

Now we're talking

Citation for published version (APA):

Maurer, T. L. (2023). Now we're talking: The impact of artificial intelligence drivers on consumer evaluations and behavior with voice assistants. [Doctoral Thesis, Maastricht University]. Maastricht University. <https://doi.org/10.26481/dis.20230510tm>

Document status and date:

Published: 01/01/2023

DOI:

[10.26481/dis.20230510tm](https://doi.org/10.26481/dis.20230510tm)

Document Version:

Publisher's PDF, also known as Version of record

Please check the document version of this publication:

- A submitted manuscript is the version of the article upon submission and before peer-review. There can be important differences between the submitted version and the official published version of record. People interested in the research are advised to contact the author for the final version of the publication, or visit the DOI to the publisher's website.
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Impact Paragraph

Artificial intelligence (AI) advances rapidly and increasingly influences our daily lives. Recent developments such as the introduction of OpenAI's chatbot ChatGPT demonstrate just how quickly AI and its applications can have an impact on our life but also on society as a whole. The chatbot ChatGPT can answer complex questions and prompts ranging from mathematics over solving programming errors to writing essays and e-mail drafts, depending on the parameters that users specify in their chat with the bot. Naturally, with increasing intelligence and more human elements of technology come opportunities and challenges. Staying with the example of the recently introduced ChatGPT, a challenge depicts the impact on the education system – if technology can craft essays, summaries, and debates on a specific topic, what will students be tested and graded on in the future? At the same time, this offers the opportunity to tie in AI technology into education and learn to work with technology to discover its benefits (e.g., automation of tasks) and pitfalls (e.g., reliability, misinformation). While other challenges relate to important data privacy and ethical implications as discussed in the *General Discussion* of this dissertation, AI technology advancements bring important opportunities like enhanced accessibility, convenience, and automation of tasks. For example, AI enabled voice assistants (VA) can empower users with visual impairment to coordinate tasks and smart home functionalities through voice.

To address the emergence of AI in everyday life and the associated implications for marketing and the consumer but also for privacy, ethics and the broader society, this dissertation set out to investigate which AI and VA specific factors drive consumer evaluations and behavior with AI enabled VAs throughout the consumer's voice-assisted journey with VAs. The findings and implications of my dissertation set a starting point to foster important discussions among academics, practitioners, and policymakers regarding AI in the consumer realm. *Chapter 2* conceptualizes how consumers evaluate VAs. I propose that VA specific, observable, and firm-adjustable factors relating to the VAs 'artificiality' or 'intelligence' likely affect consumer evaluations of the VA (Guha et al. 2022; Chapter 2). Artificiality here means the 'machinelikeness' of the VA, and the intelligence, how accurately it can perform tasks (Guha et al. 2022; Chapter 2). Grounded in signaling theory, the framework advances the conceptual understanding of AI enabled VAs linking it to specific AI and VA factors (Guha et al. 2022). For example, social cues like the age of the VA or the naturalness of the voice serve as signals that can reduce artificiality perceptions of AI enabled technology (Guha et al. 2022). As the introduction of OpenAI's ChatGPT or

Google's equivalent Google Bard indicate, AI and VA technology will likely advance rapidly in the coming years, accompanied by new features (e.g., enhanced conversational ability) introduced to AI technology. Therefore, the framework is flexible in that new observable factors can be linked to the technology's reduced artificiality (more humanlike) or intelligence. Moreover, the framework accounts for different user segments and situations in which consumers use AI technology. A later version of this chapter has been published in the *Journal of the Academy of Marketing Science*, a top-tier marketing journal listed in the Financial Times Top 50 Business and Economics journals, which is renowned for linking scholarly research with practice and for its high impact factor²³. The rich agenda for future research can animate, on the one hand, researchers to dig deeper into the AI enabled VA field, and, on the other hand, policymakers to discover important discussion topics in the consumer AI technology realm.

Chapter 3 builds on the previous chapter and investigates VA's artificiality and intelligence as factors driving consumer outcomes like purchase intentions with VAs. Interestingly, I find that AI is likely not static over time, in that consumers' perceptions of AI's intelligence and human likeness change with usage, likely explained through changes in themselves, the technology, and the dynamic between the two. Furthermore, consumers are more inclined to purchase through AI enabled VAs when they perceive the AI to be less artificial (more humanlike) and more intelligent. These findings are interesting for research and practice alike to find out how to best design and facilitate experiences with consumer-facing AI enabled technologies. This chapter is ready to be submitted to the *Journal of the Academy of Marketing Science*, providing relevant insights to researchers and practitioners. Chapter 4 compares text-based chatbot- and vocal VA-interactions, finding that delight plays an important role in enhancing VAs' trustworthiness in voice-assisted service encounters. Facilitating delightful experiences with AI technologies can be important to overcome consumers' skepticism with intelligent technology. This chapter has been presented at the *International Conference on Challenges in Managing Smart Products and Services 2022*.

As posited throughout my dissertation, firms or institutions that design VAs can signal information to consumers by introducing or altering salient characteristics

²³ <https://www.springer.com/journal/11747>

of VAs (Chapter 2; Guha et al. 2022; Spence 1973). These characteristics can be, for example, a natural sounding voice of a VA or a female (instead of male) sounding voice as well as how accurately a VA like Amazon Alexa responds to users' voice commands (Guha et al. 2022; Chapter 2). These characteristics serve as signals for consumers' perceptions of how artificial, that is, how machinelike, or how intelligent, VAs appear. In turn, this likely shapes how consumers evaluate AI enabled VAs like Amazon Alexa or Google Assistant. Diminished artificiality and enhanced intelligence of AI enabled VAs, which could be, for example, a VA with a natural sounding voice and one that accurately performs consumers' voice requests, have a positive impact on consumers' evaluations of the AI enabled technology (Guha et al. 2022; Chapter 2). For example, a more natural sounding VA that performs exactly as asked likely appears less artificial and more intelligent, increasing consumers' evaluations in comparison to machinelike-sounding VAs that only perform well on every third consumer request. Throughout the chapters I employ and extend the signaling theory, in that I posit that the ability and motivation to receive AI signals differs with (1) time, (2) individual consumer characteristics, as well as (3) with situations and different states (i.e., delighted state). The abstraction and the extensions of the signaling theory throughout this dissertation constitute theoretical contributions that can foster future research among researchers in the marketing realm and add to the general understanding of the factors that can influence consumers in the interactions with AI technology.

From a methodological point of view, my dissertation aims to investigate consumer evaluations and behavior with AI enabled VAs as close to reality as possible, through employing a variety of methods. With help of a comprehensive framework and propositions as well as an initial empirical testing with consumer text data, I could advance the conceptual understanding of VAs in *Chapter 2*. AI technologies like VAs have been investigated mostly from a cross-sectional stance, in that prior work takes snapshots of consumers' usage and VA perceptions. Through conducting an empirical longitudinal usage study with actual VA devices in *Chapter 3*, this dissertation makes an important contribution to the research community in that it investigates VA usage over time. The experimental design with scenarios and technology interactions in *Chapter 4* compares different interaction modes and aids in highlighting potential differences between, for example, text-based chatbots and VAs.

As discussed throughout my dissertation, AI will likely become more and more intelligent in the future; sending increasing AI signals to consumers that can influence their evaluations and intended behavior with AI technology. Furthermore, the perceived costs (e.g., privacy) and benefits (e.g., elevated convenience) of these interactions (i.e., cost-benefit trade-off; see Chapter 2) may change due to the increases in 'intelligence' and decreases in 'artificiality'. To practically demonstrate the impact that AI technologies like VAs but also recent AI introductions such as ChatGPT can have in the future, I have asked ChatGPT to discuss the question how consumers' daily life changes with digital voice assistants like Amazon Alexa or Google Assistant. **Example A** presents the results.

Example A – AI enabled ChatGPT answer

T Please discuss how consumers' daily life changes through digital voice assistants like Amazon Alexa or Google Assistant. Analyze it in terms of ethics, privacy, and society. Write it for a top-tier academic journal publication and ensure to draft it in a concise and condensed manner.



The emergence of digital voice assistants, such as Amazon Alexa and Google Assistant, has introduced a new form of human-computer interaction that is transforming consumers' daily lives. These devices offer a range of functionalities, from setting reminders and playing music to controlling home appliances, and are becoming increasingly integrated into people's homes and daily routines. This article examines the impact of digital voice assistants on ethics, privacy, and society, and highlights the need for ongoing analysis and reflection on these emerging technologies.



From an ethical perspective, the use of digital voice assistants raises important questions about the rights and responsibilities of both users and technology companies. As these devices collect and store vast amounts of personal data, it is imperative that clear policies be established regarding the use and protection of this information. Additionally, the potential impact of AI algorithms on employment, bias and discrimination, and decision-making processes merits further investigation.

In terms of privacy, digital voice assistants pose significant challenges as they collect, store, and potentially share a wide range of personal information, including voice recordings, search history, and information about the user's home and habits. This raises concerns about the potential misuse of this data, as well as the impact on individual privacy rights, particularly in the context of the home.

From a societal perspective, the increasing use of digital voice assistants has the potential to transform the way people interact with technology and with each other. On the one hand, these devices can support those with disabilities or limited mobility and improve their quality of life. On the other hand, the growing dependence on these technologies raises questions about the impact on face-to-face communication, critical thinking skills, and decision-making processes.

In conclusion, the widespread adoption of digital voice assistants is changing consumers' daily lives in significant ways, and raises important ethical, privacy, and societal concerns that merit ongoing analysis and reflection. As these technologies continue to evolve, it is essential that policymakers and technology companies consider the potential impacts and take proactive steps to mitigate any negative consequences.

After reading through the AI generated answer, it should be left up to the reader to compare the results to that of the previously (human-) introduced impact paragraph. The AI could generate this answer in a very short time frame, while it would take a human author much longer to draft a similar text. It becomes apparent that AI technologies can perform increasingly more (complex) tasks and have an enhanced conversational ability. In the future, this may be amplified through adding, for example, a natural voice, personality traits and pleasantries to the AI, thereby, making it even less artificial. Importantly, with the current text-to-speech capabilities, we may see at some point that chatbot's like ChatGPT receive a voice. Conversely, it may not take too long until VAs such as Amazon Alexa are operated on large language models like ChatGPT, which would immensely improve the conversational ability of AI enabled VAs. In addition, these advancements further bear implications on a macro-level, for instance, for automation, professions, or the education system, which would go beyond the scope of this dissertation. Yet, despite the acceleration of AI advancements, it is important to point out that the human capability remains that humans can 'frame' (Cukier et al. 2021), in that they can set the parameters and the frame in which the AI operates. In Example A, I have set the frame and the parameters through phrasing a question and specifying parameters of the anticipated answer (e.g., discussion topics, parameters such as academic writing style and conciseness). It is about what humans make out of AI technology. To further emphasize this, I would like to end the impact paragraph with number 6 of my propositions from the book *Framers: Human Advantage in an Age of Technology and Turmoil*.

'Meanwhile AI may make better decisions than people and steal our jobs, but computers and algorithms cannot frame. AI is brilliant at answering what it is asked; framers pose questions never before voiced. Computers work only in a world that exists; humans live in ones they imagine through framing.' Cukier et al. (2021, p.17) in the book *'Framers: Human Advantage in an Age of Technology and Turmoil'*