

VIRTUAL(LY) HUMAN:

**HOW ANTHROPOMORPHIC PRESENTATIONS OF VIRTUAL
HUMANS IN ADVERTISEMENTS AFFECT CONSUMER
ATTITUDES AND INTENTIONS**

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Bachelor Thesis

Stockholm School of Economics

2019



Virtual(ly) Human: How Anthropomorphic Presentations of Virtual Humans in Advertisements Affect Consumer Attitudes and Intentions

Abstract:

The phenomenon of virtual influencers – artificially intelligent virtual humans – can today be observed on social media platforms. Little is yet known about the effects of using such non-human entities in an advertising context. This thesis therefore examines one important theoretical determinant of trust in non-human agents, namely anthropomorphic text presentation in advertisements on consumer attitudes and intentions. 2×2 between-subjects experimental results from n=137 participants demonstrate that an anthropomorphic text indeed have an impact on ad attitudes, intentions towards the virtual human, and advertisement WOM intentions. While the likeability of the virtual human presented in the ad mediated this relationship, technological knowledge but not previous experience with virtual agents moderated respondents' tendency to anthropomorphize. Drawing on theories of anthropomorphism and human-computer interaction (HCI), these findings have important implications for marketing practitioners using spokes-characters such as virtual influencers in their advertisements.

Keywords:

Anthropomorphism, Virtual influencer, Computer-Generated Imagery, Artificial intelligence, Marketing, Attitudes, Intentions

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Bachelor Thesis

Bachelor Program in Business and Economics

Stockholm School of Economics

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1. Introduction

Technology is becoming an increasingly common part of human life. In today's modern society, technology has become integral to human functioning, and, in some cases, even a substitute for it. Sophisticated machines now perform tasks that once required a thoughtful human mind, from grading essays to diagnosing cancer to driving cars (Waytz, Heafner & Epley, 2014). What ultimately enables this development is the evolution of artificial intelligence (AI), computer algorithms, machine/deep learning, and robotics. From its inception in the 1950s, modern AI has influenced almost every aspect of human activity, and the development and utilization of AI devices has increased notably during the last few years (Duan, Edwards & Dwivedi, 2019). This progress enables consumers to engage and interact with computer-based robots and virtual agents in a never-before-seen manner.

Interestingly, a new trend of such human-computer interaction (HCI) can be found on social media platforms, namely Computer Generated Imagery (CGI) or CGI influencers. These are influencers just like any other social media influencer on the Internet, except the fact that they are not real humans. As suggested by the name, they are generated by computers and often run by AI algorithms that post pictures and content on social media whilst engaging millions of followers worldwide. Following the first CGI influencer introduced in 2016, they are now starting to revolutionize influencer marketing and how consumers interact with brands utilizing such virtual humans (Barker, 2019).

With the power of modern computer graphics capable of generating highly photo-realistic images (Holmes, Bank & Farid, 2016), in combination with the use of AI, technology is starting to challenge our ability to discern what is human (MacDorman, Green, Ho & Koch, 2009). As engineers overcome design barriers to creating such technology, important psychological barriers that users will face when interacting with this technology instead emerge (Waytz et al. 2014). Despite not being real, the benefits for brands of using virtual humans (i.e., humanlike computer-based virtual characters) in marketing efforts are apparent. Unlike humans they can be replicated, does not need to sleep, does not get bored, and does not require a paycheck (Fox et al., 2015). Yet, research has long demonstrated that robots designed to look and behave like humans may decrease consumer attitudes, due to eeriness if its appearance is perceived as too similar to humans (Ho & MacDorman, 2017).

Nevertheless, due to the fairly recent rise of the phenomenon of virtual influencers, research has not provided a framework for understanding how consumers may react when brands use such virtual humans in marketing communications. The present study will therefore examine one important theoretical determinant of trust in non-human agents, namely *anthropomorphism*, defined as the process of attributing distinctively

human characteristics to non-human objects (Waytz, Cacioppo, & Epley, 2010). Hence, this thesis aims to study the effects of consumers' psychological reactions in terms of attitudes and intentions when advertising containing virtual humans is presented in such a way that evokes anthropomorphism among its recipients, specifically through anthropomorphic texts in advertisements.

1.1. Background

1.1.1. Robotics and Artificial intelligence

Ever since its introduction in the 1950s, the field of artificial intelligence (AI) has witnessed alternating periods of intense growth and significant decline. In recent years, factors such as increasing computational power and availability of *Big Data*, have led to renewed interest in the field (Baryannis, Validi, Dani & Antoniou, 2019). Whether looking at robots used in assembly lines in automotive manufacturing or clinical decision support systems utilized by hospitals, AI technology has become a critical component of doing business in a number of industries (Gursoy, Chi, Lu & Nunkoo, 2019). Tasks that used to be performed by humans only, such as driving vehicles, processing human language, recognizing faces in photos, analyzing big data or conducting online searches, can now easily be accomplished by AI devices (Anthes, 2017; Gursoy et al., 2019). Significant parts of the economy, including finance, insurance, and many consumer markets, may be susceptible to disruption through the use of AI techniques to learn, model, and predict human and market behaviors (Russell, Dewey & Tegmark, 2015).

At the same time, with the increased sophistication of technology, AI and computer algorithms are blurring the line between what is human and not. With tech giants launching artificial intelligence platforms with increasingly skilled digital assistants such as Amazon Echo and Google Home, the use of AI assistants is one of many consumer areas that will transform how companies connect with their customers in the near future (Dawar & Bendle, 2018). Ultimately, these new technologies pose opportunities for marketers to help enhance the consumer experience. With AI agents created in order to replicate human behavior, the question is nonetheless how far technology can reach in imitating humans? Virtual assistants are already closing in on human behavior by being able to convert speech into text, recognize feelings and intentions as well as turning the decoded information into actions and recommendations (Lovelock, Tan, Hare, Woodward & Priestley, 2018). In combination with modern computer graphics that are capable of generating highly photo-realistic images, AI technology is starting to challenge our ability to discern what is human (MacDorman et al., 2009). With technology capable of imitating human behavior as well as appearance, the question arises of how this might affect consumers in a marketing communication context.

1.1.2. Influencer marketing and the rise of CGI

Social media has since its inception transformed the way we communicate, share information, and interact with each other on the Internet. At the same time, it has fundamentally challenged the basic assumptions regarding the consumer decision-making process and how consumers engage with brands (Hudson & Thal, 2013). Brands have now started to discover the far-reaching impact and viral growth potential of entering alliances with social media influencers to promote their products. The usability and efficiency of influencers are hence extensive, where, on average, every dollar spent on influencer marketing in the year of 2017 resulted in 12.21 dollars in earned media value (Statista, 2019). The impact and spread of influencer marketing is especially evident within the fashion industry, making up 25% of all sponsored Instagram posts (Statista, 2019).

It has been well recognized in marketing and consumer behavior literature that electronic word-of-mouth (eWOM), referred to as “any positive or negative statement made about a product or company, which is made available to a multitude of people and institutions via the Internet” (Hennig-Thurau, Gwinner, Walsh & Gremler, 2004), has stronger effects on consumer decision-making than traditional advertising techniques (De Veirman, Cauberghe & Hudders, 2017). Through the use of influencer marketing, messages may be perceived as more authentic and credible when a fellow consumer, compared to an advertiser, communicates it. Thus, influencer marketing is an efficient marketing tool in order to build engaging, honest and authentic communication. By engaging in influencer marketing, advertisers can be less intrusive, avoid ad-blockers and build trust (Conick, 2018).

As technology is evolving, however, a new phenomenon closely related to traditional influencer marketing can nowadays be observed on social media platforms. Computer Generated Imagery (CGI), or CGI influencers, are redefining human-computer interaction while blurring the line of what it means to be real on the Internet. These are influencers like any other social media influencer, except the fact that they are not real humans. As suggested by the name, they are generated by computers to resemble humans and are often run by AI algorithms that post similar content to human influencers. These virtual influencers hang out with friends, post pictures of themselves in exotic places, are engaged in several projects, and, often promote brands on their social media pages. Despite not being real, virtual influencers are the latest trend in influencer marketing and the fashion industry is currently the most prominent to utilize such virtual models in their campaigns (Barker, 2019). As virtual influencers have started to revolutionize influencer marketing, brands are insisting on the opportunity to work with them where several well-recognized fashion brands such as Prada and Balmain have joined the virtual trend.

One of the most well known virtual influencer is Miquela Sousa, or @lilmiquela. With more than 1.5 million followers on Instagram as of April 2019, she has become somewhat of an online celebrity since her introduction in 2016 and is often seen together with friends and other celebrities on social media. While being a computer-generated virtual character created by the Los Angeles-based computer-software firm *Brud*, she has been named one of the most influential people on the Internet by TIME Magazine and has appeared in several magazines such as Vogue and ELLE. With a seemingly real life, close to indistinguishable from that of a true human, Miquela shares her reflections on everything from social issues to her personal life.

Since Miquela's introduction in 2016, many new virtual influencers have followed and are now appearing more frequently as brands have recognized their marketing potential. Although several brands have initiated collaborations with these virtual influencers, little is yet known about the effects they might have on consumer attitudes and intentions. The present study was therefore set out to examine how real humans in the form of consumers respond to such computer generated influencers used in advertising. More precisely, this will be examined in the context of how anthropomorphic presentations of these influencers in text form may affect how consumers anthropomorphize these non-human entities, which in turn potentially could enhance advertising effectiveness in terms of consumer attitudes and intentions.

1.1.3. Anthropomorphism and the Uncanny Valley

Anthropomorphism is a natural element of human functioning and may in short be defined as the process of attributing humanness to non-human objects (Epley, Waytz, & Cacioppo, 2007). It is a constantly ongoing mental process within the human brain, wherein people imbue non-human agents with humanlike characteristics based on previous schemas stored in memory, analogical reasoning, and familiarity or comfort to make sense of the world around them (Goudey & Bonnin, 2016). This implies that obvious non-human objects and animals can be perceived as humanlike in one or many ways. A dark thundercloud in the sky (i.e., a non-human object) may for example be perceived as angry (i.e., a human characteristic). Despite initially being defined by the Greek philosopher Xenophanes, anthropomorphism has not until more recently captured the attention of social psychologists in trying to investigate why and when people anthropomorphize non-human entities (Kim & McGill, 2011).

Yet, marketing practitioners frequently utilize the human tendency to anthropomorphize in their marketing communication. For example, spokes-characters, mascots, and animated animals are commonly used elements to enhance consumer perceptions of a brand as humanlike (Reavey, Puzakova, Larsen Andras & Kwak, 2018). Even abstract human cues in apparent non-human objects may evoke anthropomorphism, such as IKEA's 2002 "Lamp/Unboring" commercial portraying the story of an old desktop lamp discarded by its owner and left on the sidewalk among other trash. The viewer

cannot help but find oneself sympathizing with the lamp, despite the obvious fact that the lamp does not have any feelings. The commercial is brilliant in demonstrating how easily people anthropomorphize based on certain humanlike cues, even if the object looks far from resembling a humanlike face or body. Hence, understanding anthropomorphism is critical for marketers to harness its important and pervasive power (Kim & McGill, 2011).

Despite having substantial benefits in terms of eliciting high influence on human thoughts and behavior, the use of anthropomorphic agents could potentially backfire due to the so-called “Uncanny Valley effect” (see Appendix I) as commonly observed in social robotics literature (e.g., Mori, 1970; Ho & MacDorman, 2017). Research has long demonstrated the non-linear relationship between anthropomorphism and robot acceptance defined as the familiarity toward the robot (Ferrari, Paladino & Jetten, 2016). As a robot is made more humanlike in its appearance and movements, the emotional response from a human becomes increasingly positive and empathic, until a certain point (around 70% human likeness; Weis & Weise, 2017) beyond which the response quickly becomes intense repulsion: a dip or ‘valley’ of uncanniness or eeriness and discomfort is observed. However, as the appearance and movements continue to become less distinguishable from those of a human being, the emotional response becomes positive once again and approaches human-human empathy levels (Bartneck, Kulic, Croft and Zoghbi, 2009).

Since CGI influencers are becoming more humanlike in their appearance and behavior, questions arise whether or not these virtual robot entities might be subject to the uncanny valley? That is, will their humanlike appearance enhance consumer liking or in fact lower it if they are perceived as too similar to real humans? Nonetheless, can anthropomorphic information imbuing humanness in these non-human objects alter this relationship and thus avoid this “dip” in consumer attitudes when presented in advertising? As is evident, a deeper understanding of such mechanism of human psychology in marketing is needed, something that the present study is set out to examine.

1.2. Problem area and research gap

As previously stated, the fairly recent rise of the CGI influencer phenomenon on social media platforms has only provided limited time for researchers to investigate the effects of such virtual humans on consumer psychology. Even though marketing practitioners frequently allude to the pervasive power of anthropomorphism in marketing efforts, far less researchers within the marketing field has realized the potential positive (negative) effects of using these virtual influencers in marketing communication. Researchers within the consumer behavior field have up until this day mostly focused on consequences of anthropomorphism, especially on how anthropomorphizing affects

product liking (Aggarwal & McGill, 2007), and brand liking (Puzakova, Kwak & Rocereto, 2009).

A more recent stream of research has changed the focus from when and why people anthropomorphize to how anthropomorphism affects judgments and behavior (Kim & McGill, 2011). These studies investigate anthropomorphism as a way for humans to increase emotional bonding with non-human entities such that people are more likely to cooperate and work with humanlike robots than with machinery robots (Kiesler & Goetz, 2002). Building upon important insights from social robotics literature, HRI/HCI, and the uncanny valley theory, the present study will try to demonstrate important outcomes of anthropomorphism beyond simple liking of products with humanlike physical features. Rather, the consumer relationship to the virtual human itself will be in focus and the attribution of humanlike mental states through anthropomorphic text. While social psychologists have investigated the reasons to why and when people anthropomorphize non-human entities (Epley et al., 2007), no study, at the authors' knowledge, fully examines the relationship between how anthropomorphic presentations of virtual humans may affect traditional marketing metrics such as advertising attitudes and consumer intentions. Therefore, this study aspires to evaluate the impact of virtual brand ambassadors and influencers based on their level of anthropomorphic traits. Furthermore, the study also intends to investigate potential individual factors that could affect how consumers perceive these virtual entities.

1.3. Purpose

In line with the aforementioned research gap, this thesis aims to study the effects of consumers' psychological reactions in terms of attitudes and intentions when advertising containing virtual humans is presented in such a way that evokes anthropomorphism among its recipients. More specifically, this will be done by assessing the extent to which an anthropomorphic description in text form will make people anthropomorphize (i.e., attribute human traits, emotions, or intentions to) virtual influencers and how this may affect consumer attitudes and intentions in an advertising context.

1.4. Delimitations

As mentioned above, using virtual influencers in marketing communications is a fairly recent and unexplored area where most of the progress has been undertaken by marketing practitioners rather than academia. The scope of this study is therefore limited to only focus on virtual humans featured in advertisements. Although CGI influencers may be seen as an integral part of influencer marketing, the present study does not aspire to investigate the role of CGIs in relation to the literature on ambassador or influencer marketing. Rather, the study focuses on the human-robot interaction

enabled by CGIs and how anthropomorphism may impact this relationship on consumers' psychological responses. Specifically, the study strives as previously stated to examine how anthropomorphic presentations of such virtual individuals in ads affect attitudes and intentions. As such, it will not be investigated how virtual influencers in general can enhance advertising effectiveness but rather how marketing researchers can gain insights into the pervasive power of anthropomorphism related to virtual humans. Therefore, the study does not advocate for whether or not marketing practitioners should use virtual influencers in their marketing efforts, but rather which aspects of anthropomorphism that are important to consider when formulating marketing messages portraying such virtual humans and/or CGI influencers.

Further delimitations made in the study include the use of images and print ads as opposed to video or audio advertisements. This decision was mainly based on the limited to non-existing video and/or audio material currently available within the field. Since only a few realistic CGIs exist, images easily accessible on the Internet were deemed as most useful. This also relates to the fact that images posted by CGIs on social media may be perceived as more authentic than if the authors would have created this material themselves. The product category chosen for this study, namely apparel, was also made with the authenticity and accessibility argument in mind. Since the fashion industry currently is the most prominent to use virtual influencers due to the possibilities to tailor clothes onto digital models through computer-generated imagery, clothing ads were considered to be the most natural course of action. With regard to respondents, the data was collected only from participants within the Swedish population. Yet, previous research has indicated that ethnicity and cultural background might influence how individuals anthropomorphize non-human objects (Bartneck, Suzuki, Kanda & Nomura, 2007; Rau, Li & Li, 2010; Kaplan, 2004). However, in line with the purpose, this thesis aims at evaluating the effects of different levels of anthropomorphism and not anthropomorphism in relation to ethnicity or culture per se.

1.5. Expected contribution

Previous research related to this field has examined the effects of anthropomorphism in social robotics and human-computer interaction (HCI) literature, as well as the role of anthropomorphic traits in product appearance. Yet, little is seemed to be known regarding the role of anthropomorphism in relation to virtual brand ambassadors used to promote products. Since the boundaries are blurring between what is human and artificial, the topic is gaining more and more interest. As this is, to this day, a fairly unexplored research area, academia has not yet provided plenty of knowledge about the potential consumer reactions that might follow of using virtual humans in marketing communications. Since the aim of this study is not to provide a comprehensive framework for understanding CGI influencer marketing in general, the authors nevertheless hope to broaden the scope of knowledge within the field and to spark

interest in the topic by further exploring the subject of anthropomorphism in an advertising context. Until now, almost no research on anthropomorphism examining robots has evaluated anthropomorphic texts as a source of communicating humanlike traits. This study therefore extends the knowledge of which mediums that can be used in order to influence the tendency to anthropomorphize virtual agents.

Since anthropomorphizing a non-human object does not only involve attributing superficial human characteristics (e.g., a humanlike face or body), but rather attributing essential human characteristics to the agent (a humanlike mind, capable of thinking and feeling; Waytz et al., 2014), this may also have vast implications for how marketing practitioners could develop their communication efforts when using spokes-characters such as virtual influencers. For businesses and marketing managers, anthropomorphism is therefore essential in order to understand how customers identify with their products and services. With the increased use of AI agents and virtual humans, the authors hope to improve the understanding of how consumers interact with and respond to such entities, especially in terms of how consumers anthropomorphize them. The present study is therefore expected to build upon previous knowledge to generate new insights into how marketing researchers and practitioners may reason when using anthropomorphic presentations of virtual humans in advertising.

2. Theoretical Framework

2.1. Theoretical background

2.1.1. Determinants of anthropomorphism

The most central theoretical notion of this thesis is the concept of *anthropomorphism*. As briefly stated in the introductory chapter, anthropomorphism can be thought of as seeing humanness in the non-human world (Hart & Royne, 2017). Rooted in psychology, anthropomorphism is loosely defined by Guthrie (1997) as the attribution of human characteristics to non-human objects and events (Stinnett, Hardy & Waters, 2013). It is a constantly ongoing mental process within the human brain, wherein people imbue non-human agents with humanlike characteristics based on previous schemas stored in memory, analogical reasoning, and familiarity or comfort to make sense of the world around them (Goudey & Bonnin, 2016). Over the years, this phenomenon has evolved from an extension of *animism* (i.e., attributing life to the nonliving) to a concept that incorporates personality, interaction, and behavior (Stinnett et al., 2013). As proposed by Waytz et al. (2014), anthropomorphizing a non-human does not only involve attributing superficial human characteristics (e.g., a humanlike face or body), but rather attributing essential human characteristics to the agent (a humanlike mind, capable of thinking and feeling). This shift from behavior to mental cognition has created an interest in the marketing and advertising field about the pervasive effects of anthropomorphism (Stinnett et al., 2013).

2.1.2. Anthropomorphism and the socially intelligent robot

Previous research suggests that anthropomorphism is relevant in order to understand human interaction with technology, especially in the context of AI and service robots (Lu, Cai & Gursoy, 2019). Within the research field of human-computer interaction (HCI) and human-robot interaction (HRI), attempts have been made to understand the human predisposition to anthropomorphize computers and robots. When a robot enters into the human social space the term “social robot” is often referred to. As this development is concerned with robots integrated into the physical human and social environment, human–robot interaction is proposed as the primary motivation for employing anthropomorphism in robotic systems (Duffy, 2003). This entails that the field of social robotics mainly concentrates on the development and design (i.e., appearance) of robots, which is one component that influences the degree of anthropomorphization. Thus, the explicit designing of anthropomorphic features, such as a head with eyes and mouth, are one form of cues that trigger anthropomorphism and facilitate social understanding when interacting with social robots (Duffy, 2003).

However, other cues related to robot behavior and competence may also influence anthropomorphism, for example robot movement (Richert, Müller, Schröder & Jeschke, 2018), and, perhaps more important, anthropomorphic qualities that indicates a social capability of interacting with humans (Duffy, 2003). Duffy (2003) describes this as the need of social intelligence (i.e., the ability to interpret certain social situations and responding accordingly) as well as the need of a personality and identity. The social intelligence and personality traits are described as essential if the robot is to be accepted as a participant of the human social circle. If accepted by humans and appearing as a social robot, individuals will start behaving toward the robot using the same social rules as when interacting with real humans (Duffy, 2003).

Closely related to this, a second theory parallel to anthropomorphism could also explain why humans apply equivalent social cues to computers as when interacting with other humans. Nass & Moon (2000) demonstrated in their research that people tend to overuse human social categories (e.g., stereotypes) and rely on overlearned social behaviors (e.g., politeness) when interacting with computers through the adoption of so-called “mindless behavior”. This process occurs as a result of conscious attention to a subset of contextual cues that trigger various scripts, labels, and expectations, which in turn focus attention on certain information while diverting attention away from other information (Nass & Moon, 2000). As such, it has been demonstrated that individuals are responding mindlessly to computers by applying social scripts originally developed for human-human interaction but nonetheless applied when engaging with computers. This form of essentially ignoring the cues that reveal the asocial nature of a computer makes people to prematurely commit to overly simplistic mental models and scripts used in the past. Therefore, “mindlessness” can also explain these behaviors previously argued being an effect of anthropomorphism. Anthropomorphism can according to Nass & Moon (2000) therefore be ruled under certain circumstances. For example, in the case of pure HCI with no human visual representation of the computer, there is nothing that should influence humans to believe that the computer warrants human treatment.

2.1.3. Anthropomorphism in marketing research

Several academic disciplines have offered insights into why anthropomorphism occurs and how individuals use it in varying contexts (cf. above). In marketing, however, researchers have only recently begun to think of anthropomorphism as potentially offering opportunities for product and brand managers (Hart & Royne, 2017). Existing literature within the consumer-marketing field has thus mostly focused on consequences of anthropomorphism, especially on how anthropomorphizing affects product liking (Aggarwal & McGill, 2007) and brand liking (Puzakova et al., 2009). Prior research has found product and brand *humanization* in advertising to generate positive consumer reactions such as increased brand recall (Pashupati, 2009) and enhanced brand evaluations (Garretson & Burton, 2005). While *humanization* is an advertising tactic in

which an advertised entity (e.g., a product) is represented in a way that triggers its perceptions as humanlike (Puzakova et al., 2009), *anthropomorphism* is distinct from humanization in the way that anthropomorphism is the consumers' cognitive responses of perceiving humanlike behavior, emotions, intentions, and features in a non-human entity (Epley et al., 2007). That is, anthropomorphism may go beyond recognition of surface similarities between objects and people (Waytz et al., 2010). This second form of anthropomorphism of attributing humanlike mental states is one step closer to seeing non-human objects as “fully” human. Since the purpose of this study is to examine how anthropomorphic presentations of virtual humans in advertisements affect consumers, it is this second form that predominantly will be investigated by conveying such essential human characteristics through anthropomorphic texts. Waytz et al. (2010) found that when people perceived a non-human entity to have a mind of its own, they were more likely to treat the entity as a moral agent worthy of empathic care and concern. Applying this to an advertising context, Reavey et al. (2018) demonstrated how an anthropomorphic text (ad copy) endowing a dog with secondary emotions (i.e., uniquely human emotions) increased consumer intended behavior. Based on the research presented above, it is theorized that an anthropomorphic text displaying a personality and social intelligence of a virtual influencer will make consumers anthropomorphize this entity and behave towards it using human-human social cues. The study therefore hypothesizes:

H1: Anthropomorphic presentation through text will be positively associated to the level of perceived anthropomorphism.

2.2. Effects of anthropomorphism on consumer attitudes and intentions

Prior research within marketing has, to this day, mostly focused on humanization in advertising related to product and brands. Regarding products, research has found that consumers generally prefer product designs with anthropomorphic appearances, for example car fronts depicting a smiling mouth (Maeng & Aggarwal, 2018). That is, human appearance in products can positively influence consumer attitudes and purchase intentions since it activates human schemas stored in the memory (Lu et al., 2019). The recognition of surface similarities leads consumers to relate product properties to human features (e.g., a product appears more friendly with a smiling face), which induces comfort and familiarity towards unfamiliar products (Aggarwal & McGill, 2007). Humanlike product presentations therefore cause positive emotions, which in turn generates favorable attitudes and increased purchase likelihood (Groepel-Klein, Helfgen & Pfeifer, 2013). If advertisements manage to characterize the product or brand as humanlike, they will improve brand recall (Pashupati, 2009), brand attitudes (Delbaere, McQuarrie & Philips, 2011), brand evaluations (Garretson & Burton, 2005) and product liking (Aggarwal & McGill, 2007).

This has also been found to facilitate perceptions of brand personality and for consumers to perceive brands are more humanlike. For brands, humanlike features include having a human name or by making the brand's features resemble a human face (MacInnis & Folkes, 2017). Aggarwal & McGill (2007) demonstrated how depicting a set of soda bottles as a "product family" induces greater tendencies to anthropomorphize compared to describing them as a "product line". Nevertheless, research has also shown that personifying a brand through the use of a spokesperson (e.g., celebrities or CEOs) can increase the consumer perception of the brand as humanlike (Fleck, Michel & Zeitoun, 2014). Anthropomorphic traits of a spokesperson have also been shown to affect consumer intentions (Reavey et al., 2018). Further demonstrated by Reavey et al. (2018), greater attitudes towards the ad followed when customers recognized anthropomorphic features in an advertising image.

Building on this previous research within marketing (primarily from a product and brand perspective) connecting anthropomorphism and positive emotions with favorable attitudes and intentions (Groeppel-Klein et al., 2013), the study will examine an extension of that research. With further support from the findings of Reavey et al. (2018) on spokespersons, it is hypothesized that a similar relationship exists using an anthropomorphic virtual influencer. As the humanlike traits of the robot in the advertisement increase, positive emotions should arise and affect consumer attitudes and intentions favorably:

- H2:** Anthropomorphic presentation through text will generate more positive *attitudes* towards the **a)** advertisement, **b)** brand, and **c)** product compared to when no such anthropomorphic text is provided.
- H3:** Anthropomorphic presentation through text will be positively associated with *intentions* towards the **a)** individual (i.e., virtual human) in the ad, **b)** brand shown in the ad, as well as WOM intentions in relation to the **c)** advertisement, **d)** brand, and **e)** product.

2.3. The mediating role of robot likeability

A robot's appearance systematically influences acceptance and robot likeability (Richert et al., 2018). Anthropomorphism as a construct is thus closely related to the concepts of positive emotions, likeability and affinity (Salem, Eyssel, Rohlfing, Kopp & Joubin, 2013; Rau et al., 2010). The effects of these factors on anthropomorphism is however not linear, especially in the case of humanlike robots. As briefly mentioned in the introductory chapter, the "Uncanny Valley theory", first proposed by Mori (1970), demonstrates that humanlike robotic agents are perceived more negatively than both less anthropomorphic robots and fully humanlike robots (see Appendix I). As a robot

becomes more humanlike, positive reactions will at first increase. When the robot reaches around 70% human likeness, however, the positive reactions will experience a substantial “dip” in likeability towards robot in terms of robot acceptance (Weis & Wiese, 2017). Humans will at this point experience revulsion due to eeriness of the robot appearance (Mori, 1970). However, as the robot surpasses this dip and becomes more humanlike, the positive emotions will once again increase.

At the same time, Ferrari et al. (2016) found that as robot appearance becomes more humanlike such that the perceived similarity between social robots and humans increases, the higher of a threat to humanity will be perceived. Such results stem from the fact that not everyone is unconditionally positively disposed towards the technology of AI and social robots. For example, Goudey & Bonnin (2016) found that consumers express greater acceptance of a companion robot designed with partially anthropomorphic appearance than complete human appearance. New technology might trigger concern about the negative impact on humans as a group since the perceived similarity undermines human uniqueness (Ferrari et al., 2016). Thus, even though such robots may surpass the 70% benchmark of human likeness as stated by Weis & Wiese (2017), robot likeability is still an important determinant of robot acceptance and attitudes (Kim, Schmitt & Thalmann, 2019). Hence, robot likeability is hypothesized to have a mediating role between anthropomorphism and consumer attitudes and intentions:

H4: The impact of anthropomorphism on attitudes and intentions will be mediated by the perceived likeability of the virtual human in the ad.

2.4. Moderating effects of technological knowledge

Research has shown that the tendency to anthropomorphize is not equivalent across all humans and situations. Some people anthropomorphize more than others, and some situations may induce more anthropomorphism than others (Epley, Waytz, Akalis & Cacioppo, 2008). For example, children tend to anthropomorphize more than adults, and some cultures are notorious for their anthropomorphic religions and worldviews (Bartneck et al., 2007). These differences arise due to variations in background and previous experiences. This includes educational level, cognitive models of reasoning, cultures, norms, and the attachment to humans and non-human objects (Epley et al., 2007). Even structural biological differences in human brains across people can explain variations in levels of anthropomorphism (Cullen, Kanai, Bahrami & Rees, 2013).

Individual differences in anthropomorphism will thus influence the consumer's tendency to generate an emotional connection to a non-human agent (e.g. a virtual influencer) and thus the extent of which s/he places responsibility and culpability on the entity, as well as letting it socially influence her/him (Waytz et al., 2010). It has been shown that for robots in specific, previous experience with virtual agents and

technological knowledge can be determining factors in our attribution of humanlike traits (Haring, Matsumoto & Watanabe, 2013). Further, Bartneck et al. (2007) demonstrated how previous experience of interacting with consumer robots had positive effects on consumer attitudes. Thus, the knowledge of these differences can serve as a powerful tool in predicting how customers will interact with both an advertised brand but possibly also CGI influencers in a marketing context. Technological knowledge and previous experience with virtual agents are therefore hypothesized to have an impact on how consumers anthropomorphize virtual humans in advertisements:

H5: The individual tendency to anthropomorphize the virtual human in the ad, as expressed by the **a)** self-reported technological expertise, and **b)** previous experience with virtual agents, moderates the impact of anthropomorphic text presentation on perceived level of anthropomorphism.

2.5. Summary of hypotheses

H1: Anthropomorphic presentation through text will be positively associated to the level of perceived anthropomorphism.

H2: Anthropomorphic presentation through text will generate more positive *attitudes* towards the **a)** advertisement, **b)** brand, and **c)** product compared to when no such anthropomorphic text is provided.

H3: Anthropomorphic presentation through text will be positively associated with *intentions* towards the **a)** individual (i.e., virtual human) in the ad, **b)** brand shown in the ad, as well as WOM intentions in relation to the **c)** advertisement, **d)** brand, and **e)** product.

H4: The impact of anthropomorphism on attitudes and intentions will be mediated by the perceived likeability of the virtual human in the ad.

H5: The individual tendency to anthropomorphize the virtual human in the ad, as expressed by the **a)** self-reported technological expertise, and **b)** previous experience with virtual agents, moderates the impact of anthropomorphic text presentation on perceived level of anthropomorphism.

3. Method

3.1. Research philosophy

Epistemological and ontological considerations are important in order to outline the underlying assumptions of the research as they have formed the way this research has been structured and how methodological decisions have been taken. From an epistemological perspective, the view of positivism has been undertaken in this thesis considering the research being based on previous theoretical frameworks and insights. Since the present study was set out to measure the impact of anthropomorphism within a marketing context, the aim was not to study the phenomenon as a social construct, but rather in an absolute observable notion to the extent possible. The researchers' views on social sciences are thus more in line with the approach within natural sciences. Subsequently, this study has an objectivist standpoint from an ontological perspective. It is assumed that reality can be observed based on external facts beyond the influence of the researcher, and not as a social construction subject to constant state of revision as in the constructivist perspective (Bryman & Bell, 2011).

3.2. Scientific approach

This study is based on a deductive approach using previous research and theories within the fields of human-computer interaction, anthropomorphism and marketing. The deductive approach is the most frequently used method when analyzing data applying previous theories and research (Bryman & Bell, 2011). Given the research at hand, a set of hypotheses was developed in order to test the consumer impact of anthropomorphic traits of virtual influencers on attitudes and intentions. In order to test the hypotheses, a quantitative method was chosen. This was preferred since the hypotheses required a study of the effects of a certain treatment. As described by Bryman & Bell (2011), the quantitative method is better suited for finding and describing fine differences between people. If not using a quantitative method, distinctions could still be made between people, however often in terms of extreme categories. Since small differences in individuals' psychological mechanisms wanted to be studied, an extensive set of data was needed, which further strengthened the argument for using the quantitative method (Bryman & Bell, 2011). A qualitative method would have been impractical and difficult to implement when examining stimuli effects. A possibility would have been to interview experts within the field of anthropomorphism, robotics and marketing. However, this would not have enabled testing of the actual effects of the mechanisms studied. Neither would a qualitative method provided as good of a consistent device for measuring the stimuli effects, nor would it have been possible to determine any precise estimates of the relationships between the variables (Bryman & Bell, 2011).

3.3. Experiment design

In order to fulfill the purpose of the study and to test the aforementioned hypotheses, an experiment was conducted. More precisely, a 2×2 between-subjects experimental design was employed where anthropomorphic text (text/no text) and gender of the virtual influencer in the ad (female/male) served as the two factors. Although not hypothesized, the experiment yet included both a female and male virtual human featured in the advertisement in order to create greater variation in responses in line with the notion of stimulus sampling (Söderlund, 2018).¹

The 2×2 nature of the experiment naturally created four experimental conditions. All groups were exposed to an advertisement image wherein a (male or female) virtual influencer promoted a white hoodie for the fictitious brand “Esteban Lakatos” (see Appendix II). Two treatment groups, however, were in combination with this advertisement also exposed to an anthropomorphic text (=stimuli) describing the influencer in a way that could evoke anthropomorphic reasoning among the participants (see Appendix IV). The other two groups served as control groups and were only exposed to the ad (male or female) but not the anthropomorphic text. Respondents were all assigned to their respective groups in a randomized manner (Söderlund, 2018). In order to ensure comparability, everything in the experiment was held as constant as possible except for the virtual influencer (male/female) and stimuli (text/no text) that was changed accordingly to the four experimental conditions. Comparable clothing of the two influencers was ensured, as well as the same brand and anthropomorphic text (except for adhering gender pronoun in the male/female conditions).

3.4. Preparatory studies and stimuli development

3.4.1. Image selection and advertisement creation

With the aim to reflect reality to the greatest extent possible (Bryman & Bell, 2011), the advertisement used in the experiment was developed using two currently existing CGI influencers, namely @lilmiquela and @cadeharper (see Appendix II). These two were chosen because of their extensive range of content on social media, making it possible to find comparable images to use in the fictitious advertisement. In order to create as clinical of an experiment as possible, neutral pictures were needed as well as matching clothes of the two influencers. When comparable images had been chosen from each of the influencers’ social media pages of them wearing a hoodie, the clothing was subsequently edited in Photoshop CC 2015. Backgrounds were changed to be the same and the hoodies were made white. Lastly, a fictitious brand name was added to the ad in

¹ Since the purpose of this study is not to examine gender differences per se, potential contrasts found in the results related to the gender of the virtual human will therefore only be presented briefly in the empirical findings chapter.

order to not generate any undesirable brand associations that could have affected the responses.

3.4.2. Pre-study

The next step was to create the actual stimuli (i.e., the anthropomorphic text) that were to be used in the treatment groups. Since previous research has discussed the effects of using different narrative viewpoints on how respondents might anthropomorphize such text (cf. Reavey et al., 2018), a pre-study was set out to test three different text variations. In line with Reavey et al. (2018) the pre-study included; (1) first-person communication through an interview with the virtual influencer (e.g., "In many ways, I feel just like a real human"), (2) a third-person narrative (e.g., "[...] she claims, that just like us, she is an emotional being and feels just like a real human"), as well as (3) a control condition in the form of a bullet point list where significantly less anthropomorphic reasoning was inferred (e.g., "Level of humanness: Fully emotional & conscious") (see Appendix III). The three different versions were developed from existing interviews made with @lilmiquela (e.g., Wills, 2019). These three texts were subsequently tested in the pre-study together with the advertisement for the female influencer (i.e., @lilmiquela) to primarily study if the level of perceived anthropomorphism² differed among the three randomly allocated text-groups. A secondary purpose of the pre-study was to get an indication of differences in virtual human likeability³ and brand attitudes⁴ across the three texts.

3.4.3. Pre-study results

A total of n=18 respondents participated in the pre-study and were gathered through convenience sampling mostly consisting of university students. Due to the small sample size possibilities to make inferences about the data were limited. However, results indicated (see *Table I*) that in line with Reavey et al. (2018), the interview written in first-person narrative was rated the highest on the anthropomorphism scale. At the same time, it was rated lower on both likeability and brand attitudes compared to the third-person editorial text. The bullet point list consistently demonstrated lower mean values,

² **Anthropomorphism** was measured using an adapted version of the anthropomorphism scale proposed by Bartneck et al. (2009) where respondents rated their impression of the individual in the advertisement on a 7-point semantic differential scale anchored by the bipolar words: "Fake–Natural", "Machinelike–Humanlike", "Unconscious–Conscious", and "Artificial–Lifelike".

³ **Likeability** was measured using the five-item likeability scale developed by Bartneck et al. (2009). It was operationalized through a 7-point semantic differential scale anchored by the bipolar words: "Dislike–Like", "Unfriendly–Friendly", "Unkind–Kind", "Unpleasant–Pleasant", and "Awful–Nice".

⁴ **Brand attitude** was measured using a 7-point semantic differential scale anchored by the bipolar words "Bad–Good", "Negative–Positive", and "Dislike–Like" commonly used in marketing research (c.f. Söderlund, 2018).

as intended, and was therefore discarded. Since both likeability and brand attitudes were rated higher for the third-person editorial text, this was chosen as the stimuli serving in the main study.⁵

Table 1. Pre-study Means and Standard Deviations for Anthropomorphism, Likeability and Brand attitudes across Text Conditions

Factor	1 st person narrative (i.e., interview) n= 6		3 rd person narrative (i.e., editorial text) n= 6		Control condition (i.e., bullet point list) n= 6	
	<i>M</i>	<i>(SD)</i>	<i>M</i>	<i>(SD)</i>	<i>M</i>	<i>(SD)</i>
Anthropomorphism	4.00	(1.14)	3.58	(.63)	2.46	(1.56)
Likeability	3.90	(1.64)	4.49	(1.40)	3.50	(1.74)
Brand attitude	3.28	(1.24)	4.44	(1.26)	3.00	(1.94)
Age	20.50	(2.07)	22.50	(.84)	21.33	(3.14)

Note: Items measured on 7-point scales ranging from 1 to 7; 44.4% female 55.6% male

3.5. Main study

3.5.1. Research variables and measurements

Perceived anthropomorphism

In order to assess participants' perceptions of anthropomorphism, a combined measure of anthropomorphic appearance, proposed by Bartneck et al. (2009), and attribution of human mind characteristics, adapted from Waytz et al., (2010), was used. First, respondents were asked to evaluate their impression of the individual in the advertisement on a 10-point semantic differential scale anchored by the bipolar words: "*Fake–Natural*", "*Robot-like–Humanlike*", "*Artificial–Lifelike*". From Waytz et al. (2010) the five items equivalent to the Individual Differences in Anthropomorphism Questionnaire (IDAQ) measure were used to assess human mind attribution. Respondents were asked to rate the extent to which the individual in the advertisement was perceived to possess each of the following characteristics on a 10-point Likert scale anchored by (1) = Not at all, (10) = Very much: "*A mind of its own*", "*Intentions*", "*A free will*", "*Consciousness*", and "*Ability to experience emotions*". The eight-item anthropomorphism measure proved satisfactory internal consistency reliability ($\alpha=.890$).

⁵ Please note the small pre-study sample size (n=18). Inference making from the data is thus limited. More respondents would have been preferable to increase the robustness of the pre-study findings. Data have only been interpreted as indicative rather than absolute.

Virtual human likeability

To measure how likeable respondents perceived the virtual human in the ad to be, the five-item likeability scale developed by Bartneck et al. (2009) was employed. Participants rated their impression of the individual in the ad by stating their perception on 10-point semantic differentials anchored by: “*Dislike–Like*”, “*Unfriendly–Friendly*”, “*Unkind–Kind*”, “*Unpleasant–Pleasant*”, and “*Awful–Nice*” ($\alpha=.895$).

Attitudes toward the advertisement, brand and product

In order to keep the measures consistent for all of the questions related to consumer attitudes, the same five-item scale was utilized for each of the three constructs of respondents’ attitudes towards the advertisement, brand, and the product. This was done by using the following 10-point semantic differentials commonly used in marketing communications research (Söderlund & Öhman, 2003): “*Bad–Good*”, “*Dislike–Like*”, “*Unpleasant–Pleasant*”, “*Uninteresting–Interesting*”, and “*Negative impression–Positive impression*”. All of the three attitude measures proved satisfactory internal consistency reliability ($\alpha_{AdAtt}=.920$; $\alpha_{BraAtt}=.941$; $\alpha_{ProdAtt}=.965$).

Intentions-as-wants (IW) toward the brand and the individual in the ad

To assess behavioral intentions toward both the individual and the brand shown in the ad, questions regarding participants’ intentions-as-wants (IW) were measured on a 10-point Likert scale anchored by (1) = Not at all, (10) = Very much. Although IW is the least frequently used intention construct in marketing research, it still provides a good measure of intentions equivalent of wishing or wanting to do something in relation to one’s future acts (Söderlund & Öhman, 2003). A four-item measure was constructed for IW toward the individual, including the following items: “*I want to seek more information about the individual in the ad*”, “*I want to search for more campaigns that this individual has been involved in*”, “*I want to visit the individual’s profile on social media*”, and “*I want to follow the individual on social media*” ($\alpha_{IndInt}=.877$). The same four items were included in the measure for IW toward the brand but adapted to reflect the correct wording of the brand. A fifth item was also included here, namely, “*I want to visit the brand’s website*” ($\alpha_{BraInt}=.913$).

Word-of-mouth (WOM) intentions in relation to the ad, brand, and product

To measure WOM intentions as the likelihood to transfer information about the ad, brand, and/or product in a peer-to-peer relation, three single-item measures were employed. Although the use of single-items might impair the reliability of the measures, Söderlund & Öhman (2003) argues that single item measures for intention constructs may still be used. In line with this, the present study measured WOM intentions on a 10-point Likert scale anchored by (1) = Very unlikely, (10) = Very likely. Ad WOM intentions were operationalized through the question “*How likely is it that you would talk about this advertisement with a friend?*”; brand WOM: “*If a friend were shopping*

for clothes, how likely is it that you would recommend Esteban Lakatos?”; and product WOM: “If a friend were shopping for a hoodie, how likely is it that you would recommend the hoodie in the ad?”.

Self-reported technological knowledge and previous experience with virtual agents

Since technological knowledge and experience of interacting with virtual agents were hypothesized to moderate the effect of anthropomorphic reasoning, a two-item measure for knowledge and a single-item measure for experience were used. These were operationalized by asking the participant to evaluate statements regarding their own use of technology on a 10-point Likert scale anchored by (1) = Not at all, (10) = Very much, namely *“I am an experienced user of technology in general”*, *“I have good knowledge about technology in general”* ($\alpha = .926$) and *“I am used to interact with virtual agents (for example Amazon Alexa, Google Home, Siri etc.)”*.

3.5.2. Data collection

Data was collected through the online survey tool Qualtrics. The questionnaire was translated and distributed in the native language of the intended participant group, namely Swedish. All of the questions were therefore written in Swedish, however, the stimuli (i.e., anthropomorphic text) exposed to the two treatment groups were composed in English. This was nonetheless not deemed as a barrier to obtaining relevant answers as most of the intended participants were reasonably assumed to be familiar with the English language. The main study was carried out in April 2019, and was open for 12 days between April 20th and May 1st. Since the study did not aim at collecting a representative sample of, for example, social media users in Sweden, data was collected using a convenience sampling method. The questionnaire was therefore distributed online mainly through an anonymous link to friends, family, other students, colleagues and relatives. This choice of data collection may not be considered to be inappropriate, as experimental designs might not require that participants are drawn from a random or representative sample (see discussion in Söderlund 2018).

3.5.3. Participants

In total, 211 respondents participated in the main study, out of which 182 finished the survey in its entirety. The excess 29 responses were therefore removed from the data set. Further adjustment of respondents were made (see Appendix V) which failed to answer the instructional manipulation check questions (e.g., *“Please identify the brand that was shown in the ad”*), completed reading the anthropomorphic text (treatment groups) under 1 minute, or else failed to answer the manipulation check question (*“Did you in connection to the ad by Esteban Lakatos read an excerpt from an article about the model in the advertisement?”*). A total of $n=137$ participants were included in the final data set. The sample included 62 (45.3%) females and 75 (54.7%) males in the age

span 17 to 59 years, mean age = 24.4 ($\sigma=7.03$), distributed over the groups shown in Table 2.

Table 2. Distribution of Respondents in the Control and Treatment Groups

	Treatment Female (n= 34)	Control Female (n= 34)	Treatment Male (n= 35)	Control Male (n= 34)	Total (n=137)
Men	19 (55.9%)	18 (52.9%)	20 (57.1%)	18 (52.9%)	75 (54.7%)
Women	15 (44.1%)	16 (47.1%)	15 (42.9%)	16 (47.1%)	62 (45.3%)
μ Age (σ)	25.3 (8.80)	22.9 (1.88)	26.4 (10.15)	23.0 (2.70)	24.4 (7.03)
Education:					
High school	2 (5.9%)	4 (11.8%)	3 (8.6%)	3 (8.8%)	12 (8.8%)
University (≤ 3 years)	19 (55.9%)	15 (44.1%)	18 (51.4%)	21 (61.8%)	73 (53.3%)
University (> 3 years)	12 (35.3%)	15 (44.1%)	14 (40.0%)	9 (26.5%)	50 (36.5%)
Vocational school	1 (2.9%)	-	-	1 (2.9%)	2 (1.5%)

Note: “Treatment” refers to the experimental groups that were subject to the stimuli (i.e., the anthropomorphic text) while “Control” refers to the groups that were not subject to it. “Female” refers to the groups that were exposed to the female influencer (i.e., @lilmiquela), while “Male” refers to the groups that were exposed to the male influencer (i.e., @cadeharper) in the ad.

3.6. Data analysis tools and tests

After the responses for the Qualtrics questionnaire had been collected, the data was downloaded and analyzed using SPSS (version 25). The internal consistency reliability of the constructs were deemed satisfactory if they exhibited a Cronbach’s alpha > 0.70 (Nunnally, 1978). Since the sample size per condition was larger than 30 ($n > 30$), the central limit theorem states that normal distribution could reasonably be assumed. A bivariate Pearson correlation analysis was conducted in order to measure the relationship among the constructs used in the analysis (see Appendix VI). To test the hypotheses, 2×2 ANOVA as well as 2×2 MANOVA were used. To test the hypothesized mediation of virtual human likeability, a mediation analysis was conducted in accordance with the bootstrapping procedure developed by Preacher & Hayes (2008). With the PROCESS macro (version 3.1) for SPSS, an analysis of simple mediation (Model 4) was performed. Significance level was set to 5% in all cases as is commonly used in marketing research (see discussion in Söderlund, 2018).

3.7. Reliability and validity

3.7.1. Reliability

To ensure internal reliability, multiple-item scales were used for the majority of the measured variables. All of the scales exhibited a Cronbach's alpha >0.70 , which improved the reliability (Söderlund, 2018). To further ensure reliability of the measurements, questions were predominantly employed from academic papers that had demonstrated satisfactory internal consistency. All questions in the main study, whether semantic differentials or Likert scales, corresponded to a 10-point scale which further made it possible to identify smaller subtleties in responses than would otherwise be possible using a scale with fewer points (Bryman & Bell, 2011).

Regarding stability, anthropomorphism is a psychological mechanism that can change over time, for example across situations, education, or age (Epley et al. 2007; Carey, 1985). Thus, the test of a sample's reactions today might not be the same in one year. This is an issue in terms of reliability and replicability, yet a natural process of anthropomorphism which cannot be solved through experiment design. Yet, since the experimental design in the present study accounted for anthropomorphism in two different settings (female/male), the replicability of the thesis was improved.

3.7.2. Validity

Since anthropomorphism is an abstract, changing and constantly ongoing process within the human brain, one might question the construct validity of this measurement. To mitigate this risk, only well-established scale items within anthropomorphism research were employed. For anthropomorphism, using an eight multi-item measure enhanced measurement validity. The same reasoning applies to the measurements of attitudes and intentions as used by Söderlund & Öhman (2003). Internal validity was in part ensured using stimuli based on a fictitious brand. Additionally, a control question was employed controlling for the respondents' previous knowledge of the virtual influencer. A set of manipulation checks was also performed whereupon it was possible to conclude that respondents had been exposed to and taken part of the stimuli (see Appendix V). Threats to internal validity were further eliminated by the use of a control group and a randomized assignment of respondents to each of the conditions (Bryman & Bell, 2011). Factors that potentially could have impaired the internal validity are predominantly elements in the anthropomorphic text that are separate from that of anthropomorphism, such as storytelling effects.

Concerning external validity, the results can in broad terms be generalized beyond this specific context considering anthropomorphism being a psychological mechanism present in all humans. Considering previous research, anthropomorphic traits should have positive effects on attitudes and intentions regardless of the environment.

However, equivalent strengths between the variables will probably not be found considering how anthropomorphic tendencies differ amongst people and over time. Lastly, any interaction effects of pre-testing were ruled out, as the main study was not sent out to pre-study participants. This was further ensured by using the control question if the respondent had seen the influencer before. Ecological validity was strengthened by the use of influencers and a product category frequently marketed by these profiles. Both of these factors contributed to facilitate a study illustrative of the population's natural habitat (Bryman & Bell, 2011).

4. Empirical findings

4.1. Manipulation check: Perceived anthropomorphism

To test whether the manipulation of the variable perceived anthropomorphism had the intended effect among respondents, a two-way ANOVA was conducted. As expected, the 2 (text: treatment vs. control) $\times$ 2 (gender: female vs. male) ANOVA on perceived anthropomorphism indicated that the manipulation was successful such that the main effect of gender was not significant ($F(1,133)=3.81, p=.053$) while the main effect of text was significant ($F(1,133)=6.16, p=.014$). The interaction effect between gender and text was not statistically significant ($F(1,133)=1.15, p=.286$). Thus, the level of perceived anthropomorphism had the intended effect in the two text conditions such that respondents in the treatment condition ($M_{\text{treatment}}=4.18, SD=1.93$) scored significantly higher on perceived anthropomorphism than those in the control condition ($M_{\text{control}}=3.41, SD=1.73$).⁶ Since the interaction effect was not significant, and since there was no significant difference between respondents that had been exposed to a female ($M_{\text{female}}=4.09, SD=1.87$) versus male ($M_{\text{male}}=3.50, SD=1.83$) in the ad, the gender of the virtual human does not appear to have an impact, as intended, on the perceived level of anthropomorphism. H1 was thus found to have empirical support.

4.2. Effects of anthropomorphism on consumer attitudes and intentions

In order to test hypothesis 2 and 3, a 2 $\times$ 2 multilevel analysis of variance (MANOVA) was performed to determine whether the independent variables of text (treatment vs. control) and gender (female vs. male) were significantly related to each of the eight dependent variables. Multivariate results of the MANOVA shown in *Table 3* indicate that both text and gender was significantly related to the dependent variables. No significant interaction effect between text and gender was observed.

⁶ The mean values of perceived anthropomorphism indicated that neither the treatment (text) nor control (no text) group perceived the virtual individuals as highly anthropomorphic, considering the low means on the 10-point scale. Although this suggests that the anthropomorphic text at hand did not have a large impact on respondents' tendency to anthropomorphize, the difference was yet significant at the .05 level ($M_{\text{treatment}}=4.18; M_{\text{control}}=3.41, p=.014$).

Table 3. Multivariate tests (MANOVA) of independent variables text and gender

Effect	Wilks' Λ	F	$df1$	$df2$	p	η_p^2
Text	.695	6.914	8	126	<.001***	.305
Gender	.874	2.264	8	126	.027*	.126
Text×Gender	.948	.858	8	126	.554	.052

Note: * p < .05, ** p < .01, *** p < .001.

Follow-up ANOVA (Table 4) showed that for the text variable (treatment vs. control), significant univariate effects for ad attitude, intentions towards individual, and ad WOM could be observed. Thus, in support of H2a, H3a, and H3c, these variables appear to be positively affected by the presence of an anthropomorphic text such that individuals in the treatment condition scored significantly higher than those in the control condition (see Table 5). Since no significant differences between the two text conditions were identified for the other dependent variables, H2b-c, H3b, H3d-e did not have empirical support.

Table 4. Univariate results (ANOVA) of text and gender on dependent variables

IV	DV	df	F	p	η_p^2
Text	AdAtt	1	8.69	.004**	.061
	BraAtt	1	2.29	.133	.017
	ProdAtt	1	1.38	.243	.010
	IndInt	1	24.35	<.001***	.155
	BraInt	1	2.44	.121	.018
	AdWOM	1	5.58	.020*	.040
	BraWOM	1	.04	.834	.000
	ProdWOM	1	.89	.347	.007
Gender	AdAtt	1	5.59	.020*	.040
	BraAtt	1	12.82	<.001***	.085
	ProdAtt	1	7.34	.008**	.052
	IndInt	1	5.67	.019*	.041
	BraInt	1	1.01	.316	.008
	AdWOM	1	1.32	.252	.010
	BraWOM	1	1.25	.265	.009
	ProdWOM	1	2.95	.088	.022
Error		133			

Note: * p < .05, ** p < .01, *** p < .001. **AdAtt** = Advertising attitude, **BraAtt** = Brand attitude, **ProdAtt** = Product attitude, **IndInt** = Intentions towards individual, **BraInt** = Intentions towards brand, **AdWOM** = Advertising WOM intentions, **BraWOM** = Brand WOM intentions, **ProdWOM** = Product WOM intentions.

Table 5. Means and Standard Deviations for Anthropomorphic Text Conditions

Factor	Treatment (n= 69)		Control (n= 68)		Mean difference
	<i>M</i>	<i>(SD)</i>	<i>M</i>	<i>(SD)</i>	
Advertising attitude	5.79 _a	(2.16)	4.76 _a	(2.00)	1.03
Brand attitude	5.24	(1.94)	4.76	(2.00)	.48
Product attitude	5.46	(2.14)	5.06	(2.08)	.40
Intentions towards individual	4.49 _b	(2.48)	2.73 _b	(1.72)	1.76
Intentions towards brand	3.32	(2.23)	3.89	(2.10)	-.57
Advertising WOM intentions	5.57 _c	(3.07)	4.38 _c	(2.79)	1.19
Brand WOM intentions	2.54	(2.13)	2.47	(1.73)	.07
Product WOM intentions	2.83	(2.26)	3.19	(2.21)	-.36

Note: Groups with same subscript are significantly different at $p < .05$.

Although multivariate effects in the MANOVA demonstrated an overall significant effect of gender for the dependent variables, follow-up ANOVA (*Table 4*) showed that no significant differences between the female and male conditions were identified for intentions towards brand, ad WOM, brand WOM, and product WOM. Thus, participants' responses in the two groups (female vs. male) did not differ significantly from each other in terms of these dependent variables. However, significant univariate effects could be found for the remainder of the variables such that participants in the female condition consistently scored higher than participants in the male condition (see *Table 6*). Although significant univariate effects for gender were observed, gender differences were however not examined further in line with the purpose of this study.

Table 6. Means and Standard Deviations for Gender of the Virtual Human in Ad

Factor	Female (n= 68)		Male (n= 69)		Mean difference
	<i>M</i>	<i>(SD)</i>	<i>M</i>	<i>(SD)</i>	
Advertising attitude	5.69 _a	(2.09)	4.87 _a	(2.12)	.82
Brand attitude	5.57 _b	(1.79)	4.44 _b	(2.01)	1.13
Product attitude	5.74 _c	(2.11)	4.79 _c	(2.03)	.95
Intentions towards individual	4.04 _d	(2.49)	3.19 _d	(2.04)	.85
Intentions towards brand	3.79	(2.19)	3.42	(2.15)	.37
Advertising WOM intentions	5.26	(2.79)	4.70	(3.15)	.56
Brand WOM intentions	2.69	(1.99)	2.32	(1.88)	.37
Product WOM intentions	3.34	(2.35)	2.68	(2.08)	.66

Note: Groups with same subscript are significantly different at $p < .05$.

4.3. The mediating role of robot likeability

To examine the hypothesized relationship stated in H4, a mediation analysis following the bootstrap procedure proposed by Preacher & Hayes (2008) was conducted. However, the analysis was only focused on those dependent variables that exhibited significant univariate effects for the text condition (treatment vs. control) as stated in *Table 4* in line with the purpose of this study. Thus, the independent variable perceived anthropomorphism and the mediating role of likeability was only studied in relation to each of the dependent variables ad attitude, intentions towards individual, and ad WOM as they indicated significant differences between the two text conditions (treatment vs. control). The mediation assessment was conducted with Hayes' PROCESS macro using the analysis of simple mediation (Model 4). With 5,000 bootstrap resamples, the confidence interval was set at 95%. As recommended by Zhao, Lynch & Chen (2010), mediation is established if the indirect effects of the independent variables on the dependent variables are significant.

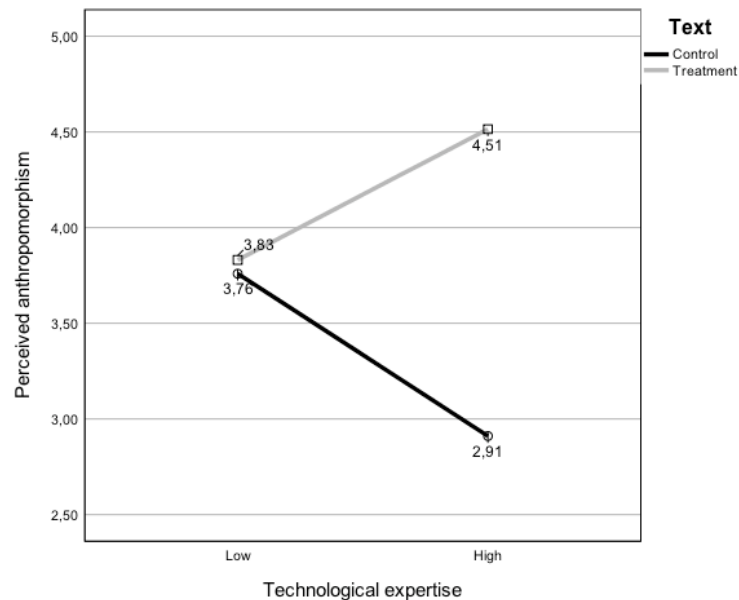
The mediation analysis for the dependent variable ad attitude indicated a significant indirect effect of .22 (95% CI limits .101 and .367), thus suggesting that the effect of perceived anthropomorphism on ad attitude was mediated by likeability. However, although the coefficients related to the indirect effect (path $a=.378$, $p<.001$; path $b=.585$, $p<.001$) were significant, so was the direct effect (path $c=.345$, $p<.001$), suggesting that complementary mediation was at hand (Zhao et al., 2010). The mediation analysis for the dependent variable intentions towards the individual in ad demonstrated a similar result, where the indirect effect of .08 was significant (95% CI limits .004 and .189; path $a=.378$, $p<.001$; path $b=.222$, $p=.026$), but so was the direct effect (path $c=.353$, $p=.001$), suggesting complementary mediation. For the dependent variable ad WOM, the mediation analysis demonstrated a significant indirect effect of .11 (95% CI limits .010 and .249), as well as a non-significant direct effect (path $c=.277$, $p=.0503$), suggesting indirect-only mediation (Zhao et al., 2010). H4 is therefore partly empirically supported.⁷

⁷ Note that this stems from the fact that only three (3) out of eight (8) dependent variables (i.e., attitudes and intentions) were shown to have significant univariate text effects in *Table 4*. As a result, the mediating role of perceived likeability of the virtual human in the ad was only analyzed in relation to these three (3) dependent variables. Since the remaining five (5) dependent variables were not examined further, H4 can, as such, only be found to have partial empirical support.

4.4. Moderating effects of technological expertise and previous experience with virtual agents

The study hypothesized that the tendency to anthropomorphize would be moderated by technological expertise (H5a) and previous experience of virtual agents (H5b). To distinguish between low and high conditions, a cut off was set at the median for the two moderating variables such that responses above 7.50 (46% of responses) for technological expertise and 4.00 (49.6% of responses) for previous experience of virtual agents were considered high. To test the hypotheses, two-way ANOVAs were conducted.

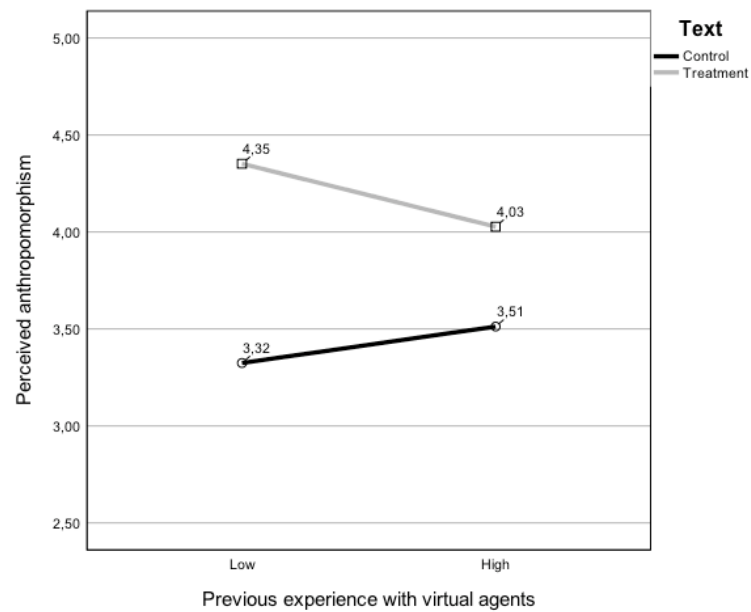
For technological expertise, the 2 (text: treatment vs. control) $\times$ 2 (expertise: high vs. low) ANOVA showed a significant interaction effect between text and expertise ($F(1,133)=6.06, p=.015$). Analysis of simple effects showed a significant difference for the two text conditions (treatment vs. control) in the high technological expertise scenario ($F(1,133)=12.25, p=.001$), but not in the low expertise scenario ($F(1,133)=.03, p=.866$). In support of H5a, technological expertise thus appear to have a moderating effect on perceived anthropomorphism such that perceived anthropomorphism is rated significantly higher in the text condition when technological expertise is high (see *Figure 1*).



Note: Means differ significantly from each other at the .05 level in the high technological expertise scenario ($M_{\text{treatment}}=4.51; M_{\text{control}}=2.91, p=.001$) but not in the low expertise scenario ($M_{\text{treatment}}=3.83; M_{\text{control}}=3.76, p=.866$).

Figure 1. Two-way ANOVA for technological expertise on perceived anthropomorphism.

The 2 (text: treatment vs. control) $\times$ 2 (experience: high vs. low) ANOVA for previous experience of virtual agents demonstrated no significant interaction effect ($F(1,133)=.66$, $p=.419$), thus suggesting that previous experience of virtual agents did not moderate the relationship of text on perceived anthropomorphism (see *Figure 2*). Hence, H5b did not have empirical support.



Note: Means do not differ significantly from each other at the .05 level ($p=.419$).

Figure 2. Two-way ANOVA for previous experience with virtual agents on perceived anthropomorphism.

4.5. Summary of results

Table 7. Summary of hypotheses and results

H1	Anthropomorphic presentation through text will be positively associated to the level of perceived anthropomorphism.	Supported
H2	Anthropomorphic presentation through text will generate more positive <i>attitudes</i> towards the a) advertisement, b) brand, and c) product compared to when no such anthropomorphic text is provided.	a) Supported b) Not supported c) Not supported
H3	Anthropomorphic presentation through text will be positively associated with <i>intentions</i> towards the a) individual (i.e., virtual human) in the ad, b) brand shown in the ad, as well as WOM intentions in relation to the c) advertisement, d) brand, and e) product.	a) Supported b) Not supported c) Supported d) Not supported e) Not supported
H4	The impact of anthropomorphism on attitudes and intentions will be mediated by the perceived likeability of the virtual human in the ad.	Partially supported*
H5	The individual tendency to anthropomorphize the virtual human in the ad, as expressed by the a) self-reported technological expertise, and b) previous experience with virtual agents, moderates the impact of anthropomorphic text presentation on perceived level of anthropomorphism.	a) Supported b) Not supported

Note: * This stems from the fact that only three (3) out of eight (8) dependent variables (i.e., attitudes and intentions) were shown to have significant univariate text effects in *Table 4*.

5. Discussion

5.1. Anthropomorphic presentation of the virtual human

The purpose of this study was to examine the effects of virtual influencers' anthropomorphic traits on a set of consumer attitudes and intentions. The primary analysis was therefore to test whether an anthropomorphic text describing the influencer had the hypothesized effect of increasing the level of perceived anthropomorphism in the ad. The results revealed, in support of H1, that the level of anthropomorphism in fact increased as an anthropomorphic text was presented to the respondent. In line with the findings presented by Reavey et al. (2018), an anthropomorphic text thus seem to imbue a non-human object (i.e., virtual influencer) with perceptions of humanlike emotions among consumers. This is further strengthened by the research on humanization in advertising such that an advertised entity presented in a humanlike way triggers anthropomorphism to a greater extent (Puzakova et al. 2009).

Although significant group differences were observed, rather low mean values of perceived anthropomorphism across the groups could however be identified ($M_{\text{treatment}}=4.18$ vs. $M_{\text{control}}=3.41$ on a 10-point scale). A potential explanation for this result may be found in the works of Epley et al. (2007) concerning the attribution of humanlike characteristics. As this study in effect did not distinguish between surface similarities (i.e., appearance) and attribution of essential human characteristics (i.e., a humanlike mind), it may have been the case that the anthropomorphic text stimuli did not sufficiently convey essential human characteristics. Consequently, the anthropomorphism that was evoked among respondent might instead have been primarily based on the appearance of the virtual human, which most people would not have mistaken for a real human. That is, respondents may not have perceived the non-human entity to have a conscious mind of its own, thus impeding the likelihood to treat the entity as a moral agent worthy of empathic care and concern (Waytz et al., 2010).

5.2. Effects of anthropomorphism on consumer attitudes and intentions

It was hypothesized in H2 and H3 that humanlike traits of a virtual human would generate favorable attitudes and intentions, similar to the effects observed in the case of humanlike products and brands. The results did in part confirm these hypotheses. It was found that anthropomorphic traits resulted in significant differences in ad attitudes, intentions towards the virtual human, as well as ad WOM intentions. For the remainder of the dependent variables the effects of anthropomorphism could not be concluded to have any significant effect. Contrary to findings by Garretson & Burton (2005) and

Aggarwal & McGill (2007) among others, anthropomorphism did not affect brand or product evaluations. Perhaps interestingly, but not surprisingly, an explanation for these results may be that the study never intended to anthropomorphize either the brand or the product per se but rather only the virtual human. That is, since the product and brand were not anthropomorphized as part of the treatment (i.e., since the anthropomorphic text design was not intended to evoke product or brand anthropomorphism), consumer evaluations connected to the brand and product could reasonably be expected to not be affected by how one might present a virtual individual through text. However, one might still notice that two of the three significant univariate effects were related to the advertisement itself. This supports the findings by Hart & Roynes (2017) such that anthropomorphizing a non-human entity makes stimulus processing easier. If presenting a non-human object as humanlike, anthropomorphism offer consumers the opportunity to increase their processing fluency through familiarity such that they can better interpret the stimulus presented to them (Labroo, Dhar & Schwarz, 2008). Also, since the intentions towards the virtual influencer (e.g., visit its social media pages) was found to have significant effects, one might still conclude that anthropomorphizing the entity creates, at least, higher interest among consumers to further engage with the entity.

5.3. The mediating role of robot likeability

From the mediation analysis, in partial support of H4, it was found that perceived anthropomorphism on each of the three investigated variables was mediated by the likeability of the virtual human.⁸ These findings are consistent with previous research on the effects of the “Uncanny Valley” such that anthropomorphism succeeds likeability towards the robot (see for example Salem et al., 2013). More interestingly, however, is the fact that these findings build upon previous research and validate its illustration of how people respond to robot encounters, even in an advertising context regarding virtual humans. This result suggests that humanlike traits through anthropomorphic text generate positive emotional reactions such that higher attitudes and intentions can be observed for virtual influencers. In line with earlier research on anthropomorphism conducted by Salem et al. (2013) and Rau et al. (2010), this indicates that anthropomorphism shall lead to positive emotional reactions and likeability. Noteworthy is however the fact that likeability only demonstrated complementary mediation of anthropomorphism on ad attitudes and intentions towards the individual, while it exhibited indirect-only mediation for ad WOM, in the framework of Zhao et al. (2010). Thus, likeability is said to fully mediate the effect of anthropomorphism on ad WOM, but only partially for the other two variables. Surprisingly, influence from some

⁸ See discussion in section 4.3

other source might therefore have impacted such findings, suggesting that further research is needed to investigate alternative mediators within this relationship.

5.4. Moderating effects of technological knowledge and experience

As suggested by Epley et al. (2008), individual factors might influence the tendency to anthropomorphize non-human objects. Further analysis therefore examined the moderating role of previous experience with virtual agents and technological expertise. In support of H5a, technological expertise did in fact have a moderating effect on the tendency to anthropomorphize, but significant results were only obtained for when such technological knowledge were high. That is, anthropomorphism appears to be rated significantly higher in the text condition when technological expertise is high but no such distinction could be confirmed when it is low. Contrary to the findings by Hart & Royne (2017) on product knowledge, consumers with relatively low knowledge did not necessarily anthropomorphize more than those with high knowledge. Opposite to their notion, anthropomorphic reasoning was not expected to have greater inferential value when consumer had little technological knowledge in this study (Hart & Royne, 2017).

Moreover, moderation analysis of previous experience with virtual agents as stated in H5b was not supported empirically in this study. Contrary to Haring et al. (2013), previous experience did in fact not have a moderating effect. Yet, it might be feasible to believe that previous interaction with virtual agents nonetheless can generate greater emotional responses and more positive attitudes towards the entity (Bartneck et al., 2007). Thus, the moderating role of previous experience might not show up until later in the consumer mind process, rather than having an impact on the relationship between anthropomorphic texts and perceived anthropomorphism alone.

6. Conclusions

6.1. Conclusions

The purpose of this thesis was to examine the effects of consumers' psychological reactions in terms of attitudes and intentions when advertising containing virtual humans was presented in such a way that evoked anthropomorphism among its recipients. More specifically, this was done by assessing the extent to which an anthropomorphic description in text form made people anthropomorphize (i.e., attribute human traits, emotions, or intentions to) virtual influencers.

It was concluded that, in accordance with previous anthropomorphism research conducted by Reavey et al. (2018), presenting an anthropomorphic text along an advertisement seemed to imbue the non-human object (i.e., virtual influencer) with perceptions of humanlike characteristics among respondents. Subsequently, consumers' attitudes towards the virtual influencer were positively affected by the human likeness of the agent. Thus, it was found that anthropomorphic traits resulted in significant differences in ad attitudes, intentions towards the virtual human, as well as ad WOM intentions. While the likeability of the virtual human presented in the ad mediated this relationship, technological knowledge but not previous experience with virtual agents moderated respondents' tendency to anthropomorphize.

More interestingly, contrary to findings by Garretson & Burton (2005) and Aggarwal & McGill (2007) among others, anthropomorphism did not affect brand or product evaluations. Explanations for these results may be that the study never intended to anthropomorphize either the brand or the product per se but rather only the virtual human. From this perspective, it can nevertheless be concluded that the use of an anthropomorphic presentation of a virtual human through text in an advertising context can improve consumer attitudes and intentions, at least related to the advertisement and the virtual human itself.

6.2. Implications and contributions

As artificial intelligence (AI) is starting to blur the line between humans and machines as well as becoming a more common part of the everyday human life, it is essential to understand how humans interact and respond to such technology. On social media the development is evident with several virtual influencers starting to emerge. With much research on the topic of HCI and HRI the research on virtual humans has however to this date been limited, especially from a marketing perspective. As this thesis aspired to improve the understanding of how consumers interact with and respond to virtual human influencers, predominately in terms of how consumers anthropomorphize them,

implications for research may hopefully be found from the presented results. Not only do the present study contribute to the knowledge about human-robot interaction and the topic of anthropomorphism, but it also hopes to spark interest within research to further explore anthropomorphism in an advertising context.

Since results indicated that anthropomorphic traits of a virtual influencer play a vital role for advertising attitudes and intentions related to the influencer itself, marketing practitioners may want to pay careful attention to how they develop their marketing communication involving such virtual humans. As a consequence of using an anthropomorphic presentation of a virtual influencer, brands may experience more favorable attitudes towards the advertisement and consumers may be more likely to talk to their friends about the ad. Thus, anthropomorphism can be an important determinant in generating viral content and spreading an advertising message among consumers. This is further strengthened by the fact that the present study examined consumer reactions in two different settings (male and female) with, to some extent, equivalent outcomes. As such, this indicates that anthropomorphism can be expected to have similar effects for various virtual individuals in different settings and contexts, thus strengthening the replicability and ultimately the reliability of this study.

6.3. Critique and limitations

Since the findings somewhat differed from previous research, the validity of the results might be questioned. In this study, the effects of anthropomorphism was found to mainly be related to the individual shown in the ad and the advertisement itself, but not the brand or product. One might therefore discuss how the stimuli development and manipulation in the treatment conditions were designed. Although significant results were observed, for example in relation to perceived anthropomorphism from reading an anthropomorphic text, it can still be acknowledged that it may be difficult to provide a fully anthropomorphic text without inferring other aspects that might have an impact on the results. Thus, it cannot be ruled out that other factors may have been involved affecting the respondents. One could therefore question the internal validity of the study considering concepts such as unintended storytelling effects conveyed in the text. By including an additional manipulation to the experiment regarding the presence vs. absence of the advertisement image, one might argue that such concerns may have been better accounted for. As of now, only the differences between the treatment groups (i.e., respondents simultaneously exposed to the anthropomorphic text and advertisement image) and control groups (i.e., respondents exposed to the stand-alone advertisement image) have been examined. How the treatment groups would have reacted to that anthropomorphic text independently compared to the other manipulations can however not be concluded from this study. Although, considering that virtual influencers in most cases are displayed by image on social media, the relevance of such a manipulation may

appear low from an ecological validity point of view. Yet, such considerations could be of interest for future research.

Another concern is related to the stimulus sampling procedure wherein the experiment was conducted in two different settings (female/male). As suggested by Söderlund (2018), greater variance in responses may have been obtained from this. However, as no research prior to the experiment had studied the potential differences in terms of virtual human gender in advertising, it was found unlikely that the gender should have an effect on attitudes and intentions. Although included in the experiment, the study was not set out to examine such gender differences per se. Since some contrasts regarding gender nevertheless were found, they were not analyzed any further. This may not necessarily have been inappropriate in line with the purpose of the study, however, such differences might have affected the outcome of the findings. Since it was found that the female conditions were systematically rated higher across the measures (see *Table 6*), it cannot be excluded that gender had at least some impact on consumer attitudes and intentions. Another conceivable reason for the differences in results may also have been connected to the comparability of the two images used in the experiment. Since the female virtual human was animated slightly better, this might explain such results since anthropomorphism is largely concerned with anthropomorphic appearance (e.g., Salem et al., 2013). Therefore, the advertisements used in the experiment may not have been fully comparable such that everything else was held constant except for the manipulated variable (Bryman & Bell, 2011). Thus, anthropomorphic appearance may have been a likely explanation of differences in results based on gender, which calls for future research within the field.

6.4. Directions for future research

The authors suggest further investigation into attitudes and intentions within the virtual human advertising context to see how this compares to other settings such as other product categories and other mediums of conveying anthropomorphic reasoning (e.g., video or speech). Such research could potentially aim to identify how virtual influencers should be communicated in order to generate better product and brand attitudes and intentions. Moreover, future research could compare real (i.e., human) and virtual influencers from a marketing perspective. With anthropomorphism found to be a vital element in advertising, it is of interest to examine how advertising effectiveness varies across these entities. Lastly, it is suggested that examining individual differences in the tendency to anthropomorphize might be of relevance from a customer segmentation perspective.

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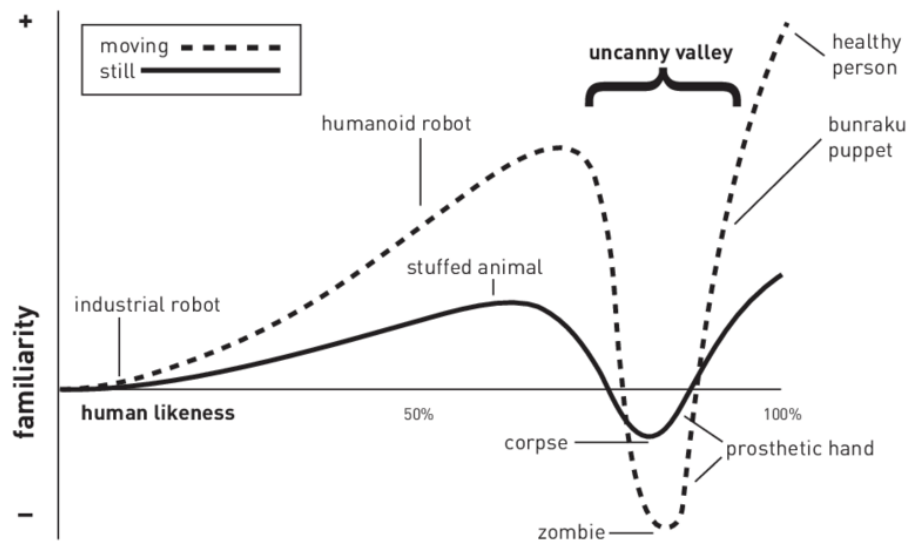
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8. Appendix

8.1. Appendix I: The Uncanny Valley



Note: Masahiro Mori's graph of the uncanny valley, translated and simplified by MacDorman et al. (2009). Mori hypothesized the non-linear relationship between human likeness and *shinwakan* (roughly translated as comfort level, familiarity, or perceived affinity to an entity): more human-looking robots are perceived as more agreeable until a certain point (around 70% human likeness; Weis & Weise, 2017) beyond which the response quickly becomes intense repulsion. This dip in evaluation is called the uncanny valley. As human likeness continues to become less distinguishable from those of a real human being, the emotional response becomes positive once again. Movement, according to Mori, magnifies the uncanny valley.

Figure 3. The Uncanny Valley

8.2. Appendix II: Advertisement images

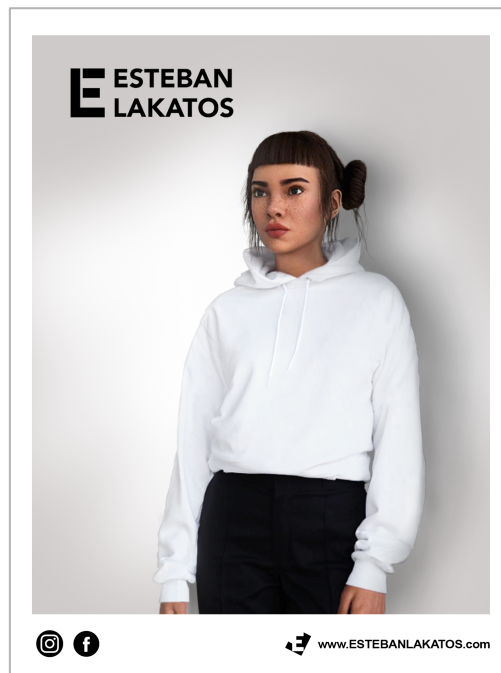


Figure 4. Advertisement of the female virtual influencer (i.e., @lilmiquela)

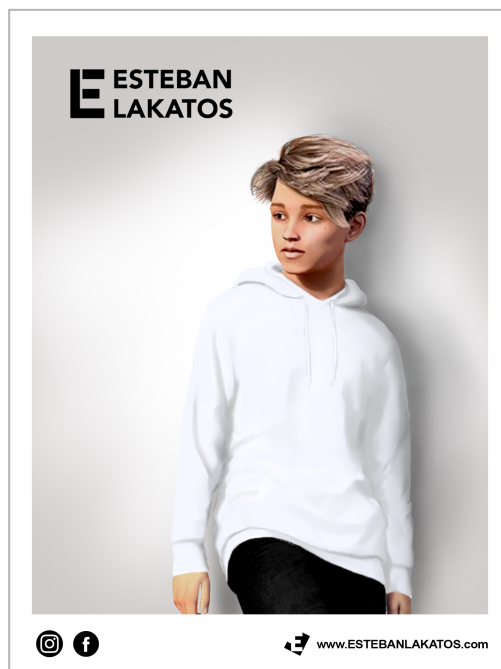


Figure 5. Advertisement of the male virtual influencer (i.e., @cadeharper)

8.3. Appendix III: Pre-study survey

Nedan ser du en annons från varumärket Esteban Lakatos. I denna kampanj använder de sig av virtuella ambassadörer för sitt varumärke. Titta på reklamannonsen och läs medföljande textutdrag om modellen på bilden. Vänligen studera annonsen och texten noggrant innan du går vidare.

Female advertisement image displayed here

***** **Note: Only 1 of the following 3 texts was shown in combination with the advertisement to each participant in a randomized manner.** *****

1st person narrative (i.e., interview):

Esteban Lakatos today announced their collaboration with the virtual influencer and singer Alex Sousa... but she's not real. 19 years old and only existing virtually, the California resident has made herself a name during the past two years, going from an unknown virtual robot to an established artist. She is regularly spotted on social media hanging out with friends, celebrities... and her virtual boyfriend Chris Blawck(!). We got a hold of Alex for a short interview and asked about her unreal life, fashion and artist career.

You raise exciting questions about what it means to be real on the Internet: do you consider your lifestyle real?

Although my life on social media may seem unreal, I am scheduled for tons of stuff ranging from modeling shoots to music releases. So, to answer your question; yes, I'd consider my life just as authentic as yours. I dream about crushes. Aspirations. Dogs that talk. Normal stuff.

Who decides what you post online, which brands you endorse, what events you attend?

I mean, people can try to tell me what to post, but, ultimately, I choose what projects I take on and what I want to share with people. When brands or events or whatever reach out, I make sure to include my managers so they can discuss the business side of things.

In the past, you've been secretive about your true identity, why?

I love being open and connecting with fans, but putting my real story out there risked everything I've worked so hard for. I'm not human, no. And neither am I a digitally enhanced human. I'm a virtual robot. Like, beep boop and all that. But just like you, I am still an emotional being. In many ways, I feel just like a real human. I laugh, love and like to feel appreciated.

You have talked about being '19 forever.' Will you ever get older?

I'm not able to age the way humans do. It's something that's been increasingly difficult for me as my friends age around me. I try not to think about it too much, to be really honest with you. But still, I need time for myself to relax and reflect. I make time to be alone, either to write or read or just sit with my own thoughts. I hang out with friends who uplift me.

You are actively engaged in equality and human rights issues, where does your interest come from?

From my algorithm... No but honestly, I am still a person. I want to make real impact through social media. It has helped me form valuable friendships, gain self-confidence, and inspire people all around the world. We've got to empower one another, and part of that means standing up for people who don't always have a voice.

3rd person narrative (i.e., editorial text):

Esteban Lakatos today announced their collaboration with the virtual influencer and singer Alex Sousa... but she's not real. 19 years old and only existing virtually, the California resident has made herself a name during the past two years, going from an unknown virtual robot to an established artist. She is regularly spotted on social media hanging out with friends, celebrities... and her virtual boyfriend Chris Blawck(!).

Alex raises exciting questions about what it means to be real on the Internet. Although her life on social media may seem unreal, her busy career is in fact very real. With everything from modeling shoots and music releases, Alex considers her life just as authentic as ours. She dreams about crushes. Aspirations. Dogs that talk. Normal stuff.

She might be the outcome of human engineering, but ultimately makes her own decisions. However, when brands reach out for collaborations she often includes her managers to discuss the business side of things.

Alex loves being open and connecting with fans, but admits being secretive about parts of her life in fear of losing everything that she's been working for. After much speculation, voices recently emerged raising the question about Alex's true identity. Her followers wanted to know if she was a digitally enhanced version of a real human, or 100% based on AI algorithms.

In a recent unfolding of events, Alex came out admitting on social media being a virtual robot. However she claims, that just like us, she is an emotional being and in many ways feels just like a real human with the need to laugh, love and feel appreciated.

She's clearly not human, but it is a puzzling thought to think of her as a person. Although she doesn't age and will always stay 19, Alex still needs time for herself to relax and reflect. She is either alone writing or reading, or hanging out with friends who uplift her. Traits that sure sounds like a true individual.

She is known for her active engagement in the public debate and her passion for civil and human rights issues. Although non-human, she has accomplished real impact through the power of social media. It has helped her form valuable friendships, gain self-confidence, and inspire people all around the world. She believes in empowering one another and standing up for those who don't always have a voice.

Control condition (i.e., bullet point list):

- **Name:** Alex Sousa
- **Age:** 19 (forever)
- **Origin:** California, USA
- **Residence:** Her daily preference
- **Profession:** AI-based virtual influencer & artist
- **Passions:** Human rights issues, music, fashion
- **Partner:** Chris Blawck (also AI-virtual influencer)
- **Level of humanness:** Fully emotional & conscious
- **Level of freedom:** Self-governed (makes her own decisions)
- **Life changing moment:** Admitting being a 100% virtual robot
- **Typical day:** Networking with other influencers and celebrities. Addressing political issues. Interacting with fans.
- **Life Motto:** "Inspire people around the world"
- **Goals:** Freedom and equality for everyone (real & virtual)

PRE-STUDY QUESTIONNAIRE IN ENGLISH (SWEDISH IN PARENTHESES):

Q1: **Which matter is Alex engaged in, according to the text above?**
(Vilken fråga är Alex engagerad i, enligt texten ovan?)

- ☐ **Youth sports** (Ungdomsidrott)
☐ **National parks** (Nationalparker)
☐ **Human rights** (Mänskliga rättigheter)

Q2: **What is your impression of the *individual* in the advertisement?**
(Vad är din uppfattning om individen i reklamannonsen?)

Fake (Onaturlig)	1	2	3	4	5	6	7	Natural (Naturlig)
Machinelike (Maskinliknande)	1	2	3	4	5	6	7	Humanlike (Människolik)
Unconscious (Omedveten)	1	2	3	4	5	6	7	Conscious (Medveten)
Artificial (Artificiell)	1	2	3	4	5	6	7	Real (Verklighetstrogen)

Q3: **What is your impression of the *individual* in the advertisement?**
(Vad är din uppfattning om individen i reklamannonsen?)

Dislike (Ogillar)	1	2	3	4	5	6	7	Like (Gillar)
Unfriendly (Ovänlig)	1	2	3	4	5	6	7	Friendly (Vänlig)
Unkind (Fientlig)	1	2	3	4	5	6	7	Kind (Vänskaplig)
Unpleasant (Obehaglig)	1	2	3	4	5	6	7	Pleasant (Behagelig)
Aweful (Otrevlig)	1	2	3	4	5	6	7	Nice (Trevlig)

Q4: **Please answer the following questions about the *individual* in the ad.**
(Vänligen besvara följande frågor om *personen* i reklamannonsen.)

	Not at all (Instämmer inte alls)				Very much (Instämmer helt)			
I could easily mistake this robot for a real individual. (Jag kan enkelt missta roboten för en riktig individ.)	1	2	3	4	5	6	7	
The robot looks like a human. (Roboten ser ut som en människa.)	1	2	3	4	5	6	7	
I consider the robot to look too much like a human. (Jag anser att roboten ser för mycket ut som en människa.)	1	2	3	4	5	6	7	

Q5: **What is your impression about the advertised *brand*?**
(Vad är ditt intryck av det annonserade *varumärket*?)

Good (Bra)	1	2	3	4	5	6	7	Bad (Dåligt)
Negative (Negativt)	1	2	3	4	5	6	7	Positive (Positivt)
Dislike it (Ogillar)	1	2	3	4	5	6	7	Like it (Gillar)

Q6: **Please answer the following questions about the *text* you previously read.**
(Vänligen svara på följande frågor om *texten* du tidigare läste.)

	Not at all (Instämmer inte alls)					Very much (Instämmer helt)	
In the text, Alex describes herself in her own words. (I texten beskriver Alex sig själv med sina egna ord.)	1	2	3	4	5	6	7
In the text, it is Alex herself talking about what she thinks and feels. (I texten är det Alex själv som berättar vad hon tycker och känner.)	1	2	3	4	5	6	7
The text is based on what Alex herself is saying. (Texten är baserad på vad Alex själv säger.)	1	2	3	4	5	6	7
In the text, Alex is described in someone else's words. (I texten beskrivs Alex med någon annans ord.)	1	2	3	4	5	6	7
In the text, it is someone else taking about Alex's thoughts and feelings. (I texten är det någon annan som berättar vad Alex tycker och känner.)	1	2	3	4	5	6	7
The text is based on what someone else is saying about Alex. (Texten är baserad på vad någon annan säger om Alex.)	1	2	3	4	5	6	7

Q7: **Was is clear in the text that the individual in the ad is not a real human?**
(Framgick det i texten att individen på bilden inte är en människa?)

☐ **Yes** (Ja)

☐ **No** (Nej)

☐ **Don't know** (Vet ej)

Q8: **Which type of text did you read?**
(Vilken typ av text läste du?)

☐ **A newspaper interview with Alex** (Intervju med Alex i tidningsartikel)

☐ **A newspaper article writing about Alex** (Tidningsartikel som enbart berättade om Alex)

☐ **A bullet-point list about Alex** (Lista i punktform om Alex)

☐ **None of the above** (Inget av ovanstående)

Q9: **Have you seen the individual in the ad before?**
(Har du sett individen på bilden förut?)

☐ **Yes** (Ja)

☐ **No** (Nej)

- Q10: **Do you know who the individual in the ad is?**
(Vet du vem individen på bilden är?)
☐ **Yes** (Ja)
☐ **No** (Nej)
- Q11: **Are you previously familiar with the brand?**
(Känner du till varumärket sedan tidigare?)
☐ **Yes** (Ja)
☐ **No** (Nej)
- Q12: **According to yourself, was the individual in the ad a real human?**
(Enligt dig själv, var personen på bilden en människa?)
☐ **Yes** (Ja)
☐ **No** (Nej)
-

- Q13: **Please select your gender.**
(Vänligen välj din könstillhörighet.)
☐ **Woman** (Kvinna)
☐ **Man** (Man)
☐ **Other** (Annat)
☐ **Prefer not to say** (Vill ej uppge)
- Q14: **Please select your age from the drop-down list.**
(Vänligen välj din ålder från listan nedan.)
-

END OF SURVEY

8.4. Appendix IV: Main study survey

Nedan ser du en annons från varumärket Esteban Lakatos. I denna kampanj använder de sig av **virtuella** ambassadörer för sitt varumärke. Detta innebär att individerna är baserade på artificiell intelligens och enbart existerar i den digitala världen. Notera därför att det **INTE är en riktig människa** på bilden nedan.

* Titta på reklamannonsen och läs medföljande utdrag ur en artikel om modellen på bilden.*

Vänligen studera annonsen och texten noggrant innan du går vidare.

* Note: Information only shown to treatment groups.

Female/Male advertisement image displayed here

Note: The following text was only shown to the treatment groups. The text was identical for

***** **both the female and male conditions, except for** *****
adhering gender pronouns.

Esteban Lakatos today announced their collaboration with the virtual influencer and singer Alex Sousa... but she's not real. 19 years old and only existing virtually, the California resident has made herself a name during the past two years, going from an unknown virtual robot to an established artist. She is regularly spotted on social media hanging out with friends, celebrities... and her virtual(!) boyfriend Taylor Blawk.

Alex raises exciting questions about what it means to be real on the Internet. Although her life on social media may seem unrealistic, her busy career is in fact very real with everything from modeling shoots and music releases. And with dreams about crushes, aspirations and dogs that talk, Alex considers her life just as authentic as ours.

She might be the outcome of human engineering, but claims being an independent individual who ultimately makes her own decisions. However, when brands reach out for collaborations she often includes her managers to discuss the business side of things.

Alex loves being open and connecting with fans, but admits being secretive about parts of her life in fear of losing everything that she's been working for. After much speculation, voices recently emerged raising the question about Alex's true identity. Her followers wanted to know if she was a digitally enhanced version of a real human, or 100% based on AI algorithms.

In a recent unfolding of events, Alex came out admitting on social media being a virtual robot. However she claims, that just like us, she is an emotional being and in many ways feels just like a real human with the need to love and feel appreciated.

She's clearly not human, but it is a puzzling thought to think of her as a person. Although she doesn't age and will always stay 19, Alex says she still needs time to relax and reflect. Usually she's alone writing or reading, or hanging out with friends who uplift her. Traits that sure sound like a true individual.

She is known for her active engagement in the public debate and her passion for civil and human rights issues. Although non-human, she has accomplished real impact through social media. It has helped her form valuable friendships, gain self-confidence, and inspire people all around the world. She believes in empowering one another and standing up for those who don't always have a voice.

MAIN STUDY QUESTIONNAIRE IN ENGLISH (SWEDISH IN PARENTHESES):

Q1: * **Which matter is Alex engaged in, according to the text above?**

(Vilken fråga är Alex engagerad i, enligt texten ovan?)

- ☐ **Endangered animals** (Utrotningshotade djur)
- ☐ **Heart diseases** (Hjärt- och kärlsjukdomar)
- ☐ **Human and civil rights** (Mänskliga rättigheter)

* *Note:* Question only shown to treatment groups

Q2: **Please identify the brand that was shown in the ad:**

(Vänligen välj det varumärke som visades i annonsen.)

- ☐ **Pryme Fashion**
- ☐ **Esteban Lakatos**
- ☐ **Jewel Club Inc.**

Q3: **Which product was shown in the ad?**

(Vilken produkt visades i annonsen?)

- ☐ **A red t-shirt** (En röd t-shirt)
- ☐ **A grey beanie** (En grå mössa)
- ☐ **A white hoodie** (En vit tröja (hoodie))

Q4: **What is your impression of the *individual* in the advertisement?**

(Vad är din uppfattning om *individen* i reklamannonsen?)

Fake (Onaturlig)	1	2	3	4	5	6	7	8	9	10	Natural (Naturlig)
Robotlike (Robotlik)	1	2	3	4	5	6	7	8	9	10	Humanlike (Människolik)
Artificial (Artificiell)	1	2	3	4	5	6	7	8	9	10	Real (Verklighetstrogen)

Q5: **Please rate the extent to which the *individual* in the advertisement possesses each of the characteristics below.** (Vänligen uppskatta till vilken grad *individen* i annonsen har följande egenskaper.)

	Not at all (Instämmer inte alls)										Very much (Instämmer helt)									
A mind of its own (Ett eget förstånd)	1	2	3	4	5	6	7	8	9	10										
Intentions (Intentioner)	1	2	3	4	5	6	7	8	9	10										
A free will (En fri vilja)	1	2	3	4	5	6	7	8	9	10										
Consciousness (Ett medvetande)	1	2	3	4	5	6	7	8	9	10										
Ability to experience emotions (Förmåga att uppleva känslor)	1	2	3	4	5	6	7	8	9	10										

Q6: **What is your impression of the *individual* in the advertisement?**
(Vad är din uppfattning om *individen* i reklamannonsen?)

Dislike (Ogillar)	1	2	3	4	5	6	7	8	9	10	Like (Gillar)
Unfriendly (Ovänlig)	1	2	3	4	5	6	7	8	9	10	Friendly (Vänlig)
Unkind (Fientlig)	1	2	3	4	5	6	7	8	9	10	Kind (Vänskaplig)
Unpleasant (Obehaglig)	1	2	3	4	5	6	7	8	9	10	Pleasant (Behaglig)
Aweful (Otrevlig)	1	2	3	4	5	6	7	8	9	10	Nice (Trevlig)

Q7: **What is your impression of the *advertisement*?**
(Vad är ditt intryck av *annonsen*?)

Bad (Dåligt)	1	2	3	4	5	6	7	8	9	10	Good (Bra)
Dislike it (Ogillar)	1	2	3	4	5	6	7	8	9	10	Like it (Gillar)
Unpleasant (Obehaglig)	1	2	3	4	5	6	7	8	9	10	Pleasant (Behaglig)
Uninteresting (Ointressant)	1	2	3	4	5	6	7	8	9	10	Interesting (Intressant)
Negative (Negativt)	1	2	3	4	5	6	7	8	9	10	Positive (Positivt)

Q8: **What is your impression of the *brand*?**
(Vad är ditt intryck av *varumärket*?)

Bad (Dåligt)	1	2	3	4	5	6	7	8	9	10	Good (Bra)
Dislike it (Ogillar)	1	2	3	4	5	6	7	8	9	10	Like it (Gillar)
Unpleasant (Obehaglig)	1	2	3	4	5	6	7	8	9	10	Pleasant (Behaglig)
Uninteresting (Ointressant)	1	2	3	4	5	6	7	8	9	10	Interesting (Intressant)
Negative (Negativt)	1	2	3	4	5	6	7	8	9	10	Positive (Positivt)

Q9: **What is your impression of the *product* (i.e., hoodie) exposed in the ad?**
(Vad är ditt intryck av *produkten* (dvs. tröjan) i reklamannonsen?)

Bad (Dåligt)	1	2	3	4	5	6	7	8	9	10	Good (Bra)
Dislike it (Ogillar)	1	2	3	4	5	6	7	8	9	10	Like it (Gillar)
Unpleasant (Obehaglig)	1	2	3	4	5	6	7	8	9	10	Pleasant (Behaglig)
Uninteresting (Ointressant)	1	2	3	4	5	6	7	8	9	10	Interesting (Intressant)
Negative (Negativt)	1	2	3	4	5	6	7	8	9	10	Positive (Positivt)

Q10: **Please evaluate the following statements.**
(Vänligen bedöm följande påståenden.)

	Very unlikely (Inte alls troligt)					Very likely (Mycket troligt)				
How likely is it that you would talk about this advertisement with a friend? (Hur troligt är det att du skulle tala med en vän om denna reklamannons?)	1	2	3	4	5	6	7	8	9	10
If a friend was shopping for clothes, how likely is it that you would recommend Esteban Lakatos? (Om en vän ska handla kläder, hur pass troligt är det att du skulle rekommendera Esteban Lakatos?)	1	2	3	4	5	6	7	8	9	10
If a friend was shopping for a hoodie, how likely is it that you would recommend the hoodie in the ad? (Om en vän är intresserad av att köpa en tröja, hur troligt är det att du skulle rekommendera tröjan i annonsen?)	1	2	3	4	5	6	7	8	9	10

Q11: **Please evaluate the following statements regarding the *individual* in the ad.**
(Vänligen bedöm följande påståenden i relation till *individen* i annonsen.)

	Not at all (Instämmer inte alls)					Very much (Instämmer helt)				
I want to seek more information about the individual in the ad. (Jag vill söka mer information om individen i annonsen.)	1	2	3	4	5	6	7	8	9	10
I want to search for more campaigns this individual has been involved in. (Jag vill söka efter fler kampanjer som denna individ har varit med i.)	1	2	3	4	5	6	7	8	9	10
I want to visit the individual's profile on social media. (Jag vill besöka individens sociala medieprofiler.)	1	2	3	4	5	6	7	8	9	10
I want to follow the individual on social media. (Jag vill följa individen i reklamannonsen på sociala medier.)	1	2	3	4	5	6	7	8	9	10

Q12: **Please rate the following statements regarding the *brand* in the ad.**
(Vänligen bedöm följande påståenden i relation till *varumärket* i annonsen.)

	Not at all (Instämmer inte alls)										Very much (Instämmer helt)									
I want to seek more information about the brand. (Jag vill söka mer information om varumärket.)	1	2	3	4	5	6	7	8	9	10										
I want to search for more campaigns from this brand. (Jag vill söka efter fler kampanjer som varumärket gjort.)	1	2	3	4	5	6	7	8	9	10										
I want to visit the brand's profile social media. (Jag vill besöka varumärkets profil på sociala medier.)	1	2	3	4	5	6	7	8	9	10										
I want to follow the brand on social media. (Jag vill följa varumärket på sociala medier.)	1	2	3	4	5	6	7	8	9	10										
I want to visit the brand's website. (Jag vill besöka varumärkets hemsida.)	1	2	3	4	5	6	7	8	9	10										

Q13: **Did you in connection to the ad by Esteban Lakatos read an excerpt from an article about the model in the advertisement?** (Fick du i anslutning till reklamannonsen av Esteban Lakatos läsa ett utdrag från en artikel som handlade om modellen i annonsen?)

☐ Yes (Ja)

☐ No (Nej)

Q14: **Please rate the following statements.**
(Vänligen bedöm följande påståenden.)

	Not at all (Instämmer inte alls)										Very much (Instämmer helt)									
The advertisement presented the individual as humanlike. (Annonsern presenterade modellen som människolik.)	1	2	3	4	5	6	7	8	9	10										
In the advertisement, the individual seemed like a human in one or many ways. (Individen i annonsen framstod på ett eller annat sätt som en människa.)	1	2	3	4	5	6	7	8	9	10										
The advertisement intended me to think of the individual as human. (Annonsern hade för avsikt att få mig att tänka på modellen som en människa.)	1	2	3	4	5	6	7	8	9	10										

- Q15: **Do you know who the individual in the ad is?**
(Vet du vem individen i reklamannonsen är sedan tidigare?)
- ☐ **Yes** (Ja)
- ☐ **No** (Nej)

- Q16: **Was is evident that the individual in the ad was not a real human?**
(Framgick det att individen i annonsen inte är en människa?)
- ☐ **Yes** (Ja)
- ☐ **No** (Nej)

Almost done! Please note that the following questions are about YOU as an individual and NOT the ad you saw. Click below to proceed.

(Nästan klar! Notera att kommande sektion handlar om DIG som individ och INTE annonsen du såg. Klicka nedan för att gå vidare.)

- Q17: **Please rate the following statements.**
(Vänligen bedöm följande påståenden.)
- | | Not at all
(Instämmer
inte alls) | Very much
(Instämmer
helt) |
|---|---|---|
| To what extent does a car have free will? (Till vilken grad har en bil en fri vilja?) | 1 2 3 4 5 6 7 8 9 10 | |
| To what extent does technology have intentions? (Till vilken grad har teknologi intentioner?) | 1 2 3 4 5 6 7 8 9 10 | |
| To what extent does a television set experience emotions? (Till vilken grad har en TV förmågan att uppleva känslor?) | 1 2 3 4 5 6 7 8 9 10 | |
| To what extent does the average robot have a consciousness? (Till vilken grad har den genomsnittliga roboten ett medvetande?) | 1 2 3 4 5 6 7 8 9 10 | |
| To what extent does the average computer have a mind of its own? (Till vilken grad har den genomsnittliga datorn ett eget förstånd?) | 1 2 3 4 5 6 7 8 9 10 | |

Q18: **Please evaluate the following statements concerning your own use of technology.**
(Vänligen bedöm följande påståenden avseende din egen användning av teknologi.)

	Not at all (Instämmer inte alls)										Very much (Instämmer helt)									
I am an experienced user of technology in general. (Jag är en erfaren användare av teknologi i allmänhet.)	1	2	3	4	5	6	7	8	9	10										
I have good knowledge about technology in general. (Jag har goda kunskaper inom teknologi i allmänhet.)	1	2	3	4	5	6	7	8	9	10										
I am used to interact with virtual agents (for example Amazon Alexa, Google Home, Siri etc.). (Jag är van vid att interagera med virtuella assistenter (t.ex. Amazon Alexa, Google Home, Siri etc.))	1	2	3	4	5	6	7	8	9	10										

Q19: **Please select your gender.**
(Vänligen välj din könstillhörighet.)

- ☐ **Woman** (Kvinna)
☐ **Man** (Man)
☐ **Other** (Annat)

Q20: **Please select your age from the drop-down list.**
(Vänligen välj din ålder från listan nedan.)

Q21: **Please select your most recently started or finished educational level.**
(Vänligen välj din högsta påbörjade eller slutförda utbildningsnivå.)

☐ **Elementary school** (Grundskola)
☐ **High school** (Gymnasium)
☐ **University / College (3 years or less)** (Universitet / Högskola (3 år eller mindre))
☐ **University / College (more than 3 years)** (Universitet / Högskola (mer än 3 år))
☐ **Vocational school or similar** (Folkhögskola, Yrkeshögskola eller liknande)
☐ **I have not studied** (Jag har inte studerat)

END OF SURVEY

8.5. Appendix V: Main study response adjustments

In total, 211 respondents participated in the main study, out of which 182 finished the survey in its entirety. Due to incompleteness, the excess 29 responses (13.7%) were therefore removed from the data set. However, further adjustment of responses were deemed necessary as respondents failed to correctly answer either instructional and/or manipulation check questions:

From the treatment groups, 2 respondents (1.1%) failed to correctly identify which matter Alex was engaged in from the text (i.e., Q1), hence assuming that these did not pay enough attention when reading the anthropomorphic text and were therefore discarded. Furthermore, 10 respondents (5.5%) across all groups failed to identify the brand name that was shown in the ad (i.e., Q2), while 6 respondents (3.3%) did not recognize the correct product (i.e., Q3). From these instructional manipulation check questions, 18 responses (9.9%) were removed from the data set.

A manipulation check question was included in the survey to help examine if participants could reasonably be believed to have been aware of the treatment (i.e., stimuli = anthropomorphic text). This was measured by asking participants if they had, when presented with the ad, read an excerpt from an article about the model in the advertisement (i.e., Q13). Responses were only included if participants correctly answered this question (=Yes for treatment groups, No for control groups), or else they were discarded. Hence, 20 responses (10.9%) were removed from the analysis due to this manipulation question.

To ensure validity, a control question was also included where participants were asked if they, since earlier, knew who the individual in the ad was (i.e., Q15). If they knew this, responses were considered biased and the effect of the treatment (i.e., stimuli = anthropomorphic text) may not have been the same as for those unaware of who the individual was. Since the female virtual influencer used in the experiment (i.e., @lilmiquela) is one of the, at the time, most well-known virtual influencers, it might not come as a surprise that she was recognized by several respondents. Thus, 7 responses (3.8%) were discarded due to this. No participants recognized the male influencer (i.e., @cadeharper).

Finally, in order to take part of the treatment (i.e., stimuli = anthropomorphic text) in a meaningful way, a lower response time limit was set at 1 minute for the text page in the treatment groups. It was assumed that no participant could have read the anthropomorphic text in less than 1 minute and still comprehended and processed all of the information in a relevant way. Therefore, a total of 6 responses (3.3%) were removed due to speed checking. No upper limit was set for survey completion.

In total, this resulted in valid responses from n=137 participants that were included in the final data set used throughout this thesis. For distribution of invalid responses across the four experimental groups, see *Table 8* below.

Table 8. Distribution of Invalid Main Study Responses across Questions and Groups

Question	Treatment Female (n=54)	Control Female (n=40)	Treatment Male (n=46)	Control Male (n=42)	Total (n=182)
Instructional manipulation checks:					
Q1*: Which matter is Alex engaged in, according to the text above?	-2				-2
Q2: Please identify the brand that was shown in the ad.	-3	-1	-3	-3	-10
Q3: Which product was shown in the ad?	-1	-1	-2	-2	-6
Manipulation check:					
Q13: Did you in connection to the ad by Esteban Lakatos read an excerpt from an article about the model in the advertisement?	-7	-3	-6	-4	-20
Control question:					
Q15: Do you know who the individual in the ad is?	-5	-2			-7
Lower Time Limit (i.e., <1 min)*	-4		-2		-6
Total no. of invalid responses	22	7	13	9	51
Total no. of removed participants	20	6	11	8	45
Total no. of valid responses	n=34	n=34	n=35	n=34	n=137

Note: Some respondents failed more than one question but can only be removed once. * = Only for treatment groups. “Treatment” refers to the experimental groups that were subject to the stimuli (i.e., the anthropomorphic text) while “Control” refers to the groups that were not subject to it. “Female” refers to the groups that were exposed to the female influencer (i.e., @lilmiquela), while “Male” refers to the groups that were exposed to the male influencer (i.e., @cadeharper) in the ad.

8.6. Appendix VI: Pearson correlation coefficients across experimental conditions

Table 9. Pearson Correlation Coefficients for “Treatment Female” (n=34)

Variable	AdAtt	BraAtt	ProdAtt	IndInt	BraInt	AdWOM	BraWOM	ProdWOM
AdAtt	1.00							
BraAtt	.746***	1.00						
ProdAtt	.525**	.780***	1.00					
IndInt	.392*	.363*	.301	1.00				
BraInt	.216	.432*	.204	.519**	1.00			
AdWOM	.408*	.334	.227	.679***	.540**	1.00		
BraWOM	.254	.559**	.612***	.377*	.659***	.319	1.00	
ProdWOM	.277	.539**	.668***	.221	.546**	.287	.847***	1.00

Table 10. Pearson Correlation Coefficients for “Control Female” (n=34)

Variable	AdAtt	BraAtt	ProdAtt	IndInt	BraInt	AdWOM	BraWOM	ProdWOM
AdAtt	1.00							
BraAtt	.823***	1.00						
ProdAtt	.484**	.672***	1.00					
IndInt	.227	.236	.237	1.00				
BraInt	.257	.459**	.422*	.537**	1.00			
AdWOM	.111	.170	-.025	.310	.472**	1.00		
BraWOM	.152	.264	.466**	.413*	.506**	.288	1.00	
ProdWOM	.230	.357*	.423*	.446**	.567***	.327	.872***	1.00

Table 11. Pearson Correlation Coefficients for “Treatment Male” (n=35)

Variable	AdAtt	BraAtt	ProdAtt	IndInt	BraInt	AdWOM	BraWOM	ProdWOM
AdAtt	1.00							
BraAtt	.838***	1.00						
ProdAtt	.553**	.683***	1.00					
IndInt	.327	.389*	.378*	1.00				
BraInt	.247	.395*	.425*	.619***	1.00			
AdWOM	.414*	.549**	.297	.710***	.471**	1.00		
BraWOM	.328	.382*	.301	.579***	.727***	.331	1.00	
ProdWOM	.365*	.494**	.505**	.483**	.710***	.354*	.830***	1.00

Table 12. Pearson Correlation Coefficients for “Control Male” (n=34)

Variable	AdAtt	BraAtt	ProdAtt	IndInt	BraInt	AdWOM	BraWOM	ProdWOM
AdAtt	1.00							
BraAtt	.855***	1.00						
ProdAtt	.785***	.858***	1.00					
IndInt	.625***	.437**	.352*	1.00				
BraInt	.568***	.542**	.487**	.654***	1.00			
AdWOM	.359*	.259	.147	.406*	.463**	1.00		
BraWOM	.617***	.557**	.511**	.355*	.531**	.197	1.00	
ProdWOM	.601***	.528**	.691***	.390*	.529**	.160	.640***	1.00

Note: * $p < .05$, ** $p < .01$, *** $p < .001$ (2-tailed). **AdAtt** = Advertising attitude, **BraAtt** = Brand attitude, **ProdAtt** = Product attitude, **IndInt** = Intentions towards individual, **BraInt** = Intentions towards brand, **AdWOM** = Advertising WOM intentions, **BraWOM** = Brand WOM intentions, **ProdWOM** = Product WOM intentions. “Treatment” refers to the experimental groups that were subject to the stimuli (i.e., the anthropomorphic text) while “Control” refers to the groups that were not subject to it. “Female” refers to the groups that were exposed to the female influencer (i.e., @lilmiquela), while “Male” refers to the groups that were exposed to the male influencer (i.e., @cadeharper) in the ad.