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## Experiencing Voice-Activated Artificial Intelligence Assistants in the Home: A Phenomenological Approach

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EXPERIENCING VOICE-ACTIVATED ARTIFICIAL INTELLIGENCE ASSISTANTS

IN THE HOME:

A PHENOMENOLOGICAL APPROACH

By

Valerie K. Jones

A DISSERTATION

Presented to the Faculty of

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In Partial Fulfillment of Requirements

For the Degree of Doctor of Philosophy

Major: Educational Studies

(Internet-based Education)

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## EXPERIENCING VOICE ASSISTANTS: PHENOMENOLOGY

## Abstract

Voice-controlled artificial intelligence (AI) assistants, such as Amazon's Alexa or Google's Assistant, serve as the gateway to the Internet of Things and connected home, executing the commands of its users, providing information, entertainment, utility, and convenience while enabling consumers to bypass the advertising they would typically see on a screen. This "screen-less" communication presents significant challenges for brands used to "pushing" messages to audiences in exchange for the content they seek. It also raises questions about data collection, usage, and privacy. Brands need to understand how and why audiences engage with AI assistants, as well as the risks with these devices, in order to determine how to be relevant in a voice-powered world.

Because there's little published research, a phenomenological approach was used to explore the lived meaning and shared experience of having an AI assistant in the home. Three overarching types of experiences with Alexa were revealed: removing friction, enabling personalization, and extending self and enriching life. These experiences encapsulated two types of explicit and implicit goals satisfied through interaction with Alexa, those that related to "Helping **do**," focused on functional elements or tasks that Alexa performed, and those related to "Helping **become**," encapsulating the transformative results of experiences with Alexa enabling users to become better versions of themselves. This is the first qualitative study to explore the meaning of interacting with AI assistants, and establishes a much-needed foundation of consumer understanding, rooted in the words and perspectives of the audience themselves, on which to build future research.

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At the risk of sounding heretical, getting a doctorate is pretty simple: you do the work. You do the coursework to build a foundation, you do the legwork to form an awesome committee, you do the gruntwork to craft a dissertation. This is about getting it done: being stubborn enough to press on through two kids and a tenure-track job; persistent enough to convince a phenomenal advisor to guide you; agile enough to avoid getting fired, dumped, or disowned; solvent enough to pay for plenty of coffee and wine; smart enough to choose a spouse who supports you no matter what; and lucky enough to have family and friends who love you anyway. I am grateful for the privilege of bringing this brainchild to life, and for all of those who sacrificed to help me do it—particularly my husband, Will; my parents, Ruth and Eric; my kids, Cora and Pete; and my advisor, Dr. Ali Moeller. I also want to thank my friends Kelli, Carin, and Shuling, with whom I forged lifelong friendships through my studies; my former professor Dr. Edward Malthouse, for his insight and suggestions; and my committee, Dr. Guy Trainin, Dr. Frauke Hachtmann, and Dr. Theresa Catalano, for investing their time in this and sharing feedback that made it better.

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### CHAPTER 1

#### Introduction

Over 100 million Alexa-enabled devices have been sold as of January, 2019 (Bohn, 2019). Alexa is a voice-powered artificial intelligence (AI) assistant that “lives” inside the Amazon Echo device, designed to be on all of the time, constantly listening for its name, ready to fulfill the needs of the user. Research firm Ovum projects that, by 2021, there will be almost as many AI assistants as people (Shulevitz, 2018). These assistants include Amazon’s Alexa, Google’s Assistant, Apple’s Siri, and Microsoft’s Cortana. Users can not only query the assistant and receive answers as they would in a search engine, but also interact and play games or do science experiments, connect with other devices and turn on lights or turn down heat, communicate with other services and play jazz or call a cab, or transact with other businesses and buy pizza or batteries. The more interaction there is with the user, the more the AI assistant learns, and the more personalized it becomes.

Voice has been called “the new OS,” or operating system (*Social Media Week*, 2017). This means that access to information, entertainment, content of whatever sort, will increasingly be controlled by using one’s voice, rather than by using a keyboard. These voice-powered devices act as the communication hub of the home, the gateway to the Internet of Things, able to communicate with any Internet-connected device, service, or object. There were so many Alexa-compatible devices at the Consumer Electronics Show in 2017 that David Pogue, tech guru for Yahoo, called Alexa “the star of the show” (Pogue, 2017).

The possibility of voice becoming the new operating system has the potential to change the way we live. Any aspect of our lives that is or could be touched by the Internet could be



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controlled through voice interaction with an AI assistant, one that is increasingly tailored to each user. This has implications for a variety of industries, from computer science and engineering, to education and ecommerce, to interpersonal communication and psychology, to marketing and advertising. This research is situated in the context of marketing and advertising.

For the past half-century, marketers have relied on communicating pre-packaged messages through a screen, to a mass audience, to influence an audience's decision. AI assistants could change this paradigm in ways not yet understood. With AI assistants, the screen can go away, and access to content is curated by the assistants, rather than selected by the user from, for example, the results of an Internet search. While it may be fine to be fifth on a search page, if a brand is the fifth result in voice, it's nowhere. Further, interaction with the assistant is a personalized, individualized conversation. Users will only be exposed to what they request, what they want or need, rather than an array of advertisements that underwrite the content. This "screen-less," curated, personalized communication presents significant challenges for brands used to "pushing" messages to audiences in exchange for the content they seek. Brands need to understand how and why audiences engage with AI assistants, as well as the risks with these devices, in order to determine how to be relevant in a voice-powered world.

Opportunities are significant for brands that understand how to form meaningful connections with consumers in a voice-first environment. With an always-on, voice-powered AI assistant in the home, marketing shifts from the traditional start/stop campaign driven activities of the last century to a constantly running, highly individualized, adaptive activity rooted in the notion that markets are truly conversations (Levine, Locke, Searle, & Weinberger, 2001).

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Marketers have talked about building a relationship with consumers for decades. Alexa and other assistants might be able to deliver on that in a way never before possible.

Technology is moving much faster than academic literature. Few studies have been published about voice assistants or the Internet of Things in the area of marketing and advertising, a surprising gap (Nguyen & Simkin, 2017). The few studies in information science focus primarily on what voice assistants are used for (Lopatovska, Rink, Knight, Raines, Cosenza, Williams, Sorsche, Hirsch, Li, & Martinez, 2018; Lopatovska & Williams, 2018). The few in marketing and management literature test technology acceptance models (Moriuchi, 2019; Kowalczyk, 2018). Considering the growing IOT and voice assistant trend, there is certainly a gap in knowledge. There is also a gap in methodology; despite how little we understand about these new technological developments, no qualitative studies about them investigating the meaning of the interaction have been published.

### **Purpose of the Study**

Little is known about how users experience AI assistants in the home and why they engage with them. This calls for a qualitative, exploratory approach. Therefore, the purpose of this study is to explore and describe the lived meaning and shared experience of having a voice-powered artificial intelligence assistant in the home, the contexts that influence this phenomenon, and the personal goals fulfilled by interacting with one.

A number of audiences will benefit from this research. Brands will gain a better understanding of the affordances, challenges, and concerns involved with engaging with AI assistants. Marketing and advertising scholars can also benefit from the new knowledge generated in a rapidly developing, understudied area. Educators looking to leverage the benefits

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of accessible content, interactivity, or connectivity can benefit by understanding the goals users want to have fulfilled by using AI assistants. Finally, consumers themselves can benefit from understanding the pros and cons of adopting an AI assistant.

### **Research Questions**

The central research question for this study is: What is the meaning of the experience of using a voice-powered AI assistant in the home?

RQ1: How do participants describe the experience of engaging with voice-powered AI assistants in the home?

- What kinds of personal goals do users wish to fulfill through interacting with AI assistants? What kinds of experiences do people have with AI assistants?

RQ2: What conditions or contexts influence how voice-powered AI assistants are experienced?

- What factors facilitate or inhibit usage of the voice-powered AI assistants?
- What is the context that supports the continuation of (or changes to) the level of usage of in voice-powered AI assistants?
- What are the intervening conditions that influence the level of usage of in voice-powered AI assistants?

RQ3: What are the implications of these findings for advertisers, marketers, and society?

Most emerging technologies fail because they don't provide great value to the user (Shugan, 2004). This will examine consumers' experiences with voice-powered AI assistants and help uncover the meaning of engaging with them in the home, drawbacks or benefits, and opportunities for providing experiences that add value to users. This study extends the use of

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phenomenology to a marketing and communication context and illustrates the usefulness of the methodology for understanding the unique affordances of emerging media and experiences of individuals using them. While scholars have noted that it has long been a challenge to publish research with true implications for advertising practitioners (Muncy & Eastman, 1998; Chang 2017), by describing usage contexts and personal goals fulfilled, practitioners can better understand the kinds of brands and experiences that could add value to users and lead to engagement.

### **Definition of Terms**

Key terms used in this study include the following:

**Artificial intelligence:** According to the father of artificial intelligence, John McCarthy, AI is “The science and engineering of making intelligent machines, especially intelligent computer programs,” (McCarthy, p. 1, 2007).

**Voice-controlled AI assistants:** These are also called virtual assistants, AI (artificial intelligence) personal assistants, AI helpers, and terms can be used interchangeably. These AI assistants include Amazon’s Alexa, Google’s Assistant, Apple’s Siri, and Microsoft’s Cortana, but the primary focus is on Alexa and Assistant.

**Voice-controlled AI devices:** These are also called smart speakers, which are the devices connected to, or serving as conduits for, the virtual assistants. These include the Amazon Echo, Google Home speaker, Apple HomePod, and Windows PC.

**Smart speakers:** Refers to Amazon Echo, Google Home, and Apple HomePod speakers

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**Artificial intelligence-powered voice:** Any piece of technology that uses machine learning and is controlled by voice, including Google searches, Alexa, Assistant, Siri, Cortana, etc.

**Internet of Things:** “Internet of Things” (IOT) refers to networkability (and smartphone apps), for household gadgets like dishwashers, refrigerators, lights, door locks, doorbells, security cameras, thermostats, showers, bikes, clothes, sports equipment, and more (Pogue, 2017). It brings the intelligence of the Internet to physical products (Hoffman & Novak, 2015), making them smart, interconnected (Nguyen & De Cremer, 2016), and able to communicate autonomously (Atzori, Iera, & Morabito, 2010).

**Machine learning:** The result of programming a computer “to use past experience or example data to solve a problem” (Alpaydin, 2014).

**Automation:** “technology that actively selects data, transforms information, makes decisions, or controls processes” (Lee & See, 2004, p. 50). A core value is the ability to perform complex, repetitive tasks quickly without error (Hoff & Bashir, 2014).

**Natural language processing:** An area of research about an application that spans computer and information sciences, linguistics, mathematics, electrical and electronic engineering, artificial intelligence and robotics, and psychology, focused on “how computers can be used to understand and manipulate natural language text or speech to do useful things” (Choudhury, 2003, p. 51).

**Adopting:** This term is used because of the technology term “early adopters,” springing from the diffusion of innovations theory (Rogers, 2003).

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**Advertising:** The stories and experiences brands create to help communicate key messages about themselves to influence audiences.

## CHAPTER 2

### Literature Review

Following the tradition of Moustakas (1994), the literature review frames the research problem and sets the stage for the inquiry. This chapter first provides an overview of what AI assistants are and why they matter, then describes some of the primary roles technologies have played in the experiences of using them. This literature review then highlights prior literature on human-computer interaction and factors influencing adoption and experiences. Finally, literature specific to AI assistants is discussed, and this research is situated among the key communications theories that inform this inquiry about why media is used and what goals are fulfilled by using it.

### **The Voice-Powered Artificial Intelligence Assistant Landscape**

As noted earlier, there are four primary voice-controlled virtual assistants: Amazon's Alexa, Google's Assistant, Apple's Siri, and Microsoft's Cortana. Each of these voice-controlled virtual assistants, also called AI (artificial intelligence) personal assistants or AI helpers, is connected with a device: the Amazon Echo, Google Home speaker, Apple HomePod, or Windows PC (Table 1). They are designed so that the interface, or the way a user would access them, "almost disappears," according to director of product management for the Alexa personal assistant (Turk, 2016). They respond to natural language—a user doesn't have to learn any specific commands—and through machine learning, they get better at understanding requests as they are used.

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Table 1

*Devices and embedded AI Assistants*

Device	AI Assistant
Amazon Echo	Alexa
Google Home	Google Assistant
Apple HomePod	Siri
Windows PC or smart phone	Cortana

Table 1

The Amazon Echo is designed to continuously add new capabilities. The Amazon Skill Kit (ASK) and Alexa Voice Services (AVS) enable any developer interested in creating new Echo capabilities (a.k.a. skills) to do so (Ives, Palese, & Rodriguez, 2016). The number of Alexa skills in the U.S. more than doubled in 2018, and is currently estimated to be over 63,000 (Kinsella, 2019), though at this point, a limited number of those are used frequently. In fact, Matt Thompson, Chief Product Officer of Bitly, says that 69% of Alexa skills have zero or one user (*Social Media Week*, 2017). Marketers don't yet seem to know how to leverage this environment. The top four Alexa skills are very practical: the Kitchen Timer, as 51% of all Echos are in the kitchen; TuneIn, a native news app that will read news to you; Spotify, a music streaming app, and Amazon Music, another music streaming app (*Social Media Week*, 2017). This indicates that marketers and advertisers are still learning about how voice-activated virtual assistants matter, how they are relevant, and what they mean for marketing.

Companies such as Amazon and Google want to establish AI ecosystems with widespread device and developer support (Newman, 2016). Making it easy for developers to create skills helps the ecosystem grow and tries to ensure their virtual assistants stay relevant



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(Newman, 2016). If they do, they will gather more and more data about users, becoming more personalized, embedded in daily life, and relevant, and also increasing their ecosystem of connected, compatible products.

What's significant about these virtual assistants or AI helpers is that they are positioned to be the gateway to the connected home, the Internet of Things. In fact, technologist David Pogue suggests that Alexa will be "what saves the Internet of Things" (Pogue, 2017), which has been talked about for years but not yet widely adopted. Voice enables easy access to and control of the slew of connected devices and data-driven services that touch so many aspects of consumers' lives, from smartphones, wearables, and soon hearables, to smart speakers, smart TVs, cameras, and refrigerators, to in-transport, in-store, and beyond.

Up to now, consumers hadn't seen a great need for things to be networkable. It has been a hassle to, for example, unlock one's phone and find an app simply to turn on the lights. However, with Alexa, rather than having to control one's lights through a specific app on one's phone, which requires unlocking the phone, opening the app, and then performing the desired action, if a user has the right bulbs, they can just ask Alexa to turn on the lights. That's just one example of a connected, compatible product. Virtual assistants are getting better at communicating with other apps and services and also emerging on the hardware of other companies, so the user will no longer need specific devices (iPhone, Windows PC, Amazon Echo, or Google Home speaker) to interact with them (Newman, 2016).

There are estimated to be more than 150 products with Alexa built in and more than 28,000 smart home devices that work with Alexa as of January 2019 (Bohn, 2019). Given this connectivity, consumers may come to expect being able to intuitively access just what they want,

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just when they want it, in the simplest way possible. From an advertising perspective, navigating a voice-first environment requires a mindset that is consumer-centric and focused on adding value to the consumer, not merely a message (Jones, 2018). Such expectations demand companies of all types, including advertisers, to ‘just be there’—to respond, to entertain, to be more human (Groopman, 2015).

### **Interacting like a Friend**

Creators such as Amazon want people to interact with AI assistants the way they would interact with friends (Turk, 2016). Over 100,000 people say “good morning” to Alexa; she has been proposed to thousands of times as well-- and that was just in 2016 (Turk, 2016). These assistants are capable of maintaining a relationship with users (Groopman, 2015), acting as extensions of users themselves (Belk, 1988). This aligns with research which indicates that people treat computers, televisions, and other devices as humans. For example, Reeves and Nass (1996) have argued for decades that humans interact with computers, television, and other media in ways that are much more similar to how they interact with other humans than we realize, treating media as entities with personalities, with politeness and emotion. This kind of relationship and interaction is compelling for brands looking to connect with audiences. Recent research suggests that friend-like interaction with voice assistants (Siri, in this case) can result in positive brand warmth and positive brand attachment (Wu & Dou, 2017). Brand warmth refers to the customer’s perceptions of a brand’s intentions (Kervyn, Fiske, & Malone, 2012). Brand attachment refers to the strength of the bond connecting the customer with the brand. Research has also shown that the perceived ability of a brand to fulfill an individual's need for competence enhancement facilitates brand attachment (Proksch, Orth, & Cornwall, 2015). Competence

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results when people feel that they have the skills and abilities needed for a certain social, academic, or athletic situation, for social activities, sports, or academia (Proksch et al, 2015). There's some evidence indicating that need fulfillment in general may lead to attachment (Proksch et al, 2015). Alexa's ability to meet user needs through friend-like interaction may increase the strength of the bond between customer and brand.

### **Learning with a Tutor**

Interactive communication technologies also have the potential to influence both the process and outcomes of teaching and learning (Cilesiz, 2011). The right kind of AI can actually improve the way people relate to one another. For example, robots have been shown to help groups communicate and perform better or worse, depending on how they're programmed (Christakis, 2019). Another study found that groups interacting with a specially-programmed smart personal assistant (SPA) tutor showed both a higher collaboration quality and task outcome than those interacting with a human tutor (Winkler, Söllner, Neuweiler, Rossini, & Leimeister, 2019). Some participants said they preferred SPAs to human tutors because they felt less pressure and more in control of their learning (Winkler et al, 2019).

However, there are concerns about how interacting with AI can affect people and our interactions and relationships with each other, particularly our capacities for love, friendship, cooperation, and teaching, what Christakis calls the "social suite" (2019). The wrong kind of AI has been shown to discourage cooperation, help polarize people, and reinforce rude rather than empathic communication patterns (Christakis, 2019).

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### **Risks and Concerns**

Bringing an AI assistant into the home is not without concerns. Privacy is one of the primary issues, and research suggests that privacy is a key factor in acceptance of an AI assistant (Burbach, Halbach, Plettenberg, Nakayama, Ziefle, & Valdez, 2019). The Echo is, after all, a small computer, equipped with microphones and speakers and connected to a network. Alexa is constantly listening for its name, and it records interactions with it and stores that data in the cloud (Ives et al, 2016). It also transmits recordings of conversations through the network to the device makers, such as Amazon and Google, which keep copies of the conversations (Shaban, 2018). The always-on nature of AI assistants can make some consumers feel creepy, like they are under surveillance (Simon, 2016). Users do have privacy options; they can prevent recordings by muting devices, access any prior recordings, and delete them anytime. However, in 2018, an Echo user in Germany asked Alexa to play his archive of recorded interactions with Alexa and got not only his own history, but also 1,700 audio files of a stranger (Shaban, 2018). Earlier in 2018, an Oregon family found that one of their Echos recorded a private conversation and sent to a random contact (Horcher, 2018). Alexa is only supposed to record when it hears its name, but unintentional recordings, in which it thinks it hears its name, can certainly happen. It is also supposed to tell users when it is preparing to send a recording, which didn't happen in the case of the Oregon family.

This highlights the security risks that are juxtaposed against the convenience of always-ready, passively listening, voice-activated AI assistants. The head scientist on Alexa's AI team, Rohit Prasad, posits that Alexa is more than a search engine, providing a long list of results for users to choose from (Shulevitz, 2018). Instead, he calls it an "action engine," because it makes

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acts on commands of and makes choices for the user. If a user's Amazon account is connected and shopping is enabled, for example, anyone speaking to the assistant could order items. One well-known incident involved a six-year-old ordering a \$170 dollhouse for herself through the Echo (Wamsley, 2018). Most assistants now have "voice printing" in which different levels of access are provided to different voices the assistant recognizes to help avoid scenarios like this. In addition, confidential information could be accidentally recorded if the device thinks it hears its name. Hackers may also be able to capitalize on which some researchers find to be a lack of proper authentication (Zhang, Mi, Feng, Wang, Tian, & Qian, 2019). One way this can happen is by hackers publishing a malicious skill for Alexa that sounds like a legitimate skill.

There are also concerns about the implications of this kind of human-computer interaction on interpersonal relationships. Users communicate with these devices, not through them. Voice creates intimacy, and may help build a bond between the AI assistant and user (Shulevitz, 2018). Users propose to Alexa and confess to it, admitting depression and sadness. Machines don't judge or shame, so the "impression management" that people engage in with other humans may not feel as necessary (Shulevitz, 2018). Researchers and companies have been building and refining computers that detect and understand the emotion in human voice for 20 years. Now companies are focused on AI that can detect and interpret emotions from voice, to inform everything from semiautonomous cars to doctors screening patients for depression and anxiety (Shulevitz, 2018). This raises questions about looking to a non-human entity for human fulfillment and what could pass for emotional intimacy in the future. What happens when a machine becomes a confidante, a friend, who is always available, usually helpful, and even seemingly loyal, when what someone might need is the tough and real love of another person?

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The influence of interactions with Alexa on children is of particular interest. While some worry that children growing up with this tech will lose their manners, others argue that “please” and “thanks yous” only reinforce the human-ness of Alexa rather than reinforcing the line between humans and machines (Elgan, 2018). The nonprofit Campaign for a Commercial-Free Childhood pressured Mattel to cancel their kids’ virtual assistant, Aristotle, due to privacy concerns and the sense that parenting was being outsourced to a machine (Elgan, 2018). Aristotle read bedtime stories, soothed babies, and helped teach the alphabet, and required kids to say please and thank you (Elgan, 2018). Few studies have observed family behaviors with Alexa, but one that did found that it contributed to forms of family cohesion, family rituals, scaffolding, and collaboration, as well as sibling rivalry, teasing and family arguments (Beirl, Rogers, & Yuill, 2019). It suggested that someday, Alexa may help children learn “the art and joy of conversation in the presence of humans and machines” (Beirl et al, 2019).

Questions about what AI assistants are helping users learn extend to issues of stereotypes and gender bias as well. United Nations agency Unesco reports that the female genders given to AI assistants can help entrench gender biases (Rawlinson, 2019). AI assistants respond to any request or command, delivered in any tone or level of hostility, which could reinforce the concept of women as subservient, obedient servants. The report also found that the AI assistants provide “deflecting, lackluster or apologetic responses to verbal sexual harassment,” and calls for society to pay attention to gendered AI technologies and the teams who build them, who are mostly male (Rawlinson, 2019).

Despite these concerns, however, people seem to be getting more and more comfortable with an open world and with “being out there” (Simon, 2016). The value exchange of sacrificing

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privacy for information, access or some rewards has been shifting for decades. For example, people willingly join loyalty programs at the grocery store, exchanging shopping data for rewards. That said, it's unclear how it will work in the future if government, police, or other companies want to access the Echo data. This is illustrated by a recent murder case in Arkansas in which police asked Amazon for audio recorded from the suspect's home hub, the Echo (Tsukayama, 2017). Amazon refused, but the suspect eventually complied.

### **Curating Information and Gatekeeping**

As noted earlier, Alexa can be thought of as an “action engine;” access to content is curated by the AI assistants, such as Amazon's Alexa, Google's Assistant, or Apple's Siri, rather than selected by the user from the results of an Internet search. They become digital gatekeepers - not just to the Internet of Things, but also to a huge variety of media, from songs to audio books to radio stations to news organizations. Gatekeeping theory addresses the flow of information from media to the public, and examines how the worldview of individuals can be shaped by the gatekeepers in media who decide what information is important (Shoemaker & Vos, 2009, Chin-Fook & Simmons, 2011). Alexa both provides access to news curated by traditional media outlets, through NPR flash briefings, for example, and curates information “herself,” by answering questions asked by the user. It also provides opportunities for any user to suggest answers to questions Alexa doesn't know through the Alexa Answers program, launched in 2019, which has been widely criticized for its accuracy (Wiggers, 2019). Regardless, Alexa users may see the device, AI technology, or brand as a gatekeeper to information, and that may influence their experiences. Further, their human-like qualities can make them trusted advisors or

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even friends, potentially mitigating or moderating the relationship with the brand advertisers wish to build directly.

### **Accepting and Adopting New Technology**

Since voice assistants are still relatively new, it's useful to look at how and why other interactive and responsive technologies have been adopted and accepted. A frequently-cited model is the Technology Acceptance Model (Davis, 1989), which indicates that users' behavioral intent to embrace a new technology is rooted in perceived usefulness (PU) and perceived ease of use (PEU) of that technology. TAM is based on Theory of Reasoned Action (Ajzen & Fishbein, 1980), which asserts that behavior is determined by intent to exhibit that behavior, comprised of a personal or attitudinal factor and a social or normative factor. These basic constructs of PU and PEU have been built on over the years, through studies specific to a variety of technologies.

Diffusion of innovations theory and the innovation-decision process are also important to consider in the adoption of new technologies. There are five stages in this process: knowledge, persuasion, decision to adopt or reject, implementation, and confirmation (Rogers, 2003). Early knowledge of innovations tends to be higher in those with higher socioeconomic status. The persuasion stage, in which users form an attitude toward the innovation, is influenced by the relative advantage of the innovation over prior ideas; compatibility with values, experiences, and needs of adopters; complexity of usage; trialability or ability to experiment with it; and observability of its results (Rogers, 1962, 2003).

Adoption and use of robots in the home can be a useful comparison for voice assistants. Fink and Bauwens (2012) studied adoption of Roombas, a vacuuming robot, and identified key



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factors of practical utility, physical space, practical relation to technology, habits, emotional relation to technology, social influence, and economic utility. These align with other typical technology acceptance models such as MATH, developed to predict PC adoption, which uses attitudinal, normative, and control beliefs to predict behavior intentions (Brown & Venkatesh, 2008).

Alaiad & Zhou (2014) studied the adoption of home healthcare robots, and found that key factors in intent to use home healthcare robots were largely sociotechnical, and included social influence, performance expectancy, trust, privacy concerns, ethical concerns and facilitating conditions, with social influence being the primary factor. Ziefle & Valdez (2017) overall found a positive attitude towards home care robots, with the biggest concerns being fear of loss of control and connection to family members.

### **Adopting and Using Voice Assistants**

The body of literature on voice assistants, specifically, largely exists outside the field of advertising and marketing. Much of the early research is in computer science, human-computer or human-robot interaction, and information systems. Personification is one important thread of the literature. Analyses of user reviews have indicated greater personification co-occurs with more social interactions with the Echo, multiple member households are more likely to personify the device than reviewers mentioning living alone, and personification predicts user satisfaction with the Echo (Purinton, Taft, Sannon, Bazarova, & Taylor, 2017). Different studies seem to yield different results, though. Lopatovska and Williams found that fewer than half of the participants demonstrated any personification tendencies, and while personification can translate into customer loyalty and satisfaction, no links with loyalty or satisfaction were found (2018).

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As noted earlier, the more interaction there is with the user, the more the assistant learns, and the more personalized it can become. Personalization is an important factor in companies and marketers connecting with their audiences (Vesänen & Raulas, 2006). Amazon ultimately wants to build a “360-degree view” of each user and their buying and usage habits in order to refine their services, target products to you, and target their own and other brands’ ads to you through their music streaming service and flash briefings (Hildenbrand, 2018). At this point, Amazon isn’t sharing or selling much of that data. Marketers can, however, get data from any Alexa Skills they build, including usage- and user-based metrics such as user enablements, number of customers, and plays.

The few studies that have analyzed usage of voice assistants are primarily conference papers. This information systems research has indicated that Alexa is primarily used for quick information searches such as checking weather forecasts and news, entertainment such as playing music or telling jokes, and controlling other devices; that placement of the device seemed to influence the type of usage; and that overall usage seemed to trend down over time among heavier users (Lopatovska, Rink, Knight, Raines, Cosenza, Williams, Sorsche, Hirsch, Li, & Martinez, 2018). Sciuto, Saini, Forlizzi, and Hong (2018) study interactive design and gathered usage histories of 75 Amazon Echo households and then interviewed seven of them to better understand how they interacted with Alexa. They found a period of exploration and experimentation, then leveling out to stable usage with things like music (25% of commands), smarthome commands (15%), weather (5%), questions (4%), and timers (4%). The number of devices and placement of them in the home influenced their usage; more devices resulted in more daily commands, and devices in bedrooms and kitchens seemed to help with more specific

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goals, while living room devices was more open-ended. Usage was greatest before 9 a.m. and in the early evening. Parents in the study also mentioned moments of both apprehension and joy in seeing their children interact with Alexa. The study concluded with recommendations for improving the design of the devices (Sciuto et al, 2018).

Researchers are just beginning to explore what influences selection and acceptance of AI assistants. One model weighed the privacy-utility tradeoff and examined performance, privacy, and price as factors in acceptance, finding that privacy was the most important (Burbach, Halbach, Plettenberg, Nakayama, Ziefle, & Valdez, 2019). Different voice assistants have also been tested and compared in terms of effectiveness and usability (López, Quesada, & Guerrero, 2017), or analyzed in terms of security and privacy (Alepis & Patsakis, 2017).

Very little published peer-reviewed research has been conducted on voice assistants in marketing or advertising. A few studies in marketing and management have focused on developing and testing models for smart speaker acceptance. For instance, Kowalczyk (2018) focused on technology acceptance of smart speakers such as Amazon Echo and Google Home and developing an acceptance model for investigating consumers' intention to use smart speakers. Using netnography and SEM, the study moved past traditional technology acceptance model (TAM) constructs of perceived ease of use and perceived usefulness (Ajzen & Fishbein, 1980) to identify the quality and diversity of a system, its enjoyment, and consumer's technology optimism and risk (surveillance anxiety and security/privacy risk) as factors that strongly affect the acceptance of smart speakers. Enjoyment had the strongest effect on behavioral intention to use smart speakers. Yang, Lee, and Zo (2017) found that mobility, security/privacy risk, and trust in the service provider are important factors affecting the adoption of smart home services.

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Moriuchi (2019) found that a user's subjective norms, or beliefs that an important person or group will support a particular behavior (Fishbein & Ajzen, 1977), have an impact on perceived usefulness, perceived ease of use, and engagement with voice assistants.

There is still a significant gap in research, particularly qualitative research. An instrumental case study from Jones (2018) explored perspectives of marketers and advertisers considering Alexa skills and integrations for their clients. It introduced the Voice-Driven Brand Strategy framework to provide guidance for brands in an environment increasingly navigated with voice. It outlines an ongoing cycle of four core elements, brand actions, audience outcomes, brand outcomes, and brand opportunities. Brands must identify how they can improve a consumer's experience with their product or service by removing friction in a process or interaction, extending a brand experience to this voice-enabled platform, building on a relationship or expectation, or integrating with other products or devices. They should consider how an audience could receive greater value through simplifying a process or service, greater access to it, more relevant and tailored information, or greater control and convenience. Achieving those outcomes can lead to greater usage, attachment, and loyalty to the brand, and richer data, revealing more detail about an audience's needs or desires and even the ability to predict them.

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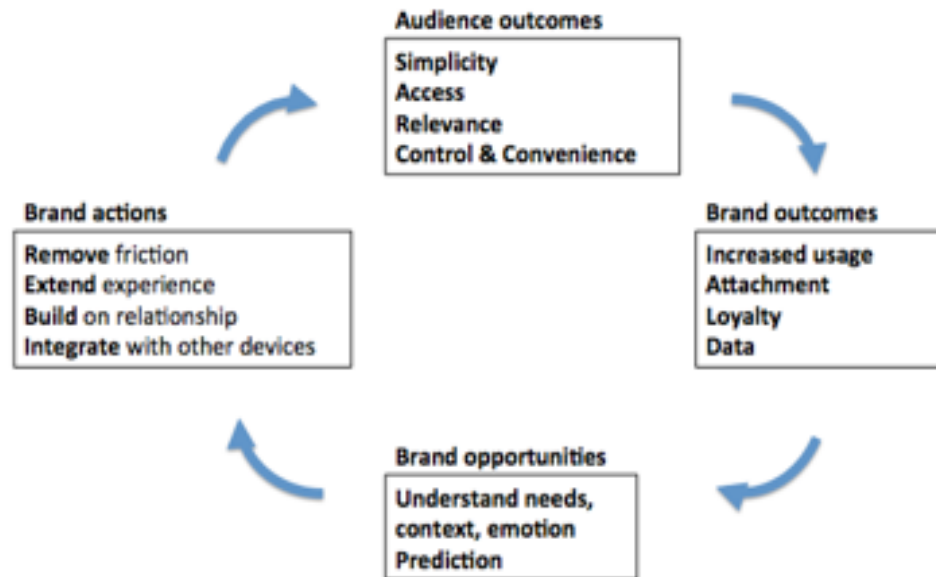


Figure 1. Voice-Driven Brand Strategy (VBS) Framework (Jones, 2018)

Lopatovska et al. (2018) suggested that scholars focus on engagement and motivation of AI assistant users, and the quality of the interaction, rather than its end result of what the user does or completes. In that vein, this research isn't trying to identify the most useful functions of Alexa or predict who will accept or adopt the technology. Unlike any prior study, this research is focused on what happens when Alexa is integrated into the home and what the interactions and experiences with the technology mean for the users. Alexa enables some of the most human interactions most people have had with a machine, and these human-computer, human-robot, or human-machine interactions will likely increase as technology continues to evolve. How does that influence the lived experience of those who share in this phenomenon? This study examines the meaning of engaging with Alexa through the lens of media and communications, regarding

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Alexa as a type of media or media experience. Thus, the theoretical review situates this study among key theories in mass communication, advertising, and marketing.

### **Alexa as Media**

**Uses and gratifications.** Media uses and gratifications theory helps explain why and how consumers engage with specific forms of media to meet specific needs (Katz & Foulkes, 1962). This perspective is rooted in the idea that consumers actively seek out various types of media, for specific reasons, rather than just passively “receive” it (Dolan, Conduit, Fahy, & Goodman, 2015). Different media, such as newspapers, magazines, television, radio, and the Internet, provide different types of gratifications ranging from utilitarian to hedonic, including knowledge enhancement, entertainment and relaxation, social interaction and reward or remuneration (Ko, Cho, & Roberts, 2005). Understanding why people seek out and use a form of media—voice assistants, in this case—has implications for what types of experiences advertisers, marketers, educators, and other audiences should craft to assist or connect with an audience.

**Engagement and experiences.** While uses and gratifications is a helpful framework, it has limitations in terms of understanding context, interaction, and consumer goals. The Calder-Malthouse set of experiences takes those factors into account (Calder & Malthouse 2004, 2005; Malthouse, Calder, & Tamhane, 2007). It focuses on the construct of engagement, measured by examining different types of experiences with media that lead to personal goal fulfillment. Understanding the ways in which an assistant satisfies the personal goals of the owner can illuminate unique experiences resulting from interaction with the device. Experiences have been shown to indicate engagement and ultimately help predict usage and attentiveness of, affective responses to, and ad effectiveness within various types of media (Calder, Malthouse, &

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Schaedel, 2009).

The table illustrates key experiences categories that help measure engagement with various types of media. Five primary types of experiences are transportation, civic orientation, interaction, discovery, and identity. These are based on a large set of interviews with 300 consumers who described their experiences with consuming media. Items were generated from those interviews, and the set of distinct experiences emerged after exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). Many are analogous to uses and gratifications identified by McQuail (1983). This study uses the Calder-Malthouse set of experiences as a foundation for exploring consumers' experiences with the media that are voice-powered AI assistants.

Table 2

*Calder-Malthouse Experiences; Uses & Gratifications* (Calder, Isaac, & Malthouse, 2016)

<b>CM Set of Experiences</b>	<b>Definition</b>	<b>U&amp;G Theory Analog</b>
<b>Transportation</b>	To escape or become diverted	Entertainment
<b>Civic-orientation</b>	To contribute to society	
<b>Interaction</b>	To connect with others	Integration and social interaction
<b>Discovery</b>	To gain insight, knowledge, or skills	Information
<b>Identity</b>	To affirm or express one's identity	Personal identity

Table 2 Calder-Malthouse Experiences; Uses & Gratifications

## CHAPTER 3

### Methodology

#### Rationale for Qualitative Design

A qualitative approach was used to explore these questions of how consumers interact with AI assistants and what the unique characteristics of the experience are. Qualitative designs are used when researchers want to understand the experiences of people and the meaning they attribute to those experiences (Merriam & Tisdell, 2016). They move beyond the “what” of quantitative research and explore questions of “how” and “why.” Philosophically, qualitative research is rooted in the ontological assumption that multiple realities exist, and that understanding and reporting these realities is valuable. From an epistemological perspective, getting close to participants and assembling the data they provide is the foundation of knowledge-- as Creswell says, “knowledge is known through the subjective experiences of people” (Creswell, 2013, p. 20). Qualitative research, then, fundamentally enables us to create knowledge.

There is also a call for more qualitative research, particularly in advertising. While quantitative research is much more common in peer-reviewed advertising journals (Chang, 2017; Kim, Hayes, Avant & Reid, 2014), Belk (2017) notes that, in a climate in which quantitative data is more readily available than ever, the need for qualitative research is greater than ever. While quantitative research provides factual information, qualitative research can explain why consumers are behaving the way they are and the meaning ascribed to their behavior (Belk, 2017). The research questions of qualitative research cannot be tested deductively; rather, the



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process is inductive, moving from specific observations to a broader understanding, with insights emerging from the data gathered in the field. As Morse (1994) points out, “The lab of the qualitative researcher is everyday life and cannot be contained in a test tube, started, stopped, manipulated, or washed down the sink.”

### **Research Design**

To create knowledge in this study, a phenomenological approach was used, which focuses on describing a phenomenon or experience shared by a small group-- a criterion sample-- and the meaning of that lived experience (Creswell, 2013). This small group usually consists of 5-25 people. Phenomenological research is well suited for developing practices or deeper understanding about the elements of a phenomenon, which is why it was selected for this study. Csikszentmihalyi (2002) suggested that phenomenological study is “the clearest way to examine the main facets of what happens in the mind” (p.25). Phenomenology is very focused on the participant experience and particularly useful for affective and intense experiences (Merriam & Tisdell, 2016). Data is gathered primarily through interviews in order to capture the experiences of participants in their own words (Creswell, 2012). This approach also illuminates what “contexts or situations influenced or affected [their] experiences of the phenomenon” (Creswell, 2013, p. 81).

The type of phenomenology applied in this study is known as psychological or transcendental phenomenology, developed by Moustakas (1994), which focuses strongly on a description of the experiences by the participants, rather than the interpretations of the researcher (Creswell, 2013). Throughout the process, there’s a concerted effort to be objective, as researchers “bracket” their experiences to try to objectively view the phenomenon (Creswell,

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2013). Moustakas refers to this as “*epoche*,” in which “the everyday understandings, judgments, and knowings are set aside, and phenomena are revisited, freshly, naively, in a wide open sense” (Moustakas, 1994, p. 33).

The data analysis procedure begins “horizontalization,” or identifying “significant statements” or direct participant quotes that illustrate how the phenomenon was experienced (Moustakas, 1994). These are then organized clusters of meaning, or themes, which, through the process of Transcendental-Phenomenological Reduction, are used to develop textural descriptions outlining what participants experienced (Moustakas, 1994). Then, structural descriptions illustrating how they experienced it-- the conditions, situations, or context that precipitate or connect with it-- are developed through a process of Imaginative Variation (Creswell, 2013; Moustakas, 1994). The aim of phenomenological inquiry is not to construct empirical generalizations, establish functional relationships, or develop theory with which to predict or control, as van Manen (1990) notes, but rather to enable plausible insights to be generated, bringing us in more direct contact with phenomena. The ultimate goal is to reduce the data provided by the participants through interviews and describe the essence of the shared experience, the common elements across the small group.

Phenomenology is particularly appropriate for exploring experiences with technologies that are being integrated into one’s daily life (Cilesiz, 2011). Indeed, in the realm of education technology research, this approach is regarded as especially useful by:

1. Enabling the study of experiences with technology in-depth and in a multifaceted and comprehensive manner;
2. Providing a unifying framework for a research agenda on experiences with technology;

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3. Providing a theoretical and philosophical framework as well as a consistent methodology and methods;
4. Providing clear guidelines on sample selection, data collection, data analysis, ethics and validity, which would facilitate its adoption in the field; and
5. Generally strengthening the qualitative basis of educational technology research (Cilesiz, p, 494, 2011).

### **Participant Selection and Description**

Criterion sampling was used to recruit participants who were early adopters, described by Rogers (1962, 2003) as the second-fastest group to adopt a new technology, requiring all participants to have experienced this phenomenon of using an Amazon Echo in their homes for at least six months. Five participants were recruited initially through a purposive sample, with emails inviting them to participate in the study. Snowball sampling was used after that, identifying seven more cases of interest that were information-rich, and emailing them to participate as well (Miles & Huberman, 1994). Eleven participants agreed to join the study. This aligns with guidelines for phenomenology; Polkinghorne (1989) suggests including 5-25 participants, and Dukes recommends studying 3-10 participants (1984). To “allow the full emergence of the phenomenon in all its aspects,” two participants were interviewed who owned an Echo but currently had it unplugged (Stevick, 1971, p. 135).

An aggregate description helps paint a general picture of the participant pool. The sample consisted of Alexa users between the ages of 27 and 69, with most under the age of 44. This aligns with the limited demographics about smart speaker ownership, which shows that 63% of smart speaker owners are 18-44 (Kinsella, 2019). A little over a quarter (27%) of the participants

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were male, and 73% were female. Female participants tended to share richer, more detailed descriptions, which is why they comprised the majority of the sample. Nearly three quarters (72%) of the participants lived in a small Midwestern city, and the remaining participants lived in large cities across the country. Most (73%) were married, nearly half had children, and all were college graduates.

Table 3

*Participants*

Participant	Alias	Age	Gender	How long owned it	Job	Children in HH
Interview 1	Gloria	34	Female	8 months	Teacher	No
Interview 2	Troy	35	Male	1 year	Researcher	2 yo
Interview 3	Edna	41	Female	2 years	Nurse	Yes, 3 and 8
Interview 4	Tim	30	Male	9 months	Interactive designer, author	No
Interview 5	Eleanor	29	Female	10 months	Membership coordinator	No
Interview 6	Ruth	69	Female	3 years	Retired entrepreneur	Grown kids
Interview 7	Marty	27	Female	1 year	UX	No
Interview 8	Lisa	31	Female	6 months	Account executive	No
Interview 9	Alice	30	Female	5 months	Manager	Yes, 1
Interview 10	Selma	44	Female	2 years	Marketer	Yes, 12 and 10
Interview 11	Dan	28	Male	1.5 years	Fundraiser	No

Table 3 Participants

The focus of phenomenology is on the world as lived by a person, not the world or reality as something separate from the person (Valle, King & Halling, 1989). With that in mind, each participant is briefly described, in order to provide context for his and her experiences with the phenomenon. Gloria is a married teacher with no children. She has an exuberant, fun-loving personality and cracks jokes often. She got her Echo because it seemed cool and fun, and she thought it could be useful for music. Troy is married with one young child, and is a researcher. He is a tech-savvy early adopter who likes to build things, and got his Echo because of the novelty; he wanted to tinker with it and try other smart products. Edna is a nurse and pragmatic,

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married mom with two children. She's the primary caregiver; her husband works often. Her husband is another early adopter who got it because he thought it would be cool and he could play music with it. Tim is an interactive designer and author, living with his parents while he launches his startup. He got it as a gift for their home and to give them a taste of the future, as he put it. He's a visionary, an innovator, and wanted to test it and break it. Eleanor is a single urbanite whose whole family is into Amazon Echos. She is curious and creative, enjoying pursuits from flower arranging to cooking. Eleanor got it primarily to act as a speaker and source for weather, but sought out additional uses, following recommendations from Amazon packaging and from other users. Ruth, a modest, down-to-earth retiree, former small business owner, and grandmother, received it as a gift from her children. She had few expectations initially but now has multiple devices in order to use it as a speaker, primarily for radio and audiobooks. Marty is a married user experience designer living in the Midwest who seems to think fast and talk even faster. She's a do-er; even sitting still for the interview seems almost unnatural to her. She just thought an Echo might be fun. Lisa is a single account executive working a stressful job in a large city, a rising star who's focused on and managing a lot in her career. She travels often, and got it to act as a speaker in her apartment when she saw so many others getting them. Alice is a married new mom, a self-described "late adopter" who works in finance as a manager. She did not seek Alexa out; she received the Echo as a gift from work. She is very thoughtful, conscientious, slightly reserved, almost philosophical, and at the end of the conversation, was the only person who asked about themes that were emerging. Selma is a savvy bilingual global marketer working in the cybersecurity space. She has two children and lives in a large city

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outside the Midwest. Dan is a practical, young, married fundraising/ development officer who travels a lot. He got it to play music because a friend loved it.

### **Data Collection and Analysis**

Data was collected in fall 2018 and spring 2019. Semi-structured interviews were conducted with study participants, with each interview lasting 45-60 minutes. The interviews were recorded on the researcher's iPhone or computer, and notes were also taken during the interviews. Each interview was transcribed as soon as possible following the commencement of the interview.

Interview is a common data collection procedure across all forms of qualitative research, allowing the researcher to learn about participants' experiences in their own words. It is generally the primary form of data collected in phenomenology (Creswell, 2013). The questions asked in an interview are open-ended and seek to aggregate perceptions or knowledge across all participants in the interview process. They provide a framework for the interview discussion and are developed in advance; however, there is greater flexibility in this data collection method than other forms including quantitative research. All of the questions were asked of the participants, with follow-up, probing questions asked to help illuminate greater detail about the participant's experiences (Appendix A).

In keeping with the approach of Moustakas (1994), the first step in the process of phenomenological reduction is to bracket biases and prejudgments, in the process known as *epoche*. This researcher's own bias is having been a digital media strategist in advertising agencies before becoming an assistant professor of advertising. Part of the job was to help clients determine how to use new kinds of media to accomplish their brand's goals. This researcher has

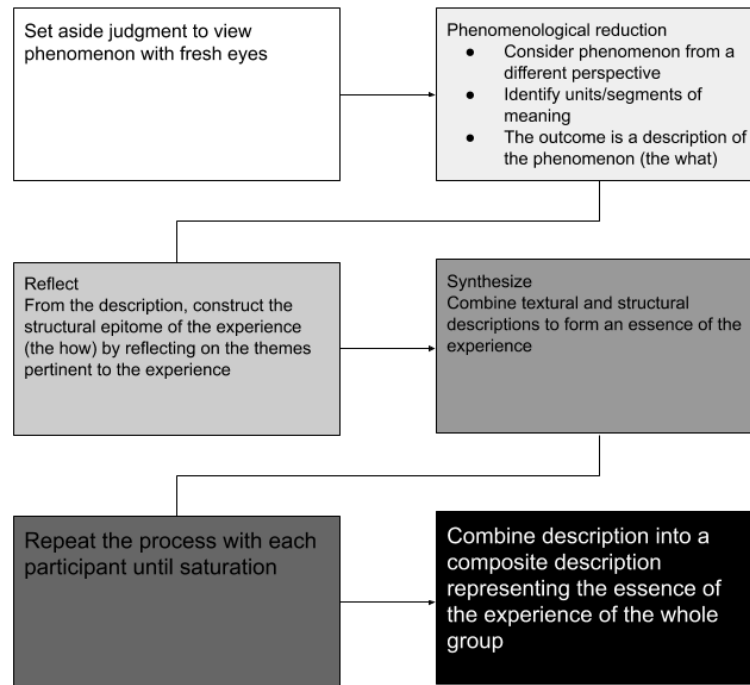
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run digital advertising campaigns with a variety of media and created digital experiences for clients for years. She now teaches courses in branding, media strategy, and digital insight and analytics, all of which are relevant to this paper. Interest in determining how to use AI assistants, as well as personal experiences with using an Amazon Echo in the home, was put aside, and the focus instead was on listening to the experiences of the participants and being open to the meaning that emerges from the shared phenomenon of interacting with these AI assistants.

The researcher used a reflective process throughout the study to analyze the participant responses to the researcher's experiences. In a reflective process, the researcher goes back to examine the research which provides opportunity for revising questions and re-frame the research topic as the project unfolds. It is a process for examining both oneself as researcher, and the research relationship (Agee, 2009).

In the next steps of phenomenological reduction, the researcher pored over the eleven transcriptions and identified significant statements about how the phenomenon was experienced in the process of horizontalization, highlighting statements in the transcript and taking high-level notes on each interview. These statements were then grouped into themes, which led to the development of rich, thick textural descriptions of what the participants experienced and structural descriptions of how they were experienced. These descriptions of "what" happened and "how" it was experienced were copied into separate columns in a Microsoft Excel spreadsheet. Finally, common elements were identified that comprised the essence of the shared experience and meaning of interacting with Alexa in the home.

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*Figure 2.* Phenomenology Process

### Validation Strategies

A number of validation strategies were employed to help document the “accuracy” of this study (Creswell, 2013, p. 250). First, triangulation was used, studying evidence from multiple sources in order to illuminate the perspectives and themes uncovered in the study. The multiple sources include multiple participants who have experienced this case as well as other documents, such as online articles and digital content, to help serve as a check.

Rich, thick description is a cornerstone of qualitative research, and care was taken to provide abundant detail in this study. This enables the reader to understand the transferability of



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the study (Creswell, 2013). Researcher bias was acknowledged through bracketing earlier in this study.

Member checking was also used to help evaluate the accuracy and credibility of the preliminary findings or analyses. In this process, the researcher connects with participants again and seeks out their views on the interpretation of the account thus far. This is generally regarded as a critically important step in qualitative research, since the whole goal of qualitative research is to understand the experiences of people and create knowledge rooted in those subjective experiences. In fact, of all commonly used validation strategies, Lincoln and Guba (1985) cite member checking as “the most critical technique for establishing credibility” (p. 314). This process can be done many different ways, by emailing transcripts, summaries of interviews, or preliminary analyses to participants and asking for feedback, or by participant focus groups (Creswell, 2013). In this case, preliminary analyses were emailed to participants.

**IRB/ethical considerations.** Ethical practices and appropriate treatment of participants is always of great concern. This study was approved by the IRB, and does not involve any at-risk or protected populations or more than minimal risk to the participants. The informed consent form was sent to the participant via email once the participant responded and showed interest. The purpose of this document is to inform participants about the goals and procedures of the study, the purposes and uses of the data, and their rights to withdraw at any time without negative consequences. Participants signed, scanned, and emailed it back to this researcher.

Confidentiality and protection of data is also a priority. The participant interviews were recorded on the researcher’s iPhone, which is password-protected, or computer. This researcher

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was the only person with access the recordings. They will be destroyed within one year of completion of the study by deleting them from the devices.

All records were kept confidential by assigning an alias rather than specific names on each record. All interview data was edited to remove references to specific people to ensure complete confidentiality of interview data. This researcher kept a physical (not digital) list linking names and aliases in a locked file in her office; no one else has access to the information provided. After completion of the study the list will be shredded. No real names were used in any computer files or stored on any server.

Most of the material is in aggregate form. Individual quotes were used from some participants, who are referred to by their alias and general description in the findings (gender, age, occupation).

## CHAPTER 4

### Findings

The purpose of this study is to explore the lived meaning and shared experience of having an AI assistant in the home. The central research question is: What is the meaning of the experience of using a voice-powered AI assistant in the home? Subquestions related to this overarching focus include:

RQ1: How do participants describe the experience of engaging with voice-powered AI assistants in the home?

- What kinds of experiences do people have with AI assistants?
- What kinds of personal goals do users wish to fulfill through interacting with AI assistants?

RQ2: What conditions or contexts influence how voice-powered AI assistants are experienced?

- What factors facilitate or inhibit usage of the voice-powered AI assistants?
- What is the context that supports the continuation of (or changes to) the level of usage of in voice-powered AI assistants?
- What are the intervening conditions that influence the level of usage of in voice-powered AI assistants?

RQ3: What are the implications of these findings for advertisers, marketers, and society?

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**What Happened**

Participants describe what happened through the phenomenon of engaging with Alexa in terms of three overarching kinds of experiences. Alexa provided value and helped users achieve goals by:

1. Removing friction, enabling easy access and becoming a seamless gateway to content, such as music, news, recipes, and weather. Removing friction facilitates the next level of engagement, of enabling personalization.
2. Enabling personalization, helping each user fulfill their unique needs, wants, and goals through the content and capabilities accessed, such as creating a certain atmosphere or mood or enabling other activities through music; customizing an environment through smart home routines; and enabling users to capture thoughts and create their own helpful content and systems through lists and reminders. This personalization can lead to the next level of engagement, of extending self and enriching life.
3. Extending self and enriching life, allowing users to extend their own presence and capacity, accomplishing things for users so they can be doing something else, helping them simplify processes that streamline their worlds and feel supported with assistance with time-consuming, time-managing tasks and companionship.

These types of experiences aren't distinct; they overlap and intersect, and enable more specific goals to be achieved. With Alexa, the goals users started out with didn't always end up being the goals that were fulfilled; there are those goals that were intentionally fulfilled and those that emerged as being fulfilled as they came to understand and use the AI assistant and integrate it into their lives. Since the Echo ecosystem is expanding and building capabilities every day,

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goals, expectations, and uses change. Two themes emerged from the explicit and implicit goals that interaction with Alexa satisfied for users: “Helping **do**,” focused on functional elements or tasks that Alexa performed, and “Helping **become**,” encapsulating the transformative results of experiences with Alexa enabling users to become better versions of themselves.

Table 3

*Types of experiences, themes and goals of engaging with Alexa*

REMOVING FRICTION	PERSONALIZING	EXTENDING & ENRICHING
Helping <b>do</b>		Helping <b>become</b>
Providing convenience & instant gratification		More free & focused
Entertaining & informing		More capable
Personalizing		More connected

Table 3

**Helping do.** By removing friction and connecting seamlessly to content, Alexa assisted users with “doing” the following types of tasks and goals:

- Providing convenience and instant gratification
- Entertaining and informing
- Personalizing and customizing

*Providing convenience and instant gratification; entertaining and informing.* As Lisa said, “It [Alexa] has simplified it [life] and sort of streamlined aspects of my life that just got in the way before.” A common refrain among Lisa and other users was how having Alexa led to

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them listening to music more. This was due to the Echo's fundamental design as a speaker, easy access to music through voice, and the utility of not having to pull out their phones. Further, Alexa can simply select music for the listener, without the listener having to decide on a specific song or artist. This removes the friction of that decision as well. Gloria said:

Before that [Alexa], I'd usually listen to Spotify and put phone in bathroom and leave the house and would already be at 60%. It saves phone battery and I like the randomness of it. Use it a lot when I do work in the living room and play classical music, and my husband calls me pretentious, but it just helps focus and I'm not wasting my battery, having to click around. Just that instant gratification of "play the Lumineers," or whatever, and it just happens, instead of me spending 10 minutes scrolling through Spotify deciding what playlist I want to listen to, what I'm in the mood for. Just that convenience. I feel like life is better.

Users who had more than one Echo enjoyed even more convenience, as well as an added benefit of synchronicity. Ruth pointed out that she listens to the radio more because, as she said, "I can have it in several rooms. I use it to listen to my audio books and I love that it's synchronized there --that it can pick up across devices and know where I am." This also illuminates one of the contextual factors that will be discussed later, the number of devices users own and where they are placed.

The easy access to content also made life more convenient by removing the need to use smartphones as often and making it simpler to get information. Lisa said:

You spend the whole day on a computer and like most people, I'm addicted to my phone, and there are certain things on my phone that I hate doing like when you want to click

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into apps that it takes like four or five clicks or taps to set an alarm. There's just stuff that should be easier that isn't. The weather forecast always takes forever to pull up; I mean it's probably five seconds but it seems like forever. I keep saying there are mild annoyances but they really are. They get on my nerves. I would not check the weather just to save those five seconds and then step outside and get rained on. Now I am not having to worry about that. It's just so easy. I do it every morning. It just sort of dovetailed into parts of my life that before weren't as easy of a fit.

Users who interacted with Alexa frequently became reliant on the seamless access to information, developing new routines and habits that replaced smartphone usage and increased knowledge. Eleanor said:

It's becoming part of my routine, talking to her, asking her questions, not having to look these things up myself or having it be hands-free and being able to do other things while I'm asking her questions and getting information while I'm running around the kitchen for this or that. It makes things much easier just having access to this vast information that quickly and that readily is really amazing. Like no longer having all of this information at your fingertips, because I don't even have to touch anything; all I have to do is ask and she tells me, out loud.

Eleanor went on to say, "She's always there and I'm always asking her questions. The wi-fi went out one day and she was down, and I'm like, what am I supposed to do? Oh, use the phone, right."

In a media environment in which fewer people are watching the news on TV or reading it in the newspaper, and people are constantly multi-tasking, the convenience of accessing it

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through AI assistants provides new opportunities to media outlets and to consumers who want to be more informed. As Eleanor remarked:

Access to news these days sounds like it's really easy, you get notifications pushed to your phone all of the time, but you have to see them and find time to read them, you can watch news on your local stations but it's hard if you don't have political stations or cable, but Alexa gives you such a quick breakdown of everything. Say "three things" and she gives you three things in news, like paragraphs; if you say what's the skinny, she gives you the entertainment news; there's something you say for sports news and she gives you that. She gives you really quick breakdowns that you say ok now we're getting more information than we would have known or that it would have taken longer to figure it out or to find the information. That is where I find out a lot of random things that I didn't necessarily know.

***Personalizing.*** Not only does Alexa remove friction, but it also enables users to take a next step and personalize their experiences and atmosphere. This ranged from playing classical music to help focus while working, as Gloria noted earlier, to playing pop music when friends come over for a party. As Gloria said, "It just kind of changes or creates a different environment in our house." Gloria titled her life with Alexa, "Ambiance." She explained, "It's just because of the way that we use it—it just kind of changes or creates a different environment in our house. And it's not- definitely not the center and the forefront of everything we think and feel and do in our home, but it generally adds something positive to it."

Another positive, personalized element it can add to the home is the ability to customize one's own lists and reminders. Dan said:



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I tend to forget lots; I have lists everywhere. Life now-- there's a certain peace of mind there, if I don't have my phone handy, that I can ask Alexa to remind me or do something for me. It's the convenience of if I don't have another device handy and I'm busy I can just do what's top of mind.

Dan went on to say that it allows him to continue doing what he's doing and "focus on other things at hand." Similarly, Ruth sets multiple timers and reminders "so I'm not lost in the week – whatever I'm reading or writing."

"Everybody's trying to earn back a few seconds, for better or worse," Dan pointed out, and Alexa helps users do that in ways customized to their lives and their needs. In our time-stressed society, earning back a few seconds can have real meaning and value.

Troy was the first participant to mention integrating Alexa with other smart home products to maximize convenience, and personalizing his environment that way. Troy said:

The Echo replaced the phone and made smart home pieces way more useful. An app that controls lights in house is no better; you're just using tech to turn on light. But the ability to set schedules, turn off outside lights makes this a more useful evolution of smart home tech. The voice activated was a missing link in the smart home stuff.

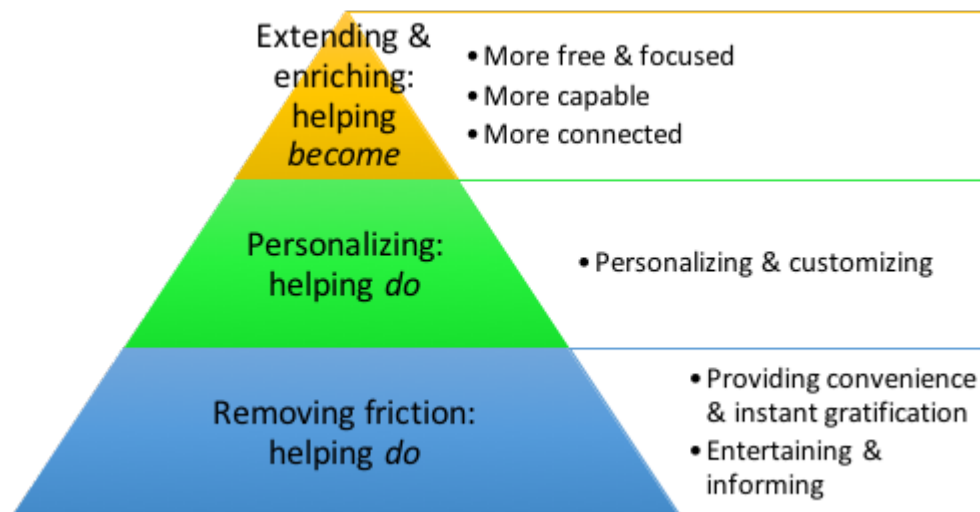
The ability to personalize and customize their media experience and environment, making it more "theirs," provides a deeper meaning of feeling understood. As with a person, that can provide a basis for a deeper relationship, greater engagement, and, perhaps, opening a path to "eudaimonia," experiencing life as being meaningful. Troy said:

It's good that it can activate things but the other thing is the understanding of YOU.

You're not just using device to activate things, it understands routines.

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Alluding to the personalization and understanding of the user, Troy titled his experience, “Alexa, Play **My** Music.”



*Figure 3.* Emergence of meaning and relationship between types of experiences, themes and goals of engaging with Alexa and usage

**Helping become.** As indicated earlier, having Alexa “help do” things can enable users to stay focused on the more important thing they’re doing-- work, packing, etc-- without having to interrupt their lives and look something up, write it down, or scroll through options. This ability for Alexa to act as an extension of themselves can make life easier, even improve it, creating meaning and experiences that seem to move past the satisfaction of the functional completion of tasks, “helping do,” into the fulfillment of “helping become” something more. This level of experiences suggests that having AI assistants in the home, interacting with an AI assistant, was a conduit to improving users themselves or their lives, making them more meaningful. This wasn’t true for everyone, but those who used Alexa more and integrated it into their lives, Alexa helped them become more.

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By extending users themselves, Alexa assisted users with implicit and explicit personal goals of achieving more, and “becoming” the following:

- Free and focused
- Capable
- Connected

*Become more free and focused.* Personalizing one’s experience with Alexa, having it “help do” by setting reminders, creating lists, and developing routines, as noted earlier, can lead to a greater sense of accomplishment and identity by extending one’s own presence and both physical and mental capabilities. As Edna said, “You can tell it to do stuff. You don’t have to write everything down.” She titled her experience, “A Hands-Free Home.” The hands-free nature and ability to do things for users so they can be doing something else can help people become more free and focused. Lisa said:

It does sort of allow a little bit of greater freedom in the home to not feel like you have to have a phone on your person all of the time. I don’t like carrying around my phone everywhere; I like to set it somewhere—within reach but somewhere away-- and not think about it for a while. So I can be on the other side of my apartment and feel like doing something and she’ll do it.

Edna: With the timing feature it’s really handy; the shopping list is nice; pairing with other devices like lights and fan is nice, too – just making the home “hands-free.” We do that a lot with, like bedtime. We say, “OK, you have 20 more minutes before you go to

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bed. You can play Legos for 20 more minutes. “Alexa set the timer for 20 minutes” and then when the timer goes off, [my son] knows he has to go brush his teeth.

***Become more capable.*** The always-available, voice-activated nature of Alexa can also enable more effective household management for users, from busy parents to busy single executives, helping them achieve personal goals of becoming more efficient and organized, improved versions of themselves due to this tool of AI assistants that helps extend their capabilities. Edna said:

I think it helps me be a more efficient parent. I read somewhere that a lot of parenting is just telling kids how many minutes they have left to do stuff, and that’s pretty much the truth, and so you set Alexa to have her go off and it’s like, OK, child, you need to brush your teeth for a whole two minutes.

Lisa: As a person who becomes increasingly brain-fried, there’s a lot that enters and exits my brain at any given moment. When I have a thought, I need to capitalize on that thought, otherwise I will lose it forever. OK, “Hey, Alexa, you remember for me.” It works better with the fast pace of stuff and thoughts moving through my head. You can act on those little things in a way that you couldn’t or wouldn’t otherwise.

Edna: I think a personal goal is always to be able to be a little bit more organized and with the To Do list shopping list the house is more organized, and then just timers and alarms and notifications for things to remember fit into the category of getting more organized and it’s also for convenience.

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Lisa: In a more complex world, it just makes life easier. I think a lot of people are trying to simplify their lives from the daily processes that they have. For me it has fulfilled that goal even though it maybe just saves me 60 seconds a day, it's just a mild annoyance that I don't have to deal with anymore.

Lisa went on to title her experience, "The Life-Changing Magic of Artificial Intelligence." She recognized that Alexa only influences a few small aspects of her life now, but found that just making those small aspects of her life so much easier led to her now "singing its [Alexa's] praises."

Becoming more capable isn't just limited to efficiency and organization, though. One participant had a goal of becoming a more accomplished cook, which again, the hands-free accessibility and variety of capabilities of Alexa helped her achieve. Eleanor said:

I've learned a lot of recipes so that's good. Because before I'd go on Pinterest and pin recipes and have to pull them up and that wasn't very effective because I'd have to, like, scroll up and my hands were messy, and I wanted to get better at cooking and learn more. Now I can just say "Check my timers" and she'll check the amount of time left on each one and so those are all really really helpful things in my goal of learning to cook better.

***Become more connected.*** Experiences heavier users had with Alexa helped facilitate connections as well, both with people they shared their home with and, for those living alone, with the device itself. For example, the utility and convenience of easily accessing music enabled

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users to personalize their environments, and create an environment more conducive to conversation. Gloria said:

My husband and I spent most of our evenings sitting on the couch on Twitter or something. But he really likes to watch sports and hates all of the shows I watch and makes fun of all of the acting. So if he's watching his shows which are sports I make him put it on mute and we listen to music on Alexa. It brought us kind of value and closeness because it's way easier to have a conversation when a basketball or football game is on when there's just music in the background as opposed to when there's sports talk happening.

Users with children in the home spoke of their interest in and enjoyment of watching their children interact with Alexa, and using it together, to share music they enjoy, have it tell jokes, ask it homework questions, try to stump it, and play trivia games. Children influenced usage of Alexa, another contextual factor discussed later.

The heaviest users also created a sense of connection and companionship with Alexa. This isn't an explicit goal they had; rather, the relationship emerged as interaction increased. The more the AI assistants are used, the more anthropomorphization seems to occur, and the more meaning seems to emerge from the interactions, though that could also be the other way around.

Eleanor said:

I knew that she could play music and I knew that she could tell me how warm it would be outside because of others having her, but I didn't know that I could chat with her and that she would have a funky personality. That was really cool.

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And also I could talk to her like she's a person, and I didn't have that expectation so that's pretty cool.

Eleanor went on to say:

Honestly, I want to put more of them in other rooms so I can use it while I'm getting ready in the morning, putting on makeup – just the small ones that I can even just talk to so I don't have to go to the kitchen. I'm pretty reliant on it.

Then, Eleanor said:

It's fun, it's informative, it's also playful – kind of like the Ironman-Jarvis relationship.

It's like having another person in the house with a lot of knowledge.

Eleanor titled her experience, “My Know-it-all Friend in the Kitchen,” and concluded the interview by saying, “I miss her when I'm away.”

### **How it Happened**

**Conditions and contexts.** It's important to place findings within a larger context of the phenomenon. While textural descriptions reveal what is experienced by participants in a phenomenon, structural descriptions illuminate how the phenomenon is experienced. A number of common conditions and contexts influence how voice-powered AI assistants are experienced. Some of these were pre-existing, before the AI assistant was acquired, and some were experienced in the process of interacting with the assistant.

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Table 5

*Existing and experienced conditions*

<b>Existing conditions</b>	<b>Experienced conditions</b>
Attitudes toward technology, data security, privacy (sociotechnical attitudes)	Sense of control
Prior experiences with technology	Feeling understood
User personality	Length of ownership/ relationship
Individual motivations and expectations	Influencers
Environmental factors	Activities

Table 5

***Existing conditions.*** A number of existing conditions factored into experiences with the AI assistant, including existing attitudes toward technology, privacy, and data security, influenced by participants' jobs, expectations, and prior experiences; participant personalities; individual motivations; and environmental factors such as the location of the device in the home, number of devices, and presence of users in the home.

*Attitudes toward tech, data security and privacy.* Alice, who got it as a gift from work, described herself as “a 30-year-old woman who doesn't trust technology.” She used the device for a few months and decided to unplug it. She said, “Honestly, it feels like we're not ready for the future, like we're technology-averse, my husband and I. I'm sure that a lot of people who have these devices in their home haven't really given it a second thought, other than it makes things easy and it's awesome. Not that they haven't considered these implications but don't seem to be concerned about the implications in the same way that we are. I feel like we're like those



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people who, when television first came out said, it's going to rot your brain." Indeed, she titled her experience with Alexa, "We're Not Ready for the Future."

This highlights the critical factor attitudes and personality play into how using Alexa is experienced, as well as the level of usage and continuation or cessation of usage. Edna, on the other hand, has a different relationship with technology, and different goals. As a mom with two kids, she said:

Everybody has their own little system for stuff and not everybody's looking for something like that, but for our family – we're pretty tech oriented – it [Alexa] works well for us.

Edna's pre-existing attitude toward technology, and the fit and role of technology into the lives of her family, facilitated their initial and continued use of technology.

*Data collection, security, privacy.* Privacy is a major concern with technology. From using Facebook to smartphones to Alexa, many tech users today find themselves weighing tradeoffs and balancing the potential benefits with the potential risk, particularly with new technology and forms of media. Lisa said:

One of my chief concerns was sort of the big brother aspect of it, and I think when I sort of weighed the pros and cons, the ease of use have outweighed my concerns about the government snooping on me or like companies having all of my data or whatever.

That was a common theme among Alexa users and users of many new technologies--convenience trumps privacy. While Dan suggested that there was a generational difference, noting, "I'm probably of the generation that prioritizes convenience over privacy," no

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generational difference was found in this study. Alice, a new mom, is 30, and felt that the value received from Alexa didn't outweigh the lack of privacy she felt it brought into the home. She said, "I wouldn't ever try to dissuade someone from having it, but it doesn't necessarily align with what we want to have in our house. It adds a lot of convenience for a lot of people; I just don't think that that benefit is there for us."

Jobs, expectations, and prior experiences seemed to factor in heavily to attitudes among users who didn't use Alexa as much or at all anymore. Selma titled her experience with Alexa "A Cautious Courting," and said:

By virtue of working for the company I do, being in that space, the cybersecurity space, security and privacy is a big deal to me, so I think about it a lot. Maybe that's why I don't use it [Alexa] a lot, because I'm hesitant about what's going to happen once I fully leverage all of the capabilities.

Alice said:

I am concerned about my privacy, basically because I have no expectation that information that is supposed to be private and secure is going to remain that way. And the reason for that is that I was impacted by the Experion breach and also by a breach that happened about three years ago that involved several million government employees. It [not having Alexa] is my way of limiting to a small degree what information I'm putting out there.

Attitudes of heavier Alexa users were much different than that. Common themes about data collection, security and privacy among heavier Alexa users were the idea that data

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collection or breaches weren't controllable or worth worrying about, and that they didn't have anything to hide anyway-- the value or significance of their data wasn't very great. They described themselves as the kind of people who just aren't prone to worrying about things too much. There was a general feeling of ambivalence among most Alexa users, and acceptance of or resignation to data collection and surveillance. These kinds of attitudes were important conditions for the continued use of Alexa. Gloria said:

It doesn't matter what bunker I build, if somebody wants my information they're gonna find a way to it. So I just try to not worry about things I can't control.

Edna said:

I just don't think that if anyone were to access our data that they would find anything that was interesting at all, so that makes me not think about it so much. If some Russian hacker wanted to be like, oh on Oct. 11 we asked Alexa to tell us a joke 5 times, I don't know how that would harm us in any way.

Lisa said:

I'm such a regular citizen that even if they are gathering information, they would not get anything of value except what a 31-year-old single female does in the evening. I think at this point I just really know that Apple and all of these companies like Facebook are gathering all of this data on me and I just choose to turn a blind eye but yeah, the only time I worry about it is with work stuff.

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Troy said:

We live in a world today that you can't hide your data from other people. The only way is to quit participating in society, but I don't think that's good. As long as I'm not doing sneaky shit, that's the best defense.

Edna said:

I honestly do just assume that there is data-gathering from Amazon, but I really don't care because it's not personal information. I'm not like telling Alexa my medical records or anything.

While most Alexa users felt like data breaches were out of their control and not worth worrying about, another important condition was a sense of self-efficacy, that they could fix or work through anything that went awry. Gloria said:

I've just grown up with tech and know that data breaches happen and it's like, ok, if somebody can somehow steal my identity because Alexa has been listening and got hacked, it's going to be a pain in the butt, but I'll figure it out.

Marty said:

Maybe I should [worry] but I don't. I don't worry about what's on my computer either, but maybe I should. Anything that I care about I can usually get back under control pretty quick. If I worried about it, I would spend way too much time worrying about it.

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In terms of motivations and expectations, many who purchased Echos were just interested in new technology, or had heard about them and thought it would be interesting to try one and experience it for themselves. Those who didn't seek it out and got it as a gift were generally more reserved in their use. Troy noted that he wanted it for the novelty, and having something new to tinker with, and those relatively low expectations were exceeded and have resulted in continued use. Tim, on the other hand, was motivated to buy it because he designs those sorts of interfaces and interactions and wanted to test it and break it. His expectations were high, and he was able to break it easily, ending up being disappointed in its abilities and not using it much.

*Environmental factors.* Finally, environmental factors such as the time of day, physical location of the device in the home, number of devices, and presence of users in the home made a difference, and helped facilitate or inhibit usage of the device. Users tended to use Alexa most in weekday evenings and weekends, unless a morning routine was set up. Selma explained that the majority of her family's usage is during the weekend, "when we're actually relaxed and doing things around the house." She said her kids use it after school, but "I rarely do-- I'm too fed up with real people."

Those with more than one device in prominent locations in the home often used them for streaming audio, from books to music, so it was seamless, and placing Alexa in less prominent positions was related to less usage. Selma said:

We used it way more the first week- played music, asked questions trying to trip it up, positioned in a prime spot. Right now it's on the back counter, by the sink, and we can't

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see it. Like any other toy- we're gonna get over it and move on. We use it more now for homework questions, like the 7th grade curriculum.

Who was in the home mattered as well, such as the presence of kids, or friends, or how often adults were home versus traveling or at work.

***Experienced conditions.*** Two primary conditions emerged through participants' experiences as requirements for continued use: a sense of control over the experience/ household, and a feeling of being understood.

*Sense of control.* When there was an unexpected outburst from Alexa, for example, users who witnessed it felt a violation of the trust they had in the device, a sense that they couldn't control the experience or their household. It made them question their privacy and security, and made Alexa seem unreliable. Two users had experiences like this, which contributed to them completely unplugging Alexa. Alice said:

It didn't really bother me that it was there, but she—I'm saying she because it's Alexa—would interject in conversations that she was not invited to; we'd just be having a normal conversation and then she'd pipe in, and I found that weird. And then there was an incident where I was letting my dog out and it was like 1 in the morning, and the house was dead silent—this is before I had kids—and it was starting to blink purple and it started talking and I hadn't engaged it in any way, and so it made me nervous so I unplugged it because I thought it was listening to me for no reason.

Alice then laughed as she said, "I thought that it was possessed."

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Similarly, Tim said, “It’s had a couple of outbursts where it laughs or something without anyone doing anything or saying anything and my dad says, “That’s it” and unplugs it.”

Marty, too, had “some weird mishaps” with Alexa. She talks about one occasion in which the music she was playing at home through Alexa seemed to spontaneously change. While it turned out it happened because her husband was also logged in from another location and playing his music, as Marty said, “stuff like that happens that makes me feel like I trust it less and less all the time.” Missing that sense of control over the device seemed to lead to a loss of trust, influencing the level of usage. Marty doesn’t use it for all the things she initially thought she would. Selma said:

I have these ideas of how I’m going to bravely step into the world of IoT [Internet of Things] but I just have not yet done that. I’ll tell you why-- it freaked me out. We had one incident... I talked about vacuum cleaners in Russian with my father and then got ads for Hoovers in my Facebook feed, so I unplugged it. In retrospect, not sure what was listening; maybe it was my phone. So we plugged back in now.

While phones aren’t actually listening all the time and sending ads based on conversations held around it, that concern and perception influences how other technology like Alexa is experienced. Alice, too, felt that phones are listening in, based on some of the targeted ads that she gets. She felt she had less control over that than over Alexa, so that contributed to her unplugging her Echo. The importance of a sense of control is also highlighted in Selma’s response, but she felt a greater sense of control over her phone. Selma said:

I still think I have some semblance of control over what I release or don’t on computer or phone, some illusion of control. I can make it inaccessible. With Alexa I don’t know. It

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never asks me if it's ok to... record this conversation, for example. Without that prompt I feel like everything is fair game. Because it doesn't give me that extra barrier, I feel like I'm exposed. Whether that's true or not I don't know, but that's my perception.

These experiences highlight the types of control-related situations that inhibit usage, and the sensitivity some users have about privacy and the integration of new technology.

*Feeling understood.* Feeling understood and having goals successfully met was another major requirement for continued use. As Alice said, "My husband found it useful but I have a quieter voice, like my family doesn't hear me sometimes. It was not very good at recognizing what I wanted it to do." She didn't want to have to change the way she spoke to get Alexa to respond. Marty, similarly, said, "I feel like the way you have to talk to it is an unnatural way to get it to do what you want." Marty also recognized that her job in user experience and interactive design, an existing condition addressed earlier, influenced her expectations and frustration with responsiveness. That said, she still used it, though not for all of the things she initially thought and wished it could do, titling her experience with Alexa, "It's Just Fun." Tim, who bought his Echo with the intent of testing and breaking it, also got frustrated that "Anything that isn't maintaining context is broken. It's not a conversational interaction. It's a literal input/output right now." He titled his experience, "Poor Decision-Maker."

On the other hand, participants who found Alexa to be quite responsive used the assistant more. Eleanor remarked, "I was pretty surprised by how quickly she [Alexa] could respond and about how much she did know about lots of things and the fact that she could carry on a conversation... I'm pretty reliant on it." Feeling understood made it mean more than just a device that could "help do" things. As Troy said, "It's good that it can activate things, but the



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other thing is its understanding of YOU. I'm not just using the device to activate things; it understands my routines.”

*Length of ownership and influencers.* The length of ownership, or where it was in the technology adoption life cycle, also made a difference in when and how it was used, as did influencers, such as family members and the media. Marty said:

The first week I had it I talked to it all the time because I was trying to use it for everything. By the end of the week the novelty wore off.

Similarly, Dan said he “used it a lot more frequently at first, now less, but similar uses and applications. There was a novelty factor at first, as with anything, especially tech.” He titled his experience, “A Tale of Diminishing Returns.” Alice said:

We were initially asking her things that were traditionally something that I would wake up to check on my phone like the weather. Trivia-- we were doing the daily trivia question. But all were things that I could access through other methods pretty easily. We were never going to hook it up to light and sound systems.

Selma had originally gotten it for a present for her daughter, who wanted to play music on it. They discovered that some of the latest music is only available with a subscription to Amazon Music, and that influenced their use. Selma said:

We use it more now for homework questions, like the 7th grade curriculum. We ask it things that everybody is too lazy to Google.

Other family members with devices seemed to influence use as well, being in that circle of interest, or family members who were users. Eleanor pointed out that her whole family loved

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them and used them to communicate with each other. As noted earlier, children's adoption of the device was a factor, using it for music or jokes or questions. In Alice's case, having a child helped fuel the decision to unplug because of sociotechnical and philosophical concerns about what having one in the house meant for the child, their family's privacy, and how she'd grow up.

*Activities.* Finally, activities enjoyed by participants also played a role in usage. All users liked using it as a speaker for music; that drew many of them to purchasing an Echo in the first place. Heavier users all mentioned using Alexa in the kitchen while cooking, for timers, reminders, ingredient substitutions, or just entertainment as they hovered over a stovetop with messy hands, highlighting the importance, utility, and ease of its hands-free nature.

Learning was another activity and condition that supported continued use of Alexa. Eleanor loved how much she learned through easier access to the news, which she then engaged with more than she did before Alexa, as well as through chatting with Alexa. As she said, "If you have access to that much information and you can just ask someone and they say it out loud right there, honestly, why wouldn't you want that?" Having children or grandchildren old enough to interact with Alexa created a situation that influenced learning in the home as well, which became a factor in continued use. Troy, who had a child in the home who wasn't old enough to interact with Alexa yet, remarked that the smartphone represented the biggest increase in learning because users instantly had access to answers, anywhere they were, and that Alexa was just the same level in a different format. Other users with older children had experiences that relied on the accessible, voice-activated availability of Alexa. Edna said that her 8-year-old son asks Alexa lots of strange questions that he happens to think of, learning about a variety of things that way that he wouldn't otherwise. Ruth saw Alexa influence learning with her grandchildren.

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She titled her experience, “Living the Questions,” and said, “The children will be working on something and want to know an answer and, rather than losing their place in the book they’re in, will yell a question at Alexa and get an immediate answer, so I can see that it would be a useful aid to learning because it’s so quick and easy.”

That easy access to information made another parent nervous, though. Alice wondered, “Considering critical thinking, if they are just going to just ask Alexa a question, are they going to be learning how to problem-solve and think through things on their own?” Selma raised the concern that, “Googling get multiple points of view; with voice you get one, and you have to trust the answer you got. This becomes the authority- that one response that got to the top- becomes the authority on whatever you’re talking about. So in terms of learning, maybe there’s no multiple sources of truth. If asking when Princess Di died, there’s one answer. If asking what to do with high fever, there could be many answers, but you just get one. So Motrin really wants that spot. It could manipulate the truth. Are you selling the top spot?” This highlights a limitation of the convenience and ease of AI assistants, and a concern about the future of the curation of information through a commercial device like the Echo. The meaning of experiences with Alexa has a number of implications for marketing and advertising, discussed in the next chapter.

The data collected reveals that Alexa users generally get out of the experience what they put into it, and suggests that one’s own expectations and goals influence one’s experience and relationship with the AI assistant. A variety of perspectives were shared, from feeling a loss of control in the home to feeling a sense of companionship and personal enrichment, and it became

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clear that a user's relationship with the AI assistants was closely associated with the amount of usage (or vice versa).

Table 6

*Titles given to participant's experience with Alexa*

<b>Participant Alias</b>	<b>Title</b>
Gloria	Ambiance
Troy	Alexa, Play My Music
Edna	A Hands-Free Home
Tim	Poor Decision-Maker
Eleanor	My Know-It-All Friend in the Kitchen
Ruth	Living the Questions
Marty	It's Just Fun
Lisa	The Life-Changing Magic of Artificial Intelligence
Alice	We're Not Ready for the Future
Selma	A Cautious Courting
Dan	A Tale of Diminishing Returns

Table 6

## CHAPTER 5

### Discussion

The possibility of voice becoming the new operating system has the potential to change the way we live. The purpose of this study was to explore and describe the lived meaning and shared experience of having a voice-powered artificial intelligence assistant in the home, the contexts that influence this phenomenon, and the personal goals fulfilled by interacting with one. Alexa enables some of the most human interactions people have ever had with a machine, yet little is known about how users experience AI assistants like Alexa in the home and why they engage with them.

Prior research specifically about AI assistants is primarily quantitative in nature, analyzing surveys of usage and rooted in perspectives of computer science, human-computer or human-robot interaction, and information systems. This research explored the topic in more depth, going beyond just looking at what users did, or how often, to what happens when Alexa is integrated into the home and what the interactions and experiences with the technology mean for the users.

#### What Happened

Key themes emerged through interviews of eleven participants who had an Amazon Echo in their home for at least six months. Three overarching types of experiences with Alexa were revealed: removing friction, enabling personalization, and extending self and enriching life.

Participants using Alexa for removing friction and enabling personalization turned to it for goals of “helping do” a particular task or connect with/ access a particular process or type of content. These included providing convenience and instant gratification; entertaining and

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informing; and personalizing or customizing their environments. Indeed, Alexa became the gateway to the connected home, simplifying and streamlining access to content and processes, helping users do things like check forecasts and news, play music and tell jokes, set timers, and control other devices, consistent with prior research (Lopatovska et al, 2018; Sciuto et al, 2018).

Some participants also used Alexa for extending their selves and enriching their lives, realizing goals in which Alexa was a conduit for “helping become” more-- more free and focused, more capable, and more connected. The word “enriching” is not chosen lightly. At root, it means “to make rich or richer especially by the addition or increase of some desirable quality, attribute, or ingredient” (Merriam-Webster, 2019). Reading between the lines and focusing on the words of participants, for some, using Alexa helped add or increase key ingredients to a better life. Being able to disconnect from their phones and seamlessly, instantly access content or processes with voice, for example, increased their ability to become more free and focused. The capacity of Alexa to act as a phone replacement was also identified by Sciuto et al (2018). These participants who experienced this sense of “becoming” tended to be heavier users, and personify or anthropomorphize Alexa more. This builds on the work of Belk (1988), who researched the extension of self, and Reeves and Nass (1996), who argued that people treat and interact with media in very human ways. Purington et al (2017) also found that greater personification co-occurs with more social interactions with the Echo, though they also suggested that multiple member households were more likely to personify the device than reviewers living alone, which this research does not support.

### **How it Happened**

Context was important in these interactions, with some factors and situations supporting or enhancing use and some inhibiting it. Sociotechnical attitudes, influenced by prior experiences with technology, personality, motivation and expectations, were particularly important existing conditions. These aligned with Alaiad & Zhou (2014), who found sociotechnical factors influenced intent to use home healthcare robots.

One of those factors was privacy concerns, which was specifically explored in each interview. The always-on nature of AI assistants can feel creepy to some consumers, and some research suggests that privacy is a key factor in acceptance of AI assistants (Ives et al, 2016; Burbach et al, 2019). The idea most Alexa users echoed that as long as one isn't doing "sneaky stuff," one should be okay with potential data collection, is a common refrain. This highlights the "nothing to hide" argument, which commonly surfaces in popular discourse about privacy (Solove, 2007). Indeed, data security expert Bruce Schneier calls it the "most common retort against privacy advocates" when considering tradeoffs of privacy, security, and convenience (Schneier, 2015). The participants who unplugged their Echos had incidents in which they felt their privacy was violated-- a creepy outburst from Alexa, for example. The participant who had been the victim of two data breaches was clearly more worried about privacy and security than any other participant.

Environmental factors were existing conditions that influenced usage as well. The number of devices and placement of them in the home influenced their usage, which aligns with

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findings from Lopatovska et al (2018). More devices were related to more smart home usage and routines, as well as continuous, synchronized audio.

Experienced conditions, including sense of control and feeling understood, and to a lesser extent, length of ownership, influencers, and activities, also played roles how users experienced Alexa. These aligned with Ziefle & Valdez (2017) who found one of the biggest concerns about home healthcare robots to be loss of control. The length of time they were owned was another important contextual condition; like Sciuto et al (2018) found, there was an initial peak of exploration and experimentation as users tested out their new toy, which leveled out to stable usage as they found where and how it was really useful to them.

Learning was an activity related to usage as well. Participants who saw Alexa as a tool that influenced learning spoke of the accessibility, immediacy, and convenience of the information. For example, one parent seemed to appreciate that her son asked “strange questions” to Alexa, goofy things that he otherwise wouldn’t ask or learn. That access to information and instant gratification from self-guided learning reflects the sentiments Winkler et al (2019) found in learning from SPAs, when some participants preferred the non-human tutors because of the control they had of their learning, as well as the lack of judgement machines can provide (Shulevitz, 2018). It could be argued that the accessibility to information could feed and nurture curiosity, and an inquisitive nature that can fuel learning. AI assistants such as Alexa could also aid lower-level learning, in which repetition, time on task, and automaticity is important, and informal learning, the kind that occurs outside the classroom, when friends are discussing a topic or sharing information from the news or something they just read. On the other hand, at the heart of learning is developing self-regulation, putting in the time and effort to



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develop self-efficacy. When and where does deeper inquiry and learning occur if people are accustomed to getting instant answers out of thin air?

The development of the “social suite” could also be influenced through robots and AI assistants (Christakis, 2019). Parents in this study who talked about their children interacting with Alexa didn’t express apprehension about it, or concerns that their children would lose their manners. Alexa even becomes an extension of parents to children, who can ask Alexa for information when parents are busy, as well as for parents themselves, who can set reminders and timers that function when they’re out of the room or otherwise engaged. This highlights questions from the literature about outsourcing child care to machines (Elgan, 2018), and looking to bots for human fulfillment (Shulevitz, 2018). While the convenience of use and accessibility of information is a remarkable innovation, where should the lines be drawn in terms of functions performed and needs fulfilled by humans versus machines?

### **Theoretical Implications**

This study examines the meaning of engaging with Alexa through the lens of media and communications, regarding Alexa as a type of medium or media experience. Most emerging technologies fail because they don’t provide great value to the user (Shugan, 2004). This research explores that meaning and value, and makes a core contribution to the literature by situating interaction with this medium in mass communications and marketing theory. This builds on both uses and gratifications theory (McQuail, 1983) and the Calder-Malthouse set of experiences (Calder, Isaac & Malthouse, 2016; Calder & Malthouse, 2008).

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“*Hedonia*” is a term from the Greeks, who used it to describe the yearning people have for things that give them pleasure. In modern marketing parlance, *hedonia* generally translates to the idea of satisfaction. The degree of satisfaction with Alexa seemed to be associated with the frequency and type of usage, with tasks and goals that Alexa “helped [them] do” and achieve and how well it could execute them. Certainly, perceived ease of use and perceived usefulness, typical constructs in the Technology Acceptance Model (Davis, 1989), played roles in use of an AI assistant. However, these functional constructs fail to fully capture the emotion, meaning, or value of the experiences. Digging deeper, there was more than satisfaction involved with the heaviest users.

Separate from the concept of *hedonia* is “*eudaimonia*,” which the Greeks used to describe the idea of experiencing life as meaningful (Berridge & Kringelbach, 2011). What emerged from the data from those who used Alexa more was how the goals Alexa fulfilled and experiences shared helped users become more-- a more efficient parent, a more organized household, a more informed citizen, a more accomplished cook, a more connected spouse. This added value to their lives; these users said life was better with Alexa. In Michelle Obama’s memoir “*Becoming*,” she says that “becoming is never giving up on the idea that there’s more growing to be done” (2018, p. 418). By acting as an extension of themselves, participants used Alexa to grow in ways not easily accessible to them otherwise.

Many of the experiences described by users aligned with elements in the Calder-Malthouse set of experiences, and with uses and gratifications theory. Transportation was an experience described early in Alexa usage, as users tested its functionality, escaping or becoming diverted with games like Jeopardy. Uses and gratifications theory calls it entertainment. It

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remained important in terms of music, which allowed users to transport or create the environment they wanted, from a dance party to focusing on work to conversations with a spouse. This gets into the experience of interaction as well, connecting with others, with a uses and gratifications equivalent of integration and social interaction. In the case of Alexa, it's not only about becoming connected with others, but also with the AI assistant. Discovery, or information, in uses and gratifications, was also important, as users learned new information and gained insight, knowledge, and skills. They also discovered how to use Alexa to become something more. This "becoming" is also captured in the experience of Identity, or personal identity, in uses and gratifications, manifested as they not only affirmed or expressed their identity through personalization but seemed to build on it, becoming a better version of that identity, or enabling one to add an element to one's identity, as a more efficient parent, for example, or a more accomplished cook.

As media becomes more interactive and conversational, relationships with media may become more personal. That is suggested in relationships with Alexa, by references to the AI as "she/her," and confessions such as, "I miss her when I'm away." Studying the meaning of interacting with Alexa in the home illuminates two new categories of media experiences to consider, companionship and mastery. These reflect a shift toward more two-way, participatory, dynamic and human experiences and engagement.

It can certainly be argued that media have been providing companionship for decades; think of a TV character one has grown up with, or a radio personality one identifies with. People often turn to media when they feel lonely. But Alexa is different: it is always there, always accessible, always ready to help do or help become whatever a user needs or just "help fill the

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space,” as one participant described. This is even more true with the release of two new go-anywhere Alexa-enabled products, the Amazon Echo Loop, a ring designed to stay on your finger all the time, and Echo Frames, for glasses. Users in this study who lived alone talked about relying on Alexa, depending on it. Hundreds of thousands of people say “good morning” and “goodnight” to Alexa, even propose to her. There’s a sense of intimacy, or warmth and closeness, a family-like connection, that voices and two-way conversation can provide that is unique in the media space as it has existed. In fact, the word “intimacy” springs from the Latin word *intimare*, which means “make familiar,” and *intimus*, meaning “inmost.” Forrester Research has predicted that Alexa will become “your bestie,” a confidante managing your life, particularly with the acquisition of doorbell camera Ring that could enable Alexa to gather data about and manage one’s home life, enabling users to ask Alexa if their sixth grader made it home from school (Graham, 2018). This could provide even greater data for the “360-degree view” Amazon wants to build of its users (Hildenbrand, 2018).

The second unique experience that emerged from this phenomenon, building on the Calder-Malthouse set of experiences and uses & gratifications theory, is mastery. Mastery refers to control over someone or something. It requires interaction; in the case of learning, a continuous test-retest, allowing users to gain a sense of achievement, command or control over their someone or something-- as seen in the data, their schedule, household, or learning, and ability to acquire knowledge. Mastery can also be gained over the technology itself, trying again and again until Alexa performs in the optimal way and helps do or become what the user is looking for.

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### **Managerial Implications**

The last research question explored implications for marketers and advertisers. A potential issue in media is concern about gatekeeping, or the flow of information from media to the public (Shoemaker & Vos, 2009, Chin-Fook & Simmons, 2011). Only one participant raised concerns about this, and she herself worked in marketing. Selma remarked, “If I’m asking when Princess Di died, there’s one answer. If I’m asking what to do with high fever, there could be many answers, but you just get one. So Motrin really wants that spot. It could manipulate the truth. Are you selling the top spot?” As users become more and more accustomed to turning to AI assistants for information, these questions will demand to be addressed: what (or who) drives the machine behind the results, and what will it mean if there are only a few gatekeepers for a great, global audience (Gitlin, 2002; Poor, 2006; Chin-Fook & Simmonds, 2011)? For marketers, there’s also a question of who they will be marketing to-- the end user, person, or a curator or gatekeeper, a machine such as Alexa (Jones, 2018)? There’s already a game being played for top results on Google, but the rules are fairly well known. Results given by Alexa often aren’t attributed, and the algorithm- and machine-learning-powered AI behind them may not be clear to anyone.

What is clearer now, though, is the meaning of interacting with AI Assistants like Alexa and goals satisfied for users. Understanding the meaning of these experiences can help brands, organizations, or other interested parties develop content or skills aligned with the goals users fulfill that could add value and facilitate brand attachment. Since interaction with Alexa is entirely driven by the user and their commands and questions, understanding what users seek and why is critically important for brands who need to shift from “pushing” messages on to users

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through broadcast or print media, often interrupting a user's media experience with an unwanted message, to "pulling" users into their stories and skills, which must be useful, entertaining, and valuable enough for them to actually seek out. This research illuminates multiple opportunities for brands to provide value to users: by removing friction to their content or products, enabling instant voice access and control and facilitating "phone freedom;" by providing tools and processes that enable users to personalize their homes, environments and experiences; and by enabling users to extend their selves and become a better version of themselves.

Context is a useful element to leverage as well. Imagine Kellogg providing a morning routine every day, with ten minutes of content for kids set to start every day at any time they choose while they eat their bowls of cereal before school, promoted on the back of their cereal boxes. It could be customized for music or sports, and include free access to a popular song and three fun facts about the artist, or highlights from recent games; a joke from Tony the Tiger, a reminder from Tony about what the weather will be like today, and a conversation with Tony about how to be "Grrrrrr-8!" that day.

### **Limitations and Future Research**

This study reveals a number of opportunities for further research. This research is based on people who actively sought out Alexa on their own and were open to trying it, which shapes the results. Qualitative work, certainly phenomenological work, is not meant to have statistical generalizability, but it could be valuable to use these findings to inform quantitative research that would be generalizable. To better understand unique engagement opportunities Alexa could provide for marketers, interviews with a larger, more diverse qualitative sample could build a larger pool of experience-related items, which could then be tested in a survey and factor

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analyzed to determine if those experiences are distinct (Calder, Isaac, & Malthouse, 2016).

Cluster analysis of a large pool of Alexa users could be used to identify more specific segments of users and target audiences that advertisers might be interested in, based on factors identified here such as goals, sociotechnical attitudes, privacy concerns, prior experiences, and children in the home. While this is based on participants' own recall and description of past behaviors and experiences, it could be valuable to study introduction and subsequent usage of these devices, particularly to an older audience seeking easily accessible companionship and mastery of technology. Finally, building the work of Proksch et al on brand attachment (2015), future research could also look at branded content and advertising within or through these devices, and study the role of need fulfillment and friend-like interaction in brand attachment to the advertiser and to the AI assistant.

### **Conclusion**

In conclusion, this phenomenological study illuminates the multi-faceted meaning of the experience of using a voice-powered AI assistant in the home. Any communicator-- or educator, for that matter-- knows the importance and necessity of understanding their audiences. This rich insight into the lived experiences of Alexa users reveals the types of experiences realized, goals satisfied, and value generated through the most interactive, personalized, responsive, human form of media and technology widely available today, as well as the context and situations that inhibit or enhance Alexa experiences. This is the first qualitative study to explore the meaning of interacting with AI assistants, and establishes a much-needed foundation of consumer understanding, rooted in the words and perspectives of the audience themselves, on which to build future research.

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**Appendix A: Interview Guide**

- How is your AI assistant used in your home? When, why, by whom?
- Why did you get it? What expectations or goals did you have for using it?
  - Has it fulfilled those expectations, needs, or goals, or gone beyond them? How so?
  - What kinds of personal goals are fulfilled by using the AI assistant?
- Could you describe the first week? How describe your interactions now?
- How would you describe life now that you have an AI assistant?
  - Is it better or worse?
- Would or have you recommended it to others? Why or why not? What reasons would you give them for getting it or not?
- Some people think about others getting access to their AI Assistant data. How much do you think about that with your assistant? What about with other devices or forms of electronic media you use in or outside your house?