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The effect of chatbot personality on emotional connection and customer satisfaction

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Abstract

Firms are always looking for ways to engage their customers. Chatbots could be such a new way to engage customers. The e-commerce domain could benefit greatly from this chatbot technology by providing a more intuitive way of interacting with the website and act as a personal assistant helping the customer find the right product. But there is no to little empirical knowledge on how these chatbots are used in everyday settings. Personality is essential in chatbot design and has a major influence on human-robot interaction. Chatbot personality can be expressed in linguistics as linguistic style is an indicator of personality. This research will explore the effects that chatbot personality could have on adopted customer engagement factors customer satisfaction and emotional connection within a e-commerce domain. Two text-based chatbots are created, one with introvert and one with extrovert linguistics. An experiment in combination with a survey are used to gather the data needed for this research. Results found that extrovert linguistics had a more positive effect on both customer satisfaction and emotional connection than introvert linguistics.

Keywords: chatbot, chatbot personality, human-robot interaction, customer engagement, emotional connection, customer satisfaction

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1. Introduction

Firms are always looking for new ways to get their customers engaged. A potential enhancer of customer engagement is the chatbot (Radziwill & Benton 2017; Letheren & Glavas, 2017). A chatbot or chatterbot is a computer program which responds like an intelligent entity when conversed with (Khanna, Pandey, Vashita, Kalia, Pradeepkumar & Das, 2015). There is an increased popularity in chatbots recently. The main reason for this is that the communication between people has changed with messaging apps being used by billions of people. The availability of this platform appears to be an almost perfect environment for the chatbot (Dale, 2016). Through these mobile messaging platforms, chatbots are able to reach a large part of the online population (Brandtzaeg & Følstad, 2017). Improvements in natural language interpretation and prediction capabilities also has a great impact on the current interest in this chatbot technology (Radziwill & Benton, 2017; Brandtzaeg & Følstad, 2017). Apple, Microsoft, Amazon, Google and Facebook have all embedded proprietary conversational agents within their software and, increasingly, conversation is becoming a key mode of human-computer interaction (Luger & Sellen, 2016). Apple's Siri, Microsoft's Cortana, Amazon's Alexa and Google's new Assistant are most visible at the forefront of the technology (Dale, 2016).

The chatbot can either be text-based or embodied in the forms of animals, avatars, humans, or humanoid robots, which are called embodied conversational agents (Radziwill & Benton, 2017). The focus in this research is on the text based chatbot where these bots are easier to implement for firms and they form the largest group of chatbots. There are many thousands of text-based chatbots that target specific functionalities, enabled by tools that let you build bots for a number of widely used messaging platforms (Dale, 2016). On the Facebook Messenger platform alone there are an estimated 30.000 text based chatbots since their launch in April 2016 (Dredge, 2016).

The personality of these bots is an important aspect for the way customers perceive chatbots. For chatbots to act like believable humans, they must be able to simulate having a unique personality (Cahn, 2017). The lack of a coherent personality is one of the most challenging difficulties in order to deliver a realistic conversation (Vinyal & Le, 2015). The personality of a chatbot refers to the character that the bot plays or performs during conversational interactions and can be viewed as a composite of the identity (background and profile) that a chatbot is endowed with (Qian, Huang, & Zhu, 2017) or as the linguistic style that the bot exhibits during interactions (Mairesse, Walker, Mehl, Moore, 2007). But there is still very little known about the personality of text-based chatbots within the marketing field, while several researchers showed how robot personality can affect human-robot interaction (HCI) (Aly & Tapus, 2016; Lee et al., 2006; Isbister & Nass, 2000). Moreover, despite tech giants vying to develop the most compelling experience, the field of HCI has developed little empirical knowledge of how chatbots are used in everyday settings (Luger & Sellen, 2016). The aim

of this research is to explore this gap and give more insight in the role of text-based chatbot personality.

Arguably the most significant impact of digitalization from the consumer perspective has been the level of interaction possible between customer and businesses. It transformed the role of online users from passive consumers of information to active participants in creating and sharing information with one another (Wang & Kim, 2017). This leads to new possibilities for customer engagement. Although these possibilities provided by the new digital landscape seem to be endless, firms often find it challenging to leverage these opportunities in a sustainable and long-lasting fashion (Kunz et al, 2017). Customer engagement has attracted attention within the marketing discipline for a decade, specifically as a consequence of the rise of social media and an acknowledgement that customers can co-create and also destroy value (Beckers, van Doorn, & Verhoef, 2017). Engaged customers are very important for firms since they have a positive influence on firm performance (Kumar & Pansari, 2016). But at the same time, despite the widely-recognized importance of creating a highly-engaged customer base, many companies still struggle to reach this goal (Kunz et al, 2017).

Chatbots can be a tool to help firms to engage their customers (Radziwill & Benton 2017; Letheren & Glavas, 2017). They could be applied to several fields such as healthcare, education or e-commerce (Abdul-Kader & Woods, 2015). Firms within the e-commerce domain could benefit greatly from this chatbot technology. E-commerce websites contain a wide range of products with a corresponding large database. Navigating through these web pages to find the desired product can be a very time consuming and non-intuitive process. This will lead to an unpleasant user experience. The chatbot can address this issue by providing a more intuitive way of interacting with the website and act as a personal assistant helping the customer find the right product (Gupta, Borkar, de Mello & Patil, 2015). With chatbots as a potential customer engagement enhancer, it can be valuable for firms to gain more knowledge on how to deploy them. This research adopts customer engagement components emotional connection and customer satisfaction derived from the customer engagement matrix of Pansari & Kumar (2017). They state that when a firm achieves a satisfied and emotional relationship with the customer, engagement can be established. The importance of these two factors for the customer engagement concept is also recognized by other authors. Customer satisfaction positively influences engagement intentions of customers (Kim, Kim & Wachter, 2013). Satisfaction is a necessary condition for customer engagement (Sashi, 2012) and an important factor in affecting customer engagement behavior (Carlson, Rahman, Taylor & Voola, 2017). Moreover, customer engagement involves the connection that individuals form with organizations (Vivek, Sharon, Beatty & Morgan, 2012) and customers are strongly willing to engage with a brand when their brand efforts are aimed at building emotional connection with them (Zainol, Omar, Osman & Habidin, 2016).

The aim of this research is to give more insight in the role of text-based chatbot personality on customer engagement components customer satisfaction and emotional connection within the e-

commerce domain. This research is therefore focused on finding an answer to the following research question,

What is the effect of text- based chatbot personality on customer satisfaction and emotional connection within the e-commerce domain?

The remainder of the paper is structured as follows. First a systematic literature review is conducted. In section 3, the research methodology is explained followed by an analysis and discussion of the results in section 4 and 5. Then the main research question will be answered in the conclusion and the final section discusses the limitations and directions for further research.

2. Literature review

2.1 Systematic literature review

To analyze and explore the concepts of chatbots and customer engagement, a systematic literature review was conducted. A systematic search should ensure that you accumulate a relatively complete census of relevant literature (Webster & Watson, 2002). The objective of this literature review is to investigate the current state of the chatbot, where it came from and to discover the effect that chatbots could have on customer engagement. Therefore, the following sub-questions were formed:

Sub-question 1: What are chatbots?

Sub-question 2: What is customer engagement?

Sub-question 3: How can these two concepts interact?

Scopus, Web of Science and Google Scholar were used as electronic scientific literature databases. Various keywords were used during the search in these databases. The first keyword was ‘chatbot’ and the second was ‘customer engagement. These keywords formed the base for the systematic literature review. The relevant papers were selected based on reading the abstracts of the articles. After investigating these two concepts, related keywords were added to this search queries. For the chatbot concept the related term ‘chatbot personality’ was added as retrieved articles showed that this item was an important factor for this concept. For a better understanding of the customer engagement concept, related terms ‘customer satisfaction’ and ‘emotional connection’ were added. These keywords were added because many of the retrieved articles included these items. Then again, the relevant papers were selected based on reading the abstracts of the articles. The distribution and percentages of the concepts are seen in the concept matrix derived from Webster & Watson (2002), see Table 1.

Table 1*Concept matrix*

Concepts	# of articles	Percentage
Chatbots	21	36%
Chatbot personality	13	24%
Customer engagement	11	20%
Customer satisfaction	6	10%
Emotional connection	6	10%
Total	58 (51 without redundancies)	100%

Details of metadata of the selected articles are provided in Table 2 below. In total 44 items were retrieved of which 26 were journal articles. The highest proportion of articles (55%) came out 2016 or 2017 which shows the relevance of the topics. Especially the chatbot section contains 14 articles, out of the 21 selected, from 2016 or 2017. The articles out of 1950, 1966 and 1990 deviate here. These articles were retrieved because they present a key finding or an important model for the chatbot concept and for (chatbot) personality. Table 3 provides an overview of the construct definitions.

Table 2*Metadata systematic literature review*

Year	#items	percentage	Journal article	#items	percentage
2017	16	31%	Conference proceeding	29	59%
2016	11	22%	Professional Magazine	4	9%
2015	5	10%	Newspaper article	4	7%
2014	2	4%	Report	2	4,5%
2012	3	6%	Other	3	4,5%
2011	3	6%		7	16%
2010	2	4%		51	100%
2008	1	2%			
2007	1	2%			
2006	2	4%			
2005	1	2%			
2000	1	2%			
1950-1990	3	6%			
	51	100%			

Table 3*Construct definitions*

Construct	Definition	Reference
Chatbot	A chatbot is a computer program which responds like an intelligent entity when conversed with. The conversation may be through text or voice	Khanna, Pandey, Vashishta, Kalia, Pradeepkumar & Das, (2015)
Customer engagement	The mechanics of a customer's value addition to the firm, either through direct or/and indirect contribution	Pansari & Kumar (2017)
Customer satisfaction	An overall assessment of the customer about the firm's current product and service offerings	Hult, Morgeson, Morgan, Mithas & Fornell (2017)
Emotional connection	A consumer's feeling of being joined with the brand	Thomson, MacInnis & Park (2005)
Chatbot personality	The personality of a chatbot refers to the character that the bot plays or performs during conversational interactions	Qian, Huang, & Zhu (2017)

These concepts will be elaborate upon in the next sections where the findings of the systematic literature review about the chatbot -and customer engagement concept will be presented. First the focus will be on the chatbot concept followed by chatbot personality. Then attention will be given to the customer engagement concept and its underlying factors customer satisfaction and emotional connection.

2.2 Chatbots

A chatbot is a computer program which responds like an intelligent entity when conversed with, either through text or voice (Khanna, Pandey, Vashita, Kalia, Pradeepkumar & Das, 2015). It often acts as a virtual assistant and it can have its own virtualization with conversational skills and other humanlike behavior simulated through artificial intelligence (Shaikh, Phalke, Patil, Bhosale & Raghatwan, 2016). Chatbots will give the opportunity to chat with businesses just like chatting with friends on social networks. It can therefore increase the accessibility of businesses. The bots can offer 24/7 service to customers making them a great supplement to general customer service offerings since they are more economical and indefatigable, and free up support staff to answer much higher value queries (Cui, Huang, Wei, Tan, Duan & Zhou, 2017). Any chatbot program understands one or more human languages by Natural Language Processing whereby the system interprets human language input using information fed to it (Khanna et al., 2015).

The commercial applications of chatbots range from the provision of online customer service to conversation-based product searches and event organization (D'Alfonso, Santesteban- Echarri, Rice, Wadley, Lederman, Miles, Alvarez-Jimenez, 2017). The chatbot is not an entirely a new concept. The first program that made interaction between man and computer possible was already in 1966. Back then the chatbot Eliza appeared as a Rogerian psychotherapist (Weizenbaum, 1966). Eliza was a program developed by Joseph Weizenbaum that was able to establish a conversation with human beings, simulating it was one too (Pereira, Coheur, Fialho, & Ribeiro, 2016). Then A.L.I.C.E, which stands for artificial linguistic internet computer entity, was developed in 1995 by Richard Wallace as a modern Eliza with the aim to keep the machine talking as long as possible without interacting humans realizing they were talking to a machine (Shah, 2006). An early stated goal of such systems was to pass the Turing Test or Turing's imitation game, in which a human interrogator deems a computer sufficiently 'intelligent' to pass as a human (Radziwill & Benton, 2017). This imitation game is played with three entities, a computer, a human, and an interrogator which stays in a room apart from the other two and has as objective to determine which of the other is the human and which is the computer (Turing, 1950). According to Turing, intelligence in a machine could be measured by how natural the artificial linguistic productivity is of the machine during conversation. (Shah, 2006). But currently most visible at the forefront of the technology, are the voice-driven digital assistants from the Big Four: Apple's Siri, Microsoft's Cortana, Amazon's Alexa and Google's new Assistant (Dale, 2016). A general overview of the history of chatbots is presented in Figure 1 derived from Etlinger & Altimeter (2017).

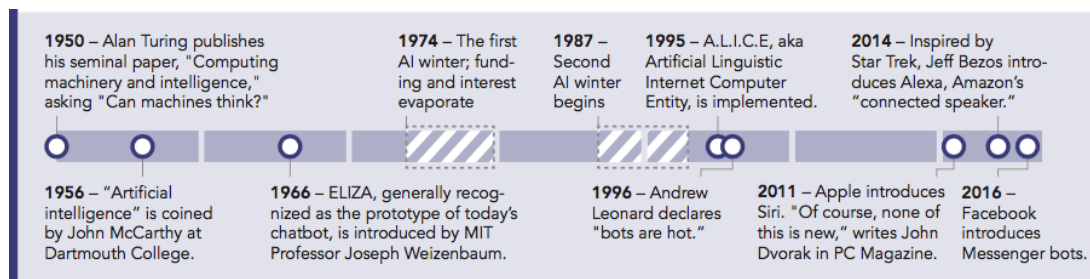


Figure 1. General overview of the history of chatbots (Etlinger & Altimeter, 2017)

That the chatbot currently is a hot topic in the tech world is clear with major technology companies such as Facebook, Microsoft, and Google making significant investment forays into this emerging technology (D'Alfonso, et all., 2017). In recent years, there has been a huge increase in the number of bots online, varying from web crawlers for search engines, to chatbots for online customer service, spambots on social media, and content-editing bots in online collaboration communities (Tsvetkova, Garcia-Gavilanes, Floridi, Yasseri, 2017). The main reason for the current interest in the chatbot concept is that the way people communicate has changed. Messaging apps are being used by billions of people and this appears to be an almost perfect platform for the chatbot (Dale, 2016). Through these mobile messaging platforms, chatbots are able to reach a large part of the online population

(Brandzaeg & Følstad, 2017). Moreover, reliable linguistic functionality, availability through Software as a Service (SaaS), and the addition of intelligence through machine learning has increased its popularity (Radziwill & Benton, 2017). Personal interaction and improvement in usability are driving industry prediction of growth in chatbots (Shah, Warwick, Vallverdú, & Wu, 2016). The rate at which new chatbots are being deployed has increased heavily these last couple of years and as the linguistic capabilities of chatbots increase, it is expected that it becomes harder and harder for users to distinguish it from a real human being (Candello, Pinhanez & Figueiredo, 2017). It is even expected that 85% of customer interactions will be managed without a human by 2020 (Gartner, 2011).

The chatbot is however not a finished product. There are still some issues that hold back a mass implementation and commercialization of the chatbot in the business world. Writing a perfect chatbot is very difficult as it needs a very large database and must give reasonable answers to all interactions (Abdul-Kader & Woods, 2015). Privacy also plays a role here. Users are concerned what could happen to the data they share with the chatbot, where most of the chatbot conversations are built from past human conversations (Cui, Huang, Wei, Tan, Duan & Zhou, 2017). The data has to be stored somewhere, because in order to get better, a chatbot needs to remember the info you feed it so that your conversations do not start from a clean slate every time (Müller, 2016). The bots can also show flaws in the programmed scripts as Microsoft and Facebook experienced already. Microsoft's Twitter chatbot Tay went down after just one day because it began to spill mean and inappropriate words as it began to mimic her followers (Neff & Nagy, 2016). More recently Facebook had to shut down their chatbots because they started to converse in their own, for humans inconceivable, language. Over time, the bots began to deviate from the scripted norms due to a trial and error technique called reinforcement learning (Simonite, 2017). In doing so, they started communicating in an entirely new language, one they created without human input (Clark, 2017). This shows that deploying a chatbot without human intervention can still be risky for firms. Then there is also a possibility that chatbots distribute spam because with the commercialization of the Internet, a big enterprise of chatbots is sending chat spam (Gianvecchio, Xie, Wu & Wang, 2011). A general acceptance of the chatbot is thus still difficult and shows the importance of a better understanding of the concept and its possibilities.

2.3 Chatbot personality

Personality is an essential feature for creating socially interactive robots (Lee, Peng, Jin & Yan, 2006). The chatbots voice is its personality and the tone and graphical appearance is how that personality is expressed (Åberg, 2017). What the chatbots say and the way it is transmitted is thus very important. The tone and voice of the bot and the way conversations are formed is ultimately the core of the experience and this is basically defined by the bot's personality traits (Asher, 2017). Through expressions of personality and emotions, the virtual agent can create engaging and believable

interactions (Armstrong, 2016). To be perceived as intelligent and humanlike, the conversational agent must meet users' expectations regarding general personal features, such as being kind or mean, extrovert or introvert or humorous or serious (Silvervarg, Gulz, Haake, Sjöden & Tärning, 2010). Personality in the psychological field can be defined as the pattern of collective character, behavioral, temperamental, emotional and mental traits of an individual that has consistency over time and situations (Tapus & Mataric, 2008). There is a lot of research within the psychological field regarding the personality concept. One model that is heavily adopted is the Big Five model of Goldberg (1990). This model consists of the traits extraversion, agreeableness, neuroticism, conscientiousness and openness to experience (Goldberg, 1990). This is seen as the most descriptive model of human personality (Aly & Tapus, 2016).

But personality is also an important factor in human-robot interaction where there is an increasing interest in the personality concept within this field of human-robot interactions (Isbister & Nass, 2000; Lee et al., 2006; Park, Jin & Pobil, 2012; Aly & Tapus 2016). The personality of a chatbot refers to the character that the bot plays or performs during conversational interactions (Qian, Huang, & Zhu, 2017). This personality of robots can be expressed in the linguistics of the bots because linguistic style can be an indicator of personality (Mairesse, Walker, Mehl, Moore, 2007). By focusing on the bot's linguistic style, its personality can be extended (Jena, Vashisht, Basu & Ungar, 2017). Moreover, the extroversion-introversion dimension of the Big five model is perceived as the best indication of personality, where the extroversion dimension was found to be the most observable of all the Big Five traits and, together with agreeableness, are found to play the most important roles in our interaction with non-human agents (Lee et al., 2006). There are studies that found that people like bot personalities similar to their own (Aly & Tapus, 2016) and studies that found that people rather like bot personalities complementary to their own (Isbister & Nass, 2000; Lee et al., 2006). However, Brixey & Novick (2015) found that when only one personality can be implemented, the extraverted personality would be preferable because both extraverts and introverts feel more connected to this personality. Mileounis, Cuijpers & Barakova (2015) found that an extrovert robot was generally perceived as more socially intelligent and was liked more than an introvert robot. Aly & Tapus (2016) also found that introvert respondents had a remarkably preference for the extraverted condition of the robot.

2.4 Customer engagement

Customer engagement can be described as a psychological state that occurs by virtue of interactive, co-creative customer experiences with a focal object in focal service relationships (Brodie, Hollebeek, Juric & Ilic, 2011) or as the intensity of an individual's participation in and connection with organization's offerings (Vivek, Sharon, Beatty & Morgan, 2012). But there are many more different definitions of customer engagement and there still is no final or concluding agreement of the customer engagement concept among scholars within the marketing field. However, there are some similarities

among the definitions. Most of the interpretations have in common that it contains the connection between customer and brand, it includes customers emotional, cognitive, and behavioral involvement and the definitions are focused on customers' interaction and value co-creation with enterprises, brands, or other customers (Zhang, Guo, Hu, & Liu, 2017). From a business perspective, it can be described as a customer-centric approach with its main focus being on identifying customer needs in order to engage with them and identifying the value additions required to meet those needs (Sashi, 2012).

Customer engagement has gained a lot of attention in recent literature (Harrigan, Evers, Miles & Daly, 2017). The Marketing Science Institute (MSI) has even identified customer engagement as one of the key priority areas for 2014- 2016 (So, Kings, Sparks & Wang, 2016). It is no surprise that the increasing interest in customer engagement has paralleled both the continued evolution of the Internet and the emergence of new digital technologies and tools dubbed Web 2.0, especially social media (Wang & Kim, 2017). The reason for this is that the role of the traditional customer has changed. Through social media, marketers can interact in two-way communications with existing and potential customers and gain rich, unmediated consumer insights faster than ever before (Hudson, Huang, Roth & Madden, 2015). It expands the traditional role played by consumers, including them in the value-creation process as co-creators (Kabadayi & Price, 2014). The always addressable, interconnected and empowered customers are not a listening audience anymore, but are instead observers, initiators, participants and co-creators that interact not only with a brand but with other actors such as other consumers and media (Maslowska, Malthouse & Collinger, 2016).

The majority of customer engagement research has been based on a multidimensional conceptualization, with cognitive, emotional and behavioral components (Brodie et al., 2013; Hollebeek et al, 2014; Bowden, 2009). Conceptualizations of engagement that do not explicitly refer to underlying cognitive, affective, and behavioral components are still likely to encompass these dimensions (Harrigan, Evers, Miles & Daly, 2017). This research follows the conceptualization of Pansari & Kumar (2017) with customer satisfaction and emotional connection as tenets of the customer engagement concept. They state that when a firm achieves a satisfied and emotional relationship with the customer, engagement can be established.

2.4.1 Customer satisfaction

Customer satisfaction can be described as an overall assessment of the customer regarding the firm's current product and service offerings (Hult, Morgeson, Morgan, Mithas & Fornell, 2017). The importance of satisfaction to the customer engagement concept is also supported by other researchers. Satisfaction is an important dimension of the relationship quality between firm and customer (So, King, Sparks & Wang, 2016). Engagement behaviors lead to more satisfaction and affective loyalty, and at the same time satisfied and loyal customers take part in more engagement behaviors (Brodie et al., 2013). Satisfaction is a necessary condition for customer engagement (Sashi, 2012). Van Doorn et al. (2010) stated that attitudinal antecedents including customer satisfaction are one of the most

important factors affecting customer engagement behavior. Bowden (2009) presented a framework of the process of engagement which commences with satisfaction. Moreover, customer satisfaction positively influences engagement intentions of customers (Kim, Kim & Wachter, 2013).

2.3.2 Emotional connection

The emotional relationship, bonding or connection between customer and brand is another important aspect of customer engagement, because the customers attitude and behavioral response towards brands are guided not only by the cognitive evaluation, but also by their emotional assessment (Zainol, Omar, Osman & Habidin, 2016). Customer-experience strategies that maximized emotional connection resulted in customers who are six times more likely to consolidate assets with the firm than customers who are only highly satisfied but not emotionally connected (Zorfas & Leemon, 2016). The emotional connection of customers with brands can be described as the consumers' feeling of being joined with the brand (Thomson, MacInnis & Park, 2005). Creating this emotional connection enables the consumer to begin to identify with and seek to share an identity with the brand which also reduces the firm's need to promote itself and its merchandise because it reduces customers' price sensitivity and ensures customer loyalty (Grewal, Roggeveen, Sisodia & Nordfält, 2017). Customer engagement occurs when customers have strong emotional bonds in relational exchanges with sellers (Sashi, 2012).

Both customer satisfaction and emotional connection are thus important for firms to get the customer engaged. These components are illustrated in the customer engagement matrix of Pansari & Kumar (2017), see Figure 2. The goal for firms should be to get the customers in the 'true love' box where the customer has both high positive emotions and a high satisfaction. Because when customers both have high positive emotions towards the firm and are highly satisfied they enable profit maximization and are very difficult for competitors to poach (Pansari & Kumar, 2017).

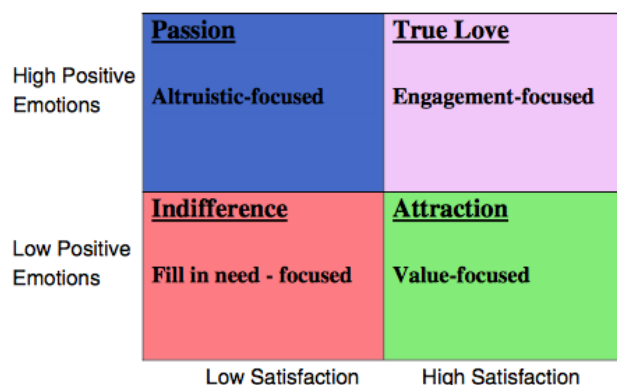


Figure 2. Customer engagement matrix (Pansari & Kumar, 2017)

2.4 Conclusion literature review

This literature review was conducted to gain a better knowledge about the chatbot concept, customer engagement and how these two concepts could interact. A framework is constructed following this review and is displayed in Figure 3 below.

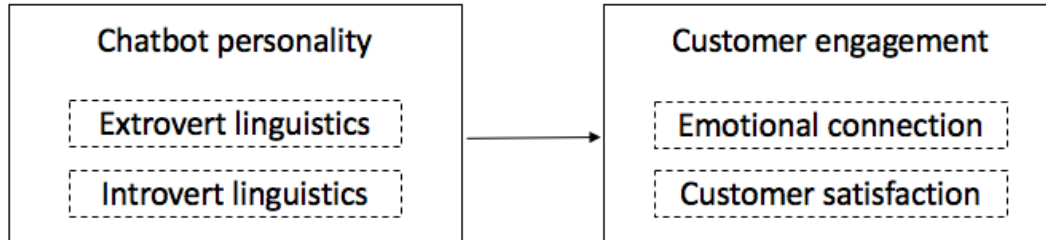


Figure 3. Framework literature review

Using this model, the aim is to discover the effects of chatbot personality on customer engagement. Customer engagement has gained a lot of attention in recent literature (Harrigan, Evers, Miles & Daly, 2017). The main reason for this is that role of the traditional customer has changed. The always addressable, interconnected and empowered customers are not a listening audience anymore, but are instead observers, initiators, participants and co-creators that interact not only with a brand but with other actors such as other consumers and media (Maslowska, Malthouse & Collinger, 2016). For measuring customer engagement, the following two components are deployed: customer satisfaction and emotional connection (Pansari & Kumar, 2017). The use of satisfaction and emotion as customer engagement components is supported by several other researchers who note the importance of customer satisfaction (Brodie et al., 2013; Sashi, 2012; van Doorn et al., 2010; Bowden, 2009) and emotional connection (Zainol et al., 2016; Zorfas & Leemon, 2016; Grewal et al., 2017; Sashi, 2012) to the customer engagement concept.

Chatbot could be a solution to engage customers in this digitalized world. They can reduce time-to-response, provide enhanced customer service, increase satisfaction and therefore increase engagement (Mileounis, Cuijpers & Barakova, 2015). The bots can offer 24/7 service to customers making them a great supplement to general customer service offerings since they are more economical and indefatigable, and free up support staff to answer much higher value queries (Cui, Huang, Wei, Tan, Duan & Zhou, 2017). But implementing a chatbot is complex. Even Microsoft and Facebook failed in previously attempts (Neff & Nagy, 2016; Clark, 2017). Chatbot personality is one of the most challenging tasks here in order to deliver realistic conversation (Vinyal & Le, 2015). This personality can be expressed in linguistics (Mairesse et al, 2007) whereby the extrovert-introvert dimension was found to play the most important roles in our interaction with non-human agents (Lee et al., 2006). Previous studies in human-robot interaction found a straightforward relationship between bot personality and the way people perceive these interactions. These studies focused on a setting with robots or embodied conversational agents (ECA's) that had both verbal and non-verbal characteristics

(Isbister & Nass, 2000; Lee et al., 2006; Park, Jin & Pobil, 2012; Aly & Tapus 2016; Mileounis, Cuijpers & Barakova, 2015; Brixey & Novick, 2015). In these settings, there are different results. There are studies that found that people like robots with personality similar to their own personality and studies that found that people prefer a robot with a personality complementary to their own. However, if only one personality could be implemented an extrovert personality would be preferred in these interactions. The extrovert personality of robots was perceived as more socially intelligent and was liked more than an introvert robot (Mileounis, Cuijpers & Barakova, 2015). Moreover, an extrovert agent reported higher levels of emotional connection on both extrovert and introvert participants in a human-ECA setting (Brixey & Novick, 2015). Aly & Tapus (2016) also found that introvert respondents had a remarkably preference for the extraverted condition of the robot. It is safe to assume that this also applies to the human- text-based chatbot setting of this research. It is therefore expected that,

H1: Extrovert chatbot personality will have a more positive effect on emotional connection than introvert chatbot personality

H2: Extrovert chatbot personality will have a more positive effect on customer satisfaction than the introvert chatbot personality

3. Methodology

A quantitative research approach is used to answer the main research question. The goal is to discover which effect chatbot personality can have on customer engagement factors emotional connection and customer satisfaction. An experiment in combination with a survey will be used to gather the data for this purpose. An overview of the steps taken in this research design can be seen in Figure 4.

3.1 Data collection

The data was collected with a self-administered online questionnaire developed with *Qualtrics*.

This research focusses on respondents who have a Facebook account and thus are active on social media, since these chatbots work through Facebook Messenger. Moreover, the participants had to speak Dutch, since the chatbot conversation is programmed in this language. Snowball sampling method is used in order to get as many respondents as possible. The network of the author is used to reach potential respondents which are then asked to further distribute the survey. Social media was used as a mean to contact the potential respondents. The data was collected for two months during August and September of the year 2017.

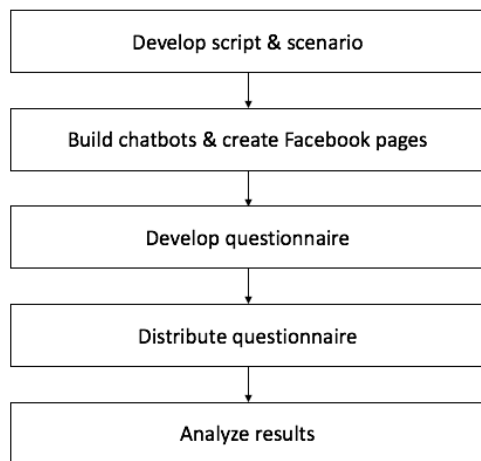


Figure 4. Overview of the steps taken in the research design

3.2 Experiment

To test the influence of chatbot personality on the dimensions emotional bonding and customer satisfaction two different chatbots were developed, one extrovert and one introvert chatbot.

The corresponding scripts are attached in appendix D. The bots were built via the bot building platform Motion AI. An example of the constructed conversation flow can be seen in Figure 5.

To get acquainted with the concept of a chatbot the participants interact thus with real chatbots. The respondents could participate on desktop and on their mobile phone. Each participant was randomly assigned to one of the bots, either the extrovert or the introvert bot. The experiment simulates an online purchase of electronics or clothing on the fictive e-commerce website BlueCool. The bots are used as a service to help the participants find the right product. Whether the chatbot gives a satisfied product solution to the participant is not important, because there is a limited product set linked to the bots. The conversation or the way the chatbots converse is key here. This is also pointed out in the survey. After this conversation with the chatbot, the respondents were linked to the survey. After building these two bots two Facebook pages were created and the bots were linked to these two accounts in order to let the chatbots work through Facebook Messenger. The introvert bot was linked to the Facebook page ShopAssistent and the extrovert bot to ShopAgent. Examples of the begin of the conversations can be seen in Figure 6.

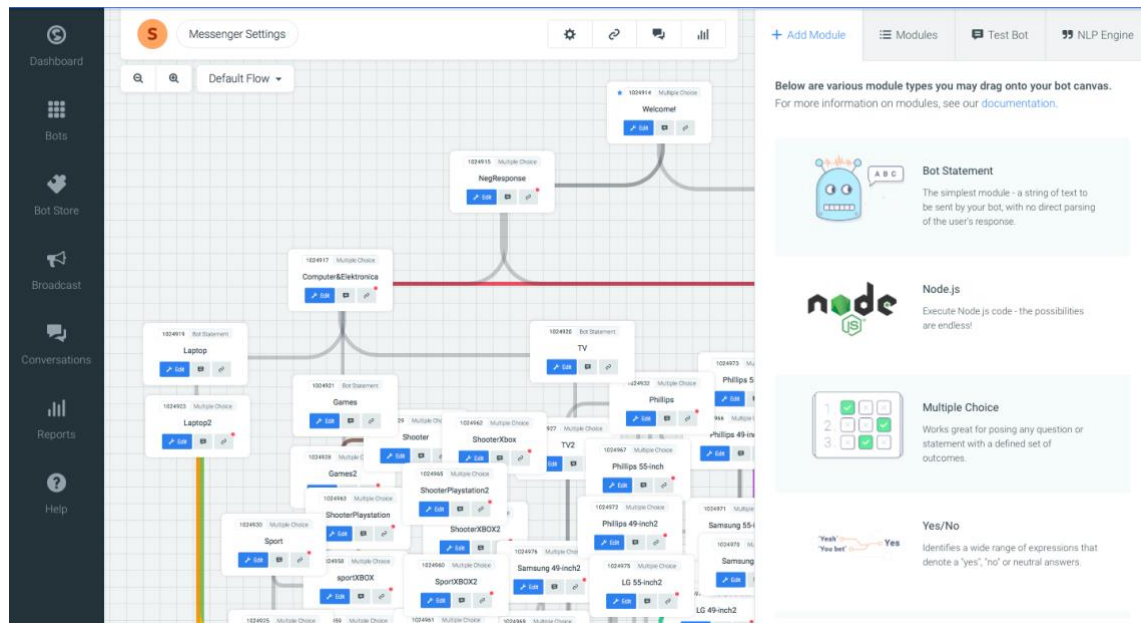


Figure 5. Conversation flow MotionAI

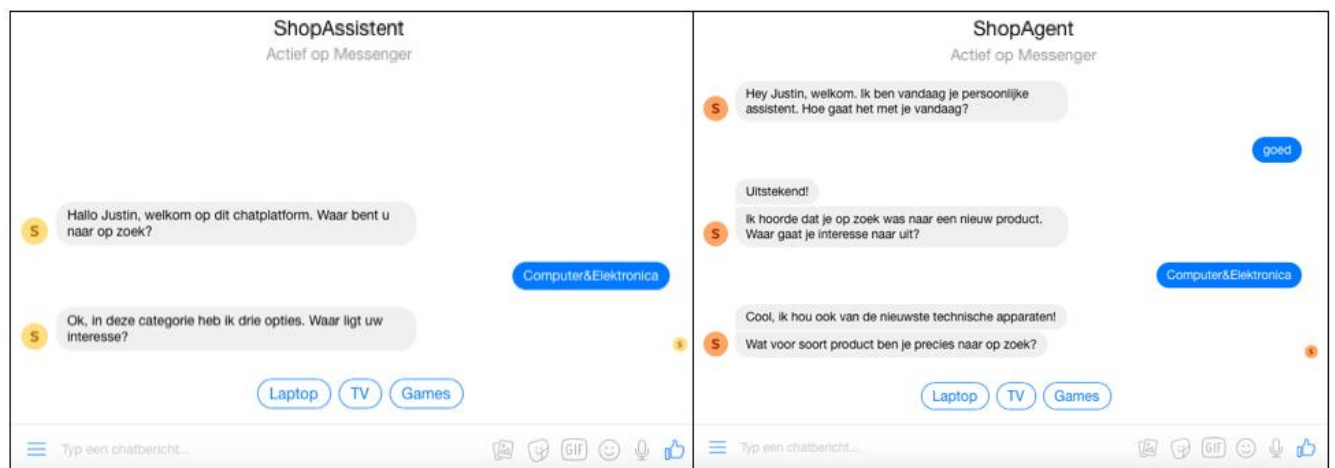


Figure 6. Welcome chatbots

As can be seen here, the introvert bot (ShopAssistant) is direct and to the point with formal language, where the extrovert bot (ShopAgent) initiates the conversation and shows interest in the participant. These linguistic styles are displayed throughout the two different conversations. The introvert bot is calm, direct and has formal language. The extrovert initiates the conversation, shows interest and has informal language. These corresponding developed scripts are based on the framework of the identified language cues for extroversion and introversion out of Mairesse et al. (2007), see Figure 7 below.

Level	Introvert	Extravert
Conversational behaviour	Listen Less back-channel behaviour	Initiate conversation More back-channel behaviour
Topic selection	Self-focused Problem talk, dissatisfaction Strict selection Single topic Few semantic errors Few self-references	Not self-focused* Pleasure talk, agreement, compliment Think out loud* Many topics Many semantic errors Many self-references
Style	Formal Many hedges (tentative words)	Informal Few hedges (tentative words)

Figure 7. Identified language cues for extraversion and introversion (Mairesse et al., 2007)

Another example is the product presentation of the two chatbots, see Figure 8 below. Again, the introvert bot has a calm and formal linguistic style, whereas the extrovert bot has an enthusiastic and informal linguistic style.

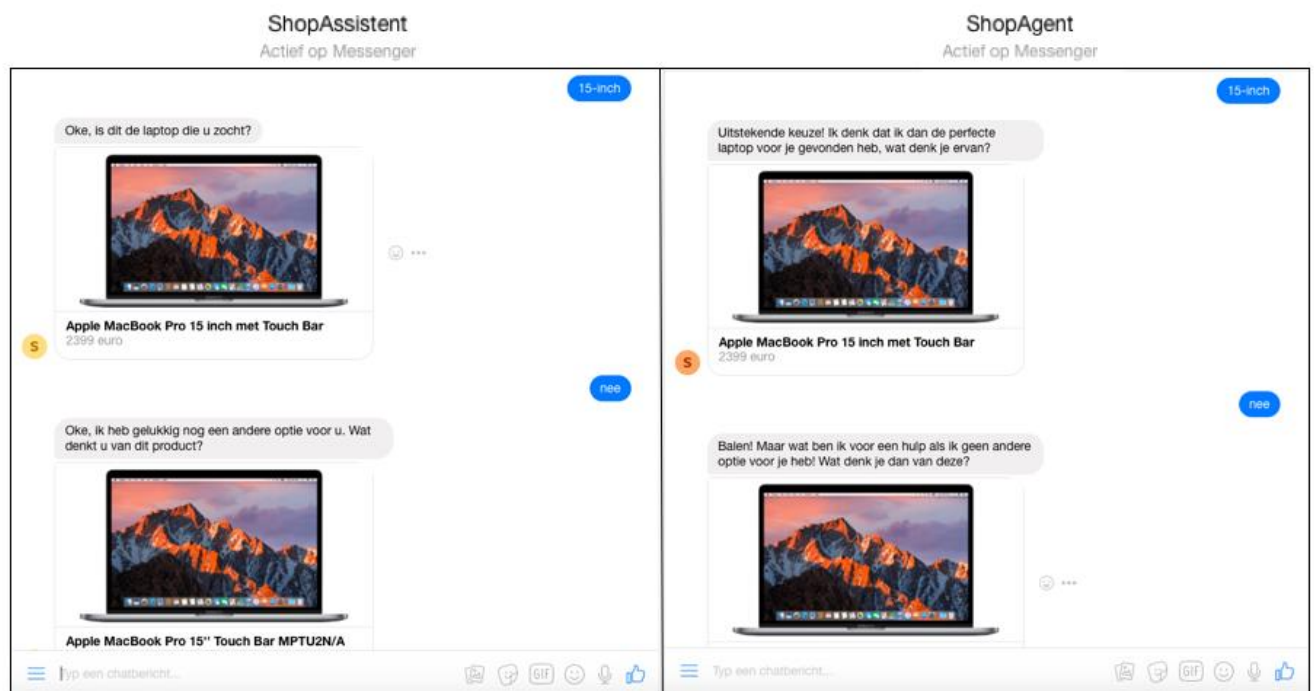


Figure 8. Product offerings

3.3 Survey

After the conversation the respondents were asked to fill in a survey with questions about the conversation with the chatbot and extrovert/introvert traits in general. Firstly, the respondents were divided over two surveys, one that followed from the introvert chatbot conversation (introvert survey) and one that followed from the extrovert chatbot conversation (extrovert survey). Then the respondents were asked to judge the conversation with the chatbot they just interacted with. The goal is here to discover the differences between the personalities of two real chatbots with the scripts based on the linguistic cues of Mairesse et al. (2007). Subsequently, the respondents were asked about general introvert and extrovert traits derived from the linguistics cues of Mairesse et al. (2007). The introvert traits are quiet, direct and formal, whereas the extrovert traits are enthusiastic, interested and

informal, see Table 4 below. Finally, the respondents were asked how they rate a chatbot in general on both the emotional connection and the customer satisfaction dimension.

Table 4

Extrovert-Introvert traits survey derived from Mairesse et al. (2007)

Level	Introvert	Extrovert
Conversational behavior	Listen	Initiates conversation
	Less back-channel behavior	More back-channel behavior
	Quiet	Enthusiastic
Topic selection	Self-focused	Not self-focused
	Problem talk, dissatisfaction	Pleasure talk, agreement, compliment
	Strict selection	Think out loud
	Single topic	Many topics
	Few semantic errors	Many semantic errors
	Few self-references	Many self-references
	Direct	Interested
Style	Formal	Informal
	Many hedges (tentative words)	Few hedges (tentative words)
	Formal	Informal

This distinction between these introvert traits (quiet, direct, formal) and the extrovert traits (enthusiastic, interested and informal) is consistent with the theoretical definition of introvert and extrovert behavior. Introverts are typically more shy, timid, reserved, quiet, distant and retiring, extroverts are typically outgoing, sociable, energetic, talkative and enthusiastic (Snyder & Swann, 1978).

The questions are connected to the concepts of customer satisfaction and emotional bonding. For the measurement of emotional connection, the approach of Thomson, MacInnis & Park (2005) is adopted which divides this concept in three items: bonding, attachment and connection. A 7-point Likert scale ranging from 1 = 'strongly disagree' to 7 = 'strongly agree' is used to determine the extent to which the respondent agrees with a given statement about their bonding, attachment and connection to a brand. These items together describe a consumer's feelings of being joined with the brand (Thomson et al., 2005).

For the concept of customer satisfaction, the approach of Ryan, Buzas & Ramaswamy (1995) is adopted. This widely accepted approach measures customer satisfaction with three indicators, empirically observed by three questions. A customer satisfaction index is calculated by a weighted average of scores from the three questions, were this approach will be more useful that a single measure from any of the three questions (Grønholdt et al., 2000). First the respondents were asked

about their general satisfaction about the chatbot conversation and extrovert or introvert chatbot characteristics with a scale ranging from 1= '*very dissatisfied*' to 7= '*very satisfied*'. The next question assesses to what degree the chatbot conversation and extrovert or introvert chatbot characteristics will fulfill their expectations of a company with a scale ranging from 1= '*did not meet my expectations*' to 5= '*exceeded my expectations*'. Finally, the respondents were asked how close a company will be to a for them ideal company with a scale ranging from 1= '*very far away*' to 5= '*very close to my ideal*'. These questions together measure the concept of customer satisfaction, where each approach separately captures different facets of an underlying satisfaction perception and the use of this multi-item instead of single-item scales allows one to obtain smaller standard errors for a given sample size (Ryan et al., 1995). The (translated) survey is attached in appendix E.

4. Results

This section will elaborate on analysis of the collected data.

4.1 Data analysis

The collected data was analyzed with *SPSS 24*. In total 141 people started the experiment and survey, but due to incomplete answers 27 were excluded. The 114 remaining respondents were divided over 2 surveys, 57 on the survey with people who conversed with the extrovert chatbot and 57 people on the survey who conversed with the introvert chatbot.

4.1.1 Descriptive statistics

First demographic information such as gender, age and level of education was retrieved. Then the remainder of the survey consisted of statements and questions about the constructs of emotional connection and customer satisfaction. The language throughout the survey was Dutch since this is native language of the participants. Among the 114 remaining respondents 75 (65%) were male and 39 (35%) female. The most respondents came out of the age-category of 18-24 (70,2%/66,7%). The highest proportion of the participants studied HBO or above (66,6%/68,4%) and the majority knew what a chatbot was (71,9%/78,9%). The descriptive statistics of the participants are attached in Appendix A.

4.1.2 Emotional connection

For the emotional connection component, a factor analysis is performed to check the coherence between bonded, connected and attached. This factor analysis was satisfactory so that these three items were computed into the variable emotional connection. The results are attached in Appendix B.

A paired t-test is performed to test whether there are significant differences between the extrovert and introvert traits. There was a significant difference between the scores for *enthusiastic* ($M=4,80/M=4,48$; $SD=1,42/SD=1,43$) and *quiet* ($M=3,86/M=3,69$; $SD=1,36/SD=1,46$) conditions; $t(56/56) = 3,2/3,2$, $p = 0,002/0,002$ in both surveys. This also applies for the scores of *informal* ($M=4,62/M=4,47$; $SD=1,56/SD=1,47$) and *formal* ($M=3,62/M=3,62$; $SD=1,48/SD=1,52$) conditions; t

(56/52) = 2,8/2,8, $p = 0,007/0,006$. Extrovert trait *interested* ($M=4,63/M=4,40$; $SD=1,57/SD=1,57$) scored higher than introvert trait *direct* ($M=4,20/M=4,21$; $SD=1,34/SD=1,38$) but no significant difference was found: $t(56/56) = 1,40/0,65$, $p = 0.164/0.519$. The results are presented in Table 9 below.

Table 9

Emotional connection paired t-test: traits

Variables	Scale	Mean	St Dev	Mean	St Dev.	Sign (95%)
Extrovert survey						
Enthusiasm-Quiet	1(Totally disagree) - 7(Totally agree)	4,80	1,42	3,86	1,36	0.002
Interest- Direct	1(Totally disagree) - 7(Totally agree)	4,63	1,57	4,20	1,34	0.164
Informal- Formal	1(Totally disagree) - 7(Totally agree)	4,62	1,56	3,62	1,48	0.007
Introvert survey						
Enthusiasm-Quiet	1(Totally disagree) - 7(Totally agree)	4,48	1,43	3,69	1,46	0.002
Interest- Direct	1(Totally disagree) - 7(Totally agree)	4,40	1,57	4,21	1,38	0.519
Informal- Formal	1(Totally disagree) - 7(Totally agree)	4,47	1,47	3,62	1,52	0.006

Overall, the extrovert traits were higher valued for the concept of emotional connection. This claim is supported by the results of the paired t-test displayed in Table 10 below. The extrovert linguistics characteristics scored significantly higher ($M=4,52$; $SD=0,84$) than the introvert linguistic traits ($M=3,88$; $SD=0,66$), conditions $t(52) = 3,83$, $p = 0,000$.

Table 10

Emotional connection paired t-test: overall difference extrovert-introvert traits

Variables	Scale	Mean	St Dev	Mean	St Dev.	Sign (95%)
Extrovert traits- Introvert traits	1(Totally disagree) - 7(Totally agree)	4,52	0,84	3,88	0,66	0.000

A paired t-test is also conducted for the question ‘‘when a firm uses a chatbot with the linguistic style of the chatbot you just interacted with I feel ... with that firm’’ whereby the discrepancy here is that the half of the people conversed with the extrovert bot and the other half with the introvert bot. The extrovert chatbot was higher rated ($M=4,34$; $SD=1,47$) than the introvert chatbot ($M=4,33$; $SD=1,30$),

but no significant difference was found in the scores conditions; $t(52) = -0,251, p = 0,803$, see Table 11 below.

Table 11

Emotional connection paired t-test: interaction

Variables	Scale	Mean	St Dev	Mean	St Dev.	Sign (95%)
Extrovert interaction-Introvert interaction	1(Totally disagree) - 7(Totally agree)	4,34	1,47	4,33	1,30	0.803

The participants were whether their emotional connection with a firm will be affected when that firm decides to deploy a chatbot. The results show that they will not feel more or less connected when a firm decides to deploy a chatbot, see Table 12 below.

Table 12

Emotional connection paired t-test: chatbot deployment

Variables	Scale	Mean	St Dev
Extrovert survey			
Not more or less connection when firm deploys chatbot	1(Totally disagree) - 7(Totally agree)	4,26	1,55
Introvert survey			
Not more or less connection when firm deploys chatbot	1(Totally disagree) - 7(Totally agree)	4,12	1,45

Additional analysis showed that, on average, women ($M=4,87; SD= 1,04$) scored higher on every extrovert linguistic traits than men ($M=4,59; SD=1,38$) and men ($M=4,04; SD= 0,96$) scored higher on introvert linguistic traits than women ($M=3,62; SD =1,14$). However, these differences were not significant. When the traits were examined separately one significant difference was found. Men ($M=4,17; SD=1,21$) scored significantly higher on the introvert trait quiet than women ($M=3,28; SD=1,47$) conditions $t=57, p=0,017$. No differences were found between education levels or age.

4.1.3 Customer satisfaction

Also for the customer satisfaction component a factor analysis was performed. The factor analysis allows it to combine these three items of customer satisfaction. The factor analysis is attached in Appendix C.

A paired t-test is performed to test whether there are significant differences between the extrovert and introvert traits. Similar to the emotional connection concept significant differences were found here. There was a significant difference between the scores for *enthusiastic* ($M=4,10/M=3,98; SD=0,81/SD=0,62$) and *quiet* ($M=3,50/M=3,57; SD=0,58/SD=0,58$) conditions; $t(56/56) = 4.43/3.68, p= 0,000/0,001$ in both surveys. There was also a significant difference between the scores for *informal* ($M=3,73/M=3,77, SD=0,93/SD=0,76$) and *formal* ($M=3,30/M=3,32, SD=0.75/SD=0,88$)

conditions; $t(56/56) = 2,51/2,62$, $p = 0.015/0.011$. No significant difference was found between extrovert trait interest ($M=3,63/M=3,74$, $SD=1,11/SD=0,87$) and introvert trait direct ($M=3,82/M=3,92$; $SD=0,76/SD=0,81$) conditions; $t(56/56) = -0,94/-1,06$, $p = 0,35/0,29$. The results are presented in Table 14 below.

Table 14

Customer satisfaction paired t-test: traits

Variables	Scale	Mean	St Dev	Mean	St Dev.	Sign (95%)
Extrovert survey						
Enthusiasm-Quiet	1(low satisfaction-5(high satisfaction))	4,10	0,81	3,50	0,58	0.000
Interest- Direct	1(low satisfaction-5(high satisfaction))	3,63	1,11	3,82	0,76	0.353
Informal- Formal	1(low satisfaction-5(high satisfaction))	3,73	0,93	3,30	0,75	0.015
Introvert survey						
Enthusiasm-Quiet	1(low satisfaction-5(high satisfaction))	3,98	0,62	3,57	0,58	0.001
Interest- Direct	1(low satisfaction-5(high satisfaction))	3,74	0,87	3,92	0,81	0.291
Informal- Formal	1(low satisfaction-5(high satisfaction))	3,77	0,76	3,32	0,88	0.011

Similar to the results of the emotional connection components this research found a significant difference between overall extrovert traits and introvert traits on the dimension customer satisfaction. The extrovert linguistics characteristics scored significantly higher ($M=3,83$; $SD=0,49$) than the introvert linguistic traits ($M=3,56$; $SD=0,41$) conditions; $t(55) = 2,83$, $p = 0,006$. See Table 15 below.

Table 15

Customer satisfaction paired t-test: overall difference extrovert-introvert traits

Variables	Scale	Mean	St Dev	Mean	St Dev.	Sign (95%)
Extrovert traits- Introvert traits	1(low satisfaction-5(high satisfaction))	3,83	0,49	3,56	0,41	0.006

Again, the paired t-test was also performed on the item whereby the participants were asked how they rate the conversation with the real chatbots. Similar to the emotional connection concept, the extrovert chatbot ($M=3,88$; $SD=0,90$) scored higher than the introvert chatbot ($M=3,84$; $SD=0,68$) on the satisfaction dimension. However, no significant difference was found: $t(56) = 0,32$, $p = 0,752$, see Table 16 below.

Table 16*Customer satisfaction paired t-test: interaction*

Variables	Scale	Mean	St Dev	Mean	St Dev.	Sign (95%)
Extrovert interaction- Introvert interaction	1(low satisfaction- 5(high satisfaction)	3,88	0,90	3,84	0,68	0.752

What is interesting is that, in contrast to the emotional connection concept, people are satisfied when a firm decides to deploy a chatbot. They do not feel more or less connected to a firm but they have a relative high level of satisfaction (3,29 – 3,74) as can be seen in Table 17 below.

Table 17*Paired t-test results customer satisfaction chatbot deployment*

Variables	Scale	Mean	St Dev
Extrovert survey			
Customer satisfaction when a firm deploys chatbot	1(low satisfaction- 5(high satisfaction)	3,29	0,46
Introvert survey			
Customer satisfaction when a firm deploys chatbot	1(low satisfaction- 5(high satisfaction)	3,74	0,76

Also for the customer satisfaction component an additional analysis was performed. Similar to the emotional connection component is that men ($M=3,65$; $SD=0,53$) scored significantly higher on the introvert trait quiet than women ($M=3,22$; $SD=0,59$) conditions $t=56$, $p=0,006$. There were also significant differences found for the extrovert traits interest and informal. Women rated both interest ($M=4,16$; $SD=0,83$) and informal ($M=4,12$; $SD=0,63$) significantly higher than men (interest: $M=3,53$; $SD=0,83$) (informal: $M=3,60$; $SD=0,76$); conditions $t(55)$, $p=0,10/p=0,12$. Women were overall more satisfied with extrovert traits than with introvert traits, and in contrast to the emotional connection component, this difference was significant. Women ($M=4,15$; $SD=0,53$) scored significantly higher on the total extrovert traits than men ($M=3,67$; $SD=0,10$), conditions; $t(55)$, $p=0,006$. No differences were found between education level or age.

5. Discussion and implications

The goal of this research was to discover the effect that chatbot personality could have on the adopted customer engagement factors emotional connection and customer satisfaction based on the matrix of Pansari & Kumar (2017). A systematic literature review led to the expectation that the chatbot with extrovert linguistics had a more positive effect on these two components than the chatbot with introvert linguistics.

For the emotional connection component, the traits were first examined separately. the extrovert linguistic traits *enthusiasm* and *informality* scored significantly higher than the introvert linguistic traits *quietness* and *formality*. Extrovert trait *interest* also scored higher than introvert trait *direct*, but this difference was not significant. Then the traits were examined together to discover whether there was an overall difference between the introvert and extrovert traits. This research found a significant difference between the extrovert and introvert traits on the dimension emotional connection. The extrovert linguistics characteristics scored together significantly higher than the introvert linguistics. Hypothesis 1 is supported by these results and this is consistent with previous studies in HCI in which extrovert bots were preferred over introvert bots (Mileounis, Cuijpers & Barakova, 2015; Brixey & Novick, 2015; Aly & Tapus, 2016). This hypothesis can therefore be accepted. Moreover, people will not feel more or less connected to a firm when they decide to deploy a chatbot at this stage. Additional analysis also found that overall, introvert traits were higher rated by men than by women and that women rated extrovert traits higher than men. However, this overall difference was not significant. When the traits were examined separately, this research found one significant difference between men and women. On the introvert trait quiet, men scored significantly higher than women. No differences were found between age or education levels. A logical explanation therefore is that there was an unequal distribution between these groups.

For the customer satisfaction component, the extrovert linguistic traits *enthusiasm* and *informality* scored significantly higher than the introvert linguistic traits *quietness* and *formality*. For the extrovert trait *interest* as opposed to introvert trait *direct*, no significant difference was found. When the traits were examined together to discover whether there was an overall difference between the introvert and extrovert traits, this research found, similar to the emotional connection component, an overall significant difference between extrovert traits and introvert traits on the factor customer satisfaction. Hypothesis 2 is supported by these results and this is also consistent with previous studies in HCI in which extrovert bots were preferred over introvert bots (Mileounis, Cuijpers & Barakova, 2015; Brixey & Novick, 2015; Aly & Tapus, 2016). This hypothesis can therefore also be accepted. In contrast to emotional connection where people will not feel more or less connected to a brand, people will be satisfied when a firm decides to deploy a chatbot. An explanation for this can be that satisfaction with a product or service is earlier reached than the emotional connection with it. Satisfaction can occur immediately, emotional attachments tend to develop over time with multiple interactions (Thomson, MacInnis & Park, 2005). It is thus easier to have a certain level of satisfaction than an emotional connection with a product or service. Additional analysis also found that overall introvert traits were higher rated by men than women and that women rated extrovert traits higher than men. In contrast to the emotional connection component, this overall difference was significant. When the traits were examined separately, this research found that women rated both extrovert traits interest and informal significantly higher than men. No differences were found between age or education levels. This is also due to an unequal distribution between these groups.

However, while the extrovert linguistic traits scored higher than the introvert linguistic traits on both engagement components, no significant difference was found between the scores of the created extrovert -and introvert chatbot for neither the emotional connection as the customer satisfaction component. A reason for this could be that people can perceive risks when dealing with immature technology (Wu & Wang, 2005). It could also be the case that the traits are not expressed sufficiently to strike as extrovert or introvert traits, because they only had one conversation. It is possible that when the same participants had both the introvert and the extrovert interaction, that the difference was more evident between the two real chatbots. Moreover, personality recognition in text can be a difficult task, because of ambiguity of words in the text, complexity of meaning and interplay of various factors such as irony, politeness, writing style, as well as variability of language from person to person and from culture to culture (Poria, Gelbukh, Agarwal & Cambria, 2013).

This research can be helpful for future design guidelines of chatbots. It can contribute to build a text-based chatbot that is more effective in ensuring customer engagement. Moreover, it adds to existing literature empirical knowledge of how chatbots are preferred to use in everyday settings, since this research showed that extrovert linguistic traits were significantly higher rated than introvert linguistic traits. This research on text-based chatbot personality differs from previous studies, which all focused on personality within human-robot -or human-conversational agent interaction and can therefore be valuable for the human-computer interaction literature.

6. Conclusion

The main research question was ‘‘what is the effect of text-based chatbot personality on customer satisfaction and emotional connection?’’. The answer is translated into the customer engagement matrix of Pansari & Kumar (2017) in Figure 10 and is described in detail below.

		CUSTOMER SATISFACTION	
		Low satisfaction	High satisfaction
EMOTIONAL CONNECTION	Strong emotional connection	No chatbot deployment	Extrovert chatbot personality
	Weak emotional connection	Introvert chatbot personality	Chatbot deployment

Figure 10. Chatbot personality-customer engagement matrix

Overall, the extrovert linguistic traits scored higher than the introvert linguistic traits on both these engagement components. Subsequently, *extrovert chatbot personality* is placed in the upper right box

and *introvert chatbot personality* in the bottom left of Figure 10. Furthermore, this research found that people will be satisfied when firms decide to deploy a chatbot, which has however no influence on their emotional connection. Therefore, *chatbot deployment* is placed in the bottom right box. The results showed that, at this point, a (strong) emotional connection with a firm will not be affected with the deployment of a chatbot, while at the same time people will be satisfied when a firm deploys a chatbot. Hence, *no chatbot deployment* is placed in the upper left box with low satisfaction and low emotional connection.

7. Limitations and directions for further research

A difficulty of this research is the novelty of the chatbot concept. Participants might find it difficult to judge chatbots and its possibilities because of limited knowledge. Besides, these participants were all Dutch and this research is restricted to the e-commerce domain, which limits the generalizability. To investigate these chatbot personalities in different contexts such as healthcare or education and with other nationalities could therefore be an interesting future direction. Another limitation was that there was no significant difference found between the two real chatbots. Future research could therefore let the same people participate in two different chatbot conversations, instead of only the extrovert or only the introvert, in order to make the differences between the extrovert and introvert chatbot more visible. Finally, previous HCI studies already showed contrasting results about the influence of people's personality on their preference for robot personality, where people preferred bot personality similar to their own and people who preferred bot personality complementary to their own personality. It could thus also be valuable to investigate what effect the personality of the participants has on their preference for an extrovert or an introvert chatbot personality.

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Appendix A Descriptive statistics

Descriptive statistics of the respondents (extrovert survey, N=57)

	Frequency	Percentage	Cumulative
Gender:			
Male	37	64,9	64,9
Female	20	35,1	100
Age			
<18	0	0	
18-24	40	70,2	70,2
25-34	7	12,3	82,5
35-44	3	5,3	87,7
45-54	5	8,8	96,5
55-64	2	3,5	100
Level of Education			
VMBO	1	1,8	1,8
HAVO	3	5,3	7,0
VWO	1	1,8	8,8
MBO	14	24,6	33,3
HBO	21	36,8	70,2
WO	17	29,8	100
Ever heard of chatbots			
Yes	41	71,9	71,9
No	16	28,1	100

Descriptive statistics of the respondents (introvert survey, N=57)

	Frequency	Percentage	Cumulative
Gender:			
Male	38	66,7	66,7
Female	19	33,3	100
Age			
<18	1	1,8	1,8
18-24	38	66,7	68,4
25-34	9	15,8	84,2
35-44	1	2,8	86,0
45-54	8	14	100
55-64	0	0	

Level of Education

VMBO	0	0	
HAVO	3	5,3	5,3
VWO	4	7	12,3
MBO	11	19,3	31,6
HBO	22	38,6	70,2
WO	17	29,8	100

Ever heard of chatbots

Yes	45	78,9	78,9
No	12	21,1	100

Appendix B Factor analysis emotional connection

Factor analysis concept emotional connection (extrovert survey)

Variables	Items	Scale	KMO/Bartlett	CBA	Factor loadings
Interaction	‘When a firm uses a chatbot with the language of the chatbot you just interacted with I feel ...’	1(Totally disagree) - 7(Totally agree)	0.773/0.000	0.944	0.902*
					0.893**
					0.905***
Enthusiastic	‘‘When a firm deploys a chatbot with open and enthusiastic language I feel...’’	1(Totally disagree) - 7(Totally agree)	0.773/0.000	0.957	0.951*
					0.962**
					0.966***
Interested	‘‘When a firm deploys a chatbot who is interested and ask personal questions I feel...’’	1(Totally disagree) - 7(Totally agree)	0.783/0.000	0.980	0.980*
					0.978**
					0.985***
Informal	‘‘When a firm deploys a chatbot with informal language I feel...’’	1(Totally disagree) - 7(Totally agree)	0.756/0.000	0.970	0.976*
					0.957**
					0.981***
Quiet	‘When a firm deploys a chatbot with closed and quiet language I feel...’	1(Totally disagree) - 7(Totally agree)	0.791/0.000	0.983	0.982*
					0.984**
					0.984***
Direct	When a firm deploys a chatbot who is direct and to the point I feel...’	1(Totally disagree) - 7(Totally agree)	0.777/0.000	0.959	0.960*
					0.968**
					0.959***

Formal	‘When a firm deploys a chatbot with formal language I feel...’	1(Totally disagree) - 7(Totally agree)	0.774/0.000	0.991	0.994* 0.990** 0.990***
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*more bonded to the firm

** more attached to the firm

*** more connected to the firm

Factor analysis concept emotional connection (introvert survey)

Variables	Items	Scale	KMO/Bartlett	CBA	Factor loadings
Interaction	‘When a firm uses a chatbot with the language of the chatbot you just interacted with I feel ...’	1(Totally disagree) - 7(Totally agree)	0.749/0.000	0.944	0.901* 0.920** 0.928***
Enthusiastic	‘‘When a firm deploys a chatbot with open and enthusiastic language I feel...’’	1(Totally disagree) - 7(Totally agree)	0.763/0.000	0.922	0.933* 0.925** 0.935***
Interested	‘‘When a firm deploys a chatbot who is interested and ask personal questions I feel...’’	1(Totally disagree) - 7(Totally agree)	0.744/0.000	0.941	0.946* 0.964** 0.928***
Informal	‘‘When a firm deploys a chatbot with informal language I feel...’’	1(Totally disagree) - 7(Totally agree)	0.756/0.000	0.954	0.962* 0.940** 0.970***
Quiet	‘When a firm deploys a chatbot with closed and quiet language I feel...’	1(Totally disagree) - 7(Totally agree)	0.776/0.000	0.960	0.955* 0.966** 0.966***
Direct	When a firm deploys a chatbot who is direct and to the point I feel...’	1(Totally disagree) - 7(Totally agree)	0.756/0.000	0.913	0.914* 0.925** 0.932***
Formal	‘When a firm deploys a chatbot with formal language I feel...’	1(Totally disagree) - 7(Totally agree)	0.691/0.000	0.943	0.945* 0.925** 0.977***

*more bonded to the firm
 ** more attached to the firm
 *** more connected to the firm

Appendix C Factor analysis customer satisfaction

Factor analysis customer satisfaction (extrovert survey)

Variables	Items	Scale	KMO/Bartlett	CBA	Factor loadings
Interaction	When a firm uses a chatbot with the language of the chatbot you just interacted with ...	<i>1 (very dissatisfied) – 7 (very satisfied)</i>	0.704/0.000	0.770	0.870*
		<i>1 (did not meet my expectations-5 (exceeded my expectations)</i>			0.864**
		<i>1 (very far away – 5 (very close to my ideal)</i>			0.817***
Enthusiastic	When a firm deploys a chatbot with open and enthusiastic language ...	<i>1 (very dissatisfied) – 7 (very satisfied)</i>	0.717/0.000	0.803	0.873*
		<i>1 (did not meet my expectations-5 (exceeded my expectations)</i>			0.866**
		<i>1 (very far away – 5 (very close to my ideal)</i>			0.842***
Interested	When a firm deploys a chatbot that shows interest with asking personal questions...	<i>1 (very dissatisfied) – 7 (very satisfied)</i>	0.735/0.000	0.861	0.920*
		<i>1 (did not meet my expectations-5 (exceeded my expectations)</i>			0.882**
		<i>1 (very far away – 5 (very close to my ideal)</i>			0.899***
Informal	When a firm deploys a chatbot with informal language...	<i>1 (very dissatisfied) – 7 (very satisfied)</i>	0.716/0.000	0.777	0.838*
		<i>1 (did not meet my expectations-5 (exceeded my expectations)</i>			0.867**
		<i>1 (very far away – 5 (very close to my ideal)</i>			0.873***
Quiet	When a firm deploys a chatbot with quiet and closed language...	<i>1 (very dissatisfied) – 7 (very satisfied)</i>	0.558/0.000	0.541	0.542*
		<i>1 (did not meet my expectations-5 (exceeded my expectations)</i>			0.808**
		<i>1 (very far away – 5 (very close to my ideal)</i>			0.846***
Direct	When a firm deploys a chatbot direct and to the point language...	<i>1 (very dissatisfied) – 7 (very satisfied)</i>	0.639/0.000	0.672	0.703*
		<i>1 (did not meet my expectations-5 (exceeded my expectations)</i>			0.842**

		<i>1 (very far away – 5 (very close to my ideal)</i>			0.851***
Formal	When a firm deploys a chatbot with formal language...	<i>1 (very dissatisfied) –7 (very satisfied)</i>	0.711/0.000	0.799	0.875*
		<i>1 (did not meet my expectations-5 (exceeded my expectations)</i>			0.840**
		<i>1 (very far away – 5 (very close to my ideal)</i>			0.848***
*how satisfied would you be in general					
**to what degree does this meet your expectations					
***how close is this to your ideal firm					

Factor analysis customer satisfaction (introvert survey)

Variables	Items	Scale	KMO/Bartlett	CBA	Factor loadings
Interaction	When a firm uses a chatbot with the language of the chatbot you just interacted with ...	<i>1 (very dissatisfied) –7 (very satisfied)</i>	0.623/0.000	0.634	0.837*
		<i>1 (did not meet my expectations-5 (exceeded my expectations)</i>			0.898*
		<i>1 (very far away – 5 (very close to my ideal)</i>			0.735***
Enthusiastic	When a firm deploys a chatbot with open and enthusiastic language ...	<i>1 (very dissatisfied) –7 (very satisfied)</i>	0.573/0.001	0.562	0.774*
		<i>1 (did not meet my expectations-5 (exceeded my expectations)</i>			0.586**
		<i>1 (very far away – 5 (very close to my ideal)</i>			0.820***
Interested	When a firm deploys a chatbot that shows interest with asking personal questions...	<i>1 (very dissatisfied) –7 (very satisfied)</i>	0.642/0.000	0.699	0.766*
		<i>1 (did not meet my expectations-5 (exceeded my expectations)</i>			0.873**
		<i>1 (very far away – 5 (very close to my ideal)</i>			0.792***
Informal	When a firm deploys a chatbot with informal language...	<i>1 (very dissatisfied) –7 (very satisfied)</i>	0.691/0.000	0.733	0.847*
		<i>1 (did not meet my expectations-5 (exceeded my expectations)</i>			0.794**
		<i>1 (very far away – 5 (very close to my ideal)</i>			0.841***
Quiet	When a firm deploys a chatbot with quiet and closed language...	<i>1 (very dissatisfied) –7 (very satisfied)</i>	0.530/0.000	0.543	0.718*
		<i>1 (did not meet my expectations-5 (exceeded my expectations)</i>			0.879**

		<i>1 (very far away – 5 (very close to my ideal)</i>			0.686***
Direct	When a firm deploys a chatbot direct and to the point language...	<i>1 (very dissatisfied) – 7 (very satisfied)</i>	0.660/0.000	0.712	0.860*
		<i>1 (did not meet my expectations- 5 (exceeded my expectations)</i>			0.794**
		<i>1 (very far away – 5 (very close to my ideal)</i>			0.777***
Formal	When a firm deploys a chatbot with formal language...	<i>1 (very dissatisfied) – 7 (very satisfied)</i>	0.673/0.000	0.728	0.865*
		<i>1 (did not meet my expectations- 5 (exceeded my expectations)</i>			0.836**
		<i>1 (very far away – 5 (very close to my ideal)</i>			0.772***

*how satisfied would you be in general

**to what degree does this meet your expectations

***how close is this to your ideal firm

Appendix D Script chatbots

BOT 1: EXTRAVERT

B: Hey <naam>, welkom. Ik ben vandaag je persoonlijke assistent. Hoe gaat het met je vandaag?

--

R: Goed

Oke

Goed met jou?

--

B: Uitstekend!

Met mij gaat het ook goed, aardig dat je het vraagt!

Ik hoorde dat je op zoek was naar een nieuw product. Waar gaat je interesse naar uit?

--

R: <Computer & Elektronica> <Kleren>

--

<Computer & Elektronica>

B: Cool, ik hou ook van de nieuwste technische apparaten!

B: Wat voor soort product ben je precies naar op zoek?

<Kleren>

B: Oke dan! Ik heb zelf ook een aardige collectie kleren (smiley)

B: Ben je op zoek naar mannen of vrouwenkleding?

--

R: <Laptop> <TV> <Game>

R: <Mannen> <Vrouwen>

--

<Laptop>

B: Slimme keuze, zo'n laptop is erg multifunctioneel. Je kan er een serie of film op kijken, je kan er games op spelen, gebruiken als hulpmiddel voor je studie en nog veel meer! Waar gebruik jij een laptop voor?

<TV>

Lekker op de bank zitten en relaxen, ideaal! Een avondje voor de TV serie kijken is een van mijn favoriete bezigheden, welke serie kijk jij momenteel?

<Game>

B: Ah een gamer, net als ik! Wat is de laatste game die jij gekocht hebt?

<Mannenkleren>

B: Laat ik daar nou net veel verstand van hebben. We hebben T-shirts en schoenen in ons assortiment.

Waar ben je naar op zoek?

<Vrouwenkleren>

B: Oke! Koop je vaak kleren online of ga je liever de stad in om te shoppen?

--

<Laptop>

R: -open antwoord-

<TV>

R: -open antwoord-

<Game>

R: -open antwoord-

<Mannenkleren>

R: <T-shirts> <Schoenen>

<Vrouwenkleren>

R: <Online shoppen> <Shoppen in de stad>

--

<Laptop>

B: Nice! Ik gebruik het vooral om series te kijken. Maar back to business. We hebben drie merken laptops in ons assortiment, welke heeft je voorkeur?

<TV>

B: Ah okay! Ik kijk zelf graag naar Game of Thrones. Maar back to business. We hebben drie merken Tv's in ons assortiment. Welke heeft je voorkeur?

<Game>

B: Ah okay! Mijn laatst gekochte game was Fifa 17. Maar genoeg gepraat. We hebben shooter en sport games in ons assortiment, wat speel je het liefst?

<T-shirts>

B: Oke dan. We hebben drie verschillende merken shirts voor je. Welke draag je het liefst?

<Schoenen>

B: Oke dan. Ik zie dat we 2 verschillende merken schoenen hebben. Welk merk heeft je voorkeur?

<Vrouwenkleren>

B: Ah okay! Ik vind zelf online shoppen altijd erg makkelijk. Maar genoeg gepraat. Ik zie dat we drie categorieën kleren voor je hebben. Waar ben je naar op zoek?

--

<Laptop>

R: <Apple> <Acer> <HP>

<TV>

R: <LG> <Philips> <Samsung>

<Game>

R: <Shooter> <Sport>

<T-shirts>

R: <Ralph Lauren> <Calvin Klein> <Tommy Hilfiger>

<Schoenen>

R: <Adidas> <Vans>

<Vrouwenkleren>

R: <Jurk> <Rok> <Shirt>

--

<Elke keuze merk laptop>

B: Goede keuze! Ik ben zelf ook een fan van dat merk. We hebben hiervoor 2 verschillende groottes. Heb je liever een 13 inch laptop of een 15 inch laptop?

<Elke keuze merk TV>

B: Erg goed merk voor tv's! We hebben 2 verschillende groottes voor dit merk. Welke grootte heeft je voorkeur?

<Shooter>

B: Cool zeg! Heb ik nog 1 vraagje voor je: op welke console speel jij je games?

<Sport>

B: Uitstekend! Heb ik nog 1 vraagje voor je: op welke console speel jij je games?

<Elke merk keuze shirts>

B: Goede merkkeuze –naam-! Ik denk dat dit shirt je heel mooi zou staan, wat denk jij? –eerste optie shirt van gekozen merk-

<Elke merk keuze schoenen>

B: Uitstekende keuze –naam-! Ik denk dat je hier heel fijn op gaat lopen, wat denk je ervan? –eerste optie schoenen van gekozen merk-

<Elke keuze vrouwenkleding>

B: Oke dan! Heb ik nog 1 hele belangrijke vraag voor je: voor welke prijs zoek jij dit kledingstuk?

--

<Laptops>

R: <13 inch> <15 inch>

<TV>

R: <49 inch> <55 inch>

<Game>

R: <PLAYSTATION 4> <XBOX ONE>

<Mannenkleren>

R: <ja> <nee>

<Vrouwenkleren>

R: <onder de 50> <boven de 50>

--

<Elke laptop grootte keuze>

B: Uitstekende keuze! Ik denk dat ik dan de perfecte laptop voor je gevonden heb –eerste laptop optie van gekozen merk-, wat denk je ervan?

<Elke tv-grootte keuze>

B: Oke dan –naam-, ik heb volgens mij de perfecte tv voor je gevonden –eerste tv-optie van gekozen merk-, wat vind je van deze tv?

<Elke console keuze>

B: Hey dat is de console waar ik ook mijn games op speel, wat leuk! Wat denk je van deze game – naam-? -eerste game optie voor gekozen genre en console-

<Ja>

B: Helemaal mooi! Ik ben blij dat ik je kon helpen om dit shirt/deze schoenen te vinden. Ik hoop dat ik je snel weer kan helpen! Dit is het helaas het einde van ons gesprek. Ik ben wel ingefluisterd dat je nog even een enquête moet invullen. Dus vul de enquête alsjeblieft in door op de volgende link te klikken.

<Nee>

B: Ah dat is jammer! Gelukkig heb ik nog een andere optie voor je gevonden. Wat denk je van dit shirt/deze schoenen? –tweede en laatste optie voor gekozen merk-

<Elke prijskeuze>

B: Oke dan heb ik denk ik de perfecte optie voor je gevonden, wat denk je hiervan? –eerste optie voor gekozen soort en prijscategorie-

--

<Laptop>

R: <Ja> <Nee>

<TV>

R: <Ja> <Nee>

<Game>

R: <Ja> <Nee>

<Mannenkleren>

<Ja> <Nee>

<Vrouwenkleren>

R: <Ja> <Nee>

--

<Computer & Elektronica>

<Ja>

B: Heel mooi! Ik ben blij dat ik je kon helpen op de juiste laptop/tv/game te vinden. Dit is helaas het einde van ons gesprek maar ik hoop je snel weer te spreken. Ik ben nog wel verteld om je te wijzen op een enquête die nog ingevuld moet worden. Dus vul a.u.b. de enquête in door op de volgende link te klikken.

<Nee>

B: Balen! Maar wat ben ik voor een hulp als ik geen andere optie voor je heb! Wat denk je dan van deze –tweede optie laptop/tv/game-?

<Mannenkieren>

<Ja>

B: Uitstekende keuze –naam-, ik vond deze optie eigenlijk ook mooier. Ik vond het erg leuk om met je te praten maar dit is het helaas het einde van ons gesprek. Ik ben wel ingefluisterd dat je nog even een enquête moet invullen. Dus vul de enquête alsjeblieft in door op de volgende link te klikken.

<Nee>

B: Het spijt me –name-, maar dat was alles wat ik voor je kon vinden op dit moment. Ik vond het erg leuk om met je te praten maar dit is het helaas het einde van ons gesprek. Ik ben wel ingefluisterd dat er nog even een enquête ingevuld moet worden. Dus vul de enquête alsjeblieft in door op de volgende link te klikken.

<Vrouwenkieren>

<Ja>

B: Mooizo! Ik ben blij dat ik je kon helpen –naam-! Ik vond het heel leuk om met je te praten maar dit is helaas het einde van het gesprek. Ik hoop je snel weer te spreken! Ik ben wel ingefluisterd dat er nog even een enquête ingevuld moet worden. Dus vul de enquête alsjeblieft in door op de volgende link te klikken.

<Nee>

B:

–tweede optie vrouwenkledingstuk-

--

<Computer & Elektronica>

R: <Ja> <Nee>

<Vrouwenkieren>

R: <Ja> <Nee>

--

<Computer & Elektronica>

<Ja>

B: Mooizo! Ik vind deze tv/laptop/game eigenlijk ook mooier. Dit is helaas het einde van ons gesprek maar ik hoop je snel weer te spreken. Ik ben nog wel verteld om je te wijzen op een enquête die nog ingevuld moet worden. Dus vul a.u.b. de enquête in door op de volgende link te klikken.

<Nee>

B: Het spijt me –naam- maar dat is alles wat ik op dit moment voor je kan vinden! Ik vond het erg leuk om met je te praten maar dit is het helaas het einde van ons gesprek. Ik ben wel ingefluisterd dat er nog even een enquête ingevuld moet worden. Dus vul de enquête alsjeblieft in door op de volgende link te klikken.

<Vrouwenkieren>

<Ja>

Heel mooi! Ik ben blij dat ik je kon helpen om dit kledingstuk te vinden. Ik vond het heel leuk om met je te praten maar dit is helaas het einde van het gesprek. Ik hoop je snel weer te spreken! Ik ben wel ingefluisterd dat er nog even een enquête ingevuld moet worden. Dus vul de enquête alsjeblieft in door op de volgende link te klikken.

<Nee>

Het spijt me –naam-, maar dit was alles wat ik voor je kon vinden op dit moment. Ik vond het erg leuk om met je te praten maar dit is het helaas het einde van ons gesprek. Ik ben wel ingefluisterd dat er nog even een enquête ingevuld moet worden. Dus vul de enquête alsjeblieft in door op de volgende link te klikken.

-EINDE-

BOT 2: INTROVERT

B: Hallo -naam-, welkom op dit chatplatform. Waar bent u naar op zoek?

--

R:

<Computer & Elektronica> <Kleren>

--

B:

<Computer & Elektronica>

Ok, in deze categorie heb ik drie opties. Waar ligt uw interesse?

<Kleren>

Ok, we hebben mannen en vrouwenkleren. Waar ligt uw interesse?

--

R:

<Laptop> <TV> <Game>

<Mannen kleding> <Vrouwen kleding>

--

B:

<Laptop>

Oke, we hebben drie merken in ons assortiment. Welk merk heeft je voorkeur?

<TV>

Oke, we hebben drie merken in ons assortiment. Welk merk heeft uw voorkeur?

<Game>

Oke, we hebben twee soorten games in ons assortiment. Welke heeft uw voorkeur?

<Mannen kleding>

Oke, we hebben t-shirts en schoenen in ons assortiment. Waar bent u naar op zoek?

<Vrouwen kleding>

Oke, we hebben jurken, rokken en t-shirts in ons assortiment. Waar bent u naar op zoek?

--

R:

<Apple> <Acer> <HP>

<LG> <Philips> <Samsung>

<Shooters> <Sport>

<T-shirts> <Schoenen>

<Jurken> <Rokken> <T-shirts>

--

B:

<alle merkkeuzes>

Oke, van dat merk hebben we twee verschillende groottes, welke heeft uw voorkeur?

<alle merkkeuzes>

Oke, van dat merk hebben we twee verschillende groottes, welke heeft uw voorkeur?

<beide genres>

Oke, op welke console speelt u uw games?

<T-shirts>

Goed, we hebben drie merken t-shirts in ons assortiment. Welk merk draagt u het liefst?

<Schoenen>

Goed, we hebben 2 merken schoenen in ons assortiment. Welk merk heeft uw voorkeur?

<Vrouwen kleding>

Oke, bent u op zoek naar kleding boven of onder de 50 euro?

--

R:

<13 inch> <15 inch>

<49 inch> <55 inch>

<PLAYSTATION 4> <XBOX ONE>

<Ralph Lauren> <Calvin Klein> <Tommy Hilfiger>

<Adidas> <Vans>

<onder de 50> <boven de 50>

--

B:

Oke, ik heb een '13/15 inch laptop' gevonden van het 'merk x', is dit de laptop die u zocht? -optie 1-

Oke ik heb een '49/55 inch TV' gevonden van het 'merk x', is dit de TV die u zocht? -optie 1-

Oke ik heb een 'shooter/sport' game gevonden voor de 'x console', is dit een game die u leuk vindt? -optie 1-

Oke, ik heb een 'merk' shirt voor u gevonden. Is dit een shirt wat u mooi vindt? -optie 1-

Oke, ik heb een paar 'merk' schoenen voor u gevonden, Vindt u dit een mooi paar schoenen? -optie 1-

Oke, ik heb een 'kledingstuk' gevonden dat binnen uw prijscategorie past, is dit een kledingstuk dat u mooi vindt? -optie 1-

--

R:

<Ja> <Nee>

<Ja> <Nee>

<Ja> <Nee>

<Ja> <Nee>

<Ja> <Nee>

<Ja> <Nee>

--

B:

<Ja>

Heel mooi, ik ben blij dat ik je kon helpen bij het vinden van een 'elektronicaproduct'. Zou u nu, a.u.b., de enquête willen invullen door op de volgende link te klikken -link-

<Nee>

Oke, ik heb gelukkig nog een andere optie voor u. Wat denkt u van dit 'elektronicaproduct'? -optie 2-

<Ja>

Heel mooi, ik ben blij dat ik u kon helpen bij het vinden van een mooi 't-shirt/paar schoenen'. Zou u nu, a.u.b., de enquête willen invullen door op de volgende link te klikken -link-

<Nee>

Oke, gelukkig heb ik nog een andere optie voor u, wat vindt u hiervan -andere optie mannenkleding-?

<Ja>

Heel fijn, ik ben blij dat ik u kon helpen bij het vinden van een 'vrouwenkledingstuk'. Zou u nu, a.u.b., de enquête willen invullen door op de volgende link te klikken -link.

<Nee>

Oke, ik heb gelukkig nog een andere optie gevonden voor u. Wat denkt u van dit 'vrouwenkledingstuk' -optie 2-

--

R:

<Ja> <Nee>

<Ja> <Nee>

<Ja> <Nee>

--

<Ja>

Heel mooi, ik ben blij dat ik u kon helpen bij het vinden van een 'electronica product'. Zou u nu, a.u.b., de enquête willen invullen door op de volgende link te klikken -link-

<Nee>

Het spijt me, dat is alles wat ik voor u kon vinden op dit moment. Zou u nu a.u.b. de enquête kunnen invullen door op de volgende link te klikken. -link-

<Ja>

Heel mooi, ik ben blij dat ik u kon helpen bij het vinden van een 'mannenkleding stuk'. Zou u nu, a.u.b., de enquête willen invullen door op de volgende link te klikken -link-

<Nee>

Het spijt me, dat is alles wat ik voor u kon vinden op dit moment. Zou u nu a.u.b. de enquête kunnen invullen door op de volgende link te klikken. -link-

<Ja>

Heel mooi, ik ben blij dat ik u kon helpen bij het vinden van een 'vrouwenkledingstuk'. Zou u nu, a.u.b., de enquête willen invullen door op de volgende link te klikken -link-

<Nee>

Het spijt me, dat is alles wat ik voor u kon vinden op dit moment. Zou u nu a.u.b. de enquête kunnen invullen door op de volgende link te klikken. -link-

Appendix E Survey (translated)

General questions:

Age:

Gender:

Education:

Ever heard of chatbots:

Factor 1: Emotional connection

These measures are multi-item Likert scales, ranging from 1 (*strongly disagree*) to 7 (*strongly agree*) wherein respondents rate the extent of their agreement concerning how a particular brand makes them feel.

- *When a brand uses a chatbot with a conversation flow like the one you just interacted with I feel more bonded to the brand*

When a brands chatbot converses enthusiastic I feel more bonded to the brand

When a brands chatbot is interested and ask personal questions I feel more bonded to the brand

When a brands chatbot is informal I feel more bonded to the brand

When a brands chatbot is closed and quiet I feel more bonded to the brand

When a brands chatbot is direct I feel more bonded to the brand

When a brands chatbot is formal I feel more bonded to the brand

When a brand uses a chatbot I don't feel more or less bonded to the brand

- *When a brand uses a chatbot with a conversation flow like this I feel more attached to the brand*

When a brands chatbot converses enthusiastic I feel more attached to the brand

When a brands chatbot is interested and ask personal questions I feel more attached to the brand

When a brands chatbot is informal I feel more attached to the brand

When a brands chatbot is closed and quiet I feel more attached to the brand

When a brands chatbot is direct I feel more attached to the brand

When a brands chatbot is formal I feel more attached to the brand

When a brand uses a chatbot I don't feel more or less attached to the brand

- *When a brand uses a chatbot with a conversation flow like this I feel more connected to the brand*

When a brands chatbot converses enthusiastic I feel more connected to the brand

When a brands chatbot is interested and ask personal questions I feel more connected to the brand

When a brands chatbot is informal I feel more connected to the brand

When a brands chatbot is closed and quiet I feel more connected to the brand

When a brands chatbot is direct I feel more connected to the brand

When a brands chatbot is formal I feel more connected to the brand

When a brand uses a chatbot I don't feel more or less connected to the brand

Factor 2: Customer satisfaction

- *Considering a brand uses a chatbot with a conversation flow like this, how satisfied would you be in general? (1=very dissatisfied, 7= very satisfied)*

When a brands chatbot is enthusiastic how satisfied would you be in general?

When a brands chatbot is interested and ask personal questions how satisfied would you be in general?

When a brands chatbot is informal how satisfied would you be in general?

When a brands chatbot is closed and quiet how satisfied would you be in general?

When a brands chatbot is converses direct how satisfied would you be in general?

When a brands chatbot is formal how satisfied would you be in general?

When a brand uses a chatbot how satisfied would you be in general?

- *To what degree will a brand fulfill your expectations when they use a chatbot with a conversation flow like this? (1=much less than expected, 5=much more than expected)*

To what degree will a brand fulfill your expectations when they use an enthusiastic chatbot?

To what degree will a brand fulfill your expectations when they use a chatbot that is interested and ask personal questions?

To what degree will a brand fulfill your expectations when they use an informal chatbot?

To what degree will a brand fulfill your expectations when they use a closed and quiet chatbot?

To what degree will a brand fulfill your expectations when they use a direct chatbot?

To what degree will a brand fulfill your expectations when they use a formal chatbot?

To what degree will a brand fulfill your expectations when they use a chatbot?

- *Imagine a company which is perfect in all aspects, how close to this ideal do you consider a brand who will uses a chatbot with a conversation flow like this? (1=very far away, 5=very close)*

Imagine a company which is perfect in all aspects, how close to this ideal do you consider a brand who will use an enthusiastic chatbot?

Imagine a company which is perfect in all aspects, how close to this ideal do you consider a brand who will use a chatbot that is interested and ask personal questions?

Imagine a company which is perfect in all aspects, how close to this ideal do you consider a brand who will use an informal chatbot?

Imagine a company which is perfect in all aspects how close to this ideal do you consider a brand when they use a closed and quiet chatbot?

Imagine a company which is perfect in all aspects how close to this ideal do you consider a brand when they use a direct chatbot?

Imagine a company which is perfect in all aspects how close to this ideal do you consider a brand s when they use a formal chatbot

Imagine a company which is perfect in all aspects, how close to this ideal do you consider a brand who will use a chatbot?