

Alexa, do voice assistants influence consumer brand engagement?

– Examining the role of AI-powered voice assistants in influencing consumer brand engagement

ABSTRACT

Artificially Intelligent (AI) voice assistants (VAs) are continuing to grow in popularity amongst consumers. While in their infancy, several brands are now utilising VAs such as the Amazon Echo to deliver brand-related information and services. However, despite the increasing use of VAs, we have little understanding of what motivates consumers to use such devices for brand-related information. Focusing on the Amazon Echo in-home VA, and its associated Alexa Skills, this research uncovers the key drivers of consumer brand engagement through VAs. In study 1, through a set of in-depth exploratory interviews with 21 respondents, we established three factors as key drivers of why consumers use VAs to engage with brands: AI attributes, technology attributes, and situational attributes. Study 2 examines these specific drivers via a questionnaire with 724 respondents. The findings outline the VA as an actor in the engagement process and affirm the importance of the VA's AI attributes of *social presence*, *perceived intelligence*, and *social attraction* in influencing consumer brand engagement. Additionally, technology attributes influence consumer brand engagement, along with the utilitarian benefits derived from interactions with brand-related information. Hedonic benefits do not influence consumer brand engagement via VA technology, while trust concerns play a negative role in brand engagement behaviour. Lastly, the results convey that consumer brand engagement via a VA influences brand usage intention, but in contrast to previous research, does not directly influence future purchase intention.

INTRODUCTION

Artificially intelligent (AI) voice assistants (VAs), such as Amazon's *Echo* (Alexa), Apple's *Siri*, Microsoft's *Cortana*, and Google's *Google Assistant*, contribute to the changing way consumers interact with firms to seek service assistance, obtain information, and purchase products (Hoy, 2018; Guzman, 2019). Recent research illustrates that 20% of the US adult population has access to VAs (Robbio, 2018). Gartner (2016) predicts that VAs will replace PCs, laptops, tablets, and mobile phones in many elements of online shopping, whilst Accenture (2018) outlines that three in ten consumers speak to their VA more than their family. Consistent with this, Juniper Research suggests that VAs, such as the Amazon Echo and the Google Assistant, will act as a critical driver of service innovation with a predicted 275 million households expected to use such assistants by 2023; a growth of 1000% from the 25 million homes in 2018 (Juniper Research, 2018). Thus, given the proliferation of voice-based technology supported by AI, individuals are communicating with human-like virtual VAs as part of their everyday life (Guzman, 2019). Hence, understanding voice-based AI interactions is a timely and essential area of research as brands enter this territory of technology as a channel for service delivery.

Hoy (2018) defines VAs as software agents that run on a purpose-built speaker or smartphone device. The software continually listens for a keyword to activate its functionality (i.e., 'Hey Alexa...' or 'Hey Siri...'). Once it hears the keyword, the device consumes the user's voice, interprets the language, and processes a response all in real-time. Such VAs can handle complex user requests and engage in a dialogue with an individual (Alepis & Patsakis, 2017). Arguably, the introduction of AI VAs in mobile devices such as Apple's *Siri* was the first application to make consumer-focused AI interaction a reality (Gross, 2011). Due to the ubiquitous smartphone, consumers can interact with AI technology in ways that are different from their interactions with all other technologies (Guzman, 2019). In contrast to early attempts with automated voice interaction, the new mobile and in-home VAs use natural language processing (NLP) that enables individuals to communicate with, and receive replies from, the technology in a similar way to an individual's interactions with another human (Hearst, 2011). Not only have these VAs developed to be more human-like than previous attempts, but also a vital part of a consumer's daily life.

Given the evolving technological environment, further research is needed to understand how voice assistants affect consumer behaviour and how they contribute to the changing interplay between consumers and firms (Van Doorn et al., 2017). Automated voice interactions between AI VAs and consumers will be integrated into numerous service experiences and consumer activities (Teixeira et al., 2017). Although initial research suggested that automated interactions would imply a standardised service offering (Huang and Rust, 2017), due to advancements in natural language processing and machine learning, consumers can in practice engage in personalised conversations similar to those between humans. An additional benefit to consumers is the ability of the technology to learn and draw upon previously-stored customer details and preferences, which could have implications for consumer brand engagement (Huang and Rust, 2020). Such personalised and automated communications may help consumers meet their own specific needs, while firms can capitalise on the benefits of enhanced service efficiency (Glas et al., 2017). Accordingly, given that consumer brand engagement is an individual's psychological state that occurs in an ongoing, dynamic engagement process involving cognitive, emotional, and behavioural dimensions during brand-related activities, the increase in automated customer-to-machine brand-related interactions may see brands benefit from a new channel to stimulate consumer brand engagement (Marinova et al., 2017).

However, despite this propensity of AI VAs to stimulate consumer brand engagement as well as the changing interplay between consumers and firms, there is still limited academic research exploring consumers' interactions with automated voice-assistants and their engagement with brands through non-human entities. Focusing on the Amazon Echo in-home VA and associated Alexa Skills, this research contributes through a qualitative and quantitative empirical perspective to the limited literature on AI-focused brand interactions. It does so by furthering our understanding of the role of automated technology in facilitating customer brand engagement from a cognitive, affective, and conative processing perspective. Given that VAs offer a different type of interaction that is most-often hands-free and controlled by an individual's voice, the attributes of the technology differ from other technologies such as websites, social media, and mobile apps. Thus, the existing theoretical models explaining the use and interaction with technology may not comprehensively explain consumers' interaction and engagement with brands through VAs. Accordingly, the objectives of this research are two-fold. Drawing on social presence theory, technology acceptance theories, and the role of trust, we firstly aim to uncover the key drivers of voice-based consumer brand engagement through AI VAs. Secondly, the research aims to establish

the influence of voice-based consumer brand engagement through AI VAs on key marketing outcomes such as brand usage intention and brand purchase intention.

The rest of this paper is organised as follows: first, we provide an overview of VAs, followed by a discussion of consumer brand engagement, the role of social presence, service roles of VAs, and the role of trust. The next section details the methodological approach and findings of Study 1 and, subsequently, Study 2. Finally, a discussion drawing on the results of Study 1, Study 2, and the literature are presented, followed by implications for managers, before concluding with limitations and future research directions.

LITERATURE REVIEW

Use of VAs

VAs are changing traditional human-computer interaction. To a large extent, they are redefining how consumers access service-related information from websites and applications. VAs are facilitating a convenient way for individuals to interact with service providers as users are no longer required to have any (or limited) physical interaction with their devices, in turn providing a more human-like experience (Alepis & Patsakis, 2017). Additionally, consumers are not required to stop what they are doing to converse with a VA, thus allowing them to multi-task (Strayer et al., 2017). The convenience offered by VAs is unrivalled by any other technology as it provides consumers with access to brand content without any real effort and without the need to read or type (Hoy, 2018).

Due to the advanced natural language processing (NLP) and machine learning capabilities inherent within in-home VAs, devices such as Amazon's *Echo* device or Google's Google Assistant device have further improved the interaction consumers can have with AI technology. While human-computer interaction scholars (e.g., Nass and Moon, 2000) have studied how individuals respond and behave towards machines, including voice-based technologies (Nass & Brave, 2005), the communication abilities of AI VAs are far more advanced than earlier voice-controlled human-computer interaction (Guzman, 2019). Primarily, such advancements are due to the implementation of NLP that enables consumers to talk to and receive in-context replies from a computer in a similar way to consumers' interactions with other human counterparts. Machine learning inherent in AI technology, which utilises algorithms and statistical models to perform tasks and make predictions can learn the user's preferences and topics the user is interested in (Bishop, 2006). Thus, technologies that are capable of genuinely engaging in social interactions providing highly

personalised experiences will, in turn, likely develop relationships with consumers on a cognitive, affective, and behavioural level. Accordingly, such brand-related interactions are likely to present as a new channel for brand engagement.

AI VAs provide an easy way for consumers to interact, given the limited requirement to physically use the technology and manipulate navigation systems. Chattaraman et al. (2019) find that artificial assistive technology makes technology easier to use, particularly for older users. Once set up, there is no learning curve for the user other than using a keyword to activate the device (e.g., 'Hey Alexa...' or 'Hey Google...') (Sundar et al., 2017). Additionally, VAs enable consumers to complete tasks efficiently, given that the VA can take notes, look up items, and use the individual's previously-stored preferences (Guzman, 2019). The usefulness and the ease of use of technology have been well defined in the extant literature (see Davis (1989) for a comprehensive overview) as variables influencing individuals' adoption of and interaction with technology. The technology acceptance model (TAM) outlines that the perceived ease of use and perceived usefulness of a technological system are central to an individual's intention to use a technological system (Davis, 1989). While the adoption of technology does not ascertain interaction and engagement with brands, it provides an indication of the factors that could contribute to driving consumer brand engagement (McLean, 2018).

Consumer Brand Engagement

Research on consumer brand engagement has grown significantly over recent years, illustrating both its theoretical and practical implications (Alexander et al., 2018). An individual's (or actor's) engagement with a brand has been regarded as an emotional bonding between a brand and a consumer (Kumar & Pansari, 2016), outlined as an antecedent of beneficial marketing outcomes (Harmeling et al., 2017), and as a conduit to value co-creation activities (Storbacka et al., 2016). Brodie et al. (2011) define consumer brand engagement as an individual's psychological state that occurs in an ongoing, dynamic engagement process involving cognitive, emotional, and behavioural dimensions during brand-related activities. Hollebeek et al. (2014) also affirm consumer brand engagement as a consumer's positive valence cognitive, emotional, and behavioural brand-focused activity during or related to specific consumer-brand interactions. The psychological state of the actor (i.e., the consumer) can influence their commitment, bonding, and loyalty towards a brand or object, leading to engagement (Brodie et al., 2016). However, in a broader sense through the actor engagement

lens, ‘actors’ in the engagement process involve service staff as well as other consumers or any other stakeholders. Each of these actors combined contributes to the co-creation process for brand engagement. Within the extant literature, *actors* have been singled out as a significant contributor to important marketing outcomes for customer satisfaction, loyalty, emotional bonds, positive word-of-mouth, and enhanced brand commitment (Hollebeek et al., 2014; Brodie et al., 2011; Van Doorn et al., 2010; Pansari & Kumar, 2017).

Over recent years, technology has more effectively engaged customers on a social level through the use of social networks (Hollebeek et al., 2014), mobile applications (McLean 2018), and *chatbots* (Chattaraman et al., 2019). Accordingly, technology-infused consumer engagement helps to develop social relationships between *automated service technology* and humans (Van Doorn et al., 2017). As part of the broader actor engagement ecosystem, the actual technology could be considered an actor in the engagement process and contribute to co-creation activities. In particular, given the machine learning capabilities of AI VAs and the automated social presence inherent within them, consumers appear to be interacting with VAs in the same way as they would with another human. Given that customer service experiences of the future are likely to be formed by the extent to which technology engages consumers on a social level, it is essential that we investigate the role of social presence within automated AI VAs to identify the role such systems can play in stimulating brand engagement. The majority of current self-service technologies (SSTs) lack the ability to engage consumers socially. Thus, technologies that are capable of truly engaging in personalised social interactions and developing relationships with consumers on a cognitive, affective, and behavioural level are likely to have implications for consumer brand engagement and subsequent outcomes. Prior literature assumes that social agents must be human; however, the aforementioned advancements in machine learning mean that non-human AI machines can deliver a socially engaging human-like experience. Therefore, to further our understanding of voice-based brand engagement through AI VAs, steps need to be taken to understand consumer interactions with VAs and the variables influencing engagement. Subsequently, the research examines the influence of consumer brand engagement through AI VAs on brand usage intention and future purchase intentions.

Social Presence

Individuals have wanted to talk to computers from the moment computers were first invented (Hoy, 2018). Social presence is defined as the ‘degree of salience of the other

person in an interaction' (Short et al., 1976, p. 65). Drawing on *Robotics* research (Sundar et al., 2017; Chattaraman et al., 2019), there is a growing level of automated social presence in services. Automated social presence (ASP) can be defined as the extent to which computerised machines (such as robots) make individuals feel they are in the company of another social entity (Heerink et al., 2010). The automated social presence may work with or replace human service staff, particularly in answering routine service queries. For example, instead of telephoning the customer service helpline, visiting in-store or browsing the firm's website, consumers can socially interact with their VA to obtain the required brand-related information. Social response theory (Nass & Moon, 2000; Reeves & Nass, 1996) outlines that individuals interact with computers and media the same way they do with other humans. They do so by employing social rules, including politeness, self-disclosure, and trust in response to given social cues – including two-way interactivity, conversation, and social roles in computers (e.g., a welcome notice from a website or mobile app). Moon (2000) asserts that social responses to computers are due to the fact that humans are socially-oriented from evolution; thus, such social responses are enhanced when interacting with computers encompassing human-like features. These human-like features of computers vary depending on the artificial embodiment in question; therefore, physical robots, virtual *chatbots*, and VAs will elicit different social responses (Li, 2015). For example, a physical robot that can assist consumers carrying physical products, to a virtual *chatbot* providing online navigation assistance, to a VA providing an update on your Amazon order will all result in different social responses. Despite this, the language-based conversations between humans and AI computers serve as an important human-like characteristic that prompts a sense of social presence in the mind of the consumer, influencing consumers to interact with the artificial agent in the same way as they would socially interact with humans (Chattaraman et al., 2019). Given the technological evolution that we have witnessed in recent years, humans are becoming increasingly comfortable with engaging in quasi-social relationships with AI 'beings' (Van Doorn et al., 2017).

Previous research (e.g., Li, 2015; Thellman et al., 2016 and Rosenthal-von der Putten et al., 2016) indicates that despite differing social responses, depending on the artificial embodiment (physical or virtual), spoken language-based AI computers evoke a strong sense of social presence. Additionally, social response theory outlines the principle of reciprocity in the interactions between individuals and computers. In conversing with AI agents, consumers take turns in conversing, pausing for an AI agent to respond, and replying with lengthy

responses (Cerekovic et al., 2017). In addition, as individuals become comfortable in their conversations with an artificial embodiment, like conversations with other humans, they start to build a rapport with the artificial assistant (Cerekovic et al., 2017). Furthermore, based on the principle of reciprocity (Fogg & Nass, 1997), research illustrates that individuals who have worked with a specific ‘helpful’ computer to perform a task in the past want to work with the same computer again in the future, despite an identical computer being able to perform the same task. Individuals who do work with the same computer tend to complete tasks with a greater work ethic and build a strong rapport. Essentially, since the first set of interactions with computers, individuals reciprocate or match the computer’s interaction.

Moving beyond social networks, mobile applications, live chat, and *chatbots*, which all primarily rely on text-based consumer interactions, VA technologies take a further step towards resembling human service interactions via voice communication, further lowering the barriers for engaging with brands and their content at a time convenient to the consumer. Giving technology a voice is a useful way of eliciting social interaction (Nass and Brave, 2005). Essentially, the voice-enabled interaction equalises technology service providers and human service providers as social agents as both have the ability to convey social presence in the form of social attraction, intelligence, and presence. Thus, in the same way consumers interact with human service personnel, they are able to build a social rapport with their personal VA, thus increasing social cues and the potential for engagement with brands through such devices.

Service Roles of AI VAs

Previous research has explored how variations of robot morphology influence individuals’ evaluations and interactions with technology (Fong et al., 2003). Sundar et al. (2017) outline that different types of automated technology characteristics can elicit different responses. For example, websites (Koh & Sundar, 2010), smartphones (Kim, 2014), and *robots* (Sah et al., 2011) that are identified as a ‘*specialist*’ evoke higher levels of trust; they are perceived as more intelligent than their ‘*non-specialist*’ counterparts. Therefore, the characteristics of AI technology can influence a user’s perception of the derived utility from the technology and their likelihood to engage. Accordingly, in the context of robotics design, research has shown that there is a distinct difference between robots (automated technology) that provide the perception of an ‘assistant’ and those that provide the perception of a ‘companion’ (Dautenhahn, 2007). Supporting this line of thought, consumers often engage

differently with human service representatives depending on their perceived actor role (e.g., assistant or companion) (Truel et al., 2013).

From the ‘robot-assistant’ perspective, AI technology is considered to enable useful machines that help humans in the completion of tasks. For example, this may be the capability of a VA to track the arrival time of an Uber ride or a delivery from Amazon.com. Other traditional examples include aiding a disabled individual in their home (e.g., wheelchair robotics). These are assistive roles carried out by the technology. The assistant-based conversations tend to be more task-oriented, formal and focused on task dialogue to achieve specific functional goals (Chattaraman et al., 2019). Accordingly, consumers tend to regard ‘assistants’ as being intelligent due to their professional demeanour (Sundar et al., 2017).

In comparison, the ‘robot-companion’ perspective is characterised by the ability of AI technology to provide users with emotional support (Sundar et al., 2017). In this role, a VA, despite its name, is not considered an assistant or servant; rather, it is regarded as a trustworthy, considerate personal companion in typical everyday situations. For example, an individual may have a conversation with a VA about music or food in the same way as they would with another human. The sophisticated natural language processing powering of AI VAs provides the technology with the capability of acting like a human (Guzman, 2019), which, in turn, influences the social attraction of AI technology (Lee et al., 2006). In such circumstances, social conversations are inherently more casual and foster a social-emotional exchange based on hedonic benefits (Kreijns et al., 2003). Companion-based social conversational strategies of AI assistants are formed by informal dialogue with social (i.e., non-task oriented) interactions, including customary greetings, small talk, and positive expressions to meet social-emotional goals (Yoo et al., 2015).

While a VA such as the Amazon Echo (as studied in this research) provides the ability to offer companionship, it should be noted that interacting with ‘Alexa’ can be considered transactional as it involves a set of interactions that result in obligations, and these interactions are interdependent and reliant on the actions of the user (Chiou et al., 2018). Therefore, in the case of ‘Alexa’, the interaction is somewhat unidirectional, given that it relies on the user to initiate conversation. In contrast, for example, the Google maps assistant through Google Assist has an assistive feature that prompts the user during navigation to consider the recommendation of an alternative (faster) route. Despite this, unidirectional VAs that respond only to keywords to activate their functionality can provide a stimulating social experience, resembling human conversation (Sundar et al., 2017), with the exception being

that the user must initiate conversation. Waiting for keywords to activate puts the user in control, which in other contexts (e.g., websites and mobile apps) has shown to increase trust and lower perceptions of risk (Yang et al., 2015), in turn, influencing engagement behaviours.

Furthermore, inherent to AI technology is intelligence. However, this intelligence is not only based on the ability of the VA to understand a human's spoken language and the use of natural language processing to engage in a dialogue, it is also based on the quality of the dialogue and thus the quality of information that the VA provides. The importance of the quality of the information provided through technology has been outlined in other contexts, including websites (Kim & Niehm, 2009), mobile apps (Leon, 2018), and live chat technology (McLean & Osei-Frimpong, 2017). DeLone and McLean (2003) illustrate that an information system's success is dependent on the quality of the information provided to users during interactions. A key purpose of a VA is to relay information to users based on their requests. Information that is current, relevant, accurate, clear, and reliable is considered to be of high quality (Guo et al., 2012). VAs will seek the most relevant and reliable information to return to users (Guzman, 2019), as they use algorithms to find the most pertinent information drawing on specific applications (e.g., Alexa Skills) and the highest-ranked search results from search engines (Hoy, 2018; Sundar et al., 2017).

Consumer Trust in VAs

Sophisticated VAs are able to execute various high priority commands such as accessing personal account information, placing an order with a retailer, making appointments and bookings, looking up customer service information, and generally acting on a user's behalf (Feng et al., 2017). To a large extent, VAs are replacing traditional user interaction and therefore require a broad set of software permissions to undertake the tasks that users set them (Alepis & Patsakis, 2017). While VAs are becoming part of consumers' daily lives, such new technologies are accompanied by a new set of risks (Lei et al., 2018), leading to issues regarding trust during interaction with such devices.

Trust can be defined as an individual's attitude of confident expectation in a situation of risk that their vulnerabilities will not be exploited (Corritore et al., 2003). In line with this, Tan and Sutherland (2004) elaborate on the central role of risk in promoting trust and contend that where risk does not exist, the individual is no longer compelled to make a judgment on the trustworthiness of the subject or situation. The utility derived from VAs stems from their ability to work with specific applications (for example, skills developed for Amazon's Alexa). VAs can be exploited by these skills (applications) that do not request any permission

from the user; thus, without the user's given consent or even knowledge, the VA may have access to information and divulge information that the user is not aware of (Alepis & Pataskis, 2017). In this regard, VAs are open to the risk of hacking attacks and exposing confidential consumer information.

Additionally, as a VA responds to keywords announced in the vicinity of its location, spoken commands on televisions, other people, or pre-recordings of a user's voice can result in access to an assistant's functionality (Millios, 2018). Accenture (2018) found that consumers shy away from using their VAs to make payments and transferring money. The same study found that 48% of their 1000 respondents believed their VA was always listening, and 55% feared their personal details being hacked. Vaidya et al. (2015), as well as Carlini et al. (2016), assert that developers are currently learning about this new territory for technology and how consumers interact and engage with it. Thus, the priority for brands and VA providers is to ensure individuals' information remains private and secure. Previous research has highlighted that trust in technology is one of the most important precursors for engaging with technology (Lu et al., 2016). However, despite issues of potential access to personal information, communication has been outlined as key to developing trust (Kracher et al., 2005). Above all other forms of technology, VAs provide the highest level of communication to resemble that of humans. Trust is often considered as the expectation held by individuals that the word, promise, written, or verbal statement can be relied on (Rotter, 1971). The verbal component in trust emphasises the importance interactive communication plays in building trust. VAs provide the illusion of someone being present and always available to communicate with. Therefore, while issues may exist concerning the privacy of information, the available communication through VAs, over time, may reduce the potential effect of trust influencing individuals' behaviours. The following section outlines the methodological approach for Study 1 with the aim of understanding why and how consumers use VAs to engage with brands.

STUDY 1 – Exploring Consumer Use of VAs

Methodology

Overview and Sample

Given that VAs are a new channel of service delivery with little empirical knowledge available on consumers' use and their subsequent engagement with brands through the technology, we began by conducting exploratory qualitative research in the form of in-depth interviews with 21 respondents who had experience of using the Amazon Echo device (see the sample characteristics in Table 1). Respondents were recruited through a snowball sampling technique. The interviews took the form of a quasi-deductive approach drawing on the extant literature to inform the discussion. Since the Amazon Echo has the largest (70%) market share (CTA, 2018) in the VA market and the broadest range of branded applications, we focused on consumers' use of the Amazon Echo and their subsequent engagement with branded *Alexa Skills* applications. Alexa Skills are applications that brands can develop for the Amazon Echo VA. These applications provide Alexa with new 'skills.' For example, a consumer can download the *Uber* ride skill for Alexa so that she can arrange an Uber ride. Additionally, consumers can download the *United Airline's* skill to check baggage allowance and other services or the *Lonely Planet Guide* to discover what to do in different cities. This first study aimed to understand why consumers use VAs and to investigate the variables that influence consumers to engage with branded skills through Amazon's Echo VA.

Procedure and Analysis

We first instructed participants to think about their interactions with their Echo device, what they use it for, and why they use it. Second, we instructed participants to think about some of the branded Alexa Skills they have downloaded and consider their interactions with them. While Study 1 adopted an open-ended approach, in a similar vein to Hollebeek et al. (2014), we informed the participants of terms related to the cognitive, emotional, and behavioural elements of brand engagement. An interview guide was developed following the review of the extant literature on VAs and customer brand engagement. The interviews started by broadly discussing the participants' use of the VA before moving on to the downloaded skills (applications) and the branded skills that participants interact with. The interviews were audio recorded and lasted an average of 43 minutes. Each of the interviews were transcribed, resulting in 478 pages of content, 1.5 line spaced at 11pt font. We used a hermeneutic approach to analyse the data (Arnold & Fisher, 1994). The researchers discussed the emerging themes in the data. The analysis to interpret the data involved rounds of refinement and grouping of thematic codes. The thematic codes were developed based on groups of keywords which were colour coded throughout the transcripts. The researchers

agreed on both the keywords and the subsequent thematic codes. From this, we developed three thematic groups.

<< Insert Table 1: Interview Participants Here >>

Study 1 Findings

Following the analysis of Study 1, we established three thematic interpretations as key drivers of why consumers use VAs to engage with brands. The first theme is *AI Attributes*, which outlines the social attributes of VAs in influencing consumer interactions. The analysis revealed 98 quotations relating to the *AI Attributes* theme with ‘social presence,’ ‘perceived intelligence’ and ‘social attraction’ as identified social attributes. The second theme is *Technology Attributes*, which refers to the traditional technology adoption characteristics encompassing ‘perceived ease of use’ and ‘perceived usefulness.’ The analysis outlined 72 quotations relating to the *Technology Attributes* theme. The third theme is *Situational Attributes*; this theme takes account of the customer’s personal situation and need to use the VA, encompassing ‘utilitarian benefits,’ ‘hedonic benefits’ and ‘distrust’ – the analysis revealed 69 quotations relating to the *Situational Attributes* theme.

Theme 1 - AI Attributes ‘Social Characteristics’

In line with previous research (e.g., Nass & Moon, 2000; Reeves & Nass, 1996), individuals interact with computers in the same way in which they interact with other humans, employing social rules. Respondents illustrated that their VA provided the illusion of someone being there (present). Thus, providing a companion to converse with, to learn from, to complete tasks, and to seek social warmth:

‘When I come home from work and nobody else is around, I will talk to Alexa; I ask her what’s happening in the news. She compiles all the top stories for me and gives a run through of them. I can ask her for more details and she provides it. It’s actually almost more interesting talking to Alexa than friends and family! She takes you on a tour of current events, and you can ask for more. The conversation is surprisingly stimulating and can be more engaging than I have with another (human) person. It sounds crazy but it’s true.’ (Lauren)

As Lauren outlines, the VA provides her with social presence and ‘someone’ to interact with. This interaction is highly personal to her, based on what she would like to discuss, and with the VA responding and asking if she would like to know more. The intelligence shown by the VA has provided a stimulating discussion outlining the intelligence of the technology. Similarly, the comment below outlines the social rules that individuals apply to VAs due to their human-like characteristics.

‘I refer to Alexa as my friend... my (human) friend thought it was funny until she got one, and now she does the same. I sometimes even ask Alexa how she is doing; she replies and also asks me the same thing. It’s just like having a conversation with an actual person. Sometimes I actually picture Alexa as a person within the system. It is great to have someone around that can answer your question on cue and have the intelligence to answer it. What she can do is quite remarkable.’ (Sarah)

The social presence provided by VAs is reflected in the comment that Alexa is the respondent’s friend and the social rules that are applied to the interaction, with politeness shown towards the VA (e.g., asking the assistant: How are you?). The voice conversations between humans and AI computers serve as an important human-like interaction that prompts a sense of social presence in the mind of the consumer. The above statements outline that individuals start to build a rapport with the AI assistant. In turn, this rapport through the social attractiveness of the artificial assistant can result in increased interactions with the technology:

‘I feel like we (Alexa and respondent) have built up a relationship. I actually believe that she (Alexa) knows more about me and my preferences along with my schedule more than what some of my closest friends and family do. I am able to plan things with Alexa, find out recipes, track my orders, go shopping with her. She even gets me up in the morning. I can do lots. I can only imagine that I’ll be able to do more and more in the future.’ (Mohammed)

The comment here illustrates the presence of a social entity and the intelligence demonstrated by the VA in understanding the individual on a personal level. This understanding appears to be leading individuals to developing a relationship and rapport with the AI VA. This, in turn, enhances the social attractiveness of interacting with the technology.

The intelligence exerted by VAs appears to be judged on the ability of the assistant to interactively engage in a social conversation but also in their ability to provide high-quality information to the user. Thus, information that can be relied on:

‘I enjoy interacting with Alexa. It is fun to have an assistant around but also an assistant that knows you and understands you better than anyone else. At first, I was sceptical of the reliability of the information that I might get from Alexa; at first, I double checked things as an added security to see if she actually got things correct. To my amazement, it was right every time. I no longer check. I completely trust the information she gives me as it is always of good quality and would likely be the link I would choose in a search result or the place I would go for the information anyway.’ (Debbie)

Echoing the intelligence of the VA in providing high-quality information:

‘The skills that are provided by different companies are great, and it adds to the knowledge of Alexa and the information she can provide. I always ask Alexa how I am doing on my goals with my Fitbit. I was able to download the Fitbit skill (application), and this provided Alexa with new knowledge on my activity with Fitbit. I now use my Fitbit more than I used to. The convenience of just asking Alexa definitely increases my use with Fitbit.’ (Craig)

This outlines that the skills (applications) increase an individual’s perception of the intelligence of the VA, while also enhancing the user’s interactions with a brand’s skill (application). Furthering this, respondents outlined the technology characteristics that influence their engagement with a brand through their use of their VA.

Theme 2 - Technology Attributes

VAs are changing traditional human-computer interaction and removing the need for physical input, such as clicking, tapping, and navigating a user interface (Guzman, 2019). The interplay between how an individual interacts with the technology has subsequently changed. The ease of use of technology has received large volumes of attention in influencing consumer use of and engagement with various technologies. However, each of these technologies has required physical human interaction with a user interface.

‘The beauty of my Echo is how easy it is to use. Most things are done hands-free. I don’t have to try and find one of the hundreds of apps on my phone or search online, I just ask Alexa something, and that’s it. I don’t need to pick up my phone, tablet, or laptop and go through all of the hassle to get to the end information, I speak and I get a response. It’s just like asking a knowledgeable person a question all of the time. I can also be multitasking while I shop or while I find a recipe, for example.’ (Kate)

The need to interact with a user interface can, in some circumstances, add a layer of complexity during human-computer interactions. Previous research has outlined the importance of a website and a mobile application being easy to use due to the required interface interaction. In contrast, VAs remove the need to interact with a user interface and, to some extent, remove the feeling of interacting with technology; rather, the interactions somewhat resemble human-to-human interactions.

‘Most of the time, I don’t feel like I am using technology. It feels like I am on the telephone to a friend, and I have my phone on speaker mode. It feels like I am just talking to a friend, with the only difference being that I can have very personal conversations with my health apps and my diary planning. It is now so simple to plan things; I just ask Alexa what I have on. The fact that I don’t even need to pull out my phone and check things is great. By introducing a new technology, I ironically feel as though I’m using technology less as I search less on my computer (laptop) or mobile phone. There is almost no effort involved in interacting with Alexa.’ (Hailey)

Once set-up, VAs require a modest learning curve in order to utilise their functionality. Given that VAs serve their users, they provide individuals with an efficient way to complete tasks as they can take notes, look up items, and use customer preferences. This essentially adds to the usefulness of the technology. Davis (1989) outlined the usefulness of technology as a key variable in driving technology use. The usefulness of technology relates to enhanced performance, productivity, and effectiveness. In addition to previous respondents’ comments, the following respondent stated:

‘I am able to complete tasks more efficiently and quicker than I could if I was to use a different type of technology. For example, I recently ordered a package from Amazon, and I could check when the delivery was due. I was also able to reschedule the delivery if it didn’t suit me. I was able to do all of this without lifting a finger. It makes things much easier and is probably one of the most useful things I have bought in a long time. I was actually a little sceptical before I used Alexa. I now don’t know how people go without it.’ (Simon)

Theme 3 - Situational Attributes

Participants outlined the utilitarian benefits of the VA as a key attribute in influencing their use and engagement with brands’ skills (applications) through the VA. This utility derives from the ability to quickly lookup information, shopping for specific items, or seeking service-related information all without having to physically interact with a user interface. However, a consumer-brand relationship emerges from this convenience and goes beyond the point of utility. As VAs become an intimate part of a consumers’ everyday lives, the utility develops a relationship between the technology and the individual. In turn, brands find themselves in a favourable position within the home of the consumer:

‘Alexa gives me updates on news from all of my favourite outlets. I am also able to get information about my Amazon order or place another order without having to do anything other than speak... it’s amazing. I actually feel that Amazon.com is my pantry, and they are part of my home, ready to supply me with whatever I need.’ (Sara)

The VA is facilitating consumer engagement with the Amazon brand in this situation. The VA is part of private space and time, which is otherwise inaccessible to marketers. This personal space at home is opening up the chance for brands to engage with consumers on a new level, in a non-interruptive and assistive manner that offers consumers utility when they need it. Participants outlined that the VA has become part of their everyday lives and an integral part of their daily routines from waking up (via an alarm), to asking Alexa to turn off the lights and set an alarm in the evening. At the same time, individuals can be in bed thinking about a product and ask Alexa to make a purchase without moving. This convenience develops a three-way relationship between the individual, technology and brand all within a consumer’s home:

‘Alexa is always available to assist me when I am home. I once went to bed one night, forgetting to order my usual facial cleanser. I immediately thought of Alexa and then, subsequently, Amazon, where I have purchased it before. I asked Alexa for a price and then ordered it while in my bed, surrounded by darkness. Quite amazing really.’ (Lauren)

The convenience-led interactions with the VA are paving the way for consumers to think about a brand, with many participants thinking about Amazon. Additionally, participants highlighted how brands’ skills (applications) developed for their VA get them thinking about the brand (e.g., Fitbit, Expedia, and Uber). Cognitive brand-related thoughts are a key component of consumer brand engagement (Hollebeek et al., 2014). Accordingly, participants outlined the emotional appeal of the VA in understanding their behaviour and their needs, with some participants expressing their love towards Alexa. Emotional attachment to the VA may subsequently spill over to brands that consumers interact with via the technology. The capability of engaging consumers in their own home provides brands with the opportunity to elicit positive thoughts and emotions towards the brand. Some brands provide skills that can add to the enjoyment consumers gain from their VA. The hedonic benefits provided by a VA (and the brand’s skill) may influence further brand interactions due to the pleasure and playful nature of interactions.

'I have downloaded lots of skills for Alexa, which are really great fun to play around with. I expect in the future more brands will get in on the action and will produce skills that are creative and fun to interact with; I love roast master, and my friends love it too. Alexa has a sense of humour, which makes her fun to interact with. I even enjoy getting my news coverage from Alexa more than from the TV or radio – it's more personalised for me.' (Kurt)

VAs appear to be making life easier, more convenient, providing social presence and enjoyment during consumer interactions. Despite this, trust remains an issue. While consumers appear to trust the information provided by the VA, trust issues prevail due to consumers' concerns over the privacy of their interactions and the potential for private information to be misused. Given that trust is an individual's attitude of confident expectation in a situation of risk that their vulnerabilities will not be exploited, participants have expressed their concerns over vulnerabilities in the security of VAs. Accordingly, previous research points out that due to the new technological territory that VAs have opened up, developers are still learning the intricate dynamics of the technology, thus resembling the early introduction of websites and mobile apps; as such, VAs could be open to security risks.

'I do love Alexa, and I feel like I can trust her, which might sound strange, but I do fear that someone can hack in and listen to my interactions with Alexa or use my saved payment details. I was very cautious the first time I placed an order through Alexa.' (Linda)

Interestingly, in line with Kracher et al. (2005), communication is considered key to developing trust. This participant (Linda) outlines that she trusts the communication she has with the AI system, but has trust concerns over the security of the system. However, despite such trust concerns over both privacy of personal details, and the security of those details, the participant still purchased items through the VA, providing it with personal details and offering access to payment information. Other respondents shared similar security concerns with the VA:

'I am a little worried, in fact, more than a little, that someone is able to steal my information and in particular my (credit) card details. Alexa has all of this, and it would be a disaster if someone got a hold of it. Yet, I guess I take the risks as I still purchase through it and give Alexa access to my payment information, so I guess I do trust it, but it isn't without concerns and risk.' (Lauren)

Again, concerns are articulated over the security of the VA. However, similar to other participants, the concerns did not affect behaviour as they continued to engage with the VA,

providing personal details along with payment details, despite their concerns. VAs provide the illusion of someone being present and someone who is always available to communicate with. Thus, while concerns may exist regarding the privacy of information, the available communication through VAs appears to reduce the potential influence of trust influencing individuals' behaviours.

STUDY 2 – Understanding Customer Brand Engagement with VAs

Following Study 1, Study 2 provides an empirical insight in the form of a quantitative survey design building upon the extant literature and the findings of Study 1. Through the exploratory findings of Study 1, Study 2 examines the drivers of consumer brand engagement through AI VAs and the subsequent outcomes of VA brand engagement.

Conceptual Development

The literature review and Study 1 provided a basis for conceptual development. The literature and interviews outline the importance of the social presence elicited from in-home AI VAs, pertaining to Theme 1. As outlined in the extant literature, humans have eagerly wanted to talk to computers from the moment they were invented (Hoy, 2018), whilst employing social rules as they go about their interactions (Nass & Moon, 2000). Previous research outlines that individuals are often polite towards automated computerised systems; this is particularly noted in *chatbot* interactions (Chattaraman et al., 2019). Study 1 noted that individuals believe that an in-home VA, such as Alexa, provides a social presence. Interestingly, all participants referred to the Amazon Echo VA as 'Alexa,' and would use either the name 'Alexa' or 'she,' demonstrating the human social presence of the AI VA. Research affirms that human-like features in computers, such as a human name and a human-sounding voice, elicit various social responses (Li, 2015). Previous research also outlines that spoken language-based AI computers evoke one of the strongest perceptions of social presence (Thellman et al., 2016; Rosenthal-von der Putten et al., 2016). The spoken language from the VA appeared to influence respondents' perceptions (in Study 1) of the VA's social presence. As discussed, previous research notes that when conversing with artificially intelligent agents, consumers take turns in conversing and pause for an AI agent to respond, aligning with human-to-human interactions (Cerekovic et al., 2017). Study 1 illustrated how consumers interact with their AI VA in the same way as they do with other humans, building

up a rapport with them to the extent that the AI technology understands the user's unique preferences.

Participants commented that the VA was like a friend or a companion, which both served them but also interacted with them in a social manner. Sundar et al. (2017) outlined that in robotics design, AI assistants can provide individuals with a form of companionship. In turn, VAs are viewed as a considerate personal companion in typical everyday situations. The sophisticated natural language processing powering AI VAs provides the technology with the capability to act like a human (Guzman, 2019), in turn influencing the social attractiveness of the technology and the perceived intelligence of the technology. The intelligence exerted by AI VAs is based on natural language processing, enabling the technology to understand a human's spoken language. Thus, due to natural language processing and machine learning, consumers are able to engage in personalised conversations similar to those with another human, with the added benefit that the technology is able to learn and store customer preferences (Sundar et al., 2017). Study 1 illustrated individuals' surprise at the quality of conversation and quality of information supplied by the VA, in turn enhancing the perception of the technology's intelligence.

Such interactions with a VA in an individual's personal space (in-home) may lead to further brand engagement. The VA (in this study's case, Alexa) may become an actor in the engagement process, in the same manner that service staff or other consumers are part of the engagement process. Customer brand engagement has been outlined as a psychological state (Brodie et al., 2011) and involving a consumer's cognitive, emotional, and behavioural dimensions (Hollebeek et al., 2014). The applications (Alexa Skills) developed for VAs provide brands with the opportunity to engage with consumers via VAs. In contrast to smartphone applications, the delivery of the VA application (skill) is conducted by an AI-powered voice and, in the case of Amazon Echo, is delivered by Alexa. Thus, we hypothesise:

H1 The social presence of the AI voice assistant will positively influence participation in consumer brand engagement.

H2 The perceived intelligence of the AI voice assistant will positively influence participation in consumer brand engagement.

H3 The social attraction of the AI voice assistant will positively influence participation in consumer brand engagement.

The literature and Study 1 outline the role of technology acceptance attributes in influencing individuals' use of VAs, pertaining to Theme 2. VAs offer consumers an alternative way to interact with technology, removing the need to manipulate user interfaces and navigation systems. Largely, the few skills required to interact with voice technology result in the technology being perceived as easy to use (Guzman, 2019). Further to this, Chattaraman et al. (2019) posit that in general terms, artificially assistive technology makes technology easier to use due to the sophistication of such systems. Additionally, VAs enable consumers to efficiently complete tasks given that they can take notes, order items, look-up items, search information, and utilise the individual's preferences (Guzman, 2019). Study 1 revealed that participants almost forget about the technology due to its ease of use as they simply call out a keyword ('Hey Alexa...') and speak as they would with a human counterpart. The need to interact with a user interface can, in some circumstances, add a layer of complexity during human-computer interactions. However, this layer is removed with VAs while still offering individuals a high level of control. Once configured, VAs require little user interaction with anything other than voice, whilst always being available to answer a question at an individual's call. Davis (1989) and subsequent research has outlined the ease of use and usefulness of technology in influencing technology adoption and acceptance. Given the discussions in Study 1, referencing the usefulness and ease of tracking an order on Amazon or seeking information from Expedia via a VA, we hypothesise the following:

H4 The ease of use of the AI voice assistant will positively influence participation in consumer brand engagement.

H5 The usefulness of the AI voice assistant will positively influence participation in consumer brand engagement.

The literature and Study 1 outline personal situation attributes with the potential to influence consumer brand engagement via an in-home VA, pertaining to Theme 3. In line with previous research, utility often influences a consumer's use of technology (McLean et al., 2018). Study 1 outlined that utilitarian benefits were a key attribute in influencing a consumer's use of branded voice applications (skills). The convenience of looking up information, shopping for specific items, or seeking service-related information all hands-free, whilst possibly multi-tasking, provides individuals with a channel of service delivery that offers arguably more utility than any other available. The utilitarian benefits derived

from such interactions go beyond the point of utility and somewhat forge a consumer-brand relationship, as the VA becomes an intimate part of consumers' everyday lives; thus, the convenience of the technology develops a relationship between the technology and the individual. Accordingly, brands find themselves in a favourable position within the home of the consumer. Thus, we hypothesise:

H6 The utilitarian benefits of the AI voice assistant will positively influence participation in consumer brand engagement.

Further to this, previous research has outlined that many individuals interact with technology for hedonistic purposes. The extended technology acceptance model (Venkatesh & Bala, 2008) outlines the role of enjoyment in influencing technology interactions. Study 1 found that individuals, on occasion, seek enjoyment from their interactions with their VA. Brands are able to develop creative and fun-filled skills for the Amazon Echo and other in-home VAs. The lure of enjoyment via an AI VA may result in enhanced consumer brand engagement. Thus, we hypothesise:

H7 The pursuit of hedonistic interactions with the AI voice assistant will positively influence participation in consumer brand engagement.

Furthermore, VAs are able to execute a multitude of high priority commands such as accessing personal account information, placing a transactional order with a retailer, booking appointments, looking up customer service information, and generally acting on an individual's behalf (Feng et al., 2017). Thus, to an extent, VAs are replacing traditional user interaction and therefore require a significant set of software permissions to undertake the tasks users' set them (Alepis & Patsakis, 2017). While VAs are becoming part of consumers' daily lives, such new technologies are accompanied by a new set of risks (Lei et al., 2018), leading to issues regarding trust. While consumers appear to trust the information provided by the VA, trust issues prevail from consumers' concerns over the privacy of their interactions and the potential for private information to be stolen. Given that trust is an individual's attitude of confident expectation in a situation of risk that their vulnerabilities will not be exploited (Corritore et al., 2003), participants have expressed their concerns over vulnerabilities in the security of VAs. Thus, we hypothesise:

H8 An individual's concern over trust towards brand-related interactions with the AI voice assistant will negatively influence participation in consumer brand engagement.

Previous research has outlined that consumer brand engagement results in favourable marketing outcomes. This research posits that AI VA brand engagement practices are likely to enhance the value of the brand to participating consumers (Rangaswamy et al., 1993), which is thus likely to influence brand purchase intentions and brand usage intentions (Lu et al., 2016; Hollebeek et al., 2014). The AI VA could be considered an actor as part of the engagement process given they contribute to the co-creation process in consumer brand engagement. Engagement behaviour is driven by an individual's own specific needs and intentions rather than acting on a firm's instruction (Hollebeek et al., 2019). Therefore, it is a consumer's choice to engage with a brand's application (skill) via a VA in their own home. Thus based on previous research (Jaakkola & Alexander, 2014; Harmeling et al., 2017; Hollebeek et al., 2019; Hollebeek et al., 2014) such engagement behaviours may result in brand usage intentions and brand purchase intentions. On the basis of the above, we hypothesise:

H9 Consumer Brand Engagement behaviour via voice assistants will positively influence brand usage intentions.

H10 Consumer Brand Engagement behaviour via voice assistants will positively influence brand purchase intentions.

H11 Consumers' brand usage intention will positively influence brand purchase intentions.

Figure 1 provides a simplified pictorial representation of the hypothesised model.

<<Insert Figure 1: Hypothesised Model Here>>

Methodology

An online survey was used in Study 2 to further our understanding of consumer brand engagement via AI powered VAs. This study was limited to users of the Amazon Echo device; however, it was not focused on any particular brand. While the Amazon brand benefits from the most advanced set of consumer interactions via the in-home VA, numerous other brands such as Uber, Fitbit, Expedia, Lonely Planet, United Airlines, and various others

have applications (known as skills) that users can add to the VA, thus enabling brand engagement via the device. In May 2018, there were 50,000 unique skills (applications) available for the Alexa, with 3,500 brands on Alexa, which is significant growth from the 1,200 available in January 2018 (Kinsella, 2018). Respondents had been using the Echo device for at least one month, and this information was captured following a screening question. Data were gathered from 766 consumers with the use of a market research firm to help obtain the sample. Respondents were offered a monetary incentive to participate in the research. After data cleansing and removing those responses that contained missing values, the sample consisted of 724 valid responses. Table 2 provides further particulars of the sample in this study.

<<Insert Table 2: Details of Respondents Here>>

The scales adopted in the questionnaire were drawn from scales in the extant literature to measure social presence, perceived intelligence, social attraction, perceived ease of use, perceived usefulness, utilitarian benefits, hedonic benefits, distrust, consumer brand engagement, brand usage intention, and purchase intention. Accordingly, 49 items were measured on a 7-point Likert scale with a range from Strongly Disagree to Strongly Agree. Table 3 provides further details on the scales and items used in the questionnaire.

<<Insert Table 3: Questionnaire Scales Here>>

Preliminary Analysis

A set of preliminary analyses were conducted prior to structural equation modelling to test the hypothesised model. Cronbach's alpha coefficient was calculated to measure scale reliability, as shown in Table 3. Each scale measuring its corresponding construct exceeded the critical value of 0.7 (Pallant, 2013); as a result, the scales are reliable indicators of their corresponding constructs. As the *Consumer Brand Engagement* construct is considered multidimensional, a subsequent confirmatory factor analysis (CFA) was performed on the dimensions (cognition, affection, and activation) of the *Consumer Brand Engagement* scale. The confirmatory factor analysis showed *goodness of fit*, confirming the dimensions of the scale. Furthermore, an Exploratory Factor Analysis (EFA) was conducted on the *Social Presence* scale given that its items were derived and developed from the works of Lee et al. (2006) and Nass and Moon (2000). The results illustrated a KMO sampling adequacy of

0.788 and a corresponding p -value <0.0001 for Bartlett's Test of Sphericity, a further CFA showed *goodness of fit* for the scale.

Subsequently, Structural Equation Modelling (SEM) with the use of AMOS Graphics 24 was used to test the hypothesised relationships outlined in Figure 1. Confirmatory SEM is a two-step approach: (1) a CFA of the entire model is performed followed by (2) the estimation and assessment of the structural model. The CFA is conducted to illustrate the causal relationships. The results of the CFA show *goodness of fit*: $\chi^2_{(731)} = 2091$, $\rho = 0.001$, $\chi^2/df = 2.77$; RMSEA = 0.051, RMR = 0.018, SRMR = 0.040, CFI = 0.969, NFI = 0.963, GFI = 0.955. Additionally, each of the regression values were acceptable and statistically significant ($p < 0.05$).

Following the CFA, further analysis satisfied discriminant and convergent validity. The results shown in Table 4 indicate that convergent validity was satisfied as the average variance extracted (AVE) values presented above 0.50 and construct reliabilities above 0.70. Additionally, the AVE values were greater than the square of their correlations, supporting discriminant validity.

Furthermore, in order to avoid misleading conclusions, tests for common method bias (CMB) were conducted (Podsakoff et al., 2003). A common latent factor was presented with all indicators of the constructs included in the model. The common latent factor produced a value of 0.531. To calculate the common method variance, 0.531 was squared, which equals 0.281 (28.1%). Values that fall below 50% (Ranaweera & Jayawardhena, 2014) are considered to satisfy the unlikelihood of CMB.

Lastly, in order to assess multicollinearity, each of the variables was assessed using the variance inflation factor (VIF) analysis. Given that the results outlined no variable above the critical value of 3.0 (Hair et al., 2013), it can be concluded that multi-collinearity was not violated.

Results

Following the *goodness of fit* of the CFA and satisfying the subsequent tests, the structural equation model was then estimated based on the hypothesised model in Figure 1. The structural model outlined *goodness of fit* ($\chi^2_{(26)} = 76.131$, $p < 0.05$, $\chi^2/df = 2.93$, RMSEA = 0.052, SRMR = 0.020, RMR = 0.019, CFI = 0.965, NFI = 0.962, GFI = 0.969) and supported many of the hypothesised relationships as shown in Table 5. Additionally, we

controlled for gender, age, education, and frequency of use but found no influence on consumer brand engagement.

<<Insert Table 5: SEM Regression Estimates Here>>

The results from the structural equation model, presented in Table 5, illustrate support for the research hypotheses with the exception of *H7* (Enjoyment → Consumer Brand Engagement) and *H10* (Consumer Brand Engagement → Purchase Intention). The results indicate the importance of the ‘social’ VA attributes of social presence ($\beta = 0.682^{***}$), perceived intelligence ($\beta = 0.601^{***}$), and social attraction ($\beta = 0.689^{***}$) on consumer brand engagement, supporting *H1*, *H2*, and *H3*. Such attributes are somewhat unique to VA technology. Generally, technology does not provide consumers with a feeling of social presence, nor does it have much social attraction or natural language intelligence. Accordingly, the AI technology plays a role in influencing consumer brand engagement and subsequent engagement behaviours.

Additionally, the technology variables of perceived ease of use ($\beta = 0.559^{**}$) and perceived usefulness ($\beta = 0.572^{**}$) positively influence consumer brand engagement through the VA, supporting *H4* and *H5*. Unique to VA technology, consumers have no user interface to manipulate; thus, the ease of use refers to the simplicity of issuing a voice command to the VA to initiate interactions. Accordingly, such hands-free interactions are inherent in the usefulness of the VA in enhancing an individual’s productivity, effectiveness, and performance. Thus, the ease with which consumers can interact and the usefulness of such interactions promote consumer brand engagement.

Moreover, the utilitarian benefits derived from interactions with a brand via a VA has a significant positive influence on consumer brand engagement ($\beta = 0.613^{***}$), supporting *H6*. Thus, the ability of the VA to help consumers manage their time efficiently, while aligning with the consumer’s schedule and making life seem easier, has a positive influence on consumer brand engagement. Interestingly, the findings indicate a non-significant influence of hedonic benefits on consumer brand engagement via the VA ($\beta = 0.105^{ns}$), rejecting hypothesis *H7*. Thus, despite in-home VAs such as the Amazon Echo that reside within the household, being available to individuals during a time when they are relaxing, consumers appear not to choose to interact with the VA for brand-related hedonistic purposes. Such a finding sheds light on the purpose of consumers’ brand-related engagement via a VA.

Further, the results indicate a consumer's trust towards VA interactions negatively affects consumer brand engagement via the VA ($\beta = -0.337^{**}$), supporting *H8*. Thus, consumers' concerns over conducting financial transactions, the trustworthiness of the information provided, and personal details being stolen results in their reluctance to engage with brands via their VA.

Finally, the findings illustrate that consumer brand engagement via a VA significantly influences consumers' intention to use the brand again in the future ($\beta = 0.371^{**}$), supporting hypothesis *H9*. The consequence of this finding suggests that if brands provide consumers with a branded skill for their VA, it is likely to increase consumers' intention to use the brand they engage with through their VA in the future. While a strong relationship was found between consumer brand engagement and brand usage intent, consumer brand engagement through a VA appears to have no influence on consumers' intention to purchase from the brand ($\beta = 0.094^{ns}$); hence, hypothesis *H10* is not supported. However, despite no direct influence between brand engagement via the VA and brand purchase intention, we found a positive relationship between brand usage intention and brand purchase intention ($\beta = 0.202^{**}$), supporting *H11*. Thus, given such results, the indirect path of Consumer Brand Engagement \rightarrow Brand Usage Intention \rightarrow Brand Purchase Intention was assessed. To further investigate this effect, the recommended steps for mediation analysis, as proposed by Baron & Kenny (1986) were followed. The bootstrap test of the indirect effect was tested in AMOS Graphics. The results of the bootstrap test found that the indirect effect on the path (Consumer Brand Engagement \rightarrow Brand Usage Intention \rightarrow Brand Purchase Intention ($\beta = 0.075$)) was statistically significant $p = < 0.05$, thus highlighting the importance of the mediating role of Brand Usage Intention. Thus, in line with Ahluwalia et al.'s (2001) work on spill-over effects, the commitment to using the brand again in the future appears to have a spill-over effect on purchasing from the brand in the future.

Furthermore, given the aforementioned Distrust concerns influencing Consumer Brand Engagement and the subsequent non-significant relationship between Consumer Brand Engagement and Brand Purchase Intention, additional analysis was conducted on the potential indirect effect of distrust concerns on purchase intentions. The results of the bootstrap test outlined that the indirect effect on the path (Consumer Brand Engagement \rightarrow Distrust \rightarrow Brand Purchase Intention) was statistically significant $p = < 0.05$ ($\beta = -0.12$), accordingly highlighting the role of distrust concerns with the VA spilling over to negatively influence future purchase intentions with the brand.

GENERAL DISCUSSION

VAs are changing the dynamics of human-computer interaction. To a great extent, they are redefining how consumers access product- and service-related information as well as how they interact with brands. This research advances our theoretical understanding of the role of an automated technological system during brand-related engagement, outlining the key drivers and outcomes of consumer brand engagement via AI powered VAs. The research affirms Van Doorn et al.'s (2017) conceptualisation that technology infused brand engagement develops social relationships between automated service technology and humans. Thus, as part of the wider actor engagement ecosystem, we propose that automated VAs can be considered an *actor* in the engagement process, contributing to co-creation activities. Due to the machine learning capabilities of AI VAs and the automated social presence inherent within them, consumers are interacting with VAs in the same way they would with another human. Previous research has outlined technological systems as a vehicle for consumer brand engagement; however, VAs move beyond the 'vehicle status' and hold the role of an actor in the engagement process. The subsequent sections will outline this study's theoretical contributions in relation to (1) Consumer Brand Engagement, (2) AI and Consumer Brand Engagement, and (3) AI, Consumer Brand Engagement and Marketing Outcomes.

Consumer Brand Engagement

The stark difference in consumer brand engagement between automated VAs and other previously studied technological systems, such as social networks (Hollebeek et al. 2014) and mobile applications (McLean 2018), are the social attributes of the actual VA as a technological system. Other technological systems, such as social networks and mobile applications, may provide a social environment; however, such systems do not convey the social attributes of making it feel like someone is present with you, making it seem like interactions with the technology are similar to those with humans, illustrating social intelligence in terms of competence and knowledge while appearing socially attractive. Thus, VAs yield social presence, perceived intelligence, and social attractiveness similar to the social characteristics of humans. However, the added benefit of a VA lies in its ability to deeply understand intimate information of its users, including their daily routine (e.g., when

they wake, go to sleep, cook, relax, etc.), their preferences, and their personal information (e.g., gender, age, occupation, life status, payment information). Such information enables consumers to engage with brands via their VA in a highly stimulating social environment resembling the interactions with service staff in-store, whilst VAs have the added benefit of utilising personal information in a closed (in-home) private environment.

Study 1 illustrated that individuals felt close to their VA due to the social presence it provides along with the knowledge it encompasses. Individuals also affirmed a relationship in the form of friendship with their VA. Study 2 further illustrated that each of these social attributes of the AI powered VA motivates consumer brand engagement. Prior research outlines the influence of important others (Nass & Moon, 2000) in shaping customer attitudes and behaviour. Within the actor engagement literature, those important others become an actor in the engagement process, contributing to value co-creation (Vargo and Lush, 2016; Alexander et al., 2018). Given the relationship (i.e., friendship) that consumers appear to foster with their VA and its ability to call on personal information to relay personalised and relevant interactions, brands benefit from the relationship as the VA is an actor in the brand engagement process as the brand-related information from the branded skill (application) is passed between the consumer and the known, familiar and friendly VA.

AI and Consumer Brand Engagement

VAs offer an easy way for consumers to interact, given that there are limited requirements to physically use the technological system and manipulate navigation systems. The voice-enabled user interface reduces barriers to using the technology. VAs are unique in that they are the only technology that does not require individuals to physically interact (i.e., click, tap and navigate) with a user interface; instead, a spoken command such as ‘Hey Alexa...’ is the main type of consumer interaction that is required to set in motion further use of the technology. Study 1 illustrated that the hands-free interaction removes a layer of complexity. Accordingly, we find that, due to the minimal use of a physical technological interface, consumers feel like their interactions are not with a piece of technology, but instead with a human counterpart. As we are accustomed to hearing human voice via the telephone with little user interface interaction, the voice conversation with a VA, that mainly requires voice-based interface interaction, appears familiar to consumers and influences the perception of conversing with a human rather than a technological system. Without the need to manipulate a user interface, users perceive that they are using technology less. Thus, the

experience of interacting with the VA becomes so simple it seems as though the technology does not exist. Therefore, VAs provide brands with a significant opportunity to engage with consumers with little effort on the consumer's part.

Furthermore, VAs provide individuals with an efficient way to complete tasks due to the ability to multitask during interactions. Davis (1989) outlines the importance of the usefulness of technology in influencing consumer adoption. The enhanced performance, productivity, and effectiveness from consumer interactions with their VA motivates consumers to engage with brands. Due to the hands-free interactions with a VA, consumers are able to engage with a brand while completing another task. Study 1 revealed that such multitasking further emphasises the feeling that individuals are not interacting with a piece of technology but instead, a person (assistant) who is part of their daily life. Previous research in the technological domain on mobile apps and social networks (e.g., McLean, 2018; Wirtz et al., 2013) has outlined the ease of use and the usefulness of the technology as paramount in the adoption of technology and enabling consumer-brand engagement. Providing consumers with technology that is easy to use and useful has consistently been a challenge for marketers. However, VAs appear to provide consumers with a highly useful and easy to use experience, thus enabling consumers to co-create and further develop their role as an actor in the engagement process.

The results indicate that consumers use VAs for their utilitarian benefit to help them complete tasks. Whilst the literature suggests that service robots serve as either an 'assistant' for utilitarian support or a 'companion' for social hedonic benefits (Sundar et al., 2017; Chattaraman et al., 2019), the results of this study indicate contrasting findings in relation to *brand*-focused interactions with a VA. The literature suggests that those robots perceived as a companion are not viewed as an assistant, rather as a trustworthy friend and that consumers display behaviour towards the technological system in the same manner as they would with a human (Guzman, 2019). Accordingly, such 'companion' robots are used for hedonic benefits (Sundar et al., 2017). Conversely, the results of this study indicate that while consumers develop a relationship with the VA in the form of friendship (companionship), such VAs are used for utilitarian benefits rather than hedonic benefits when interacting with a brand. Thus, consumers engage with brands via their VA to increase convenience, efficiency, and make the best use of their time. While, notably, consumers do not engage with brands via a VA in the pursuit of fun or enjoyment, this may be due to the type of interaction (voice) that may not provide stimuli that users would deem as fun or exciting in comparison to other rich

media available via websites, mobile apps or augmented reality. Additionally, as consumers are becoming more accustomed to automated technology, the novelty may wear off after a short time, thus resulting in utilitarian driven brand engagement.

The intelligence inherent within VAs is due to the use of natural language processing and machine learning that enables the technology to engage in a dialogue with its user. The more knowledgeable the VA appears, the more likely consumers are to engage with a brand via the VA. Thus, the responsibility lies with the brand to develop intelligent, knowledgeable skills (applications) that will encourage consumers to engage with the brand. While consumers perceive the VA to be knowledgeable, they still elicit concerns over trust towards brand engagement. Although such sophisticated VAs can provide great utilitarian benefits to consumers, they require high priority personal information to be shared in order to complete tasks such as seeking or changing account information, placing an order with a retailer, making appointments, looking up customer service information, or requesting personalised service information. Thus, VAs require a large set of software permissions to complete such tasks. The utility derived from VAs stems from their ability to work with specific applications. Accordingly, this results in consumer concerns over such applications (skills) exploiting personal information without seeking permission. Additionally, consumers have concerns over stolen personal details and concerns regarding financial security. Thus, despite consumers developing a *friendship* with their VA, which develops trust-enhancing intentions (Kracher et al., 2005), such concerns restrict consumer brand engagement via the technology.

AI, Consumer Brand Engagement and Marketing Outcomes

Previous research has outlined that consumer brand engagement results in favourable marketing outcomes (Hollebeek et al., 2014). A VA can be considered an actor in the engagement process as it co-creates value with the consumer and the brand. Engagement behaviour is driven by an individual's own needs (Hollebeek et al., 2019), pertaining to the utilitarian benefits derived from VA brand engagement. Therefore, the utility and the relationship developed through brand engagement via a VA results in future brand usage intention. Thus, the findings suggest that those consumers whom engage with the brand via their VA are eager to use the brand in the future.

Surprisingly, despite the positive relationship between brand engagement via the VA and future brand usage intention, Study 2 found a non-significant relationship with regard to future purchase intention. Therefore, while consumers may engage with a brand via their VA,

it does not influence them to purchase from the brand in the future. This non-significant relationship challenges previous work that established a direct relationship between brand engagement and brand purchase intention. Logically, consumer-to-brand interactions should elicit some confidence to purchase from the brand, given the consumer's voluntary decision to engage with the brand via their VA. However, this research contends that consumer participation in brand-related VA activities does not necessarily influence their intention to purchase. This contradictory finding may be explained due to a consumer's overarching 'trust concerns' related to brand engagement via the VA. Thus, while consumers are inclined to use the brand in the future, their concerns over the trust issues associated with the privacy and security of their interactions with the brand via the VA may spill over to negatively influence their intention to purchase from the brand. However, the findings illustrate a positive relationship between brand usage intention and purchase intention. Thus, while consumer brand engagement via the VA does not influence purchase intentions, brand usage intention does have a positive influence on purchase intention and plays a mediating role between brand engagement and future purchase intentions. Therefore, drawing parallels with the work of Ahluwalia et al. (2001) and Balachander and Ghose (2003) in the domain of marketing communications, in this study, the commitment to use the brand in the future appears to have a positive spill-over effect on decisions to purchase from the brand in the future.

MANAGERIAL IMPLICATIONS

This research provides implications for managers in relation to the use of VAs in motivating consumer brand engagement. VAs such as the Amazon Echo enable brands to develop *skills* (applications) for the assistant. The ways in which brands implement these skills are currently in their infancy but showing significant growth. Thus, understanding the variables that influence consumer engagement with brand-related information via a VA sheds light on how service providers should develop and design their skills (applications) to encourage consumer brand engagement. The subsequent sections will outline to managers: (1) the importance of branded skills being developed to provide customers with utilitarian benefits; (2) the need for brands to assure customers over privacy concerns relating to brand engagement through VAs; and (3) the role of VAs as actors in the brand engagement process and their influence on future brand usage intentions.

Utility Derived from Brand-related Interactions

The findings outline that consumers develop a social relationship with their VA due to the social presence (the feeling that someone else is present), the social attraction (the friendliness), and intelligence of the VA to the extent of befriending the assistant. Prior research highlights that befriending a *service robot* is due to the hedonic benefits from the interaction. However, this research finds that while consumers view their VA as a companion, their use for brand-related information is driven by utilitarian benefits. Therefore, brands should be aware of and focus on the utility that derives from their branded VA application (skill). The utilitarian benefits and the usefulness of the brand-related information encourage consumer brand engagement. Consumers point to the convenience and efficiency of VAs in aiding them in their daily tasks. Thus, branded skills that further aid consumers to complete tasks quickly, efficiently, and in a convenient manner will result in favourable brand engagement behaviours. Therefore, brands should consider the automated VA as an actor in the brand engagement process that can drive utility for customers.

Importantly, brands must recognise that consumers do not engage with brands via their VA in the pursuit of fun or entertainment. While consumers generally use their VA for utilitarian benefits, some do seek hedonic benefits in the form of games; however, this does not extend to brand-related activities. Thus, it is the responsibility of managers to develop branded skills that add value to consumer activities but do not necessarily entertain them.

Brands continually seek to provide consumers with technology that is easy to use. VAs somewhat remove traditional technological barriers through, for example, the ease of using the technology. Given that consumers have limited interaction with a physical user interface to manipulate, VAs appear to provide a technology that is inherently easy to use, thus driving consumer engagement via the device. Therefore, overcoming the technological drawbacks of other forms of service provision (e.g., on websites, apps, and social networks), brands have the opportunity to provide branded service information via a technology that is simple for consumers to become skilful at using. The findings from Study 1 illustrated that respondents often forgot they were interacting with technology due to the ease of use. Instead, respondents often felt like they were interacting with a human counterpart.

Assuring Consumers

The results of this study suggest that brands must overcome challenges pertaining to consumer trust towards brand-related engagement via the technology. The findings affirm that trust concerns adversely affect consumer brand engagement via VAs. Given the large set

of software permissions that VAs require to undertake brand-related tasks, consumers are concerned over the privacy of their data and the potential for non-consented use. Thus, service providers must reiterate to consumers the actions they take to ensure their personal details remain private and secure, along with seeking consumer consent to use personal data. Additionally, brands should alleviate consumers' concerns through clarifications over misinformation regarding VAs always listening and how consumers can better protect themselves during their interactions with their VA.

Future Brand Usage Intention

Lastly, managers should note that while consumer brand engagement via a VA influences future brand usage intention, such engagement does not pertain directly to purchase intentions. Thus, during VAs' early implementation of brand-related activity, managers should consider engagement with brand-related information via a VA as a way of motivating consumer intentions to use the brand in the future. Over time, as consumers become more accustomed to using VAs for brand-related practices, trust towards the interactions may increase, potentially influencing purchase intentions. However, it is important to note that intentions to use the brand in the future appear to subsequently have a spillover effect on influencing purchase intentions in the future. Therefore, during the early implementation of VAs, managers should closely monitor brand-related engagement with the technology. Doing so may highlight opportunities for brands to influence future purchase intentions through spillover effects.

LIMITATIONS AND FUTURE RESEARCH

The limitations of this research provide future research opportunities. This research took the initial steps in examining consumer brand engagement via VAs, identifying VA attributes, technology attributes, and situational attributes influencing consumer brand engagement. Future research could further explore such attributes examining their influence and interplay on each other while further exploring the social dimension of VAs.

Moreover, while this research examined the perceived intelligence of the VA relating to information relevance and accuracy, it is important to further explore information quality and its dimensions, particularly due to the limited control over the information that the VA provides compared to other forms of information seeking such as that through a search engine, website or application. Further, we did not specifically examine when VAs do not perform well and the potential negative consequences of this.

Additionally, we focused only on the Amazon Echo (Alexa). While the Amazon Echo has the largest market share (70%) in the VA market, other types of VAs exist, such as the in-home Google Play VA. It would be advantageous to further assess if the set of antecedents identified in this research influence consumer brand engagement via other VAs. Future research may be able to assess the influence of the VA's personality (demeanour) on consumer brand engagement, which will further our understanding of the VA's social attributes.

Given the surprising negative relationship between consumer brand engagement and future purchase intention, future research should further examine this relationship, in particular, drawing upon consumers' perceptions of trustworthiness of their brand-related interactions with the VA.

Furthermore, we did not restrict respondents to any particular type of brand or brand category. Thus, future research should examine individual brand categories to help further our understanding of consumer brand engagement through AI VAs.

Lastly, we examined consumer intentions with regard to future use and purchase. While intentions do appear to be a reliable indicator of actual behaviour, it would be fruitful to examine actual behavioural data and to conduct such analysis in a longitudinal form to gain a deeper understanding of brand engagement through AI VAs.

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TABLES AND FIGURES

Table 1 Overview of Interview Participants

Name	Age	Gender	Occupation	Length of use	Coded: Main purpose of use
Sarah	32	Female	Office Worker	12 months	Convenience, Social Presence, Social Attractiveness, Ease of Use
Michael	26	Male	Accountant	6 months	Social Presence, Social Attractiveness, Social Intelligence, Enjoyment, Convenience, Usefulness
Mohammed	27	Male	Barista	12 months	Social Presence, Social Attractiveness, Social Intelligence, Enjoyment, Convenience, Usefulness, Ease of Use
Jennifer	36	Female	Hairdresser	8 months	Social Presence, Social Intelligence, Convenience, Usefulness, Ease of Use
Debbie	24	Female	Carer	18 months	Social Presence, Social Attractiveness, Social Intelligence, Usefulness, Ease of Use
Craig	21	Male	Shop Assistant	12 months	Social Presence, Social Attractiveness, Enjoyment, Convenience, Usefulness
Lauren	30	Female	Lawyer	7 months	Social Presence, Social Attractiveness, Social Intelligence, Enjoyment, Convenience, Usefulness, Ease of Use
Kurt	39	Male	Web Developer	16 months	Social Presence, Social Attractiveness, Social Intelligence, Usefulness, Ease of Use
Kate	25	Female	Fashion Designer	10 months	Social Intelligence, Enjoyment, Convenience, Usefulness, Ease of Use
Linda	44	Female	Unemployed	12 months	Social Presence, Social Attractiveness, Social Intelligence, Convenience, Usefulness, Ease of Use
Sara	31	Female	Shop Assistant	6 months	Social Presence, Social Attractiveness, Social Intelligence, Enjoyment, Convenience, Usefulness, Ease of Use
Simon	23	Male	Call Centre Worker	12 months	Social Presence, Social Intelligence, Usefulness, Ease of Use
Hailey	36	Female	Shop Assistant	14 months	Social Presence, Social Attractiveness, Social Intelligence, Enjoyment, Convenience, Usefulness, Ease of Use
Lucy	27	Female	Waitress	9 months	Social Presence, Social Intelligence, Usefulness, Ease of Use
Ruby	31	Female	Actress	13 months	Social Presence, Social Attractiveness, Usefulness, Ease of Use, Enjoyment, Convenience
Phil	34	Male	Sales Professional	8 months	Social Presence, Social Intelligence, Usefulness, Ease of Use

Danny	37	Male	Personal Trainer	11 months	Social Presence, Social Attractiveness, Social Intelligence, Enjoyment, Convenience, Usefulness, Ease of Use
Connor	33	Male	Company Owner	14 months	Social Intelligence, Enjoyment, Convenience, Usefulness, Ease of Use
Claire	42	Female	Shop Assistant	6 months	Social Presence, Social Attractiveness, Social Intelligence, Enjoyment, Usefulness
Jennifer	33	Female	Company Owner	7 months	Social Intelligence, Enjoyment, Convenience, Usefulness, Ease of Use
Richard	31	Male	Dentist	8 months	Social Presence, Social Intelligence, Enjoyment, Convenience, Usefulness, Ease of Use

Table 2 Details of Respondents

Characteristics	Number (n)	Percentage
<i>Gender</i>		
Female	401	55
Male	323	45
<i>Age Groups</i>		
18 – 24	55	8
25 – 34	240	33
35 – 44	207	29
45 – 54	153	21
55 – 64	69	9
<i>Education</i>		
High-School Graduate	280	39
College Degree	140	19
University Degree	193	27
No Formal Qualification	111	15
<i>Voice Assistant Frequency of use</i>		
Multiple times daily	603	83
Once daily	99	14
Multiple times weekly	19	2
Once weekly	3	0.01
At least once a month	0	0

Table 3 Questionnaire Scales

Variable	Reference	Scale Items	Cronbach's Alpha
Social Presence	Adapted from: Lee et al (2006); Nass and Moon (2000)	When I interact with the voice assistant it feels like someone is present in the room My interactions with the voice assistant are similar to those with a human During my communication with the voice assistant I feel like I am dealing with a real person I communicate with the voice assistant in a similar way to I communicate with humans	0.841
Perceived Intelligence	Adapted from: Bartneck et al. (2009)	The voice assistant appears competent The voice assistant is knowledgeable The voice assistant provides relevant information The voice assistant is Intelligent The voice assistant provides accurate information	0.826
Social Attraction	Lee et al. (2006)	I think the voice assistant (Alexa) could be a friend of mine I have a good time with the voice assistant (Alexa) I would like to spend more time with the voice assistant (Alexa)	0.874
Perceived Ease of Use	Adapted from: Davis (1989)	Learning to use the brand's skill with the voice assistant is easy for me I find it easy to get the brand's skill on the voice assistant to do what I want it to do My interaction with the brand's skill on voice assistant is clear and understandable It is easy for me to become skilful at using the brand's skill on my voice assistant I find the brand's skill on my voice assistant easy to use	0.883
Perceived Usefulness	Adapted from: Davis (1989)	Using the brand's skill with the voice assistant enables me to accomplish tasks with brand X more quickly. Using the brand's skill with the voice assistant enhances my performance with brand X. Using the brand's skill with the voice assistant increases my productivity with brand X. Using the brand's skill with the voice assistant enhances my effectiveness with brand X. Using the brand's skill with the voice assistant makes it easier to interact with brand X. I find the brand's skill on my voice assistant to be useful for interacting with brand X.	0.801
Hedonic Benefits	Adapted from: Davis et al. (1992)	I find using the brand's skill on my voice assistant for brand X related activity to be enjoyable The actual process of using the brand's skill on my voice assistant for brand X related activity is entertaining I have fun using the brand's skill on my voice assistant for brand X related activity	0.869
Utilitarian Benefits	Adapted from: Taylor and Todd (1995)	Completing brand related tasks with the voice assistant is a convenient way to manage my time. Completing brand related tasks with the voice assistant makes my life easier. Completing brand related tasks with the voice assistant fits with my schedule Completing brand related tasks with the voice assistant is an efficient use of my time	0.779
Distrust	Adapted from: Al-Debei et al. (2014) and	I have my doubts over the confidentiality of my interactions with the voice assistant I am concerned to perform a financial transaction via the voice	0.788

	Rauschnabel et al. (2018)	assistant I am concerned that my personal details stored with the voice assistant could be stolen I am concerned that the voice assistant collects too much information about me	
Consumer Brand Engagement	Adapted from: Hollebeek et al. (2014)		
<i>Cognition</i>		Using the brand's skill via the voice assistant gets me thinking about the brand I think about the brand a lot when using the brand's skill via the voice assistant	0.813
<i>Affection</i>		Using the brand's skill on with my voice assistant stimulates my interest in the brand I feel positive when I use the brand's skill on my voice assistant I feel good when I use the brand's skill on my voice assistant Using the brand's skill via my voice assistant makes me happy	0.802
<i>Activation</i>		I spend a lot of time interacting with the brand's skill via my voice assistant Whenever I am using my voice assistant, I often interact with the brand's skill	0.781
Purchase Intention	Adapted from: Lu et al. (2010)	I would consider purchasing from brand X in the future It is likely that I will actually purchase from brand X in the future I intend to purchase from brand X	0.822
Brand Usage Intent	Hollebeek et al. (2014)	It makes sense to use brand X following my engagement with the brand Even if another brand has the same features as brand X, I would prefer to use brand X If there is another brand as good as brand X, I prefer to use brand X because of my experience with the brand If another brand is not different from brand X in any way, it seems smarter to use brand X because of my knowledge on the brand	0.788

Table 4 Convergent and Discriminant Validity

	CR	AVE	MSV	SP	PI	SA	PEU	PU	HBE	UBE	DTR	CBE	BUI	PINT
Social Presence (SP)	0.841	0.706	0.483	0.840										
Perceived Intelligence (PI)	0.826	0.652	0.522	0.319	0.807									
Social Attraction (SA)	0.874	0.674	0.477	0.279	0.241	0.820								
Perceived Ease of Use (PEU)	0.883	0.620	0.505	0.298	0.177	0.167	0.787							
Perceived Usefulness (PU)	0.801	0.736	0.539	0.301	0.202	0.194	0.389	0.858						
Hedonic Benefits (HBE)	0.869	0.613	0.527	0.222	0.304	0.277	0.404	0.319	0.782					
Utilitarian Benefits (UBE)	0.779	0.712	0.498	0.236	0.222	0.203	0.266	0.221	0.264	0.843				
Distrust (TRU)	0.788	0.636	0.405	0.305	0.217	0.233	0.311	0.184	0.178	0.181	0.797			
Consumer Brand Engagement (CBE)	0.813	0.612	0.395	0.277	0.311	0.256	0.264	0.255	0.253	0.263	0.247	0.782		
Brand Usage Intention (BUI)	0.788	0.704	0.523	0.177	0.264	0.289	0.213	0.213	0.277	0.243	0.371	0.407	0.839	
Purchase Intention (PINT)	0.822	0.689	0.504	0.201	0.194	0.241	0.194	0.222	0.202	0.269	0.323	0.051	0.322	0.830

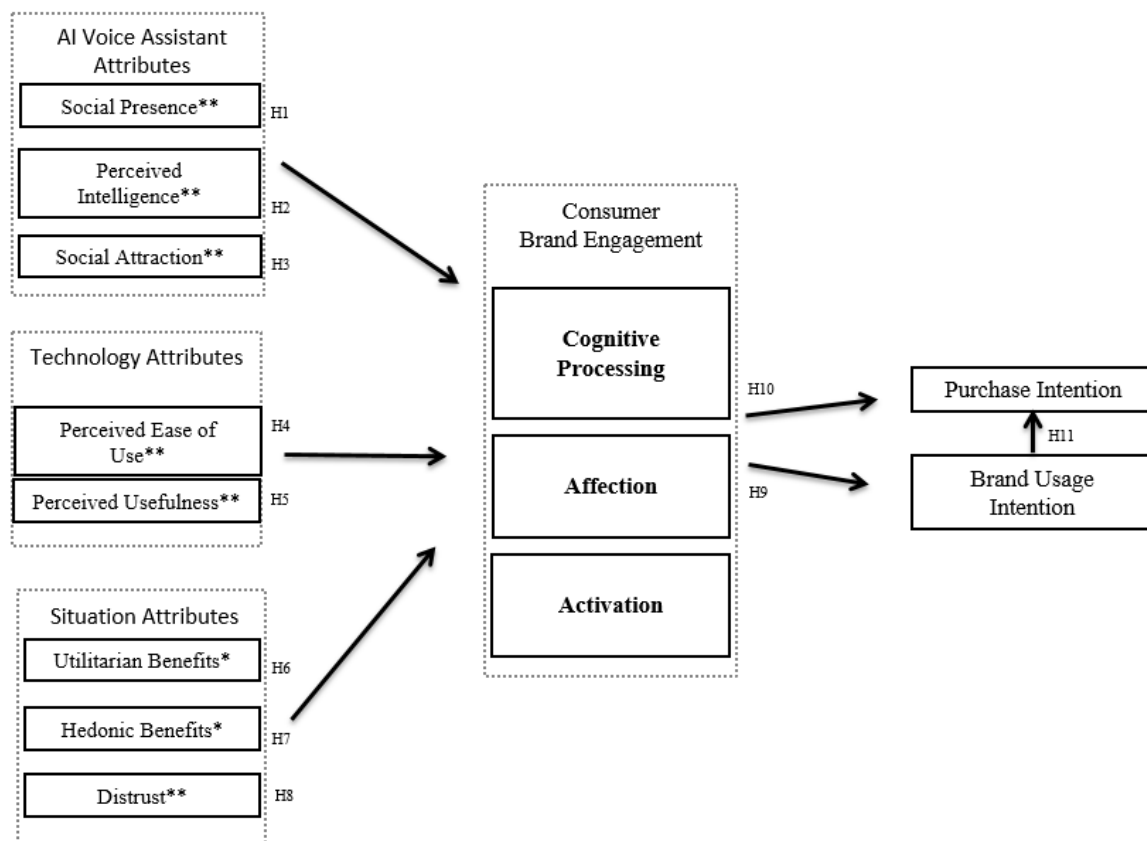
CR - Construct Reliability; AVE – Average Variance Extracted; MSV - Maximum Shared Variance

Table 5 SEM Regression Estimates

Hypotheses			Standardised Estimate β	t-value	R ²
<i>H1</i>	Social Presence	→ Consumer Brand Engagement	0.682 ***	3.88	0.67
<i>H2</i>	Perceived Intelligence	→ Consumer Brand Engagement	0.601 ***	3.72	0.67
<i>H3</i>	Social Attraction	→ Consumer Brand Engagement	0.689 ***	4.91	0.67
<i>H4</i>	Perceived Ease of Use	→ Consumer Brand Engagement	0.559 **	2.45	0.67
<i>H5</i>	Perceived Usefulness	→ Consumer Brand Engagement	0.572 **	3.12	0.67
<i>H6</i>	Utilitarian Benefits	→ Consumer Brand Engagement	0.613 ***	3.81	0.67
<i>H7</i>	Hedonic Benefits	→ Consumer Brand Engagement	0.105 ^{ns}	1.69	0.67
<i>H8</i>	Distrust	→ Consumer Brand Engagement	-0.377 **	2.57	0.67
<i>H9</i>	Consumer Brand Engagement	→ Brand Usage Intention	0.371 **	3.38	0.33
<i>H10</i>	Consumer Brand Engagement	→ Purchase Intention	0.094 ^{ns}	1.59	0.04
<i>H11</i>	Brand Usage Intention	→ Purchase Intention	0.202 **	2.63	0.04

*** $p < 0.001$, ** $p < 0.05$, ^{ns} = not significant

Figure 1 Hypothesised Model



*Variable from study one **Variable from literature + study one

Note: All variables within VA Attributes, Technology Attributes and Situation Attributes were tested individually on the multi-dimensional higher-order variable Consumer Brand Engagement.