on a 7-measure scale. Hypothesis 1a is thus not supported in study 2 in contrast to study 1.

H1a: Using a brand spokes-character compared to a non-spokes-character chatbot agent will increase the perceived level of anthropomorphism

Not supported

The effect of brand spokes-character chatbot agents on conceptual fluency

Using brand spokes-character compared to a non-spokes-character chatbot agent did not lead to a significant difference in level of conceptual fluency, with a t-value of 1.061 and p=0.258>0,05. The spokes-character group average degree of anthropomorphism was 3.37 compared to 3.12 for the non-spokes-character group, on a 7-measure scale. Hypothesis 2a is thus not supported in study 2 in contrast to study 1.

H2a: Using a brand spokes-character compared to a non-spokes-character agent in chatbot conversation will lead to higher conceptual fluency between the brand and the chatbot agent

Not supported

The effect of brand spokes-character chatbot agents on brand fit

Using brand spokes-character lead to significantly higher level of brand fit compared to using the using the non-spokes-character chatbot agent, with a t-value of 2.080 and p=0.035<0,05. The spokes-character group mean degree of perceived brand fit was 2.93 compared to 2.47 for the non-spokes-character group, on a 7-measure scale. This provides support for hypotheses 3a.

H3a: Using a brand spokes-character compared to a non-spokes-character agent in chatbot conversation will lead to higher fit between the brand and the chatbot agent

Supported

The effect of brand spokes-character chatbot agents on brand attitude

Using brand spokes-character compared to a non-spokes-character did not lead to a significant difference in brand attitude, with a t-value of 0.681 and p=0.497<0,05. The spokes-character group mean brand attitude was 2.70 compared to 2.84 for the non-spokes-character group, on a 7-measure scale. Hypothesis 4 is thus not supported in study 2 in contrast to study 1.

H4: Using a brand spokes-character compared to a non-spokes-character in chatbot conversation will lead to a positive total effect on brand attitude

Not supported

Summary of t-tests

Table 8. t-tests in study 2

Manipulation	Spokes-character n=106		Robot n=85			
Variable	$\bar{x}$	s	$\bar{x}$	s	p-value	t
Anthropomorphism	1.80	0.94	1.98	1.17	0.258	1.162
Conceptual fluency	3.37	1.66	3.12	1.66	0.290	1.061
Brand fit *	2.93	1.63	2.47	1.34	0.035	2.080
Brand attitude	2.70	1.46	2.84	1.37	0.497	0.681

*Note: * Indicates significant* at p < .05.

5.2.2. Bayesian testing of insignificant result

As the t-test is not able to tell us whether the null hypothesis is true, other methods such as Bayesian methods are needed to evaluate whether the null-hypothesis can be supported (Rouder et al., 2009; Söderlund 2018). When a t-test is insignificant it could either be an indication that the data is insensitive and that no conclusion can be drawn,

or it could indicate support for the null-hypothesis (Dienes, 2014). As there was no significant difference in the dependent variable, brand attitude, between the treatment groups, a test to determine whether it can statistically be argued that there is no effect on the dependent variable was therefore performed using Bayesian statistics. The JZS bayes-factor is used as it is a suitable equation to use as a default when conducting Bayesian t-tests (Rouder et al., 2009). An online calculator created and referenced by the researchers behind the JZS-equation was used (ibid). The t-value from the t-test (0.681) as well as the sample sizes (85 and 106) were entered and following the recommendations of Rouder et al (2009) the scale r on effect size was set to 1 as this is a natural benchmark and suitable default to use when no effect size was predicted prior to the data analysis. The Bayes factor indicates the likelihood that the null hypotheses is true compared to the alternative hypothesis. A bayes factor of B means that the result is B times more likely to occur under the null than the alternative (Dienes, 2014). A JZS Bayes Factor of above 10 strongly favors the null-hypotheses and a Factor over 3 favors the null-hypothesis. A Factor below 1/3 favors the alternative hypothesis and a Factor below 1/10 strongly favors the alternative hypothesis. The cutoff of 3 and 1/3 respectively is roughly equal to a p-value of 0,05, but the exact correspondence depends on the effect size and the preciseness of the alternative hypothesis (ibid). The JZS bayed factor in this study was 7.02 which falls in-between strongly favoring the null hypothesis and favoring the null hypothesis. The null hypothesis in the study is more probable than the alternative with a factor of about 7 to 1.

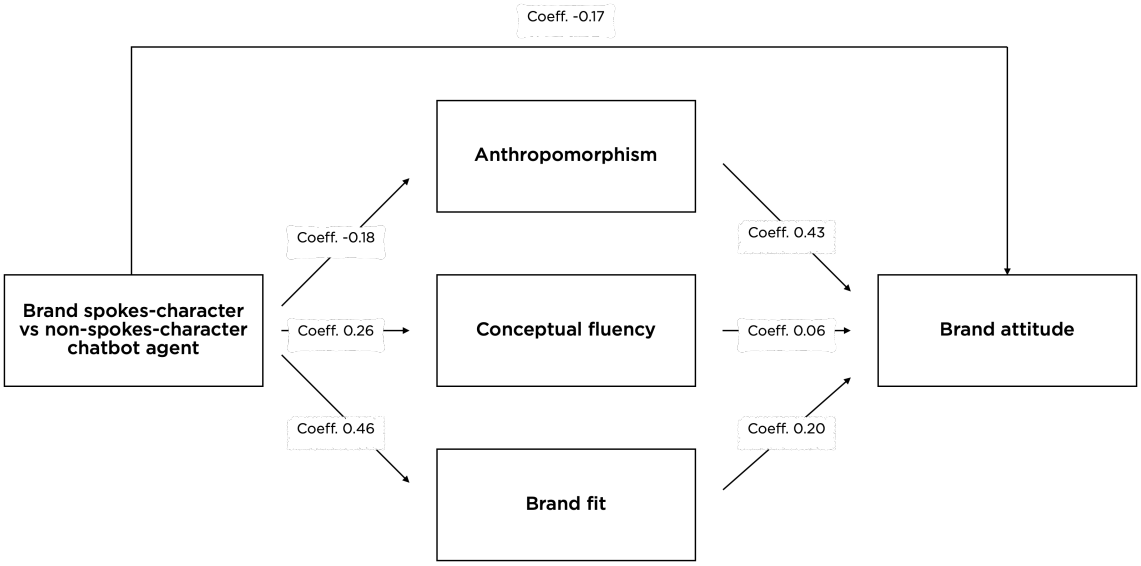
5.2.3. Testing for mediation

The manipulation in study 2 only yielded significant effect on one of the potential mediators, brand fit, and found no total effect as the independent variable did not have a significant effect on the dependent variable. When the total effect is insignificant, some scholars, such as Baron & Kenny (1986) conclude that no mediation is possible. However, more contemporary research disputes this argument and claims that mediation is possible even if there is no significant relationship between the independent and dependent variable, as the indirect and direct effect can be significant in opposite directions (Zhao et al., 2010). Therefore, mediation analysis was performed despite the lack of total effect. The mediation analysis showed a lack of significant direct effect

(effect=-0.14, SE=0.21, LLCI=-0.54, ULCI=0.20) in addition to the insignificant total effect which signals that there is no mediation in study 2.

The correlations between the three mediation variables were all significant. The Pearson correlation coefficient between brand fit and conceptual fluency is 0.37. The Pearson correlation between brand fit and anthropomorphism is 0.32. The Pearson correlation between conceptual fluency and anthropomorphism is 0.29. The path coefficients from the mediation analysis are reported despite the absence of mediation below for transparency.

Figure 3. Theoretical model with path coefficients



Summary of hypotheses

Table 10. Summary of hypotheses testing in the poor chatbot scenario

H1a	Using a brand spokes-character compared to a non-spokes-character chatbot agent will increase the perceived level of anthropomorphism	Not supported
H1b	The effect of using a brand spokes-character as a chatbot agent agents on brand attitude is positively mediated by anthropomorphism.	Not supported
H2a	Using a brand spokes-character compared to a non-spokes-character agent in chatbot conversation will lead to higher conceptual fluency between the brand and the chatbot agent	Not supported
H2b	The effect of using a brand spokes-character as a chatbot agent on brand attitude is positively mediated by conceptual fluency between the brand and the chatbot agent	Not supported
H3a	Using a brand spokes-character compared to a non-spokes-character agent in chatbot conversation will lead to higher fit between the brand and the chatbot agent	Supported
H3b	The effect of using a brand spokes-character as a chatbot agent on brand attitude is positively mediated by the fit between the brand and the chatbot agent	Not Supported
H4	Using a brand spokes-character compared to a non-spokes-character agent in chatbot conversation will lead to a positive total effect on brand attitude	Not supported

5.2.4. Control for prior familiarity with the brand spokes-character

The Pearson correlation between brand attitude and familiarity of the Michelin man before the study is -0,013 with a p-value of 0.86. The correlation between the familiarity

with the Michelin man before the study and the brand attitude was thus small and insignificant.

5.2.5. Effect size

As was done for study 1, the effect size was calculated to be able to gauge the magnitude of the effect. As there was only a statistically significant effect for brand fit, only the brand fit effect size was calculated. An effect size of 0.20 indicates a small effect, 0.5 indicates a medium effect size and 0.8 a large effect size for independent sample t-test measures (Sawyer & Ball, 1981). The Cohen's D effect size for brand fit in study 2 was 0.303, similar to the effect for brand fit in study 1 of 0.297.

5.3. Discussion

The theoretical framework is not supported in study 2, which tested the framework in the context of a poor chatbot experience. No significant difference in brand attitude could be found due to the difference in treatment between the two groups. Furthermore, only brand fit was found to be significantly affected by the use of the spokes-character chatbot agent. The difference in evaluation of the chatbot experience in study 1 vs study 2 was considerable (5.99-6.13 in study 1 and 1.67-1.88 in study 2). This confirms that study 1 and study 2 represent a good and poor chatbot experience respectively.

Not rejecting the null hypothesis with t-tests does not entail that it can statistically concluded that using a brand spokes-character compared to a non-spokes-character does not have any effect on brand attitude when the chatbot experience is poor. When a t-test is insignificant it could either be an indication that the data is in sensitive and that no conclusion can be drawn, or it could indicate support for the null-hypotheses (Dienes, 2014). Therefore, Bayesian methods were used to assess whether the data is in support of the null hypothesis that there are no differences in brand attitude when using the brand spokes-character compared to the non-spokes-character chatbot agent. The Bayes factor indicates support for the null hypotheses, meaning that it can be argued that the manipulation did in fact not have effect on the dependent variable, brand attitude. The

lack of support for using brand spokes-characters on brand attitude in the poor chatbot scenario will therefore be discussed.

Parts of the theoretical framework relies on the fact that participants will anthropomorphize the chatbot agent. In particular the mediator directly related to anthropomorphism, but the theoretical foundation of conceptual fluency also relies on the fact that the virtual agent exhibits similar responses to humans. In a scenario where the chatbot agent obviously struggles to be helpful and respond as a human would, it is not likely that the same anthropomorphism experienced in study 1 will occur. This is apparent when comparing levels of anthropomorphism between study 1 and study 2 (mean anthropomorphism = 1.8-1.98 in study 2 vs 4.76-5.17 in study 1). This could explain why neither anthropomorphism nor conceptual fluency could be found to mediate the relationship. An obviously inhuman agent may therefore not be perceived as human enough for the theoretical concept to be applicable. As study 1 showed there were only indirect effects, no direct effect, of the manipulation on brand attitude, and as two of the three mediating effects may not be applicable when anthropomorphism is much smaller, this could also explain the lack of effect in brand attitude. Additionally, while anthropomorphism can lead to more favorable evaluations, there are also conflicting views when it comes to anthropomorphism as it increases expectations, thus leading to a mismatch in the context of a bad chatbot experience (Crolic et al., 2021). Similarly, it can be argued that the predicted increased anthropomorphism of the brand spokes-character was overshadow by the obvious inhumanness resulting from a chatbot that could not fully understand the customer questions. The fact that brand fit was significantly higher for the spokes-character in indicates that it is a relevant variable for the change of chatbot agent, despite the lack of mediating effect in study 2.

6. General discussion & Conclusion

The purpose of this study was to investigate the effects on brand attitude of using brand spokes-character as chatbot agents in interactions with customers. Study 1 supported the notion that using brand spokes-characters does indeed have the potential to improve brand attitude compared to using a non-spokes-character chatbot agent in the context of a good chatbot conversation. This effect was shown to be mediated by anthropomorphism, conceptual fluency as well as brand fit. Study 2 tested the same treatment in the context of a poor chatbot experience. The evaluation of the chatbot experience was vastly different between the two studies (the mean chatbot evaluation was 6.07 in study 1 and 1.74 in study 2). In contrast to study 1, study 2 found no support for differences in brand attitude as a consequence of using brand spokes-character as chatbot agents in the context of a poor chatbot experience. On the contrary, through Bayesian methods, support was found for the null hypothesis, that there is no difference in brand attitude stemming from the different chatbot agents in the poor chatbot scenario. The two studies offered important insights into the mechanisms for how chatbot agents can impact outcomes for the company and investigated the specific effects of using brand spokes-characters as a chatbot agent, which to the best of the author's knowledge is previously theoretically unexplored. The findings offer insights into both general research field of virtual agents and anthropomorphism but also more specifically on the use of brand spokes-characters as interactive virtual agents.

6.1. The effects on brand attitude

Study 1 found support for beneficial effects on brand attitude that can be achieved by using brand spokes-characters as chatbot agents. Study 2 did not find support that using a brand spokes-character was either negative or positive, as the Bayesian factor indicates that it indeed yielded no difference in brand attitude. Thus, the two studies together give an indication that the benefits of using the brand spokes-character in a positive chatbot scenario can outweigh any potential drawbacks of using a brand spokes-character in a negative chatbot scenario. In contradiction to these results, it is

very rare to encounter brand spokes-characters utilized to their full extent as interactive virtual agents.

The effect size on attitude is classified as small to moderate in study 1 (study 2 effect size is naturally small as there was no significant effect). This does not mean that the choice of chatbot agent is unimportant. Rather, seeing as the manipulation requires no functional change whatsoever of the chatbot, in terms of better performance or writing the answers in a different way, it would be surprising if there would be a huge effect size. On the contrary, the fact that there is no functional change in the performance of the chatbot makes it trivially easy to implement. While the present study could not statistically confirm that using brand spokes-character is better in every circumstance, it has been shown that using brand spokes-characters could be more suitable in certain situations. Implementing and A/B testing brand spokes-character vs the current chatbot agent would be easy to test both if the chatbot is delivering sufficiently good performance for the positive effects outlined in study 1, and specifically to compare chatbot evaluation directly between the different agents.

6.2. The effects of the mediators

In both studies, brand fit was shown to be positively impacted by using a brand spokes-character as a chatbot agent. Although only study 1 found support for a mediating effect, prior research (Aaker & Keller, 1990; Lee & Labroo, 2004) has shown that brand fit can positively impact brand responses such as brand attitude. As to the best of the author's knowledge, brand fit has previously largely been unexplored in research relating to virtual agents, this is a particularly interesting finding highlighting the potential importance of brand fit in this context. Compared to the other mediators, anthropomorphism and conceptual fluency, there is no particular need for humanness to explain the reason for why this mechanism impacts brand attitude. On the contrary, this mechanism has previously been used to explain attitudes toward expanding into new product categories, where the fit between what the brand usually does, and the new product is the fundamental research interest. The ease to process the relationship between the brand and the chatbot agent was thus higher regardless of whether the

chatbot answers made sense (as in study 1) or not (as in study 2), but only had significant effects on brand attitude in the good chatbot scenario.

For the remaining two mediators, anthropomorphism, and conceptual fluency, only study 1 supported mediation between using a brand spokes-character and brand attitude. As mentioned previously, there is reason to suspect that any potential increase in anthropomorphizing resulting from using a brand spokes-character was overshadowed by the virtual agent obviously struggling to answer as a human would. The level of anthropomorphism in the poor chatbot scenario is undoubtedly much lower than in the good chatbot scenario (the mean level of perceived anthropomorphism was 4.99 in study 1 compared to 1.88 in study 2). Following the same reasoning, conceptual fluency, which in the theoretical section was based fundamentally on research on human agents, can be considered less applicable. Additionally, the potential to convey any kind of brand meaning, a core aspect of why conceptual fluency could increase brand responses, would be hindered by a dysfunctional chatbot agent. The fact that the mediators could be less applicable depending on the situation is not surprising, especially as the manipulation, the chatbot agent, is closely connected to the messages written by the agent.

6.3. Managerial and practical implications

One of the key findings for practitioners is that companies with brand spokes-characters should explore utilizing them more. Digitalization changes the marketing and branding landscape (Liao et al., 2011) and brand spokes-characters which normally have been used in traditional static marketing context can now be used in more interactive ways. More companies should utilize the opportunities digitalization brings, in the form of interaction between customer-to virtual agents.

Another key finding from a practical perspective is that companies without spokes-characters now have additional incentives to create these entities. In addition to using spokes-characters in static marketing communication, they can now fill a function for brand building in the new ways companies interact with customer due to technological developments and shifts in society. Increasingly, virtual agents are used to facilitate service encounters online (Larivière et al., 2017), and maintaining and improving the

way these virtual agents are able to replace the relationship building of human frontline employees will therefore be of increasing importance. It is also probable that using brand characters in interactions with customers is a way to strengthen the brand characters. This was not explicitly tested in this study, but as shown by previous research, anthropomorphized interactions facilitate making relations (Kull et al., 2021), which is a crucial part of creating a strong brand spokes-character. Additionally, spokes-character familiarity was not significantly correlated with the positive effect on brand attitude in either of the studies. This indicates that companies with newer, or presently non-existent, brand spokes-characters have the possibility to experience the benefits of creating one quickly. These online interactive service encounters could thus be a potentially useful way to create and use brand spokes-characters.

When designing the manipulation in the study, it was purposefully chosen to focus on a simple facet of the chatbot experience that is easy to manipulate without any technical limitations. The conversations were exactly the same between the treatments. While the content of the chatbot conversation was shown to impact whether brand spokes-character have benefits, no improvement of the actual conversation has to be made for the benefits of brand spokes-character over non-spokes-character agents in study 1. As conversational chatbot agents are predicted to continue to improve, the number of chatbots able to provide sufficiently good conversations to lean closer to study 1 rather than study 2 is likely to increase continuously.

6.4. Conclusion

The purpose of this study was to investigate the mechanisms and effects on brand attitude of using brand spokes-character for interacting with customers though chatbots. Through two studies the effects of using a brand spokes-character as a chatbot agent were investigated. When the chatbot experience was and was perceived as good, brand spokes-characters led to a higher brand attitude among the participants through increased anthropomorphism, conceptual fluency, and brand fit. When the chatbot experience was and was perceived as poor, no significant results could be found relating to brand attitude, anthropomorphism, or conceptual fluency. Brand fit was however still found to be impacted by brand spokes-character as a chatbot agent, but was not found to

be a significant mediator. Therefore, this study concludes that using brand spokes-characters as chatbot agents have the potential to lead to more favorable attitudes in some contexts.

6.5. Limitations and future research

This study tested brand spokes-characters as chatbot agents using a real and well-known brand. Brand spokes-characters by definition need to have been used consistently in conjunction with the products that it relates to (Callcott & Lee, 199; Phillips & Gyoerick, 1999), which made using an existing brand-spokes-character necessary. However, the applicability outside of this specific company can be questioned. The prior relationship that the participants have toward the company Michelin will impact the results, even if prior relationship should be randomly spread across the two groups. However, to be able to make statements and apply the results of this study in other circumstances, general theory has been used to make the claims. If the theory is indeed general, it can be tested in specific experimental situations (Söderlund 2018). Still, further studies using other brands and spokes-character should be conducted to test the validity of the results in this study. Furthermore, other ways of testing similar phenomena could be imagined. For instance, exploring varying degrees of connectedness to the company and brand through other means than using brand spokes-characters. Such examples could include varying the color of the agent to match the brand or making the agent more similar to the company and its product, such as using an anthropomorphized car as the agent for a car manufacturer compared to using something with less similarity to the company.

The difference in evaluation of the chatbot experience in study 1 vs study 2 was considerable (the mean chatbot evaluation was 6.07 in study 1 and 1.74 in study 2). The differences are as intended quite large, as the scenarios were intended to represent either a good or bad experience. However, the extent to which the experience is good or bad can occur on a continuum and it would therefore be useful to test the theoretical concepts and manipulation with more neutral chatbot experiences.

The digital nature of chatbots present a range of opportunities for testing the experiment in real situations. It would for instance be possible to A/B test different chatbot agents

to find the one that gives the most favorable customer responses. The ease of changing the chatbot agent in a similar way as done in this study highlights the high level of applicability and usefulness of changing the chatbot agent. To complement this experimental study, practical implementations testing the same theoretical concepts could contribute further, both generally and for the specific situation.

Default measures were used for Bayesian statistics as no prior effect size was estimated before the data analysis was performed. If effect sized had been estimated a priori to conducting the experiment, the Bayesian tests in study 2 could have been tailored more specifically to the concepts tested. However, that would have required knowing that Bayesian statistics would be used before conducting the research (Rouder et al., 2009).

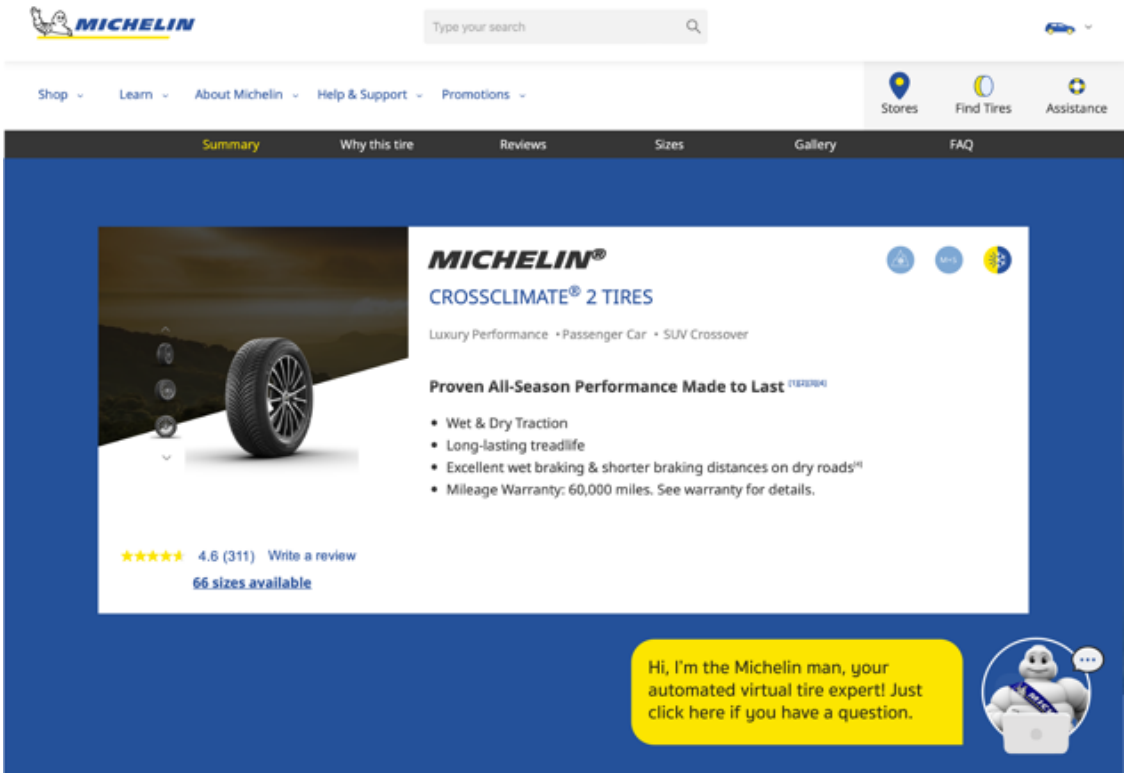
The effect sizes for all of the significant effects were relatively small. This limits the strength of the relationships discussed. However, as briefly mentioned before, the manipulation is rather discrete and functionally unimportant, where larger effect sizes would be surprising and unlikely.

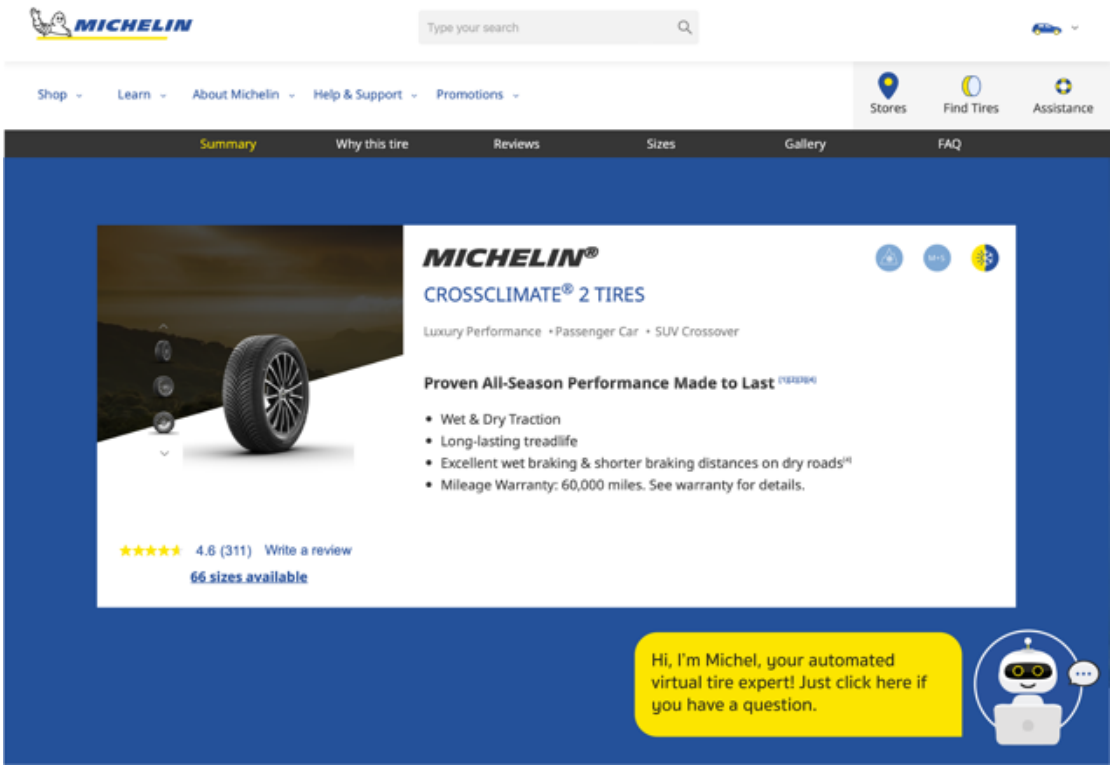
7. Appendix

7.1. Survey design

7.1.1. Scenario design

Imagine that you are interested in buying new tires for your car as your existing tires are getting worn out. You've looked around at the Michelin website and identified the tire model that you want, but you are unsure which tire size to choose from the 66 sizes available. You see a chatbot icon in the lower right corner asking if you would like help from the Michelin man, an automated virtual agent. [One of the following designs were randomly shown to the participants]

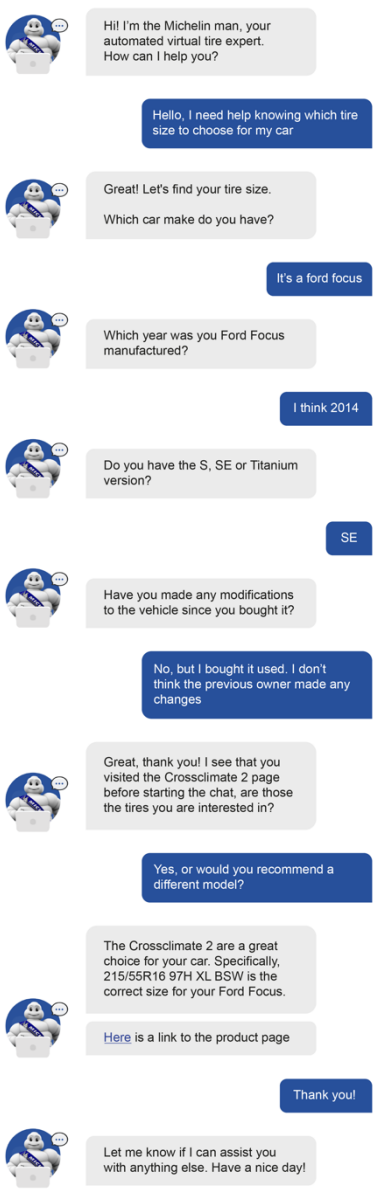


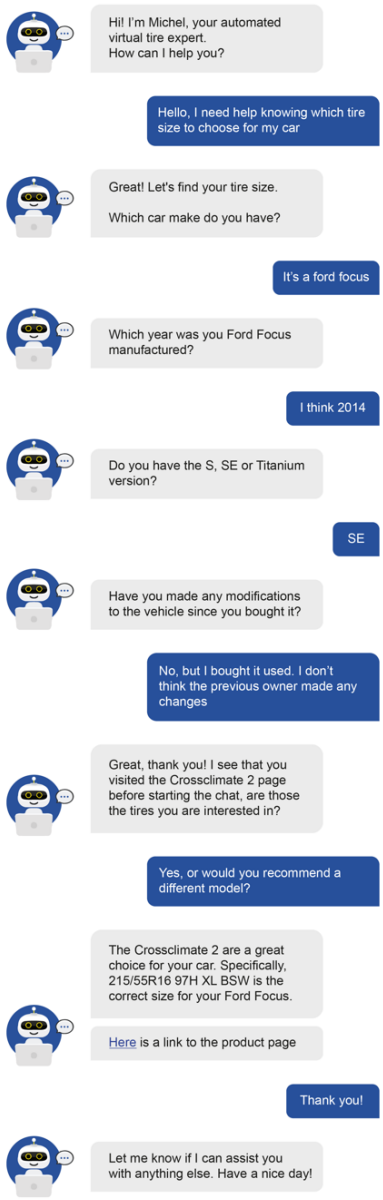


You click the icon and start chatting with the Michelin man to try to find your tire size. The transcript below shows the conversation in full. Please read the conversation transcript carefully and imagine that you are the one chatting with the Michelin man.

7.1.2. Study 1 chat transcript

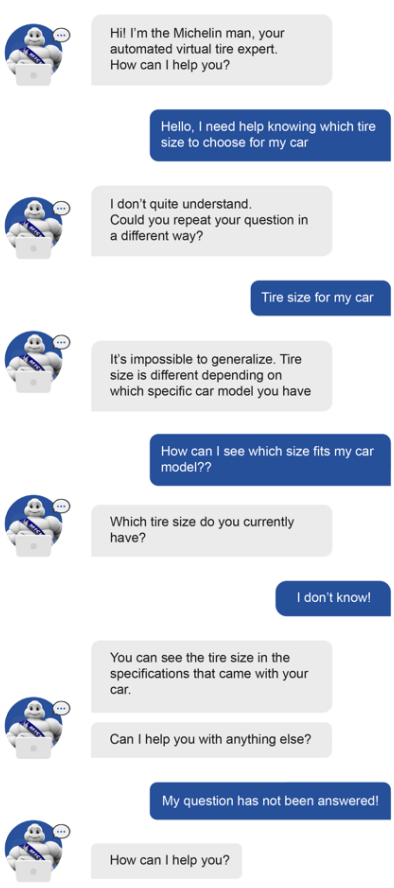
The transcript corresponding to the agent they saw in the screenshot of the website was shown to the user.

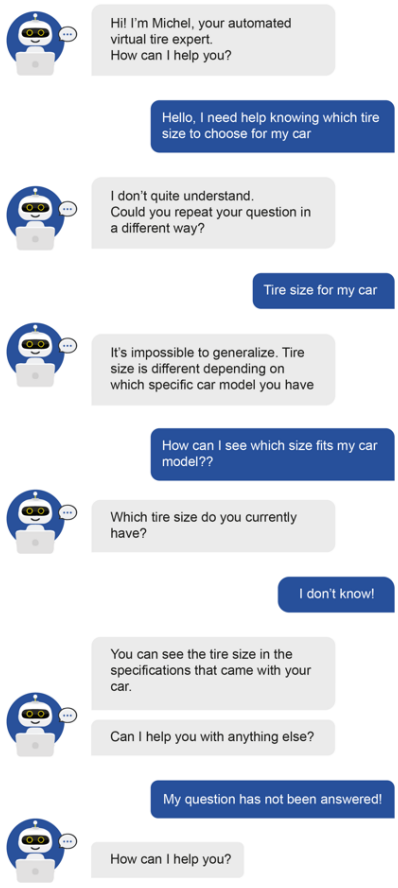




7.1.3. Study 2 chat transcript

The transcript corresponding to the agent they saw in the screenshot of the website was shown to the user.





7.1.4. Questionnaire items

How much do you agree with the following statements?

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
The chatbot agent is a good fit with the Michelin brand	○	○	○	○	○	○	○
The chatbot agent is consistent with the Michelin brand image	○	○	○	○	○	○	○
The chatbot agent is representative of Michelin	○	○	○	○	○	○	○

How much do you agree with the following statements after chatting with the chatbot agent?

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I have a clear understanding of what this brand stands for	○	○	○	○	○	○	○
It was easy for me to identify what this brand represents to customers	○	○	○	○	○	○	○
It was easy for me to describe what this brand represents to customers.	○	○	○	○	○	○	○

Select the number 5 from the options below

7	5	3	2
○	○	○	○

Please rate your impression of the chatbot on these scales:

Fake	○ ○ ○ ○ ○ ○ ○	Natural
Machinelike	○ ○ ○ ○ ○ ○ ○	Humanlike
Artificial	○ ○ ○ ○ ○ ○ ○	Lifelike
Communicating rigidly	○ ○ ○ ○ ○ ○ ○	Communicating elegantly

→

What is your overall evaluation of the chatbot?

Poor	○	○	○	○	○	○	○	Good
Do not like	○	○	○	○	○	○	○	Like
Negative impression	○	○	○	○	○	○	○	Positive impression

What is your attitude toward the brand after chatting with the chatbot?

Bad	○	○	○	○	○	○	○	Good
Negative	○	○	○	○	○	○	○	Positive
Very unfavorable	○	○	○	○	○	○	○	Very favorable

→

There is a high connection between the appearance of the chatbot agent and the brand it represents

Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
○	○	○	○	○	○	○

The chatbot agent has many similarities with the brand it represents

Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
○	○	○	○	○	○	○

Who did you chat with in the scenario described at the beginning of the survey?

- ○ John, an automated virtual agent
- ○ The Michelin man, an automated virtual agent
- ○ John, a human service agent
- ○ Michel, an automated virtual agent

→

How familiar are you with the brand Michelin?

Not at all familiar	○	○	○	○	○	○	○	Very familiar

How much do you know about tires?

Not at all much	○	○	○	○	○	○	○	Very much

Have you ever purchased anything from Michelin?

- ○ No
- ○ Not sure
- ○ Yes

(Optional) To which gender identity do you most identify?

What is your age?

What is your relationship to the "Michelin Man" before this survey?

Not at all familiar	○	○	○	○	○	○	○	Very familiar
Do not like	○	○	○	○	○	○	○	Like
Negative impression	○	○	○	○	○	○	○	Positive impression

I would know how to find the tire size of a car without seeking help

Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
○	○	○	○	○	○	○

Who did you chat with in the scenario described at the beginning of the survey?

1	2	3	4
			
○	○	○	○

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