

# Consumers' perception on artificial intelligence applications in marketing communication

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## Abstract

**Purpose** – This study aims to examine consumers' perception of artificial intelligence (AI) and AI marketing communication.

**Design/methodology/approach** – Twenty in-depth interviews were conducted to collect data and phenomenological reduction was used to analyze data.

**Findings** – Findings suggest that consumers' interpretation of AI is multidimensional and relational with a focus on functionality and emotion, as well as comparison and contrast between AI and human beings; consumers' perception of voice-assisted AI centers on the aspects of function, communication, adaptation, relationship and privacy; consumers consider AI marketing communication to be unavoidable and generally acceptable; and consumers believe that AI marketing communication to be limited in its effect on influencing their evaluation of products/brands or shaping their consumptive behaviors.

**Originality/value** – According to the authors' knowledge, this study is the first research project to gauge consumers' perception on AI and AI marketing communication.

**Keywords** Qualitative research, Consumer perception, Artificial intelligence, Marketing communication, Smart speakers

**Paper type** Research paper

## 1. Introduction

Artificial intelligence (AI) has displayed the power and potential to shake up the *status quo* in various fields, including digital marketing (Bolton *et al.*, 2018; Davenport *et al.*, 2020). Many applications equipped with AI technology such as personal assistant (e.g. Alexa, Siri and Cortana), streaming music (e.g. Pandora) and financial planning (e.g. Olivia) for personal uses, as well as digital marketing (e.g. Sentient), process automation (e.g. Amazon MTurk) and facial recognition (e.g. Haystack) for business uses are widely adopted in different industries such as finance, electronics and media (Kumar *et al.*, 2019; Chan-Olmsted and Wolter, 2018). While human factors embedded in branding such as the experience and intuition of marketing practitioners and the psychological analysis of consumers continue to play a vital role, AI offers a new way to acquire, process, analyze data, as well as to generate insights and deliver personalized results (Jarek and Mazurek, 2019). Such applications can fundamentally change how marketers engage the consumers (Kumar *et al.*, 2019).

With the advancement in AI technology, it is much more convenient for marketers to obtain not only a large amount of consumer data but diverse types of data efficiently in the sense that machines can now take visual, auditory or language input directly without human involvement and in a speedy way (Dhar, 2016; Jarek and Mazurek, 2019). While businesses have used AI in a variety of ways, academic research seems lagging behind.



Previous research on AI in marketing mainly focuses on how companies and marketers can leverage AI to enhance their marketing practices (Campbell *et al.*, 2020; Davenport *et al.*, 2020). Consumers' experience and perception of AI applications in marketing communication are rarely examined. Only a couple of studies examined consumers' perception and receptivity of AI-enabled personalized advertising copy (Deng *et al.*, 2019) and AI-powered virtual assistants (Bergman and Sundin, 2019). However, consumers' perception not only to a large extent determines the effectiveness of AI applications but also help companies improve their AI marketing communication practices by generating insights, informing strategies and developing better engagement approaches. Furthermore, at this stage of the AI evolution characterized by more defined, functional implementations, a better understanding of how consumers are responding to this initial introduction of AI would offer insights on the path to its next stage of development when more complex, human-like applications are implemented (Kaplan and Haenlein, 2019). Accordingly, the purpose of this study is to gauge consumers' experience of and perception on AI applications in marketing communication. Given the exploratory nature, a qualitative research approach is adopted.

## 2. Literature review

### 2.1 *What is artificial intelligence?*

AI has been broadly defined as human intelligence expressed through machines (Siau and Yang, 2017) or computers that can think and perform like human beings via the use of software and algorithm (Kumar *et al.*, 2019). The supporting technology of AI can imitate the functions of human mind, including the ability to solve problems and learn. Therefore, AI could acquire, process and identify data and then to perform certain tasks (Jarek and Mazurek, 2019). In other words, AI is the technology that enables machines to learn from experiences and perform human-like functions (Davenport *et al.*, 2020). In general, there are two types of AI, namely, Strong AI and Weak AI. Strong AI or artificial general intelligence is a more advanced and complex machine with consciousness, sentience and mind, which exhibits intelligence in more than one specific area and can perform a variety of tasks. By contrast, Weak AI or artificial narrow intelligence (ANI) refers to a relatively simplified machine, which concentrates on one specific field by performing narrow tasks such as self-driving car (Siau and Yang, 2017). Based on the definition of ANI, most marketing-related applications are at the ANI stage.

Other AI-related terms include machine learning, deep learning, natural language processing and robotics. Machine learning has taken AI to a more intelligent level which enables computers to learn by themselves based on the available data by establishing connections and links between individual pieces of data and makes it possible to draw conclusions and form generalizations on the basis of performed analyses (Jarek and Mazurek, 2019). Deep learning is an advanced level of machine learning which is based on learning algorithms that do not need human beings' management and can process data and generate a new piece of information immediately by taking advantage of big data and computing power (Siau and Yang, 2017). Natural language processing is a speech recognition application supported by machine learning and deep learning and can process large amounts of text data by deciphering the context, the vocabulary, the syntax and the semantic meaning (Jarek and Mazurek, 2019). Robotics focuses on the design, development, operation and application of robots (Siau and Yang, 2017). All those technologies have been used by marketers to facilitate their marketing practices via AI applications.

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### 2.2 Artificial intelligence applications in marketing

As a powerful tool, a variety of AI applications have been used in the marketing field, such as voice, text, image recognition, decision-making, autonomous vehicles and robots (Jarek and Mazurek, 2019). Specifically, AI has been shown to facilitate marketing by the use of text mining to gain insights from online word-of-mouth, modeling direct marketing responses using evolutionary programming, predicting churn using classification trees and adapting websites automatically to better fulfill customer needs (Overgoor *et al.*, 2019). Deshpande (2019), from a practitioner perspective, summarizes nine ways to implement AI in marketing which are content creation, conversational AI, audience segmentation, predictive analytics, personalization, paid ads, sales forecasting, dynamic pricing and recommendation engines.

AI technology has been adopted in the context of marketing to serve various functions. First, personalization, which occurs when decision on marketing mix is based on previously collected customer data and the automatic machine-driven selection of products, prices, website content and advertising messages that fit with an individual customer's past behaviors (Kumar *et al.*, 2019; Deng *et al.*, 2019). Such applications offer a personal touch with existing and potential consumers and are regarded as an influential way to maintain an intimate relationship with the consumers (Stephen and Ahmad, 2017). Second, prediction and adaptation. Closely interconnected with personalized consumer experience, AI's power in prediction and adaptation can be harvested from multiple perspectives. For example, it can be applied to predict demand and customer churn (Stephen and Ahmad, 2017). It can also provide real-time adaptation not just to the consumer but also to the conditions of a specific marketing practice (Siau and Yang, 2017). Third, interaction/engagement, using cognitive technologies in the areas of natural language processing, image recognition/computer vision and decision-making related applications (Jarek and Mazurek, 2019). In particular, text/voice-assisted AI such as chatbots and virtual assistants (e.g. Google Assistant, Siri and Alexa), which have the ability to identify and "understand" spoken phrases or words and are available 24/7, are increasingly utilized in customer services, product information, marketing and sales support ("Conversational Systems Market worth \$17.4bn by 2024"). In some way, AI is already creeping into every step of the customer journey and experience ("28 Brands That Use AI to Enhance Marketing"). The increasing presence of AI as a conduit between marketers and consumers calls for a systematic investigation to explore the new phenomenon and add to our understanding of AI as a component of the marketing process from the perspective of consumers.

### 2.3 Research on artificial intelligence applications in marketing

Given the innovative nature and its ANI stage of evolution, limited academic research has been conducted to examine AI applications in marketing. Although the view that AI, as well as other types of new technology have disruptive or uncertain effect on marketing does exist, researchers generally argue for its necessity by pointing out the advantages of AI brought to the marketers and consumers, as well as stressing the large presence of AI-based approach used currently and predicting its increasing use in the future (Thiraviyam, 2019). Some researchers argued that the use of AI for marketing purposes has become a must for all innovative and successful companies around the world (Ene, 2018). Interestingly, while businesses and marketers tend to have a relatively positive attitude toward AI, given the possibilities and potentials of marketing practices enabled by AI (Overgoor *et al.*, 2019), consumers have displayed a rather negative attitude toward AI applications in marketing by showing a lack of trust in the decisions, answers and recommendations from AI (Davenport *et al.*, 2020).

With specific regard to the impact of AI in marketing, previous research has been conducted from both marketers' and consumers' perspectives. For marketers, AI can increase marketing efficiency by speeding up the decision-making process and providing marketing managers with information and insights that they could not obtain from traditional ways (Overgoor *et al.*, 2019). AI can take over the repetitive and time-consuming parts of the job and allows them to focus on the strategy and creation (Wierenga, 2010). AI can enhance both short- and long-term personalized engagement marketing by creating brand trust, superior brand experiences and facilitating different aspects of customer relationship management including acquisition, retention and growth (Kumar *et al.*, 2019). AI can also assist marketers in every stage in a strategic marketing plan from analyzing current situation to planning metrics and implication control (Campbell *et al.*, 2020). In sum, AI has shown potentials to increase revenues and reduce costs by improved marketing decisions and automation of marketing tasks, customer service and market transactions (Davenport *et al.*, 2020).

For consumers, AI can bring convenience through recommendation systems and timeless services (Jarek and Mazurek, 2019). AI can add value to brand and strengthen the brand-customer relationship by fostering an intimate feeling through personalization, purchasing process assistance and reduction of post-purchase dissonance (Jarek and Mazurek, 2019). Consumers' willingness to accept such technology has also been explored. For example, a study found that consumers' adoption of AI devices in service encounters is a multi-stage process in which their social references' norms and attitudes are important factors influencing their decisions (Gursoy *et al.*, 2019). In a similar study, consumers' adoption of AI-enabled robot advisors in financial industry was found to be shaped by their attitude toward the robot, mass media and interpersonal social norms (Belanche *et al.*, 2019). For AI applications effects, previous research revealed that anthropomorphism which refers to making social robots more like human beings increases consumers' perceived warmth of but decreases their liking of those robots (Kim *et al.*, 2019). Another study found that disclosure of AI chatbots and timing of disclosure have significant effects on customer purchase rates (Luo *et al.*, 2020). An eye-tracking experiment was conducted to evaluate consumers' reaction to various forms of AI and found that consumers are more likely to react at unexpected situations involving robots and forms of AI (Ene, 2018). While previous research on AI applications in marketing have touched on various topics, as shown below, studies on AI applications in marketing communication have mainly focused on fostering consumer and brand relationships through AI-assisted personalized communications.

#### *2.4 Research on artificial intelligence applications in marketing communication*

AI-powered virtual assistants allow companies to establish and maintain customer relationships in a new way. They can offer direct on-line services and allow for instant interaction, which can lead to the increase of frequency and length of customers' visits to websites and facilitate information dissemination and transactions (Kuligowska and Lasek, 2011). With online communication becoming more personalized, the effectiveness and efficiency of information exchange between customers and companies have improved. It is projected that programmatic advertising which optimizes the purchase of online advertising space between agencies and publishers without human intervention on a case-by-case basis will become dominant in online advertising, and company websites will also allow for real-time adjustments in design and content to optimize for Search Engine Optimization (Barriga, Maria Eugénia, and Gorjão Bertrand de, 2019). In other words, content marketing practices have been greatly enhanced by the adoption of AI techniques (Kose and Sert, 2017). Qin and Jiang (2019) further proposed an AI-assisted new advertising process

including four steps of consumer insight discovery, ad creation, media planning and buying and ad impact evaluation. This new advertising process is powered by a data-based platform with algorithms at its core and is tool-based, synchronized and highly efficient (Qin and Jiang, 2019). [Chen et al. \(2019\)](#) introduced an AI-assisted programmatic creative platform, which can facilitate advertising creative process by generating large-scale personalized and contextualized advertising messages in real-time. The personalization/contextualization strategies seem to deliver desirable outcomes, as a recent study revealed that personalized advertising copies generated by AI applications can bolster click rate in online advertising platforms ([Deng et al., 2019](#)).

In addition to personalize advertising copy to better connect with consumers, AI, especially voice-assisted AI, has been adopted as a marketing communication tool to engage consumers. Three main aspects are identified regarding how communication with virtual assistants affect the consumer's perception of a brand personality: the intent of the assistant, how it reflects its brand's personality, and how it uses human communication attributes ([Bergman and Sundin, 2019](#)). More specifically, the intent and value should be made clear between a brand-specific assistant and a general-purpose assistant; virtual assistants should be in agreement with the brand personality; human conversational attributes such as pleasure, helpfulness, dominance and synchronicity affect how the assistant portrays itself, the brand it represents, and therefore the perception of the consumers ([Bergman and Sundin, 2019](#)). Research that examines such anthropomorphic characteristics find that human voices used on virtual assistant have a stronger impression of social presence on consumers compared with a synthetic voice and they generate stronger trust and behavioral intentions ([Chérif and Lemoine, 2019](#)).

From the above discussion, it is clear that while many industries such as finance, electronics and media have adopted AI applications for marketing and marketing communication purposes, academic research on this topic is sporadic, lacking both breadth and depth. In particular, how consumers experience and perceive AI applications in marketing communication, and what this kind of marketing communication practice mean to them remain unknown, even though such issues might ground the trajectory of its growth at this stage of its evolution. To fill the research gap, the current study is designed to explore consumers' perception and interpretation of AI applications in marketing communication. Specifically, the current study focuses on consumers who own AI devices such as voice-assisted AI devices and have previous experiences of AI applications in marketing communication. Based on the research purpose, the following research questions are proposed:

- R1. What are AI devices owners' experiences of AI applications in marketing communication?
- R2. How do AI devices owners perceive and interpret AI applications in marketing communication?

### 3. Method

The target population of the study is consumers who are living in the USA, own AI devices and have encounters and experiences of AI applications in marketing communication. USA is the leader in AI technology development and adoption ([Statista, 2021a](#)) and has one of the highest AI devices ownership rates and purchase plans compared to other countries ([Statista, 2021b](#)). Therefore, consumers in the USA, especially AI device owners, may have richer experiences of AI marketing communication and more sophisticated knowledge regarding this topic. Note that voice-assisted AI and its associated physical devices are used

in the interviews for participants to describe and discuss their AI-related experiences since such interface/devices deliver the most direct interactive experience for consumers. The personal perspective based on concrete interactions is likely to offer deeper insights. In-depth interviews were conducted to collect data. Based on the purpose of the study, an interview guide consisting of two parts was developed. The interview questions were adapted and adjusted from previous studies of consumers' perception on media engagement (Chan-Olmsted and Wolter, 2018) and social media marketing (Chen, 2018). The first part focuses on participants' experiences with AI, including questions such as the following:

- What do you think of when hearing the term AI?
- Could you please share your understanding of AI?
- What are your previous experiences with AI like?
- What are your feelings toward and evaluation of AI?
- How do AI influence your life and in what ways?
- Could you please share your personal stories of interacting with voice-assisted AI (such as Siri, Google Assistant, Cortana and Alexa)?
- By intuition, who do you think you are interacting with when talking to voice-assisted AI? A human, a software, the software engineer behind this technology or the device manufacturer?
- To your understanding, what are the main differences between AI and real humans?
- Do you have any concerns about AI?
- The second part concentrates on participants' perception toward the AI applications in marketing communication including the following questions:
- Have you noticed any AI-related marketing communication practices (such as personalized recommendation, chatbots and voice search), and could you please describe that encounter?
- Have you been influenced by any AI-related marketing communication practices and what are your feelings of the experiences?
- Have you ever used voice-assisted AI to learn about or evaluate a brand? Could you please talk about that experience?
- Do you think your perception of a brand is different through traditional media such as newspaper, TV, magazine, the internet and voice-assisted AI, and why?

As qualitative research is an emergent design (Creswell, 2013), during the interview process, the interviewer constantly changed and adjusted the interview questions based on participants' responses. All the interviews were conducted either face-to-face or via video conference software of Zoom at times convenient to the participants. Each interview lasted around one hour. Purposive sampling and snowball sampling were used to recruit participants. Specifically, two researcher assistants' social network was used to recruit initial participants, and after that each participant was asked to recommend other participants until the point of saturation was reached (Corbin and Strauss, 2008). According to McCracken (1988), one of the most important principles of selecting qualitative research participants is "less is more" (p. 17), and he indicated that for many research projects eight participants are perfectly sufficient. In total, 20 consumers from 24 to 62 years old participated in the study. Among the participants, 8 were women and 12 were men. All participants own one to five devices with AI applications (Table 1). To provide an accurate

Name	Age	Gender	Education	Occupation	AI devices	Device number
Avery	32	Female	Master's	Academic advisor	Siri, Alexa	2
Anna	29	Female	Master's	History teacher	Siri, Alexa	4
Gary	27	Male	Master's	Master's student	Siri, Google Assistant	2
Kathy	28	Female	Master's	Storyteller and editor	Siri, Alexa	2
Felix	32	Male	Master's	Environmental engineer	Alexa, Google Assistant	2
Chloe	25	Female	Bachelor's	Environmental engineer	Alexa, Google Assistant	2
Henry	26	Male	Master's	Customer service at tech company	Siri, Google Assistant	2
Steven	35	Male	PhD	PhD student	Alexa	3
Simon	32	Male	PhD	PhD student	Siri, Alexa, Google Assistant	3
Theo	62	Male	Unknown	Engineer	Alexa	1
Brianna	30	Female	Master's	PhD student	Alexa, Google Assistant	2
Frank	29	Male	Master's	Master's student	Google Assistant	2
Sheryl	49	Female	Master's	Yoga instructor	Alexa	1
Arthur	38	Male	PhD	Personal trainer	Alexa, Siri	2
Byron	30	Male	Master's	Education Coordinator	Alexa	1
Tom	53	Male	Unknown	Consultant	Cortana, Alexa, Google Assistant, Siri	5
Stella	33	Female	PhD	Professor	Alexa, Google Assistant, Siri	5
Jacob	37	Male	Master's	Health Care Administrator	Alexa, Google Assistant, Siri	5
Victoria	24	Female	Master's	PhD student	Alexa	1
Cody	51	Male	Bachelor's	Engineer	Google Assistant	1

**Table 1.**  
Profile of  
participants

record of participants' comments, the interviews were audio-recorded and professionally transcribed.

Data analysis followed the principles of phenomenological reduction (Moustakas, 1994). The first step of phenomenological reduction is horizontalization, which means putting the immediate phenomena on a level plane, without assuming an initial hierarchy of "reality." To do this, the researcher took extensive notes throughout the interviews, listened at least twice to each recording, and read each transcript at least two times. The second step of phenomenological reduction is to delimit the invariant horizons or meaning units. In this stage the researcher was to identify and compare repeated or similar words, phrases and sentences appearing in every transcript; generally, 20 to 30 meaning units were generated in each transcript. The next step of the researcher was to cluster the invariant constituents into themes. During this phase, the researcher focused on the internal relationships and structures of the meaning units and grouped them into appropriate themes.

Several measures were used to ensure the quality of the results. First, the study followed the emergent design (Creswell, 2013). In this context, a flexible interview guide was used that allowed the interviewer to follow the logic of participants, respond to ideas brought up by participants, and probe for more information and clarification. Second, "emic" words were used to describe and support study findings. Third, two researchers independently analyzed the data and subsequently discussed and compared findings together to enhance the credibility of the interpretations. Fourth, the data analysis reports were provided to participants to ensure that the findings represented their perspectives and understandings. Fifth, peer debriefing and external auditors (Creswell and Miller, 2000) were used to enhance the quality of the analysis and check for possible researcher biases. Finally, the study provided a discussion of the specific research context and participants so that readers can judge how the results might be applicable to similar contexts.

## 4. Findings

### *4.1 Artificial intelligence: a multidimensional and relational concept embedded in consumers' everyday lives*

Consumers' perception on AI marketing communication is grounded and rooted in their understanding of AI and AI applications and devices. Their knowledge of AI builds a solid foundation and crucial reference and context for them to interpret AI marketing communication. Participants' interpretation of AI is multidimensional and relational with a focus on functionality and emotion, as well as comparison and contrast between AI and human being. As one participant indicated, "AI is cool and weird at the same time." On one hand, AI represents cutting-edge technological innovation and development that facilitate people's lives and "makes everything smoother." On the other hand, AI also brings potential threats and possible negative effects at personal, societal and cultural levels.

It's kind of cool that it's efficient and it knows all that but it's also kind of weird that it knows where you live without you actually type in, "Hey, this is my home address, this is where I live." It's just knows by how much time you spend there and it's very smart for just being a program, I guess. It's programmed very well and it just has a really – they put a lot of thought into it if they can figure out things by itself which is cool and weird in the sense just because of that, it's just, "Wow, it's really cool that you can do this," but it's also very weird that it can do it because it's just a computer not a human, it's not a life thing.

In what ways that influenced my life? Well, the one thing that it does help with is that it makes it more convenient for me. So, I am busy, you obviously know this, because you're a student as well, I believe, right. You don't always have all the time to keep up with everything. For me, anything



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that takes something off my plate is beneficial and so having a virtual assistant, for example, is ideal for me if I can, if I don't have to pull up an app to write down a reminder. It's amazing if I can press a button to tell something to do and it does it – it's out of my head, right. Something I don't have to think about.

As the above quotes indicate, participants are amazed by the level of intelligence and sophistication that AI could achieve to offer them multiple functions thus bringing efficiency and convenience to make their lives much easier. In this sense, AI has become an enabling technology that enhances the quality and enriches the dimensions of people's everyday lives. At the same time, AI also makes the participants feel unsettled and uncomfortable to know what a non-human machine could do to them and their communities. From this perspective, AI is an invisible force that may cause possible detrimental effects to individuals and societies. In summary, participants' perception on AI focuses on functional and emotional dimensions. While their views on AI functions are positive, their affective evaluations of AI tend to be negative.

Participants' understanding of AI is also constructed from the comparison of similarities and differences between AIs and human beings. In general, human beings are perceived to be more independent, experiential, creative, complex, empathetic, emotional and diverse than AIs. Thus, human beings are needed in dealing with complicated and sophisticated tasks or situations while AIs are more appropriate to be used in handling simple and easy tasks and situations.

Well, of course, there's the depth feelings and we won't get into her any idea that she, but yeah. So, like, the depth of feeling. Like, how like, how deeply or more, how sophisticated we can an Artificial Intelligence thing, you know, whether it's voice-assist Alexa or whatever. How complex is the thinking there compared to a human being? So, human beings supposed – hopefully, you know, has depth of feeling. They're complex and sophisticated. Sometimes, we're walking contradiction.

I guess I think of as humans as being probably the to me like the critical defining factor when humans are capable of true independent thought that is completely self-generated without the creativity factor. Whereas I think of AI as being it's got to have something for its starting points to kind of build on and then to kind of learn from. So, I guess that's probably what I would think of as the biggest driving difference.

As the above quotes suggest, according to the participants, AI cannot achieve the level of depth, complexity, sophistication, independence that human beings are capable of at both cognitive and emotional levels. The fact that at the current stage human beings are superior to AI cognitively and emotionally seems to offer a sense of comfortability and relief to the participants, suggesting that the participants' interpretation of AI is from the lens of human-centered, social constructionism of technology not from the technology-centered, technology determinism perspective. Participants' perception of AI forms a baseline and foundation for them to interpret different types of AI devices and applications they own or encounter in their everyday lives. One of such AI devices that is deeply imbedded in the participants' everyday lives and constantly shapes their daily activities is voice-assisted AI.

#### *4.2 Voice assisted artificial intelligence: a smart, simplistic, multifunctional, moody, personal assistant*

Consumers' perception of voice-assisted AI centers on various aspects, including function, communication, adaptation, relationship and privacy. For function, participants perceive voice-assisted AI as a useful addition to their lives, but most use it for functional, simple tasks. While those participants displayed a wide range of uses for their voice-assisted AI

devices, most of them reported using the devices for simple tasks that do not require human complexities such as checking weather, playing music or reading out recipes during cooking time when their hands are full. Although voice-assisted AI devices have a variety of capabilities to simplify and streamline users' lives, most users do not seem to take full advantage of everything that the device offers to them.

So, for example, the most common way that I probably use my Alexa is probably like a cooking timer. So, like I'm at home, I'm in the kitchen, I'm busy, both my hands are full, I could just set a timer and that's really easy for me, or playing music same deal. I don't have to like spend the time to go through all my apps find the playlist I want to listen to, and I could just say like, Alexa play this band or this artist or this song. Just more of a convenience thing than anything else, I guess.

I use it for reading and understanding texts for translating things for waking me up at a certain hour for setting timers and understanding my speech for asking questions and getting search results back. And yeah, for finding recipes on the internet and reading them out, step by step [...] I'll say good morning, Google. I guess it's worth noting the routine. I say, Good morning, a good morning routine that I have on my Google Home. It'll say good morning. It's this time – you're on – your schedule today is this so and so whatever, like you have these events coming up today. The weather is this high or whatever low, whatever you need. It's going to rain, anything like that. Then it goes into – after it tells me about my commute, it says, here's the latest news. And then it'll play a series of news outlets that I've picked and tailored.

For communication, despite AI devices' capabilities to communicate with humans, communication through AI devices is not quite up to human complexities. While AI devices have been developed to understand people's commands and interact in a more personal way, participants expressed some level of frustration when communicating with their devices. For instance, one interviewee called her Alexa her "teenage daughter," because it does not listen to her or interpret her command properly when she needs it to. The concept of nuance seemed to be another area where AI devices still lack human complexity. One interviewee stated that the natural language processing is still lacking and pointed out the limitations as to what it can or cannot do. Another participant stated that the devices still lack certain "bedside manners," such as answering in full volume regardless of time of day.

A real human can understand complex ideas and nuances and complex sentence structure, AI is not there yet. So, an AI can be taught over time to do more complicated things. But, you know, when it comes to like chess and calculations and algorithms it is very well but in the context of voice assistant, it's really about natural language processing and there are limitations of what natural language processing can and can't do.

It's very, very moody, I call it my teenage daughter because it won't listen to me. I don't use it much, I tried to use OK Google to lot on my phone, it's listening to me right now every time I say it, but when I try to use it for like, "Hey can you make this call or just send this message," it seems to be very clunky, it doesn't function the way I want it to function so then I just give up.

For adaptation, although a major strength of algorithmic-driven AI devices is their capability for deep learning and adapting to human inputs, humans also seem to be making the adaptation to the devices. Thus, the adaptation is mutual, rather than one-sided. For example, one participant stated that he does not talk to it like a human but talks to it in a way that is easiest for the software to understand. Therefore, over time, he learned to structure his commands for Alexa in a certain pattern, so that he can get the response that he wants.

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I'm sure it's just collected so much data and the more data it collects, I'm sure it's giving me more accurate things. Although again, it doesn't understand humor, so if I'm joking about I make a joke about pregnancy it thinks I'm really pregnant and it recommends all these. You know what I mean? So, it's missing humor but overall, I think it's gotten very, like, tailored to me probably through sheer amounts of data.

Software yeah absolutely have to talk to it like it's a software in the structured way that is easiest for that software to understand[. . .] You don't talk to it as if you're talking to a human, you have to structure it in a way, and it takes some tries to figure out how it likes to be heard. But once you figure it out, you almost teach yourself how to talk in a specific way. So, the AI will best understand your command.

For relationship, users are cautious in developing emotional relationships with AI devices, but slight emotional and human angles remain. Some participants seem to be wary of developing emotional connections with their devices, trying to limit the amount of time they speak to their devices to avoid becoming "that crazy cat lady that's talking to her robot." However, the complexity of human nature permeates interviewees' relationships with their AI devices, causing them to treat them as human beings or have emotional reactions related to their voice assistants.

I just feel like I'm afraid that by living alone I could start to form a friendship or a relationship with this robot where I'm like, "Alexa," (because that's something they market this tool as, they're like, "Let her get to know you, play games with her, she'll teach you skills,") and I don't want her to be my friend, I want to have real human friends, and do I really think it's going to happen where I become involved with this robot? No, but I'm aware that for some people it could.

I had just one Dot at the time and it was in the kitchen space and I had my first roommate then and he started using it. And that felt uncomfortable. That felt like it was a bit of crossing a personal line because that Alexa was the one that I'd spent the last two years talking to about telling news and weather and different things like that. So that was one of the reasons why I got two more because then I put other ones in different spaces. And so it didn't feel so personal if people use one of them or not.

For privacy, users' privacy concerns do not outweigh the benefits of having a voice assistant. Participants describe a general feeling of always being aware that their devices "are there" and that they seem to be always listening to them. Several mentioned their devices becoming activated even when they were not being triggered or being indirectly mentioned (such as during the interviews whenever they said the devices' name, or whenever the devices heard TV commercials containing their trigger word). However, while privacy is mentioned as an issue (rather than a concern) throughout most interviews, it seems clear that users perceived a privacy trade-off in their use of AI devices and voice assistants. Most assumed that their privacy might be compromised but argued that they did not feel they were "important enough" to be spied on or that they do not really "have anything to hide," and assessed that the benefit of convenience of these devices offsets their privacy concerns.

I know everyone tells me that I should hate how much of my data is being collected and that I should be worried about it and take steps to prevent that. And also, I should be outraged that people are monetizing and profiting off my data. But I'll be honest, it's just like I've got bigger concerns in life that it doesn't bother me at all, it is just fine. And if anything, it is improving my life marginally.

I don't feel like my life is exciting enough for anyone who needs to steal my information, but I think it's good for me to be aware of that, yeah, if the NSA wanted to blow me up they could, they could find out everything they wanted to know in two seconds because she knows everything. [...] I am concerned but not concerned enough to not have it in the house, clearly.

As the above quotes indicate, similar to their interpretation of AI, participants' perception on voice-assisted AI also focuses on functionality and emotion, and comparison and contrast between AI and human beings. While the participants appreciate the multiple functions that voice-assisted AI devices offer to them, they are cautious to develop any emotional attachment to those devices. It is interesting to note that the participants tend to treat voice-assisted AI devices as human beings by expecting and requiring those devices to follow social norms and obey social rules such as lowering voices in the nighttime or correctly interpreting and responding to their commands. At the same time, they are also trying to alienate themselves from the voice-assisted AI devices by not establishing human-like emotions with those devices. In other words, when constructing and navigating relationships with AI and voice-assisted AI, the participants are struggling to find a balancing point between functional benefits and emotional comfortability, as well as human and non-human roles. Like the participants' interpretations of AI and voice-assisted AI, the socially constructed meanings of AI marketing communication are full of tensions and hesitations which reflect, on one hand, the participants' familiarity and sophisticated understanding of commercialism and consumerism in contemporary society, on the other hand, their unfamiliarity and rudimentary knowledge of marketing communications driven by the innovative technology of AI.

#### *4.3 Artificial intelligence marketing communication: an unavoidable promotional tool with limited effects*

In general, like other types of promotions, consumers consider AI marketing communication is unavoidable and acceptable in today's highly commercialized society. However, this type of promotion is limited in its effect on influencing their evaluation of products and brands, as well as shaping their consumptive behaviors. Specifically, consumers' perception on AI marketing communication focuses on general AI marketing communication applications and voice-assisted AI marketing communication experiences.

*4.3.1 General artificial intelligence marketing communication: balancing between personalization and privacy.* For general AI marketing communication, participants feel that AI marketing communication broadens their shopping horizons but can feel disruptive of their personal space. Participants seem to have different perceptions of AI marketing communication based on their personal preferences. Those with a positive outlook of marketing communication practices appreciate that they get tailored advertising that is more relevant to their interests and mention that such practices help them "broaden their shopping horizons" (particularly, in regard to personalized recommendations). Those with a negative perception of AI marketing communication practices, on the other hand, are not as appreciative of recommendations and targeted advertising, as it can lead them to spend more money than they intend to, or they feel followed and interrupted in a space they consider to be personal.

There was something that popped up from there was oh, yeah, that was actually show I am going to tonight there's the Led Zeppelin tribute band is playing at high dive. It is supposed to be really good and I would not have normally thought about it or seen it but it happen to pop up on the side of some feed because I follow you know I searched that site, probably regularly. And so yeah, I'm going and a buddy of mine is going and probably one of the other persons so, you know, that's a

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sale that they made that and you know, not only ticket sales but whatever alcohol sales we buy there they would not have otherwise made from that experience.

I think my biggest concern would just be just the amount of marketing and advertising, specifically promotion and advertising, that it would bring into personal space. [...] So, the promotion and advertising doesn't just come to you, but your behavior and actions and words go back to them to improve their promotion and marketing. So, it's coming into your personal space and it's taking from your personal space.

As the above quotes indicate, participants' interpretation of general AI marketing communication applications reveals the psychological conflict between their needs for relevant customer journey through personalization and their privacy concerns of such smart systems/technologies. While the participants enjoy the tailored marketing information and the personalized benefits that broaden their shopping horizons, they also show their concerns of the intrusion of personal space and the privacy risks that bring a sense of deprivation and loss of control. In other words, participants' perception on general AI marketing communication pivots on the personalization-privacy paradox. Compared to the participants' description of general AI marketing communication, their discussion on voice-assisted AI marketing communication is very limited.

#### *4.3.2 Voice-assisted artificial intelligence marketing communication: not on the radar.*

For voice-assisted AI marketing communication, users are not asking their voice assistants for shopping advice. Participants do not yet consider their voice-assisted devices as part of their process to find information about brands or products. In a vast majority of cases, interviewees said it has never occurred to them, and they reckon they do not even know if their devices would be capable of it. The only exception seemed to be local restaurants or businesses, and those searches tended to be for logistical purposes (such as getting directions or finding out the businesses' hours). However, other than these cases, participants seem to be relying on other media in their product evaluation stage, such as their phones or personal computers. Among the motives interviewees referenced as reasons why, the visual element was consistently brought up: voice assistants lack a screen, and therefore are not considered by users who rely heavily on visual cues for purchases and brand evaluations. Many indicate they focus on reviews when evaluating a brand or product, and mention that they are unsure their AI devices had the ability to check reviews and, in the event that they did, assume that it would take longer than just checking the reviews on a screen. Additionally, voice-assisted devices would not offer users the ability to compare between products. Finally, one concern is the source of the information that voice-assisted devices would prompt when being used for shopping advice: users are unsure of learning brand/product information from an unidentified source and are suspicious of that information being sponsored. In conclusion, AI-enhanced marketing communication through voice-assisted devices are not yet on the users' radar, and that current AI systems' limited capabilities present various frictions in their purchasing journey.

I still like to look at things, so I like to see what my options are and not just have Alexa pick out which paper towels are going to be sent to my house. [...] Still I think it's not a good experience because you can't see what you're buying and you don't know all the information associated with it so it would take a lot more effort to get the information from Alexa retrieving it, asking her what are the reviews? what is this? when you could possibly scan it and read it faster.

Yeah, I think it has to be visual, for me. I like seeing it, I'm going to retain it more, I'm going to see myself wearing it more, so I guess if she, all of a sudden, had an Alexa homepage that I could

visit and it was like, “Hey Alex, based on this, you make these recommendations,” I think I’m more likely to listen to her based on that than a voice recommendation.

As the above quotes suggest, the modality of the voice-assisted AI device and the trustworthiness of information source are the two major factors that prevent this type of AI device to be integrated into the participants’ consumer journey to guide and facilitate their brand and product evaluation and shape their consumptive behaviors. Participants’ visual orientation and experience-driven purchase decisions limit the voice-assisted AI to become a useful tool for them to rely on when making such decisions.

## 5. Discussion

The current study examines AI device owners’ perception and interpretation of AI and AI marketing communications. Participants’ interpretation of AI includes both the general AI and the voice-assisted AI. No matter which type of AI, the socially constructed meanings of this newly developed technology among AI device owners are primarily in the domain of weak AI, built on the debate of functionality and emotion, and rooted in the comparison between machines and human beings. Accordingly, participants’ interpretation of AI marketing communication also focuses on general AI marketing communication and voice-assisted AI marketing communication. Given the newness of the technology and consumers’ limited knowledge, experience and recognition of AI marketing communication, AI device owners’ interpretation of this type of promotion is relatively shallow and constrained lacking both breadth and depth.

For general AI, findings reveal that although the participants’ understanding of AI is intuitive and scattered, they are able to touch upon different core aspects of AI such as computer, human-like, machine, algorithm, software and learning (Siau and Yang, 2017; Kumar *et al.*, 2019), suggesting that consumers have gained basic knowledge of the term directly or indirectly from various sources and in different ways. In addition, their perception of AI reflects mainly the limited functions offered by Weak AI or ANI applications (Siau and Yang, 2017), which depict AI as a conduct for relatively simple and easy tasks. This is understandable as the participants seem to experience limited AI-enhanced functionality on a daily basis. The findings also indicate that participants either don’t differentiate or are unable to clarify the relationships between AI and other related terms such as machine learning, deep learning, natural language processing and robotics (Jarek and Mazurek, 2019), suggesting their knowledge of AI is limited and lacking depth.

By contrast, the participants’ understanding of voice-assisted AI is more comprehensive and thorough possibly because of their direct experiences and interactions of voice-assisted AI-enabled devices such as Alexa and Siri (Stephen and Ahmad, 2017). Their interpretation of voice-assisted AI is multilayered and dynamically constructed from both experiential and relational dimensions. Specifically, their understanding of voice-assisted AI touched on five crucial aspects, namely, function, communication, adaptation, relationship and privacy. Among these, the first two are from the experiential perspective (Chérif and Lemoine, 2019) and the last three are from the relational angle (Belanche *et al.*, 2019).

Similar to their interpretation of AI, participants’ understanding of AI marketing communication is relatively narrow and constrained. Without the researchers’ descriptions and explanations, they cannot think of any AI marketing communication applications and practices. This might be attributed to the “newness” of such adoptions by marketers (i.e. participants had limited encounters) or the lack of relevancy to the participants. One more plausible explanation might be that AI is rather unobtrusive that users are unaware that they have interacted with the technology (Kumar *et al.*, 2019).

While previous research indicates that consumers have a positive attitude toward AI marketing communication (Bergman and Sundin, 2019), findings of the current study suggest that participants generally hold a neutral or slightly negative feeling toward AI marketing communication practices. Further examination of the contexts and participant characteristics with the corresponding sentiments points to some similarities between the consumer perception of AI in marketing communication and ad avoidance on online platforms. Specifically, as suggested by many empirical studies in ad avoidance (Logan *et al.*, 2012; Miltgen *et al.*, 2019), consumer perception of the utility offered by advertising messages tend to reduce the perceived intrusiveness of the message. This seems to ring true in the case of AI-enhanced marketing communication. The results here also support certain notions posited by the human-machine interactions literature. In particular, as discovered by many human-AI decision-making studies (Castelo *et al.*, 2019), the participants tend to perceive humans as superior to AI in performing complex or creative tasks. This has implications on the nature of AI-based marketing communication messages or recommendations from the trust perspective.

Contradicting previous findings on the effects of AI marketing communication (Chérif and Lemoine, 2019), participants in this study perceive this engagement/promotional tool to be less influential in changing their attitudinal and conative evaluation of products and brands. The perception of AI in the context of brand engagement or communications appears to be still fluid and influenced by the specific experiences/journeys of the users. Finally, the perceived duality of AI, most likely based on the participant interactions with the voice assistant enabled in physical devices, as both a machine and with human-like quality also reinforces the debate between algorithmic appreciation and aversion depending on individual differences (Matthews *et al.*, 2020). Much research is needed in this area to further investigate how consumer characteristics might affect the interactive design of such AI communications.

The study has both theoretical and practical implications. Theoretically, findings of the study suggest that when scholars further theorize and conceptualize AI, especially in the context of marketing communication, they should incorporate consumers' perspective to broaden the scope and enrich the meanings and connotations of the term. In addition, AI marketing communication research should also focus more on consumers' interpretation to identify possible perceptual gaps between consumers and marketers, as well as to expand the effect research from a meaning-based, consumer-centered lens. Practically, findings of the study suggest that marketers need more insights on the disposition and experiences of the consumers in the context of their interactions with AI for marketing communication purposes. Furthermore, it seems that current AI marketing communication practices are limited in their engagement and present multiple layers of frictions in terms of branding and triggering consumers' purchase behaviors. Therefore, marketers may want to proactively educate and promote AI and AI devices as trustworthy and useful source of brand and product information and ultimately increase the effectiveness of this promotional tool. Finally, the duality of AI presents some interesting potentials and challenges. The sentiment that there is an accepted trade-off of the interaction with AI within the communication context points to the strategic importance of offering clear value in such human-machine exchange and relationship building.

## 6. Limitation and future research

Several limitations should be noted. This research is a snapshot in time of a dynamic phenomenon. With the development and innovation of technology, both AI and AI marketing communication are constantly involving. Long-term studies and longitudinal

data would provide additional insights regarding this particular phenomenon. While the sample of this study is relatively diverse in terms of demographics, our participants are having a slightly higher educational background than the average US population. Future research should recruit a more diverse sample especially including more consumers with lower educational backgrounds to uncover similarities and differences. In the same vein, studies designed to explore the dynamics and variations among subcultures and subgroups of AI and voice-assisted AI users may enrich our understanding of this particular phenomenon. Furthermore, this study only focuses on American consumers. To broaden the research context into a cross-cultural environment, future research may examine AI and AI marketing communication in different countries and cultural areas. Finally, this research only reveals consumers' perspectives, future research could examine marketing communication practitioners' or marketers' views to provide a more complete picture of the ecosystem of AI marketing communication.

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