International Journal of Human-Computer Interaction

The role of privacy cynicism in consumer habits with voice assistants: A Technology Acceptance Model perspective

--Manuscript Draft--

Manuscript Number:	IJHC-D-20-00693R2
Full Title:	The role of privacy cynicism in consumer habits with voice assistants: A Technology Acceptance Model perspective
Article Type:	Original Research
Section/Category:	Basic Science Section
Corresponding Author:	Fulya Acikgoz, Phd Candidate Bahcesehir University: Bahcesehir Universitesi Istanbul, TURKEY
Corresponding Author Secondary Information:	
Corresponding Author's Institution:	Bahcesehir University: Bahcesehir Universitesi
Corresponding Author's Secondary Institution:	
First Author:	Fulya Acikgoz, Phd Candidate
First Author Secondary Information:	
Order of Authors:	Fulya Acikgoz, Phd Candidate
	Rodrigo Perez Vega, Dr.
Order of Authors Secondary Information:	
Abstract:	This study aims to understand the drivers behind the usage habits of VAs. To do so, we extend the Technology Acceptance Model in conjunction with the concept of privacy cynicism, a cognitive process that remains understudied in the academic literature. It is observed ease of use and perceived usefulness have a positive impact on attitude towards the usage of VA, while privacy cynicism has a negative impact on attitude towards the usage of VA. Moreover, it is found that privacy cynicism has a positive impact on trust based on the usage of VA. Interestingly, attitude towards the usage of VA does not significantly explain the usage habits of VA. Keywords : Voice Assistants (VA), TAM, privacy cynicism, Artificial Intelligence (AI), consumer habits.

The role of privacy cynicism in consumer habits with voice assistants: A Technology Acceptance Model perspective

This study aims to understand the drivers behind the usage habits of voice assistants (VAs). To do so, we extend the Technology Acceptance Model in conjunction with the concept of privacy cynicism, a cognitive process that remains understudied in the academic literature. The model is validated using PLS analysis through Smart-PLS. Data gathered via MTurk includes 265 actual VAs users. It is observed that ease of use and perceived usefulness have a positive impact on attitude towards the usage of VAs, while privacy cynicism has a negative impact. Moreover, it is found that privacy cynicism has a positive impact on trust based on the usage of VAs. Interestingly, attitudes towards the usage of VAs does not fully explain the consumers' VA usage habits.

Keywords: Voice Assistants (VAs), Technology Acceptance Model (TAM), privacy cynicism, Artificial Intelligence (AI), consumer habits.

Introduction

The use of artificial intelligence (AI) in smart devices continues to increase as the technology and the tasks that AI can perform improve (Lopatovska et al., 2019; Saad et al. 2017; Yang & Lee, 2019). One of the applications of AI in consumer products is voice assistants (VAs) which allow users to interact with AI-enabled machines in a more natural way through voice commands or in a more traditional way through taps and clicks. VAs enable cognitive engagement interactions among users and machines (Davenport & Ronanki, 2018). These interactions with VAs increasingly resemble human-to-human exchanges thanks to technology (e.g. natural language processing (NLP)) that facilitates both voice (e.g. Alexa, Google Assistant) or handheld interactions (e.g. smartphones and tablets). As a result of those interactions, VAs can perform different useful tasks, including setting up alarms, calling someone, reminding the user about certain activities, or even searching for information and making purchases on the user's behalf.

VAs provide benefits for both consumers and companies as this technology satisfies their demands by providing high personalization (Brill et al., 2019). As a consequence of these benefits, a positive attitude towards VAs might emerge (Moriuchi, 2019). On the other hand, VAs are a source of privacy concerns for some individuals (PWC, 2018; Ghosh & Eastin, 2020). Since VAs must listen to their environment to hear the commands needed to perform their tasks, research has found that some negative attitudes towards the VA can also emerge among users because of privacy concerns (Easwara Moorthy & Vu, 2015).

Privacy concerns have lately been examined in the field of VAs (e.g. Kowalczuk, 2018; Pitardi & Marriott, 2021; Vimalkumar et al., 2021). However, there still exist unanswered questions regarding users' privacy concerns. How users might deal with these privacy concerns is one of those questions. In the existing literature, to tackle those concerns, the idea of privacy cynicism as a complementary explanation for the "privacy paradox" has been conceptualized. That is, instead of constantly trying to gain control of their privacy, users have been developing other coping mechanisms, like privacy cynicism, to enable them to interact with technologies. This is because users do not want to quit using VAs in their daily lives because of the many advantages they bring, such as information sharing and gathering, and so on. Hence, gaining a deeper understanding of privacy cynicism is more important than past in the domain of new technology.

Despite the importance of gaining this knowledge, evidence of the different implications of privacy cynicism on the adoption of new technology remains understudied. There are only a few studies examining privacy cynicism empirically (e.g. Choi et al., 2018; Hoffmann et al., 2016; Lutz et al., 2020). Based on this, we aim to provide empirical evidence of the implications of privacy cynicism in the formation of habits in VA use through the study of attitudes towards as well as trust in such devices. This study also responds to scholars' above-mentioned call for further empirical research on privacy cynicism.

Therefore, our study aims to reduce this gap in the literature by examining how positive and negative factors simultaneously affect attitudes towards and trust in VAs and how these turn into habits when using this technology. Based on this, the guiding research question of the present research is: What are the factors affecting attitude-habit formation in VAs ? Which is the role of users' trust in this relationship? To achieve this, we first use the Technology Acceptance Model (TAM) (Davis, 1989). This model helps to clarify the process of acceptance and usage of VAs by users. Secondly, we extend the TAM in conjunction with the concept of privacy cynicism, a

cognitive process that is increasingly prevalent among consumers' use of technology (Lutz et al. 2020) but that remains understudied in the academic literature. Consequently, this study endeavors to measure the drivers behind the habits of using VAs by utilizing perceived usefulness, perceived ease of use, the increasing sense of privacy cynicism and trust.

Literature review

VAs enabled with artificial intelligence (AI) aim to facilitate users' daily private and work lives. This technology responds to users' general questions, sends a message or email, makes a quick call, searches for information, sets alarms, broadcasts music or news, and monitors networked devices (Lopatovska et al., 2019; Yang & Lee, 2018). In addition to these advantages, Smith (2020) has stated that consumers are using VAs to order products online. Brill et al. (2019) have highlighted that VAs provide individual task management functions (e.g. calendars) and advanced capabilities (e.g. home automation). Additionally, through advanced features in VAs, an individual can monitor their health issues and take action accordingly (Sezgin et al., 2020). Moreover, VAs are expected to integrate further with other applications such as controlling PayPal balances or arranging an Uber ride (Smith, 2020).

Accordingly, businesses and companies are using VAs as a standalone system or they have combined them with other enterprise platforms such as chatbots (Moar, 2019). These companies are endeavoring to benefit from what VAs can offer them as a way of engaging with consumers and reaching them as much as possible (Platz, 2017). Colson (2018) states that AI-based applications are useful to track companies' projects as well as to support the use of data experts. In the context of VAs, consumers acquire more information about their preferences, interactions, and intentions towards the brands (Smith, 2020). In addition to the development of searching and purchasing practices (e.g. Tassiello et al., 2021), AI-based technologies have been used for building loyalty with consumers (e.g. Moriuchi, 2019), leading to brand effect and consumers' trust in VA (e.g. Poushneh, 2021; Pitardi & Marriott, 2021), and creating brand engagement (e.g. McLean et al., 2021).

Although VAs provide benefits to their users, continued advances in technology can pose a threat to the privacy of individuals (Alepis & Patsakis, 2017). The growing proliferation of voice-activated technologies has resulted in privacy concerns (Pfeifle, 2018). In particular, users are worried about giving information regarding private and financial details to a voice-powered computer (Wharton, 2018). The reason why is that, by their very nature, these devices need to listen to their users at all times (Aeschlimann et al. 2020; Hoy, 2018). Hoy (2018) states that this creates a problem with privacy, which is a big problem for VA users. Those using VAs prefer not to utilize voice input in public spaces owing to the risks of privacy violation (Easwara Moorthy & Vu, 2015). Consequently, due to those difficulties with using VAs, there is ongoing research into enhancing both voice recognition and security features such as privacy and data protection related to VA services (Reynolds, 2017).

Whereas users are using VAs more and more despite the risks of privacy infringements, there are still a limited number of studies revealing the factors affecting attitudes towards VAs and their behavioural or post-adoption intention (e.g. Ashfaq et al., 2020; Kowalczuk, 2018; Moriuchi, 2019; Pal et al., 2020). For example, Ashfaq et al. (2020) studied how perceived coolness affects attitudes and continuance usage intention through functional, hedonic, economic, and social values in the context of smart speakers. They found that social value alone did not explain attitude towards usage VAs, while except this relationship between social value and attitude, other

relationships were found to be significant. From a similar perspective, McLean and Osei-Frimpong (2019) have revealed the motivations to use VAs. They reported that whereas the social, utilitarian, and symbolic benefits motivate the usage of VAs, the hedonic benefits do not affect usage of VAs. They also found that privacy risks have a negative impact on the usage of VAs. From another perspective, Pal et al. (2020) found that usefulness, ease of use, compatibility, and perceived complementarity have a significant impact on purchase intention. On the other hand, Kowalczuk (2018) has found perceived ease of use does not have a significant impact on behavioural intention or perceived usefulness. He additionally found that whereas enjoyment has a positive impact on behavioural intention, risk has a negative impact.

In more recent study, Pitardi and Marriott (2021) have found that whereas perceived usefulness has a positive impact on attitude, it has a non-significant relationship with trust. On the other hand, perceived ease of use has a positive impact on both attitude and trust. They also found that while privacy does have a negative impact on attitude, the relationship between privacy and trust is non-significant. Furthermore, McLean et al. (2021) found that social presence, perceived intelligence, and social attraction have a positive influence on consumer brand engagement through VAs. They found that the relationship between hedonic values and consumer brand engagement is non-significant. Lastly, they also stated that trust has a negative impact on consumer brand engagement. In another recent study, Poushneh (2021) investigated how autonomous agents with social interactions affect consumers' trust based on VAs and brand effect. In short, recent research shows that trust has become a more apparent influence in users' decisions related to the usage of VAs (i.e. Ghosh& Eastin, 2020).

Notwithstanding these results, much of the previous work is on users' behavioural intentions, many fewer studies have examined users' attitudes, and there is no study revealing the factors affecting the habit of using VAs. Whereas, VAs – considered one of the habit-forming technologies – are becoming an integral part of users' daily lives and habits (Celi, 2020). Hence, understanding habit-forming determinants is important. With this in mind, the current study aims to fill the gap by revealing factors that create habits of using VAs for real users in order to develop the growing literature on VAs. Another purpose of this study is to delve into how trust affects the process of creating a habit of using VAs. By also considering the related privacy issues, we provide a novel perspective by integrating privacy cynicism with trust and the constructs of the TAM (i.e. perceived usefulness, ease of use, and attitude).

Theoretical framework

Technology Acceptance Model

The TAM was developed by Davis (1989) and is the most widely applied model of users' acceptance and usage of technology (Venkatesh, 2000). Davis (1989) provided the TAM to clarify the reasons why people approve or disapprove of using technology by investigating the determinants of technology acceptance from the consumer's perspective. However, when it was clear that the TAM was no longer sufficient in understanding users' acceptance, Venkatesh et al. (2003) introduced the Unified Theory of Acceptance and Use of Technology (UTAUT). With the growth of consumer technologies (Tamilmani et al., 2021), the UTAUT required further development,

which they achieved by adding novel behaviour-based determinants (i.e. habit or hedonic factors), which they called UTAUT2 (Venkatesh et al., 2012).

The TAM assumes a mediating role of perceived ease of use (PEOU) and perceived usefulness (PU), which plays a critical role in predicting users' acceptance of the system. Davis (1989) explains PEOU as "the degree to which a person believes that using a particular system would be free of effort" and PU as "the degree to which a person believes that using a particular system would enhance his or her job performance" (p.230). The TAM has been further extended to TAM2, which considers PEOU and behavioural intention (BI) based on the social influences and psychological processes (Venkatesh & Davis, 2000).

A dominant category of the factors influencing the adoption and use of VAs relates to usage. These factors encompass how VA technology is deployed and the end users' evaluations of how the technology performs in a specific usage context. Most of these factors are based on the TAM and its derivatives (Davis, 1989; Venkatesh & Bala, 2008; Venkatesh & Davis, 2000; Venkatesh et al., 2012; Venkatesh et al., 2003) with PEOU and PU identified in most studies as significant drivers of intention to adopt and use intelligent conversational agents (Rietz et al., 2019; Yang & Lee, 2018; Terzis et al., 2012). Thus, the TAM has emerged as a prominent framework to clarify consumers' intentions towards utilizing novel technological devices and is acknowledged as one of the most prominent theories in the field of information, technology, and innovation system adoption (Bailey at al., 2017; Cheung et al., 2019; Chuah et al., 2016; Legris et al., 2003; Wu & Chen, 2017).

This study selects the TAM as the base model because it is one of the most robust frameworks with which to adopt the new technology and it offers a platform for a better comprehension of users' acceptance of new technology devices (Al-Momani et al., 2019; Walter & Abendroth, 2020). It is also acknowledged that different empirical research has recently used the TAM to emphasize users' behavioural intentions in diverse settings such as sports wearable technology (e.g. Kim & Chiu, 2019), healthcare technology (e.g. Cheung et al., 2019), ubiquitous media systems (e.g. Dadvari & Do, 2019), food service industry (e.g. Kang & Namkung, 2019), mobile payment (e.g. Bailey et al., 2017), augmented reality apps (e.g. McLean & Wilson, 2019), Internet-of-Things (e.g. de Boer et al., 2019). More specifically, the TAM has been used to explained behaviour in the use of other technologies. For example, Chen and Tan (2004) found that the PU has a significant effect on perceived friendliness (user) in virtual store acceptance. Along the same lines, Hassanein and Head (2007) emphasized the direct relation between high PEOU and high perceived friendliness (user) in the context of online shopping. However, VAs are a more advanced type of technology, the context of which differs from other situations in which the TAM has been tested; VAs use machine learning technology and voice recognition through natural language processing to continuously improve the outcomes that they produce (Kepuska & Bohouta, 2018), hence the drivers of adoption as suggested by the TAM are expected to improve over time of usage, as the technology adapts to the user.

Furthermore, a growing number of researchers have recognized that as AI-enabled technology relies on more users' information to operate, the intention to use technology cannot only be measured by using the TAM on its own, and they have started to examine how privacy and privacy concerns affect the use of technology devices (e.g. Fortes & Rita, 2016; Lin & Kim, 2016; Ofori et al., 2016; Oh et al., 2019; Ratten, 2015; Walter & Abendroth, 2020). For instance, while Lin and Kim (2016) found that privacy concerns predict perceived usefulness, attitudes, and purchase intentions in the context of sponsored ads, Fortes and Rita (2016) have only found a partial mediation relationship between privacy concerns and attitudes in the context of online purchasing. The findings suggest that the response that consumers will have towards the technology will be context dependent, which further justifies the need to consider the technology itself when examining the likelihood of adoption and habit formation. Considering these findings, the TAM may help to not only understand behavioural intentions, but also the habit formation process.

However, despite the importance of the dyadic relationship between the TAM and privacy, the interaction that exists between privacy concerns and intention to use technology remains inconclusive, suggesting that this remains an understudied area. Hence, this study aims to understand the habits of using VAs by using TAM as an enabling theory from which the role of privacy cynicism and trust can be empirically tested. Moreover, Sepasgozar et al. (2019) posit that the TAM has improved in response to recent technological improvements and the possible acceptance of new technologies. Based on this, the TAM is one of the most appropriate theories with which to understand the context of VAs.

Conceptual model and hypotheses development

VAs rely on habit forming in people's daily lives to improve the accuracy of their interactions via machine learning (Cuomo et al., 2021), thus sharing and receiving information is crucial. Therefore, we only examined the attitude scale based on utilitarian/information perspective. From this perspective, since users can face privacy issues while benefitting from VAs, we added a privacy cynicism and trust element to understand how to cope with privacy issues and how to store personal information, respectively. To do so, using the TAM as the base, we propose that the perceived usefulness and ease of use will impact on the attitudes towards VA, which will in turn also influence the habit of using this technology. Furthermore, we incorporate privacy cynicism as an antecedent of trust on VAs and of the attitudes that consumers develop towards these technologies. Figure 1 shows the conceptual model of VA use habits, which uses the TAM as the overarching theory in this context. The following section discusses the constructs in our conceptual model and the relationships hypothesized in this study.

Perceived usefulness

Perceived usefulness refers to the perception of consumers concerning whether technology is beneficial or not and is a belief regarding the behavioural intention (Davis, 1993). Moriuchi (2019) has stated that attitude or level of satisfaction which are laying on the psychological or social theories might be affected by perceived usefulness. The reason for this is that perceived usefulness is considered one of the primary requirements for technology acceptance (Burke, 1997). Perceived usefulness

is conceptually related to the utilitarian value which indicates customer value stemming from function-oriented features (Yang & Lee, 2018). Consistent with this view, further evidence shows how technology devices can enhance and simplify users' daily lives (Ofori et al., 2016).

Previous studies support the view that the perceived usefulness is one of the components affecting the attitude towards technological devices and behavioural intention. For instance, Walter and Abendroth (2020) have examined perceived usefulness as a functional advantage in the forming of a positive attitude towards the 'in-vehicle connected services. Furthermore, several studies have also investigated the effect of perceived usefulness on attitude and usage intentions in different contexts, such as smartphone usage intention (e.g. Park & Chen, 2007), adoption of mobile internet (e.g. Kim et al., 2007), and online shopping behaviour (e.g. Fortes & Rita, 2016; Pavlou, 2003).

With regard to VAs, perceived usefulness is described in this study as the extent to which a consumer believes that using the VA enhances their daily lives. Regarding VA studies, McLean and Osei-Frimpong (2019) have highlighted that users think that they are useful to complete a task. Hoy (2018) stated that the VAs provides useful guiding virtual tours for the management process in the library, gallery, and exhibit. He highlighted that VAs in those settings can easily handle complex tasks, coding, and issues among others. As a different example, Ashok et al. (2014) provides evidence of the usefulness and benefit of a voice-activated interface for websites for those who have vision impairment. It is also stated that some practical benefits can be motivating factors for using VAs (e.g. Coskun-Setirek & Mardikyan, 2017; Smith, 2020). Based on these arguments, we propose our first hypothesis:

H1. Perceived usefulness has a positive impact on attitude towards VAs.

Perceived ease of use (PEOU)

PEOU refers to the amount of cognitive effort needed to obtain and use a novel technology and it aims to diminish this effort both physically and mentally (Davis, 1989; Gefen et al., 2003). PEOU has been thought to be another primary construct for acceptance attitude towards any specific technology device usage (Agag & El-Masyr, 2016). That is, in terms of ease of use, technological improvements such as mobile apps are required to be fast and simple. For instance, Golden and Krauskopf (2016) declared mobile apps should be fast and straightforward so that users can easily understand how to use them.

Watterson et al. (2020) have thereby found that ease of use is a major point in the new innovative technology system. The reason for this is that the developments regarding perceived ease of use might contribute to enhancing the user's experience of the device performance (Lu et al., 2003). Fortes and Rita (2016) have also emphasized that ease of use is related to the extent to which a user is required to put effort into engaging with a particular technology. For instance, in different contexts, such as education, some studies (e.g. Eraslan Yalcin & Kutlu, 2019; Liu et al., 2010) demonstrate that students are more likely to utilize user-friendly technological systems. On the other hand, some previous studies show that behavioural intentions (e.g. usage or satisfaction) are not explained by the ease of use (e.g. Ofori et al., 2016; Oh et al., 2019).

Even though Wu and Wang (2005) found evidence that ease of use is only meaningful for non-experienced users, new technologies such as VAs should be examined for ease of use. This is because it enables individuals to understand whether to continue to use or have a positive attitude towards any particular technology (Hamid et al., 2016). To achieve this, using AI-based services is suggested since they lead to an increase in perceived ease of use for users; for instance, in the use of eye-tracking software (Fountoukidou et al., 2018). On this basis, in order to better understand users' views regarding VAs, we hypothesize:

H2. Perceived ease of use has a positive impact on attitudes towards VAs.

Privacy cynicism

Cynicism represents negative feelings and attitudes towards any person or issue (Andersson, 1996; Choi et al., 2018). Cynicism, which mostly enhances unfulfilled expectations in any environment, occurs when the user faces difficulty, lack of hope, and disappointing situations (Choi et al., 2018) and has mostly been examined in the psychology and organizational literature, especially in the dyadic relationship to date (e.g. Anderson, 1996; Dean et al., 1998; Johnson & O'Leary- Kelly, 2003; Lutz et al., 2020). These studies highlight that cynicism has a negative relationship with other constructs in the existing literature I that it represents negative feelings or issues.

The literature also demonstrates that cynicism has a negative relationship with trust in different contexts (e.g. Boush et al., 1993; Pugh et al., 2003; Regoli, 1976; Turner & Valentine, 2001). Thompson et al. (1999) stated that difficulties and unmet expectations can lead to distrust. In a similar vein, since cynicism is also derived from unfulfilled and frustrated expectations (Choi et al., 2018), it can lead to distrust (Wrightsman, 1966). Moreover, it has been highlighted that mistrust is positively associated with privacy cynicism (Lutz et al., 2020). Hence, cynicism is accepted as a negative antecedent of trust. Similar to the construct of trust, Dean et al. (1998) have described cynicism, in organizational management literature, as the negative attitudes of employees towards their companies, work, and organization as a whole. It is also said that cynicism represents negative and skeptical attitudes towards an organization (Bateman et al., 1992). In another context, Chaouali et al. (2017) have found that cynicism has a negative impact on attitudes towards learning to use mobile banking.

Cynicism has also been conceptualized as a novel and complementary explanation for the "privacy paradox" (Choi et al., 2018; Hoffmann et al., 2016). Hoffmann et al. (2016) have described privacy cynicism as "an attitude of uncertainty, powerlessness, and mistrust towards the handling of personal data by online services, rendering privacy protection behavior subjectively futile" (p.5). Privacy cynicism differs from the plain conceptualization of cynicism because the concept of privacy cynicism has been formed with users' attitudes towards data protection and privacy issues (Hoffmann et al., 2016). Hence, privacy cynicism can be one of the most important constructs related to privacy data protection and could explain new relationships between privacy issues and innovative technologies. Particularly, when taken into consideration usage of VAs among users, they can continue to interact with their own VAs by showing cynical features towards privacy concerns instead of quitting use VAs completely. In other words, they can alternatively have a more positive feelings towards VAs by both showing more positive feelings and ignoring privacy concerns.

Privacy cynicism is a relatively new concept, its relationship with more established constructs related to technology use remains understudied. Hence, in order to understand better this construct, we investigated privacy cynicism's effect in one of the most innovative contexts. Considering the research on the existing literature, we propose that privacy cynicism has also a negative impact on trust and attitude towards using voice assistants. This study aims to fill in the gap by examining the relationship between privacy cynicism and trust and attitude in the context of VA, thus we hypothesize that:

H3: Privacy cynicism has a negative impact on attitude towards VAs.

H4: Privacy cynicism has a negative impact on trust.

Habit

Habit is defined as "learned sequences of acts that have become automatic responses to specific cues and are functional in obtaining certain goals or end states" (Verplanken & Aarts, 1999, p.104). More clearly, habit is the ability to obtain intuitive and continuous usage behaviours stemming from automatic learning (Chou et al., 2013; Limayem et al., 2007; Verplanken & Wood, 2006). As a consequence of repeated performance, when people internalize habits, they might not think, be aware of, or evaluate the reasons for their performed actions (Mittal, 1988; Ouellette & Wood, 1998). In the context of VAs and other technologies that rely on machine learning, habit enables the formation of a symbiotic relationship between the user and the technology (Jaccuci et al., 2015). Hence, habit not only emerges as an explanation for daily routines (Yen & Wu, 2016), but also as an important factor that will determine the degree of engagement of users with this type of technology (Perez-Vega et al., 2021). Based on this, habit was preferred as an outcome variable in our model instead of more traditional constructs such as intention to adopt or usage.

According to the UTAUT (Venkatesh et al., 2012), habit has been considered as an essential alternative mechanism to understand technology use. In the existing literature, habit is mostly studied as an independent or moderating construct to explain people's usage of products and services. Habit has been examined in different contexts; for example, Hsiao et al. (2016) found that habit has a full mediation role between perceived usefulness and continuance intention with regard to the use of mobile apps. Unlike the previous study, Yen and Wu (2016) and have found that habit is used as an independent variable examining the effects of it on perceived usefulness, perceived enjoyment, ease of use, and continuance intention in mobile financial services. Similarly, Liao et al. (2006) have illustrated that habit has a positive impact on perceived usefulness, continuance intention as well as trust. On the other hand, Amoroso and Lim (2017) have found that consumer satisfaction has a positive impact on habit, and habit has also a positive impact on continuance intention. Moreover, habit has mediated the relationship between consumer satisfaction and continuance intention when compared to consumer attitudes in mobile phone usage. As a moderator variable, habit has been used in Hsu et al.'s (2015) study to understand the effect on the antecedents of repeat purchase intention. Lastly, McCarthy et al. (2017) have examined habit as a dependent variable in healthy food consumption to explore factors that create a habit of eating healthy.

Habit is acknowledged as a learned and automatic behaviour with unconscious intention (Amoroso & Lim, 2017; De Guinea & Markus, 2009). They state that habit plays an active role in creating information system behavioural intention and usage. During this active role, habit lessens the mindful awareness with which acts are performed (James, 1890). For instance, Farivar et al. (2017) found that when people habituate utilizing social commerce websites, they would disregard or diminish attention to some significant factors such as trust and risk. This suggests that if the behaviour is habit-driven, people are not likely to think of the considerations that they were previously conscious of. However, since technology is progressing with much greater rapidity than academia (Jones, 2018), this can vary in some cases, especially, with the emergence of technology devices like VAs, where concerns about privacy have appeared. In such circumstances, habit creation can depend on other antecedents such as attitude and satisfaction (e.g. Amoroso & Lim, 2017) so that privacy issues do not prevent habit creation in using VAs.

Trust is described as any person's willingness and belief to have confidence in another (Kumar, 1996). Trust is therefore one of the most powerful elements of overcoming uncertainty (Yang et al., 2019. When the latest technologies produce novel products or services, users initially are likely to feel uncertainty because of a lack of information. However, if users have a feeling of trust towards the product or service stemming from usage, positive word of mouth, or even previous brand experience, they may start to utilize this product or service by eliminating uncertainty. Hence, Clements and Bush (2011) have also stated that trust might be driver of the habitual usage in information system (IS) due to having privacy risks.

As a result, habit can be created through trust. As suggested by Amoroso and Lim (2017), habit creation might result from positive feelings such as satisfaction. Based on this, habit can be a result of trust. The more trust users have towards using VAs, the stronger a habit will be formed in using VAs. Moreover, research also suggests that there plays a role of trust in the adaptation of intelligent personal assistants (Liao et al., 2019). Based on this, we propose that trust positively affects habit when using VAs:

H5: Trust has a positive impact on the habit of using VAs.

Along with trust, attitude is either people's positive or negative feelings toward any object overall. Attitude gives an opportunity to determine and evaluate people's ideas (Moriuchi, 2019). Accordingly, attitude is a significant factor affecting people's behavioural intentions (Ajzen, 1991). In the existing literature, it has been found that there is a positive relationship between attitude and behavioural intentions (e.g. Fortes & Rita, 2016; Walter & Abendroth, 2020). For this relationship, it has been highlighted that habit is a close and related construct to this relationship but has not received sufficient attention (Beatty & Kahle, 1988; Verplanken & Aarts, 1999; Triandis, 1980). They also highlighted that attitude is an important determinant to understand habit construct. However, despite of the importance of this relationship, the effect of attitude on habit has not sufficiently still been examined. In this study, attitudes towards using VAs represent users' information seeking unlike other attitude scales. We suppose that when the users are motivated to seek information, their positive attitudes towards using VAs, may turn into strong habit. Hence, we posit that:

H6: Attitude towards VAs has a positive impact on the habit of using VAs.

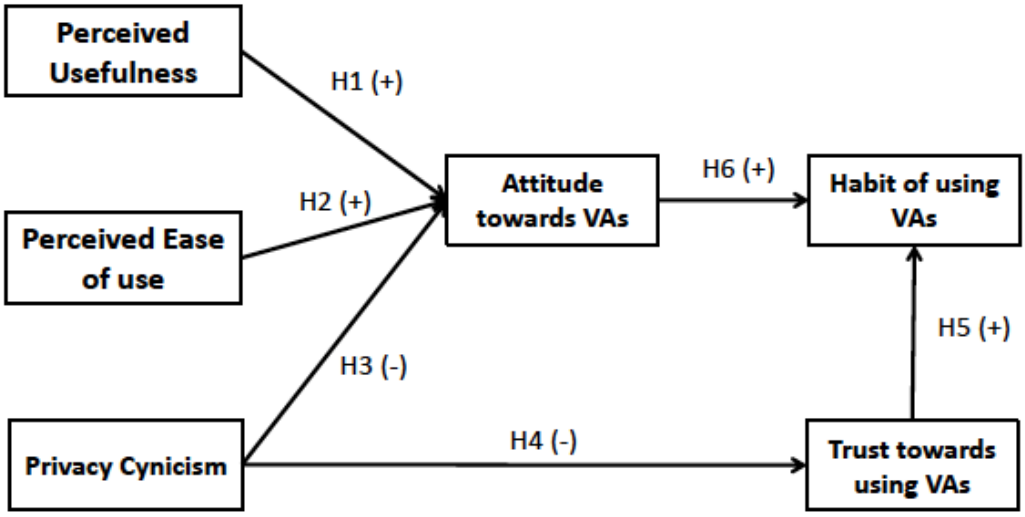

Figure 1. Conceptual model

Research methodology

Sample and data collection

Our sample includes Amazon Mechanical Turk (MTurk) respondents located in the USA. MTurk is a marketplace for a simple way to a different, on-demand workforce in exchange for payment. It is known as a beneficial source for data collection in social and behavioural sciences because of its affordability, accessibility, and simplicity for human intelligence. Hence, MTurk is extensively employed in consumer research (Goodman & Paolacci, 2017). Some reliability and validity issues through the use of MTurk in gathering data for research have appeared. But research analyses have demonstrated that data rendered by MTurk is as reliable as data gathered by other means. Moreover, prior research has shown that MTurk respondents had high-quality responses, outperforming respondents from other methods of data collection (e.g. Casler et al., 2013; Kees et al., 2017; Thomas & Clifford, 2017). Participation is completely voluntary and was free from any financial incentive. The selection criteria

for respondents in this study was that they had to (i) be 18 years old or above, and (ii) own and/or at least have had one or more experience of using VA devices.

Data was gathered over a period of 7 days in June 2020. In total, 277 responses were gathered. After removing the respondents who did not succeed in attention-check questions, we were left with 265 responses that were valid and useful, that is, all questions were completed in the survey. The sample size is sufficient given the number of items covering in PLS modeling (e.g. Brill et al., 2019; Chin, 1998; Stocchi et al., 2018). The sample included 46.8 % males and 53.2 % females, with the most answers coming from participants aged between 25 and 34 years (41.9 %), followed by 35–44-year-olds (23.4%) and 18–24-year-olds (14.7%). The vast majority of our respondents (97%) are from the USA. According to Statista (2020), it is known that 117.7 million people used a digital VA at least once a month in the USA. Moreover, it is projected that in 2021, 122.7 million people will benefit from these VA devices in the USA (Statista, 2020). Hence, the sample of this study is consistent with the aim of the study. Additionally, respondents demonstrated that their usage of VAs was largely concentrated on the top three brands: Google Assistant (35.8%), Amazon's Alexa (28.7%), and Apple's Siri (27.9%). Unlike the majority, 3.4% of the respondents chose Cortana. Table 1 illustrates the sample profile of this study.

Table 1. Sample profile (n= 265)

		%	N
Gender	Female	53.2	124
	Male	46.8	141
Age	18–24	14.7	39
	25–34	41.9	111
	35–44	23.4	62
	45–54	9. 3	25
	55–65	7..6	20
	More than 65	3.1	8
Education Level	High School	31.3	83
	Bachelor	49.8	132
	Masters	14.7	39
	Ph.D.	1.9	5
	Professional Degree	2.3	6
Nationality	American	97.0	257
	Other	3.0	8
Which VA do you use the most?	Siri	27.9	74
	Alexa	28.7	76
	Cortana	3.4	9
	Google Assistant	35.8	95
	Missing	4.2	11

Construct measures

The study findings are based upon a cross-sectional survey study. All constructs were assessed using existing measures. The measurement items for each construct in the model were based on a five-point Likert-type scale requiring an answer ranging from strongly disagree (1) to strongly agree (5). All items were adapted from the current literature to enhance efficiency in terms of the validity and reliability of the measurement model. The scale used to measure privacy cynicism with five statements was adopted from the study by Choi et al. (2018). The five statements on perceived usefulness and ease of use were taken from the study by Ratten (2015). Attitude towards VAs was measured from five statements derived from Moriuchi et al.'s study (2019). The scale used to measure trust through three statements was adopted by Kim et al.'s (2019). The habit was measured by three statements adapted from Hsiao et al.'s study (2016).

Data analysis

Using the directions provided by Hair et al. (2017), PLS-SEM (SmartPLS 3.2.6) was chosen to evaluate the structural equation models and test the hypothesis over 265 respondents (Wold, 1982). Since the measurements are taken on a Likert scale, data does not have a normal distribution. Based on these characteristics, since PLS does not need any normality assumptions and copes with non-normal distributions in a successful way (Ali et al., 2018), PLS-SEM was preferred. Following the directions, we used bootstrapping with 1,000 sub-samples to estimate the t-values to evaluate the level of significance for path coefficients.

Results

Measurement model evaluation

The measurement model was tested to evaluate its internal consistency reliability, indicator reliability, convergent reliability, and discriminant reliability (Hair et al., 2011). The results first demonstrate that the items loaded on their respective factor have coefficients between 0.765 and 0.934, which are greater than the recommended value of 0.7 (Sarstedt et al., 2014). However, one item from the ease of use and two items from privacy cynicism were deleted due to low loading. As a result, the internal consistency reliability was approved as the Cronbach’s alpha and the composite reliability scores for all the constructs were all greater than the suggested score of 0.70 (Hair et al., 2017). While the Cronbach's alpha ranges between 0.833 and 0.879, composite reliability varies between 0.901 and 0.922. In addition to the internal consistency reliability, to successfully meet the criteria about a factor's convergent validity, we followed the guideline of Hair et al. (2011), which stated that the average variance extracted (AVE) should be greater than 0.5. The AVE for all constructs is higher than 0.675, hence illustrates the capturing of convergent validity for all six constructs. These findings are presented in Table 2.

Table 2. PLS factor loadings, validity and reliability for constructs

Constructs	Items	Loadings	Cronbach 's Alpha	Rho_A	Composite Reliability	Average Variance Extracted (AVE)
Perceived Usefulness *(Ratten, 2015)*	Using a VA would enable me to accomplish more tasks more quickly.	0.814	0.879	0.884	0.912	0.675
	Using VAs increases my productivity.	0.854				
	Using VAs would make it easier to store information.	0.765				
	Overall, using VAs is advantageous.	0.827				
	Using VAs would improve my life.	0.845				
Trust in using VAs *(Kim et al., 2019)*	VA in a safe way such that information would be exchanged with others.	0.882	0.849	0.859	0.908	0.767
	VA in a reliable way such that business transactions would be conducted.	0.893				
	VA would handle personal information in a competent fashion.	0.853				
The Ease of Use (*Ratten, 2015)*	Using VAs is easy to understand and clear.	0.832	0.861	0.870	0.905	0.705
	I would find VAs easy to use.	0.856				
	I would find it easy to use VAs for accessing information.	0.881				
	I would be easy for me to become skilful at using VAs.	0.788				
Privacy Cynicism *(Choi et al., 2018)*	I have become less interested in online privacy issues.	0.896	0.841	0.855	0.904	0.758
	I have become less enthusiastic in protecting personal information provided to online vendors.	0.886				
	I doubt the significance of online privacy issues more often.	0.828				
Habit of using VAs (*Hsiao et al., 2016)*	The use of VAs has become a habit for me.	0.771	0.833	0.853	0.901	0.753
	I am addicted to using VAs.	0.890				
	I must use VAs.	0.934				
Attitude towards using VAs (*Moriuchi, 2019)*	Using VAs for information seeking is useful.	0.820	0.849	0.895	0.922	0.702
	Using VAs for information seeking is realistic.	0.871				
	Using VAs for information seeking is informative.	0.843				
	Using VAs for information seeking is specific	0.803				
	Using VAs for information seeking is logical.	0.851				

Next, we checked the model for discriminant validity. Discriminant validity refers to the "extent to which a construct truly distinct from other constructs by empirical standards" (Hair et al., 2013, p.104). Fornell and Larcker's (1981) criterion was applied to examine the discriminant validity of the variables. As shown in Table 3, the square root of AVE of each construct in the matrix diagonal is larger than the relevant correlation (off-diagonal) in corresponding rows and columns, hence showing sufficient discriminant validity is performed. Another new way to evaluate discriminant validity is through the means of heterotrait-monotrait (HTMT) ratio of correlations (Henseler et al., 2015). HTMT criterion is more conservative and considered to be a more robust method of evaluating the discriminant validity (Jeon et al., 2019). Table 4 demonstrates that all findings of HTMT values are under the recommended threshold of 0.85 (Kline, 2011), thereby indicating that discriminant validity is not an issue in the present study.

Table 3. Discriminant validity – Fornell & Larcker

	Attitude	**Privacy Cynicism**	**The Ease of Use**	**Habit**	**Trust**	**Perceived Usefulness**
Attitude	***0.838***					
Privacy Cynicism	-0.051	***0.871***				
The Ease of Use	0.694	-0.071	***0.840***			
Habit	0.299	0.438	0.199	***0.868***		
Trust	0.515	0.335	0.404	0.643	***0.876***	
Perceived Usefulness	0.749	0.157	0.615	0.494	0.665	***0.821***

Table 4. Discriminant validity – HTMT

	Attitude	**Privacy Cynicism**	**The Ease of Use**	**Habit**	**Trust**	**Perceived Usefulness**
Attitude						

Privacy Cynicism	0.150				
The Ease of Use	0.786	0.090			
Habit	0.358	0.506	0.251		
Trust	0.592	0.388	0.477	0.758	
Perceived Usefulness	0.839	0.180	0.698	0.594	0.775

To analyse common method bias, we examined a full collinearity test for the latent constructs. Kock (2015) suggests that the inter-construct variance inflation factors (VIFs) should be less than 5. The results of VIF values demonstrates that the largest value is 3.3 and the lowest value is 1.5. Thus, common method bias is not an important matter in this study.

Structural model evaluation

In the PLS structural model, to assess the explanatory power of the model, the variance explained (R^2) has been applied. The R^2 values of 0.67 (attitude), of 0.41 (habit), and of 0.11 (trust) for the endogenous variables in our model are to be considered as moderate (Chin, 1998). In order to examine the model fit criterion, the standardized root mean square residual (SRMR) is utilized as recommended by Henseler et al. (2016). They have recommended that an SRMR value should not greater than 0.08. Our SRMR value is 0.07, which points out that our model fit criterion is sufficiently met.

To test the significance of path coefficients, we ran bootstrapping using 265 cases with 1,000 bootstrap resamples and confidence intervals at 95%. Hypothesis 1 implies that ease of use has a positive impact on attitude. The size of the path coefficient is 0.344 and significant ($p < 0.001$), showing that H1 is supported. Hypothesis 2 tests the relationship between perceived usefulness and attitude, and the findings display perceived usefulness is explained by attitude, thereby H2 is supported ($\beta = 0.555$, $p < 0.001$). Hypothesis 3 expects that privacy cynicism has a negative impact on attitude. This is also significantly explained, hence H3 is supported ($\beta = -0.113$, $p < 0.05$). Hypothesis 4 tests the relationship between privacy cynicism and trust, and the results illustrate that its path coefficient is 0.335 and significant ($p < 0.001$), however, unlike expected, H4 is rejected because we found a positive effect of privacy cynicism on trust. Hypothesis 5 states that trust has a positive effect on habit. The results support this hypothesis ($\beta = 0.665$, $p < 0.001$). On the other hand, Hypothesis 6 illustrates that there is no significant relationship between attitude and habit. Hence, H6 is not supported. The findings for each hypothesis are provided in Table 5.

Table 5. Structural model results

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
H1: Perceived Usefulness -> Attitude	0.555	0.552	0.060	9.236	0.000*
H2: Ease of Use -> Attitude	0.344	0.349	0.064	5.397	0.000*
H3: Privacy Cynicism -> Attitude	-0.113	-0.113	0.041	2.723	0.007**
H4: Privacy Cynicism -> Trust	0.335	0.337	0.059	5.701	0.000*
H5: Trust -> Habit	0.665	0.668	0.048	13.897	0.000*
H6: Attitude towards using VAs -> Habit of using VAs	-0.043	-0.043	0.063	0.687	0.492

Discussion

Notwithstanding the attention given to VAs and their increasing adoption, along with their estimated future growth, there is scant academic research revealing what impacts people's attitudes towards VAs and the habit of using them. As stated by Yang and Lee (2018) since the VA services are still in the early stages of adoption market, there needs to be some understanding of the drivers behind the usage habits of VAs, which is what this study addresses. The theoretical model explained 41% of the variance usage habit of VAs and was found to be statistically significant.

The first hypothesis proposed that perceived usefulness would be positively related to attitude towards the VA. The second hypothesis predicted that ease of use has a positive impact on attitudes towards VAs. These results are consistent with previous studies examining the effect of perceived usefulness and ease of use on attitude in different contexts also capturing privacy issues (e.g. Bailey et al., 2017; Dadvari & Do, 2019; Fortes & Rita, 2016; Vijayasarathy, 2004I; Walter & Abendroth, 2020). These findings further confirmed the suggestion that perceived usefulness is a more effective determinant than ease of use for deciding consumers' attitudes towards a certain technology (Kang & Namkung, 2019).

Additionally, this is the first study to examine the effect of privacy cynicism on attitude and trust in order to cope with privacy issues. Specifically, the findings demonstrate that privacy cynicism has a negative impact on attitude, as expected. Since cynicism represents negative feelings, the more the users have more privacy cynicism, the less likely they have an attitude towards usage VAs. This finding is also in line with the organizational management literature which examines the negative relationship between cynicism and attitude. Choi et al. (2018) also conceptualized privacy cynicism

as a component of privacy fatigue, and they highlighted that privacy cynicism might result in negative behavioural intentions. Based on this, our finding is indirectly consistent with their study.

However, contrary to our hypothesis, the results illustrate that privacy cynicism positively affects users' trust in VAs; whereas the organizational management literature (e.g. Dean et al., 1998) stated that cynicism leads to distrust. Lutz et al. (2020) further state that mistrust is positively related to privacy cynicism for users in Germany. That is, as we hypothesized, they highlight that trust is negatively related to privacy cynicism. Our findings appear to contradict previous studies when applied in the context of VAs. Previous studies in the context of online transactions have already found a similar effect, where users develop expectations towards the transaction partners which lead to a more carefree reliance on the platforms used (Bhattacharjee, 2002; McKnight et al., 2002). The evidence appears to suggest that this relationship is also present in this context, where privacy cynicism acts as a coping mechanism that allows consumers to ignore their privacy concerns, even if these concerns are present, so therefore privacy cynicism acts as an antecedent of higher levels of trust towards VAs. Yet, privacy cynicism leads to more unexpected outcomes than other privacy-related constructs. Therefore, further research is needed to understand privacy cynicism in more depth.

The fifth hypothesis predicted that trust is positively related to habit in using VAs. Trust is considered a crucial requirement for the creation and growth of online services (Hoffman et al., 2016). Previous studies have highlighted how trust should be examined in VA devices' acceptance and usage (e.g. Liao et al., 2019; Foehr & Germelmann, 2020). In particular, in daily life, many consumers report that they experience trust issues with their VAs (Francis, 2018). Therefore, trust might be considered a key driver of habit with VA usage.

As a final hypothesis, our finding shows that there is no significant relationship between attitude towards using VAs and the habitual use of VAs. The reason for this is that even though users may not have a positive attitude towards using VAs from a utilitarian perspective, they can still use VAs to meet their other needs (i.e. listening to music). This finding is also in line with the study by Amoroso and Lim (2017) in a different context. They stated that the relationship between consumer attitudes and habit was not found to be significant for mobile apps. As they suggest, there might be unknown mediating constructs between attitude and habit to find a significant relationship. Law (2020) has stated that some scholars reported how attitude has a limited capacity to explore future behaviours. Hence, this finding might prove this situation; attitude should be more integrated with habit-related research models as suggested by Law et al. (2016).

Theoretical implications

This research provides a number of theoretical implications for a better understanding of consumers' habits in using VAs. First, this study extends the TAM (Davis, 1989) in conjunction with the concept of privacy cynicism in order to reveal the drivers behind the consumer usage habits of VAs. Even though the TAM has been examined in the privacy context in different settings (e.g. Bailey et al., 2017; Vijayasarathy, 2004; Walter & Abendroth, 2020), in the existing literature, the role that privacy cynicism has on attitudes and trust under this theoretical framework remains understudied. Thus, this study measures how privacy cynicism integrates with technology acceptance models while expanding the interaction that exists between those models and privacy-related

issues. As a consequence, our study provides a comprehensive framework to understand consumers' use of novel technological devices. Additionally, this study answers the call by Hoffmann et al. (2016) and Lutz et al. (2020) to empirically measure the consequences of privacy cynicism in technological contexts, yet there is a paucity of studies that support this proposition (e.g. Choi et al., 2018; Lutz et al., 2020). Hence, this research contributes to the understanding of privacy cynicism and its consequences in the context of new technology. Additionally, to the best of our knowledge, there is no existing study specifying trust and attitude as an antecedent to habit, despite the fact that for AI-enabled technology like VAs, habitual use is central to the refinement of the outcomes that the technology produces (Kepuska & Bohouta, 2018). Honkonen et al. (2005) remark that habits should be not neglected in consumer behaviours. Similarly, Ye and Potter (2011) have highlighted the necessity for further research to understand the role of habit in the domain of consumer behaviour. This study has also answered Oh et al.'s (2019) call for research into the potential factor of habit associating with innovative applications (e.g. location-based service app). From the other perspective, even though there are numerous studies pointing to trust as one of the inevitable components of success in the online environment (e.g. Alalwan et al., 2015; Casaló et al., 2011; Chiu et al., 2012; Koufaris & Hampton-Sosa, 2004), there are few studies examining the trust component in the context of VAs. This study has also contributed to the literature on VAs with respect to trust.

Managerial implications

This research presents empirical support for the drivers of habit with VA usage, thereby contributing significant contributions to practical marketing implications. First, if managers or companies are demanding to create a habit for users in the context of AI-based VAs, this research proposes that they should give more importance to trust rather than cultivating a positive attitude towards VAs. Hence, they might need to take some precautions regarding users' data privacy issues to create a feeling of trustworthiness in the devices. Second, perceived usefulness and ease of use should be considered to foster users' positive attitudes towards VA usage. VA designers should improve ease of use rather than perceived usefulness to create positive attitudes towards VA usage. On this basis, VA companies should enhance the functionality of the devices to win more technology users in the future. Third, companies and managers should be aware of the possible effect of privacy cynicism, which might result in negative consequences such as shaping the negative attitude towards VAs in the future. Otherwise, they can also use privacy cynicism as a competitive advantage to cope with the privacy paradox for their own users. Hence, marketing managers need to recognize the concept of privacy cynicism among VA users in order to eliminate the negative effects.

Limitations and future research directions

Notwithstanding its contributions, this research is subject to several limitations, which provide scope for further research. First of all, a cross-sectional approach is used in this research, which means that the survey was collected at one time. This might lead to some problems in terms of generalizability and hence other kinds of studies such as longitudinal studies are suggested for further studies on the phenomenon. Second, while the sample size is acceptable, it should be increased in future studies. Third, due to the lack of studies on conceptualized privacy cynicism and the fact this study led to

unexpected outcomes to other privacy constructs, the concept of privacy cynicism should be investigated in more depth. We used TAM constructs to investigate VA users' habits, but other technology-related theories such as Expectation Confirmation Theory (ECT) or UTAUT and Diffusion of Innovation Theory (DIT) should be used to more fully understand VAs users' habits, attitudes or behavioural intentions. In our theoretical model, we only focused on the utilitarian perspective of VAs, and a more comprehensive study would also include scales that consider study would also include scales that consider hedonic use of VAs, hence future research should focus on the hedonic perspective of VAs. Additionally, privacy concerns can be added to this model for future research. This might enable us to understand how to build a relationship between privacy cynicism and privacy concern in VA usage. Along with these, we did not find a significant relationship between attitude towards VAs and habit of using VAs. Future research should investigate this relationship in deep by considering some mediation variables (e.g. satisfaction). Our study focused on VAs to examine user habits. In future research, other AI-based technologies such as autonomous payments and conversational chatbots should be taken into consideration. Moreover, research more needed to explore what drives habitual use of VAs or in different settings.

References

Aeschlimann, S., Bleiker, M., Wechner, M., & Gampe, A. (2020). Communicative and social consequences of interactions with voice assistants. *Computers in Human Behavior, 112*, 106466.

Agag, G., & El-Masry, A. A. (2016). Understanding consumer intention to participate in online travel community and effects on consumer intention to purchase travel online and WOM: An integration of innovation diffusion theory and TAM with trust. *Computers in Human Behavior, 60*, 97–111.

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*(2), 179–211.

Alalwan, A. A., Dwivedi, Y. K., Rana, N. P., Lal, B., & Williams, M. D. (2015). Consumer adoption of Internet banking in Jordan: Examining the role of hedonic motivation, habit, self-efficacy and trust. *Journal of Financial Services Marketing, 20*(2), 145–157.

Alepis, E., & Patsakis, C. (2017). Monkey says, monkey does: Security and privacy on voice assistants. *IEEE Access, 5*, 17841–17851.

Ali, F., Rasoolimanesh, S.M., Sarstedt, M., Ringle, C.M., & Ryu, K. (2018). An assessment of the use of partial least squares structural equation modeling (PLS-SEM) in hospitality research. *International Journal of Contemporary Hospitality Management, 30*(1), 514–538.

Al-Momani, A. M., Mahmoud, M. A., & Ahmad, M. S. (2019). A review of factors influencing customer acceptance of internet of things services. *International Journal of Information Systems in the Service Sector (IJISSS), 11*(1), 54–67.

Amoroso, D., & Lim, R. (2017). The mediating effects of habit on continuance intention. *International Journal of Information Management, 37*(6), 693–702.

Andersson, L. M. (1996). Employee cynicism: An examination using a contract violation framework. *Human Relations, 49*(11), 1395–1418.

Ashfaq, M., Yun, J., & Yu, S. (2020). My Smart Speaker is Cool! Perceived Coolness, Perceived Values, and Users' Attitude toward Smart Speakers. *International Journal of Human–Computer Interaction,* 1–14.

Ashok, V., Borodin, Y., Stoyanchev, S., Puzis, Y., & Ramakrishnan, I. (2014, April). *Wizard-of-Oz evaluation of speech-driven web browsing interface for people with vision impairments* [Paper presentation]. 11th Web for All Conference, (12), 1–9. doi:10.1145/2596695.2596699.

Bailey, A. A., Pentina, I., Mishra, A. S., & Ben Mimoun, M. S. (2017). Mobile payments adoption by US consumers: An extended TAM. *International Journal of Retail & Distribution Management, 45*(6), 626–640.

Bateman, T. S., Sakano, T., & Fujita, M. (1992). Roger, me, and my attitude: Film propaganda and cynicism toward corporate leadership. *Journal of Applied Psychology, 77*(5), 768–771.

Beatty, S. E., & Kahle, L. R. (1988). Alternative hierarchies of the attitude-behavior relationship: The impact of brand commitment and habit. *Journal of the Academy of Marketing Science, 16*(2), 1–10.

Bhattacherjee, A. (2002). Individual trust in online firms: Scale development and initial test. *Journal of Management Information Systems, 19*, 211–241.

Brill, T. M., Munoz, L., & Miller, R. J. (2019). Siri, Alexa, and other digital assistants: a study of customer satisfaction with artificial intelligence applications. *Journal of Marketing Management, 35*(15–16), 1401–1436.

Boush, D. M., Kim, C. H., Kahle, L. R., & Batra, R. (1993). Cynicism and conformity as correlates of trust in product information sources. *Journal of Current Issues & Research in Advertising, 15*(2), 71-79.

Burke, R. R. (1997). Do you see what I see? The future of virtual shopping. *Journal of the Academy of Marketing Science, 25*(4), 352–360.

Casaló, L. V., Flavián, C., & Guinalíu, M. (2011). Understanding the intention to follow the advice obtained in an online travel community. *Computers in Human Behavior, 27*(2), 622–633.

Casler, K., Bickel, L., & Hackett, E. (2013). Separate but equal? A comparison of participants and data gathered via Amazon's MTurk, social media, and face-to-face behavioral testing. *Computers in Human Behavior, 29*(6), 2156–2160.

Celi, R. (2020). 5 ways voice assistants are transforming our habits. Retrived from: https://www.celi.it/en/blog/2020/02/5-ways-voice-assistants-are-transforming-our-habits/

Chaouali, W., Souiden, N., & Ladhari, R. (2017). Explaining adoption of mobile banking with the theory of trying, general self-confidence, and cynicism. *Journal of Retailing and Consumer Services, 35*, 57–67.

Chen, L.D., & Tan, J. (2004). Technology adaptation in e-commerce: Key determinants of virtual stores acceptance. *European Management Journal, 22*(1), 74–86.

Cheung, M. L., Chau, K. Y., Lam, M. H. S., Tse, G., Ho, K. Y., Flint, S. W., ... & Lee, K. Y. (2019). Examining consumers' adoption of wearable healthcare technology: The role of health attributes. *International Journal of Environmental Research and Public Health, 16*(13), 2257.

Chin, W.W. (1998). The partial least squares approach to structural equation modeling. In G. A. Marcoulides (Ed.), *Modern methods for business research* (pp. 295–336). Lawrence Erlbaum Associates Inc.

Chiu, C. M., Hsu, M. H., Lai, H., & Chang, C. M. (2012). Re-examining the influence of trust on online repeat purchase intention: The moderating role of habit and its antecedents. *Decision Support Systems, 53*(4), 835–845.

Choi, H., Park, J., & Jung, Y. (2018). The role of privacy fatigue in online privacy behavior. *Computers in Human Behavior, 81*, 42–51.

Chou, C., Chiu, C., Ho, C., & Lee, J. (2013). *Understanding mobile apps continuance usage behavior and habit: An expectance-confirmation theory*. PACIS 2013 Proceedings132, http://aisel.aisnet.org/pacis2013/132/

Chuah, S. H. W., Rauschnabel, P. A., Krey, N., Nguyen, B., Ramayah, T., & Lade, S. (2016). Wearable technologies: The role of usefulness and visibility in smartwatch adoption. *Computers in Human Behavior, 65*, 276–284.

Clements, J. A., & Bush, A. A. (2011). *Habitual IS Use and Continuance.* SAIS 2011 Proceedings. 16.

Colson, E. (2018, November 27). *Curiosity-driven data science*. Harvard Business Review. https://hbr.org/2018/11/curiosity-driven-data-science.

Coskun-Setirek, A., & Mardikyan, S. (2017). Understanding the adoption of voice activated personal assistants. *International Journal of E-Services and Mobile Applications (IJESMA), 9*(3), 1–21.

Cuomo, S., Colecchia, G., di Cola, V. S., & Chirico, U. (2021). A virtual assistant in cultural heritage scenarios. *Concurrency and Computation: Practice and Experience, 33*(3), e5331.

Dadvari, A., & Do, B. R. (2019). Modeling Gen Z continuance intention toward ubiquitous media system: Applying technology readiness and Technology Acceptance Model. *International Journal of Information and Management Sciences, 30*(1), 37–56.

Davenport, T. H., & Ronanki, R. (2018). Artificial intelligence for the real world. *Harvard Business Review, 96*(1), 108-116.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly, 13*(3), 319–340.

Davis, F. D. (1993). User acceptance of information technology: System characteristics, user perceptions and behavioral impacts. *International Journal of Man-Machine Studies, 38*(3), 475–487.

Dean Jr, J. W., Brandes, P., & Dharwadkar, R. (1998). Organizational cynicism. *Academy of Management Review, 23*(2), 341–352.

De Boer, P. S., van Deursen, A. J., & Van Rompay, T. J. (2019). Accepting the Internet-of-Things in our homes: The role of user skills. *Telematics and informatics, 36*, 147–156.

De Guinea, A. O., & Markus, M. L. (2009). Why break the habit of a lifetime? Rethinking the roles of intention, habit, and emotion in continuing information technology use. Mis Quarterly, *33*(3) 433–444.

Easwara Moorthy, A., & Vu, K. P. L. (2015). Privacy concerns for use of voice activated personal assistant in the public space. *International Journal of Human-Computer Interaction, 31*(4), 307–335.

Eraslan Yalcin, M., & Kutlu, B. (2019). Examination of students' acceptance of and intention to use learning management systems using extended TAM. *British Journal of Educational Technology, 50*(5), 2414–2432.

Farivar, S., Turel, O., & Yuan, Y. (2017). A trust-risk perspective on social commerce use: An examination of the biasing role of habit. *Internet Research, 27*(3), 586–607.

Foehr, J., & Germelmann, C. C. (2020). Alexa, can I trust you? Exploring consumer paths to trust in smart voice-interaction technologies. *Journal of the Association for Consumer Research, 5*(2), 181–205.

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research, 18*(1), 39–50.

Fortes, N., & Rita, P. (2016). Privacy concerns and online purchasing behaviour: Towards an integrated model. *European Research on Management and Business Economics, 22*(3), 167–176.

Fountoukidou S, Ham J, Matzat U, Midden C (2018). Using an artificial agent as a behavior model to promote assistive technology acceptance. *In: International conference on persuasive technology. Springer, 17* (65–87), 285–296.

Francis, G. (2018*).* Many voice assistant users have 'trust issues' with their device, study claims. *The Independent.* https://www.independent.co.uk/news/uk/home-news/voice-assistant-amazon-echo-google-home-trust-artificial-intelligence-a8534556.html.

Gefen, D. (2003). TAM or just plain habit: A look at experienced online shoppers. *Journal of End User Computing, 15*(3), 1–13.

Gefen, D., Karahanna, E., & Straub, D. W. (2003). Trust and TAM in online shopping: An integrated model. *MIS Quarterly, 27*(1), 51–90.

Ghosh, C., & Eastin, M. S. (2020). Understanding Users' Relationship with Voice Assistants and How It Affects Privacy Concerns and Information Disclosure Behavior. In *International Conference on Human-Computer Interaction*, 381-392. Springer, Cham.

Golden, A., & Krauskopf, P. (2016). Systematic evaluation of mobile apps. *The Journal for Nurse Practitioners, 12*(1), e27–e28.

Goodman, J. K., & Paolacci, G. (2017). Crowdsourcing consumer research. *Journal of Consumer Research, 44*(1), 196–210.

Hair, J. F., Hult, G. T. M., Ringle, C., & Sarstedt, M. (2013). *A Primer on Partial Least Squares Structural Equation Modelling (PLS-SEM)*. Sage Publications.

Hair, J. F., Hult, G. T. M., Ringle, C. M., Sarstedt, M., & Thiele, K. O. (2017). Mirror, mirror on the wall: A comparative evaluation of composite-based structural equation modeling methods. *Journal of the Academy of Marketing Science, 45*(5), 616–632.

Hair Jr, J. F., Matthews, L. M., Matthews, R. L., & Sarstedt, M. (2017). PLS-SEM or CB-SEM: Updated guidelines on which method to use. *International Journal of Multivariate Data Analysis, 1*(2), 107–123.

Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: Indeed a silver bullet. *Journal of Marketing theory and Practice, 19*(2), 139–152.

Hamid, A. A., Razak, F. Z. A., Bakar, A. A., & Abdullah, W. S. W. (2016). The effects of perceived usefulness and perceived ease of use on continuance intention to use e-government. *Procedia Economics and Finance, 35*, 644–649.

Hassanein, K., & Head, M., (2007). Manipulating perceived social presence through the web interface and its impact on attitude towards online shopping. *International Journal of Human-Computer Studies, 65* (8), 689–708.

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science, 43*(1), 115–135.

Henseler, J., Ringle, C.M., & Sarstedt, M. (2016). Testing measurement invariance of composites using partial least squares. *International Marketing Review, 33*(3), 405–431.

Hoffmann, C. P., Lutz, C., & Ranzini, G. (2016). Privacy cynicism: A new approach to the privacy paradox. Cyberpsychology: *Journal of Psychosocial Research on Cyberspace, 10*(4), article 7.

Honkanen, P., Olsen, S. O., & Verplanken, B. (2005). Intention to consume seafood—the importance of habit. *Appetite, 45*(2), 161–168.

Hoy, M. B. (2018). Alexa, Siri, Cortana, and more: an introduction to voice assistants. *Medical Reference Services Quarterly, 37*(1), 81–88.

Hsiao, C. H., Chang, J. J., & Tang, K. Y. (2016). Exploring the influential factors in continuance usage of mobile social Apps: Satisfaction, habit, and customer value perspectives. *Telematics and Informatics, 33*(2), 342–355.

Hsu, M. H., Chang, C. M., & Chuang, L. W. (2015). Understanding the determinants of online repeat purchase intention and moderating role of habit: The case of online group-buying in Taiwan. *International Journal of Information Management, 35*(1), 45–56.

James, W. (1890). *The Principles of Psychology.* Vol. 1. Macmillan.

Jacucci, G., Spagnolli, A., Freeman, J., & Gamberini, L. (2015, October). Symbiotic interaction: a critical definition and comparison to other human-computer paradigms. In *International workshop on symbiotic interaction* (pp. 3–20). Springer, Cham.

Jeon, H. M., Ali, F., & Lee, S. W. (2019). Determinants of consumers' intentions to use smartphones apps for flight ticket bookings. *The Service Industries Journal, 39*(5–6), 385–402.

Johnson, J. L., & O'Leary- Kelly, A. M. (2003). The effects of psychological contract breach and organizational cynicism: Not all social exchange violations are created equal. *Journal of Organizational Behavior: The International Journal of Industrial, Occupational and Organizational Psychology and Behavior, 24*(5), 627–647.

Jones, V. K. (2018). Voice-activated change: Marketing in the age of artificial intelligence and virtual assistants. *Journal of Brand Strategy, 7*(3), 233–245.

Kang, J. W., & Namkung, Y. (2019). The information quality and source credibility matter in customers' evaluation toward food O2O commerce. *International Journal of Hospitality Management, 78*, 189–198.

Kees, J., Berry, C., Burton, S., & Sheehan, K. (2017). An analysis of data quality: Professional panels, student subject pools, and Amazon's Mechanical Turk. *Journal of Advertising, 46*(1), 141–155.

Kepuska, V., & Bohouta, G. (2018, January). Next-generation of virtual personal assistants (microsoft cortana, apple siri, amazon alexa and google home). In *2018 IEEE 8th Annual Computing and Communication Workshop and Conference (CCWC)* (pp. 99–103). IEEE.

Kim, D., Park, K., Park, Y., & Ahn, J. H. (2019). Willingness to provide personal information: Perspective of privacy calculus in IoT services. *Computers in Human Behavior, 92*, 273–281.

Kim, H. W., Chan, H. C., & Gupta, S. (2007). Value-based adoption of mobile internet: An empirical investigation. *Decision Support Systems, 43*(1), 111–126.

Kim, T., & Chiu, W. (2019). Consumer acceptance of sports wearable technology: The role of technology readiness. *Journal of Sports Marketing and Sponsorship, 20*, 109–126.

Kline, R. (2011). *Principles and Practice of Structural Equation Modeling* (3rd ed.). Guilford Press.

Kock, N. (2015). Common method bias in PLS-SEM: A full collinearity assessment approach. *International Journal of e-Collaboration, 11*(4), 1-10.

Koufaris, M., & Hampton-Sosa, W. (2004). The development of initial trust in an online company by new customers. *Information & Management, 41*(3), 377–397.

Kowalczuk, P. (2018). Consumer acceptance of smart speakers: A mixed methods approach. *Journal of Research in Interactive Marketing, 12*(4), 418–431.

Kumar, N. (1996). The power of trust in manufacturer-retailer relationships. *Harvard Business Review, 74*(6), 92.

Law, M. (2020). Continuance intention to use Facebook: Understanding the roles of attitude and habit. *Young Consumers, 21*(3), 319-333.

Law, M., Kwok, R. C. W., & Ng, M. (2016). An extended online purchase intention model for middle-aged online users. *Electronic Commerce Research and Applications, 20*, 132-146.

Legris, P., Ingham, J., & Collerette, P. (2003). Why do people use information technology? A critical review of the technology acceptance model. I*nformation & Management, 40*(3), 191–204.

Liao, C., Palvia, P., & Lin, H. N. (2006). The roles of habit and web site quality in e commerce. *International Journal of Information Management, 26*(6), 469–483.

Liao, Y., Vitak, J., Kumar, P., Zimmer, M., & Kritikos, K. (2019, March). *Understanding the role of privacy and trust in intelligent personal assistant adoption*. In International Conference on Information (pp. 102–113). Springer.

Limayem, M., Hirt, S. G., & Cheung, C. M. (2007). How habit limits the predictive power of intention: The case of information systems continuance. *MIS Quarterly, 31*(4), 705–737.

Lin, C. A., & Kim, T. (2016). Predicting user response to sponsored advertising on social media via the technology acceptance model. *Computers in Human Behavior, 64*, 710–718.

Liu, I. F., Chen, M. C., Sun, Y. S., Wible, D., & Kuo, C. H. (2010). Extending the TAM model to explore the factors that affect intention to use an online learning community. *Computers & Education, 54*(2), 600–610.

Lopatovska, I., Rink, K., Knight, I., Raines, K., Cosenza, K., Williams, H., ... & Martinez, A. (2019). Talk to me: Exploring user interactions with the Amazon Alexa. *Journal of Librarianship and Information Science, 51*(4), 984–997.

Lu, J., Yu, C., Liu, C., & Yao, J.E. (2003). Technology acceptance model for wireless Internet. *Internet Research,13*(3), 206–222.

Lutz, C., Hoffmann, C. P., & Ranzini, G. (2020). Data capitalism and the user: An exploration of privacy cynicism in Germany. *New Media & Society, 22*(7), 1168–1187.

McCarthy, M. B., Collins, A. M., Flaherty, S. J., & McCarthy, S. N. (2017). Healthy eating habit: A role for goals, identity, and self-control? *Psychology & Marketing, 34*(8), 772–785.

McKnight, D. H., Choudhury, V., & Kacmar, C. (2002). Developing and validating trust measures for e-commerce: An integrative typology. *Information Systems Research, 13*, 334–359.

McLean, G., & Osei-Frimpong, K. (2019). Hey Alexa… examine the variables influencing the use of artificial intelligent in-home voice assistants. *Computers in Human Behavior, 99*, 28–37.

McLean, G., Osei-Frimpong, K., & Barhorst, J. (2021). Alexa, do voice assistants influence consumer brand engagement?–Examining the role of AI powered voice assistants in influencing consumer brand engagement. *Journal of Business Research, 124,* 312–328.

McLean, G., & Wilson, A. (2019). Shopping in the digital world: Examining customer engagement through augmented reality mobile applications. *Computers in Human Behavior, 101*, 210–224.

Mittal, B. (1988). Achieving higher seat belt usage: The role of habit in bridging the attitude-behavior gap 1. *Journal of Applied Social Psychology, 18*(12), 993–1016.

Moar, J. (2019). Hey Siri, how will you make money?. *Juniper Research*. Retrived from: https://www.juniperresearch.com/document-library/white-papers/the-digital-assistants-of-tomorrow

Moriuchi, E. (2019). Okay, Google! An empirical study on voice assistants on consumer engagement and loyalty. *Psychology & Marketing*, *36*(5), 489–501.

Ofori, K. S., Larbi-Siaw, O., Fianu, E., Gladjah, R. E., & Boateng, E. O. Y. (2016). Factors influencing the continuance use of mobile social media: The effect of privacy concerns. *Journal of Cyber Security and Mobility*, *4*(3), 105–124.

Oh, Y. J., Park, H. S., & Min, Y. (2019). Understanding location-based service application connectedness: Model development and cross-validation. *Computers in Human Behavior*, *94*, 82–91.

Ouellette, J. A., & Wood, W. (1998). Habit and intention in everyday life: The multiple processes by which past behavior predicts future behavior. *Psychological Bulletin*, *124*(1), 54.

Pal, D., Arpnikanondt, C., Funilkul, S., & Razzaque, M. A. (2020). Analyzing the adoption and diffusion of voice-enabled smart-home systems: Empirical evidence from Thailand. *Universal Access in the Information Society*, 1–19.

Park, Y., & Chen, J.V. (2007). Acceptance and adoption of the innovative use of smartphone. *Industrial Management & Data Systems*, *107*(9), 1349–1365.

Pavlou, P. A. (2003). Consumer acceptance of electronic commerce: Integrating trust and risk with the technology acceptance model. *International Journal of Electronic Commerce*, *7*(3), 101–134.

Pfeifle, A. (2018). Alexa, what should we do about privacy? Protecting privacy for users of voice-activated devices. *Washington Law Review*, *93*(1), 421–458.

Perez-Vega, R., Kaartemo, V., Lages, C. R., Razavi, N. B., & Männistö, J. (2021). Reshaping the contexts of online customer engagement behavior via artificial intelligence: A conceptual framework. *Journal of Business Research*, *129*, 902-910.

Pitardi, V., & Marriott, H. R. (2021). Alexa, she's not human but… Unveiling the drivers of consumers' trust in voice- based artificial intelligence. *Psychology & Marketing*, *38*(4), 626-642.

Poushneh, A. (2021). Impact of auditory sense on trust and brand affect through auditory social interaction and control. *Journal of Retailing and Consumer Services*, 58, 102281.

Pugh, S. D., Skarlicki, D. P., & Passell, B. S. (2003). After the fall: Layoff victims' trust and cynicism in re- employment. *Journal of Occupational and Organizational Psychology*, *76*(2), 201–212.

PWC. (2018). *Prepare for the voice revolution*. Retrived from: https://www.pwc.com/us/en/services/consulting/library/consumer-intelligence-series/voice-assistants.html.

Ratten, V. (2015). A cross-cultural comparison of online behavioural advertising knowledge, online privacy concerns and social networking using the technology acceptance model

and social cognitive theory. *Journal of Science and Technology Policy Management, 6*(1), 25–36.

Regoli, R. M. (1976). The effects of college education on the maintenance of police cynicism. *Journal of Police Science and Administration, 4*(3), 340–345.

Reynolds, M. (2017). How to stop Alexa talking to strangers. *New Scientist, 233*(3111), 11.

Rietz, T., Benke, I., & Maedche, A. (2019). The impact of anthropomorphic and functional chatbot design features in enterprise collaboration systems on user acceptance. *Proceedings of the 14th International Conference on Wirtschaftsinformatik*. https://aisel.aisnet.org/wi2019/track13/papers/ 7/

Saad, U., Afzal, U., El-Issawi, A., & Eid, M. (2017). A model to measure QoE for virtual personal assistant. *Multimedia Tools and Applications, 76*(10), 12517–12537.

Sarstedt, M., Ringle, C. M., Smith, D., Reams, R., & Hair Jr, J. F. (2014). Partial least squares structural equation modeling (PLS-SEM): A useful tool for family business researchers. *Journal of Family Business Strategy, 5(*1), 105–115.

Sepasgozar, S. M., Hawken, S., Sargolzaei, S., & Foroozanfa, M. (2019). Implementing citizen centric technology in developing smart cities: A model for predicting the acceptance of urban technologies. *Technological Forecasting and Social Change, 142*, 105–116.

Sezgin, E., Militello, L. K., Huang, Y., & Lin, S. (2020). A scoping review of patient-facing, behavioral health interventions with voice assistant technology targeting self-management and healthy lifestyle behaviors. *Translational Behavioral Medicine, 10*(3), 606–628.

Smith, K. T. (2020). Marketing via smart speakers: What should Alexa say?. *Journal of Strategic Marketing, 28*(4), 350–365.

Statista (2020). Number of voice assistant users in the United States from 2017 to 2022. *Statista.* https://www.statista.com/statistics/1029573/us-voice-assistant-users/

Stocchi, L., Michaelidou, N., Pourazad, N., & Micevski, M. (2018). The rules of engagement: how to motivate consumers to engage with branded mobile apps. *Journal of Marketing Management, 34*(13–14), 1196–1226.

Tamilmani, K., Rana, N. P., Wamba, S. F., & Dwivedi, R. (2021). The extended Unified Theory of Acceptance and Use of Technology (UTAUT2): A systematic literature review and theory evaluation. *International Journal of Information Management,* 57, 102269.

Tassiello, V., Tillotson, J. S., & Rome, A. S. (2021). "Alexa, order me a pizza!": The mediating role of psychological power in the consumer–voice assistant interaction. *Psychology & Marketing,* 1–12.

Terzis, V., Moridis, C. N., & Economides, A. A. (2012). How student's personality traits affect Computer Based Assessment Acceptance: Integrating BFI with CBAAM. *Computers in Human Behavior, 28*(5), 1985–1996.

Thomas, K. A., & Clifford, S. (2017). Validity and Mechanical Turk: An assessment of exclusion methods and interactive experiments. *Computers in Human Behavior, 77*, 184–197.

Thompson, R. C. Joseph, K. M. Bailey, L. L. Worley, J. A., & Williams, C. A. (1999). *Organizational change: An assessment of trust and cynicism.* US Department of Transportation: Federal Aviation Administration.

Triandis, H. C. (1980). Values, attitudes, and interpersonal behavior. In H. E. Howe Jr & M. M. Page (Eds), *Nebraska Symposim on Motivation*, 1979. University of Nebraska Press.

Turner, J. H., & Valentine, S. R. (2001). Cynicism as a fundamental dimension of moral decision-making: A scale development. *Journal of Business Ethics, 34*(2), 123–136.

Venkatesh, V. (2000). Determinants of perceived ease of use: Integrating control, intrinsic motivation, and emotion into the technology acceptance model. *Information Systems Research, 11*(4), 342–365.

Venkatesh, V., & Bala, H. (2008). Technology acceptance model 3 and a research agenda on interventions. *Decision Sciences, 39*(2), 273–315.

Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management Science, 46(*2), 186–204.

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly, 27*(3) 425–478.

Venkatesh, V., Thong, J. Y., & Xu, X. (2012). Consumer acceptance and use of information technology: Extending the unified theory of acceptance and use of technology. *MIS Quarterly, 36*(1), 157–178.

Verplanken, B., & Aarts, H. (1999). Habit, attitude, and planned behaviour: Is habit an empty construct or an interesting case of goal-directed automaticity? *European Review of Social Psychology, 10*(1), 101–134.

Verplanken, B., & Wood, W. (2006). Interventions to break and create consumer habits. *Journal of Public Policy & Marketing, 25*(1), 90–103.

Vimalkumar, M., Sharma, S. K., Singh, J. B., & Dwivedi, Y. K. (2021). Okay google, what about my privacy?': User's privacy perceptions and acceptance of voice based digital assistants. *Computers in Human Behavior, 120*, 106763.

Vijayasarathy, L. R. (2004). Predicting consumer intentions to use on-line shopping: the case for an augmented technology acceptance model. *Information & Management, 41*(6), 747–762.

Walter, J., & Abendroth, B. (2020). On the role of informational privacy in connected vehicles: A privacy-aware acceptance modelling approach for connected vehicular services. *Telematics and Informatics, 49*, 101361J.

Watterson, J. L., Rodriguez, H. P., Aguilera, A., & Shortell, S. M. (2020). Ease of use of electronic health records and relational coordination among primary care team members. *Health Care Management Review, 45*(3), 267–275.

Wharton, S. (2018). Many consumers still concerned about smart-home devices. *eMarketer*. https://www.emarketer.com/content/tbd

Wold, H. (1982). Soft modeling: The basic design and some extensions. In K. G. Jöreskog & H. Wold (Eds.), Systems under indirect observations: Part II (pp. 1–54). North-Holland.

Wrightsman, L. S. (1966). Personality and attitudinal correlates of trusting and trustworthy behaviors in a two-person game. *Journal of Personality and Social Psychology, 4*(3), 328.

Wu, B., & Chen, X. (2017). Continuance intention to use MOOCs: Integrating the technology acceptance model (TAM) and task technology fit (TTF) model. *Computers in Human Behavior, 67,* 221–232.

Wu, J. H., & Wang, S. C. (2005). What drives mobile commerce? An empirical evaluation of the revised technology acceptance model. *Information & Management*, *42*(5), 719–729.

Yang, H., & Lee, H. (2019). Understanding user behavior of virtual personal assistant devices. *Information Systems and e-Business Management*, *17*(1), 65–87.

Yang, S. B., Lee, K., Lee, H., & Koo, C. (2019). In Airbnb we trust: Understanding consumers' trust-attachment building mechanisms in the sharing economy. *International Journal of Hospitality Management, 83,* 198–209.

Ye, C., & Potter, R. (2011). The role of habit in post-adoption switching of personal information technologies: An empirical investigation. *Communications of the Association for Information Systems*, *28*(1), 35.

Yen, Y. S., & Wu, F. S. (2016). Predicting the adoption of mobile financial services: The impacts of perceived mobility and personal habit. *Computers in Human Behavior, 65*, 31–42.

Fulya Acikgoz is a Ph.D. candidate at the Istanbul Technical University, Istanbul. Before starting her Ph.D., she received her master's degree from the Istanbul Bilgi University in 2018. She graduated from Bilkent University, Ankara, in 2016. Her research interests are social media, technology adoption and information, privacy concerns, brand management. Her works have appeared in the *Journal of Business & Industrial Marketing, International Journal of Contemporary Hospitality Management, Behaviour & Information Technology and Journal of Marketing for Higher Education.*

Dr. Rodrigo Perez-Vega is a Senior Lecturer in Digital Marketing and Analytics at Kent Business School at the University of Kent. His research interests are in digital marketing, social media and consumer behaviour in online environments, social CRM, and applications of AI in Marketing. He has published his work in *the Journal of Business Research, Tourism Management, the Service Industries Journal and Marketing Review.* He is also the co-author of the book "Essentials of Digital Marketing". Rodrigo has also been invited to speak at practitioners' conferences such as the SME Summit and Social Media Summit. His professional experience is in brand management, entrepreneurship and digital marketing. He has worked for multinationals in FMCG industries and digital marketing agencies.

Table of Responses to IJCHI Reviewers' Comments

Reviewer #	Reviewer Issue/Comment to Be Addressed	Response/Action Taken	Document Location
Reviewer #1	I congratulate the authors on a thorough revision of their manuscript which is significantly improved. Some, mostly more minor, concerns remain:	Thank you so much for acknowledging the improvements of the revised manuscript based on your comments.	
Reviewer #1	In the introduction, the text oscillates between "virtual assistants" and "voice assistants". The former are defined as being controlled through voice or manual input. So both are obviously not identical. The manuscript should be both clear and consistent in the phenomenon the study addresses. This also affect the study's title	Thank you for highlighting this. We have double-checked the use of the wording "virtual assistants" and "voice assistants" in the whole text. We have changed "virtual" with "voice assistants". We have kept the title the same.	Abstract/Introduction
Reviewer #1	Somewhere in the introduction or the literature review, the authors may want provide an explicit research question (before turning to the research model).	Thank you very much for your valuable comment. The following part has been added in the introduction. *Based on this, the guiding research question of the present research is: What are the factors affecting attitude-habit formation in VAs ? Which is the role of users' trust in this relationship?*	Introduction – page 3
Reviewer #1	Tables 3-5 are helpful, but could probably be moved to the appendix.	Thank you for your suggestion. We have followed the common reporting for structural equational modelling (SEM). In addition, we have also looked at some example papers which	

		is published International Journal of Human-Computer Interaction (e.g. Al-Emran, 2021; Ashfaq et al., 2021). They followed the same way of reporting results. We considered that having Tables 3-5 in the main body of the manuscript makes it easier to follow. We hope the reviewer can see the value of this choice, and agree with our decision. *Mostafa Al-Emran (2021): Evaluating the Use of Smartwatches for Learning Purposes through the Integration of the Technology Acceptance Model and Task-Technology Fit, International Journal of Human–Computer Interaction, DOI: 10.1080/10447318.2021.1921481.* *Ashfaq, M., Yun, J., & Yu, S. (2021). My Smart Speaker is Cool! Perceived Coolness, Perceived Values, and Users' Attitude toward Smart Speakers. International Journal of Human–Computer Interaction, 37(6), 560-573.*	
Reviewer #1	In the results section, H4 is reported as supported by the analysis, but the research model suggests a negative relationship while the analysis finds a positive relationship that seems quite puzzling. This should be corrected and explained.	Thanks for drawing our attention to this, we have corrected in the following part: *Hypothesis 4 tests the relationship between privacy cynicism and trust, and the results illustrate that its path coefficient is 0.335 and significant ($p < 0.001$), however, unlike expected, H4 is rejected because we found a positive effect of privacy cynicism on trust.*	Results/Structural Model Evaluation – page 18
Reviewer #2	Originality The authors did indeed strengthen the contribution of the study both in terms of the theoretical and practical implications throughout the paper. I believe it much	Thank you so much for your comment. We are happy that you are satisfied with our revision.	

	improved the manuscript.		
Reviewer #2	Literature Review & Hypothesis Development As the other reviewer stated, simply including a table of relevant literature does not adequately inform the reader of the salient points from the literature listed and how the results of these previous studies inform your study. Your revised literature review is much improved, and I believe your inclusion of Ghosh & Eastin 2020 helps to support your use of trust in your model.	Thank you so much for your direction. The reference Ghosh & Eastin 2020 is added in the manuscript and reference part. As you stated, they helped us to show evidence of how trust is important for VA users. Ghosh, C., & Eastin, M. S. (2020). Understanding Users' Relationship with Voice Assistants and How It Affects Privacy Concerns and Information Disclosure Behavior. In *International Conference on Human Computer Interaction*, 381-392. Springer, Cham.	
Reviewer #2	Your hypothesis development for both H4, H5, and H6 are also improved, but I was still a little confused by some of your language in places. That said, your points about privacy cynicism and trust (and how they contribute to habit) are interesting and strengthen the contribution of your study. A little rewording/editing is still needed, but the	Thank you so much for your positive feedback in relation to the discussion of H4-6. We took your feedback in terms of lack of clarity and we also sent the manuscript to a proofreader to further improve the style. After your current suggestion, we made some minor changes as well.	

	points you trying to make are valid and better supported by the literature.		
Reviewer #2	Method The authors addressed my concerns about the method and sample size.	Thank you so much! We are glad that the current changes addressed your concerns regarding the method and sample size.	
Reviewer #2	I also appreciate the inclusion of Table 3 summarizing the measures as well as the authors' justification for using utilitarian-related measures only. I agree that it would be interesting for future studies to examine some of the hedonic use of VAs.	We also appreciated your suggestion regarding the inclusion of Table 3 summarizing the measures. We believe that distinguishing hedonic and utilitarian values is one of the contributions of this study.	
Reviewer #2	Results Based on my comments above about the hypotheses and method, my concerns about the results have been adequately addressed.	Thank you so much for your valuable comment. We are delighted to read that we were able to address your concerns to your satisfaction.	
Reviewer #2	Discussion/Implications The discussion was also much improved, as were the managerial implications.	Thank you so much for your comment.	

Reviewer #2	I agree there are some important future directions suggested by this research, and I was happy to see the authors highlight them.	Thank you so much for your comment. We also believe that this study provides future important future research directions in this field.	
Reviewer #2	Quality The paper quality is much improved other than in a few areas of the literature review as noted above.	Thank you so much for your comment. We hope that our revised version of the manuscript addressed the comments mentioned above to your satisfaction.	

7 August 2021,

Dear Prof. Constantine Stephanidis,

Thanks a lot for your speedy reply and for your guidance on the paper. Thanks to your help, we believe the paper has greatly improved and it fits International Journal of Human-Computer Interaction publication standards. We are grateful of your job and of the way this submission was handled. Reviewers' comments were honest, constructive, and helpful and the review process was rapid and transparent. We are very satisfied to have submitted our paper to IJHCI and we hope we can also help in the review process in the future.

I hope you will enjoy reading it.

Sincerely yours,

Fulya Acikgoz
Rodrigo Perez-Vega