

How AI encourages consumers to share their secrets? The role of anthropomorphism, personalisation, and privacy concerns and avenues for future research

Role of anthropomorphism

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Abstract

Purpose – This paper aims to explore the overall research question “How can artificial intelligence (AI) influence consumer information disclosure?”. It considers how anthropomorphism of AI, personalisation and privacy concerns influence consumers’ attitudes and encourage disclosure of their private information.

Design/methodology/approach – This research draws upon the personalisation-privacy paradox (PPP) and privacy calculus theory (PCT) to address the research question and examine how AI can influence consumer information disclosure. It is proposed that anthropomorphism of AI and personalisation positively influence consumer attitudes and intentions to disclose personal information to a digital assistant, while privacy concerns negatively affect attitude and information disclosure.

Findings – This paper develops a conceptual model based on and presents seven research propositions (RPs) for future research.

Originality/value – Building upon PPP and PCT, this paper presents a view on the benefits and drawbacks of AI from a consumer perspective. This paper contributes to literature by critically reflecting upon on the question how consumer information disclosure is influenced by AI. In addition,

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seven RPs and future research areas are outlined in relation to privacy and consumer information disclosure in relation to AI.

Keywords Anthropomorphism, Artificial intelligence (AI), Conversational agent, Information disclosure, Privacy calculus theory, Privacy-personalisation paradox

Paper type Conceptual paper

¿Cómo anima la IA a los consumidores a compartir sus secretos? El papel del antropomorfismo, la personalización y los problemas de privacidad y perspectivas para la investigación futura

Resumen

Propósito – Este artículo explora la pregunta general de investigación “¿Cómo puede influir la inteligencia artificial (IA) en la divulgación de información por parte de los consumidores? Se analiza cómo el antropomorfismo de la IA, la personalización y la preocupación por la privacidad influyen en la actitud de los consumidores y fomentan la revelación de su información privada.

Diseño/metodología/enfoque – Esta investigación se basa en la paradoja de la personalización y la privacidad y en la teoría del cálculo de la privacidad para abordar la pregunta de investigación y examinar cómo la IA puede influir en la revelación de información del consumidor. Se propone que el antropomorfismo de la IA y la personalización influyen positivamente en las actitudes de los consumidores y en su intención de revelar información personal a un asistente digital, mientras que la preocupación por la privacidad afecta negativamente a la actitud y a la revelación de información.

Conclusiones – Este artículo desarrolla un modelo conceptual basado en siete propuestas de investigación para el futuro.

Originalidad – Basándose en la paradoja de la personalización y la privacidad y en la teoría del cálculo de la privacidad, este artículo presenta un punto de vista sobre los beneficios e inconvenientes de la IA desde la perspectiva del consumidor. Este artículo contribuye a la literatura al reflexionar de forma crítica sobre la cuestión de cómo influye la IA en la revelación de información del consumidor. Además, se esbozan siete propuestas de investigación y futuras áreas de investigación en relación con la privacidad y la divulgación de información del consumidor en relación con la IA.

Palabras clave Antropomorfismo, Inteligencia artificial (IA), Agente conversacional, Revelación de información, Teoría del cálculo de la privacidad, Paradoja privacidad-personalización

Tipo de artículo Trabajo de investigación

人工智能如何鼓励消费者分享他们的秘密？拟人化、个性化和隐私问题的作用以及未来研究的途径

摘要

目的 – 本文探讨了“人工智能如何影响消费者的信息披露？”这一总体研究问题。它考虑了人工智能（AI）的拟人化、个性化和隐私问题是如何影响消费者的态度并鼓励他们披露私人信息的。

设计/方法/途径 – 本研究借鉴了个性化-隐私悖论和隐私计算理论来解决研究问题，并研究人工智能如何影响消费者信息披露。本文提出，人工智能的拟人化和个性化对消费者向数字助理披露个人信息的态度和意图有积极影响，而隐私问题对态度和信息披露有消极影响。

研究结果 – 本文在此基础上建立了一个概念模型，并为未来的研究提出了七个研究命题。

原创性 – 在个性化-隐私悖论和隐私计算理论的基础上，本文从消费者的角度提出了对人工智能的好处和坏处的看法。本文通过对消费者信息披露如何受到人工智能影响的问题进行批判性反思，对文献做出了贡献。此外，本文概述了与人工智能相关的隐私和消费者信息披露方面的七个研究命题和未来研究领域。

关键词 拟人化, 人工智能 (AI), 对话代理, 信息披露, 隐私计算理论, 隐私-个性化悖论

文章类型 研究型论文

1. Introduction

Artificial intelligence (AI) is contributing to a shift towards a more algorithmic society (Shankar, 2018). The exchange of value in the digital environment is changing as technology is changing from being a tool that is used by actors to being an actor in the value exchange itself (Novak and Hoffman, 2019). Human-less transaction mediated by intelligent technology is growing in numbers and frequency (Hofacker and Corsaro, 2020). Advancements in AI are now also being used across several consumer industries such as retail and e-commerce as well as in marketing. One popular application of AI in marketing is in form conversational agents (Rai, 2020; Thomaz *et al.*, 2020). These are based on natural language computer programmes designed to approximate human speech and interact with people via a digital interface (Thomaz *et al.*, 2020).

However, AI may not be welcomed favourably by all stakeholders due to the circumstance that AI implies the increased ability of technology owners to collect, analyse, combine and control consumer data (Mazurek and Malagocka, 2019). The interaction with digital assistants leaves a rich digital footprint of personal and behavioural data, which means that consumers become active participants in the erosion of their own privacy (Pomfret *et al.*, 2020). Thus, the topic of privacy is under heightened attention across academic researchers, social critics as well as regulators (Martin and Murphy, 2019) because in our knowledge-based digital market environment, information privacy and security have become the primary consumer concerns related to the internet, algorithms and data (Brill *et al.*, 2019; Hong and Thong, 2013; Kietzmann *et al.*, 2018; Mazurek and Malagocka, 2019). The notion of data privacy is critical because advancements in AI are based on and have accelerated with the availability of large amounts of data and computational capabilities to analyse them. The free flow of data is critical because data is the fuel of AI success (Mazurek and Malagocka, 2019).

Protecting consumer privacy and user information is critical to the expanding integration of digital assistants into business models as well as everyday life. Businesses face a substantial risk of abandoned investment into digital assistants if consumers lack trust in either the technology or the company to protect their privacy and personal information (Pappas, 2016). Existing research finds that privacy concerns can form a barrier to consumer adoption of new technology. However, recent research suggests that consumers showcase a trade-off between benefits and risks (Vilmakumar *et al.*, 2021). Based on this ambiguity in the existing literature, this paper will critically reflect on the topics of privacy concerns in relation to AI, benefits in terms of personalisation offered by AI, and consumer information disclosure to AI to answer the overall research question of “How can AI influence consumer information disclosure?”

This paper contributes to the growing discussion in the marketing literature around consumers' interaction with AI, benefits of personalisation versus drawbacks of privacy concerns, and consumer information disclosure. To contribute to existing literature, this study will draw upon the personalisation-privacy paradox (PPP) to examine the effects of AI on consumer attitudes and consumer information disclosure. The PPP is a valuable theoretical basis because it describes a situation in which consumers appreciate the value of personalisation offered by a technology (Aguirre *et al.*, 2015; Bleier and Eisenbeiss, 2015) while being aware of marketers' exploitation of their personal data which raises privacy concerns (Cloarec, 2020). This idea is also reflected in privacy calculus theory (PCT) (Dinev and Hart, 2006; Wang *et al.*, 2016) which is also drawn upon to better understand how and why consumers assess benefits and drawbacks of AI and decide whether to disclose their private information. Based on PCT and PPP, this research proposes a conceptual model with seven research propositions (RPs) that address how anthropomorphism of AI, personalisation and privacy concerns affect consumers' attitudes towards AI and their intention to disclose personal information to AI.

The remaining parts of this paper are structured into four sections: Firstly, literature relating to consumer interaction with AI is reviewed to provide background information on the increased need to better understand consumer interaction with AI, as well as consequences of such interaction. Secondly, the theoretical foundation for a research model is presented, and eight RPs introduced. This section will cover the topics of anthropomorphism of AI, privacy concerns in relation to AI, personalised interactions with AI, and the PPP. Thirdly, the paper will discuss insights and findings gained from the review of literature and development of a research model. Finally, a conclusion is drawn that included reflection on limitations and suggestions for future research.

2. Literature review: consumer interaction with AI

Interaction between AI and consumers is becoming a central topic of discussion in the marketing and service literature. Companies adopt these conversational agents as new front-facing customer service that interact with consumers during service encounters (Lariviere *et al.*, 2017; Thomaz *et al.*, 2020; van Doorn *et al.*, 2017; Wilson and Daugherty, 2018). It is suggested that AI will fundamentally change the nature of interaction between companies and their customers (Haenlein and Kaplan, 2019; Ramaswamy and Ozcan, 2018).

However, research relating to the impact of AI is still developing and relatively sparse (Davenport *et al.*, 2020; Steinhoff *et al.*, 2019). Table 1 gives an overview of selected studies, organised by publication date, that examine AI in the marketing, service and hospitality context. The table highlights each paper's theoretical foundation and research aim, key findings of each paper as well as limitations.

From reviewing above selected studies, four key themes emerge, which will be covered in the following paragraphs: adoption and use of AI technology; anthropomorphism of AI; benefits of AI; and potential barriers to AI success such as privacy and security concerns.

The overview of previous studies shows that most of the previous literature has focused on consumer use and adoption of AI, highlighting that AI integration and application in the consumer context is not a fad but a rising trend (Gursoy *et al.*, 2019). Research shows that consumers are rapidly embracing AI for daily use because they enable individuals to access timely and useful information and can meet customer demand for contextually relevant and highly personalised content that is delivered in real-time (Brill *et al.*, 2019; Canbek and Mutlu, 2016). In addition, research finds that the ease of using AI and its ability to provide relevant information are key factors in influencing consumers to use them, which also is found to influence loyalty (Moriuchi, 2019). Further studies find that a variety of factors along social, relational and functional dimensions are important for adoption of AI (Fernandes and Oliveira, 2021; Vilmakumar *et al.*, 2021). Research shows that individuals are mainly motivated to adopt AI based on functional elements, but they also find support for social and relational elements that drive adoption (Fernandes and Oliveira, 2021). In addition, experience with technology is important to consider in the development of attitudes and adoption intentions of new technology like AI.

Anthropomorphism of AI is a second main theme across literature. The underlying idea for anthropomorphism is that it can influence consumers to think about intelligent agents more favourably. The positive influence of increased human likeness is also confirmed in a study by Belanche *et al.* (2021) who found that human likeness positively affects utilitarian, social, monetary and emotional value expectations. However, another study examines the uncanny valley theory and find support for their hypotheses that too humanlike features lead to negative evaluations due to perceived threats to human identity (Kim *et al.*, 2019). Yet it remains unclear perceptions of uncanniness translate into behaviour. This is in line with another study that found anthropomorphism as an impeding determinant of consumers'

Role of anthropomorphism

Authors, Theoretical foundation and research aim	Context and key variables	Findings	Limitations
<p>Canbek and Mutlu (2016) examine the potential use of intelligent personal assistants for learning</p>	<p>Education context Use</p>	<p>Intelligent personal assistants such as Siri, Cortana and Google Now can be used to support learning in educational context</p>	<p>Focus on smartphone-based assistants only</p>
<p>Based on the technology acceptance model (TAM), Moriuchi (2019) examines the effect of AI integration into e-commerce on customer engagement and loyalty</p>	<p>Online shopping context Perceived ease of use Perceived usefulness</p>	<p>Strong support for the TAM variables perceived usefulness and perceived ease of use on loyalty. Engagement serves as mediator in this relationship</p>	<p>Functional antecedents only</p>
<p>Based on expectations confirmation theory, Brill et al. (2019) examine customer satisfaction with digital assistants</p>	<p>No context specified Expectations Satisfaction</p>	<p>Expectations and confirmed expectations have a positive influence on satisfaction with digital assistants</p>	<p>Study only included consumers who continued to use digital assistants or had no experience. Discontinuance was not considered. Impact on consumer behaviour is not examined</p>
<p>Buhalis and Sinarta (2019) analyse value co-creation through big data, real-time data mining and contextual data by smart technology and its effect on customer experience</p>	<p>Tourism context Interaction Co-creation</p>	<p>Interaction based on real-time data and contextual information as well as nowness are ways to co-create value with the consumer. Real-time service adds to a firm's competitiveness</p>	<p>Research is based on "best practices" within tourism context</p>
<p>Based on the uncanny valley theory, Kim et al. (2019) examine the effects of anthropomorphism of robots on consumer judgements and attitudes</p>	<p>Consumer robots Anthropomorphism Attitude Uncanniness</p>	<p>Anthropomorphism positively influences perceptions of warmth. Study also supports the uncanny valley theory by showing that too-humanlike features lead to uncanniness and negative evaluations</p>	<p>Study only examines the effect on attitudes, not how this attitude influences behaviour</p>
<p>Based on the unified theory of acceptance and use of technology (UTAUT2), Lu et al. (2019) conceptualise and test a service robot integration willingness scale to determine key dimensions in consumer willingness to adopt AI-based technology into service encounters</p>	<p>Service context Adoption Anthropomorphism</p>	<p>Performance efficacy, intrinsic motivation, facilitating conditions and emotions are positive determinants of acceptance Anthropomorphism is a barrier to adoption of service robots due to perceived threat to human identity</p>	<p>Study does not consider cultural or individual differences. Study relies on "overused" adoption theory</p>

(continued)

Table 1.
Studies examining the interaction between consumers and AI

Authors, Theoretical foundation and research aim	Context and key variables	Findings	Limitations
Based on the service robot acceptance model (sRAM), Fernandes and Oliveira (2021) examine consumer motivations to adopt AI-based digital voice assistants into service encounters	Service context Adoption	Functional, social and relational elements are drivers for adoption of AI-based digital voice assistants. Experience has a moderating role on acceptance	Convenience sample focused on young users of the Millennial generation. Potential inhibitors of acceptance are not included
Based on UTAUT2 and privacy calculus, Vilmakumar et al. (2021) examine the perception of consumers towards privacy concerns and its influence on the adoption of voice based digital assistants	Indian consumer context Privacy Adoption	Consumer perceived privacy risk does not influence adoption intentions directly but indirectly through trust	No individual consumer variables considered Limited to Indian consumers
Belanche et al. (2021) validate the humanness-value-loyalty model to examine how a robot's perceived human likeness, competence and warmth affect service value expectations and loyalty	Restaurant service context Human likeness Competence	Human likeness positively affects utilitarian, social, monetary and emotional value expectations. Competence influences utilitarian value expectations	Limited to specific service robots within restaurant context

Table 1.

acceptance of service robots due to the reason that they pose a threat to users' identity ([Lu et al., 2019](#)).

AI offers many benefits to both companies in terms of improved capabilities to collect, analyse and use data in real-time, which creates competitiveness but also the opportunity to co-create value with consumers through interaction. Yet, the paper does not consider consumer attitudes around the availability and provision for that data that is necessary for real-time co-creation. Companies like Amazon or Apple are exemplary for the utilisation of AI, either sold separately to consumers (e.g. Amazon's Echo) or included in existing consumer devices (e.g. Siri). As an operating system of iOS, Siri is one of the most salient applications of Apple that has caught attention of a tech-savvy audience ([Canbek and Mutlu, 2016](#)). One of the most significant advantages of these assistants is their conversational interface ([Vilmakumar et al., 2021](#)) and the opportunity to meet the demand for contextually relevant and personalized information that is delivered to the consumer in real-time ([Brill et al., 2019](#)). Furthermore, AI has the advantage of being highly scalable, and the ability to deliver routine customer service to large numbers of people simultaneously ([Chui et al., 2018](#); [Davenport et al., 2020](#); [Duan et al., 2019](#); [Wilson and Daugherty, 2018](#)).

The increased ability of AI to collect, analyse and store consumer data, however, also results in concerns relating to privacy and security of data. Privacy concerns are relevant to consider for adoption because they also influence trust ([Vilmakumar et al., 2021](#)). Existing literature shows that privacy concerns have a negative impact on intentions to use a technology, engagement and attitude towards an innovative technology ([Brill et al., 2019](#); [Grewal et al., 2021](#)). Consumers have also privacy concerns because they do not trust AI.

Overall, it becomes clear that perceived risk of AI poses challenges that need to be investigated to understand implications for AI.

Above discussed studies shed first light on the adoption, potential benefits and barriers as well as consequences of the integration of AI. However, it becomes evident that most studies have been from a use and adoption perspective. There is a lack of critical reflection around the necessity of data and personal information that is required for the successful delivery of AI in the first place. It has been neglected to fully examine consumer concerns and potential barriers in relation to data privacy and information disclosure to AI.

3. Theoretical background and research propositions

The following section will present the theoretical background of this study being PCT and the PPP and highlight how drawing upon these theories will offer new insights on how consumers may be encouraged to disclose their private information to AI. In addition, this section will propose a research model with seven RPs.

3.1 Personalisation-privacy paradox and privacy calculus theory

In Western developed societies, individuals have increasingly raised privacy and data security concerns (Foehr and Germelmann, 2020). Becoming increasingly aware “that they are being watched”, consumers are concerned about their data being misused or abused due to eroding confidence that firms are respecting data privacy (Fitzgerald, 2019). Individuals are challenged to manage the complex trade-offs that new technological innovation brings. It must be evaluated how the benefits of a new technology compare to the risks of information privacy concerns (Acquisti *et al.*, 2015). This trade-off has been highlighted as the PPP (Aguirre *et al.*, 2015; Bleier and Eisenbeiss, 2015) which describes the process of consumers’ critical assessment of offered benefits and added value of personalisation against marketers’ exploitation of their private information which raises privacy concerns (Cloarec, 2020). However, the evaluation can be difficult for consumers due to the circumstance that technology often functions as a black box with a lack of evidence of where consumer data is stored, or who will be able to access it (Hofacker and Corsaro, 2020).

Reflecting the idea of the PPP, and to gain a better understanding of privacy and disclosure behaviour, the concept of privacy calculus or PCT will be drawn upon in addition to the PPP. According to the privacy calculus, consumers trade off their privacy or risks to their privacy in a cognitive process of rationality against the prospect of receiving benefit or utility (Dinev and Hart, 2006; Wang *et al.*, 2016). Benefits that personalisation offers include improved experience through curation of relevant content or discounts (Zhu *et al.*, 2017). Central to the privacy calculus perspective is the underlying assumption that consumers are empowered to exercise control over their private information (Dinev *et al.*, 2016), and that rational consumers are apprehensive towards revealing personal information. PCT has been adopted in previous research to gain a better understanding of how consumers evaluate information disclosure (Gutierrez *et al.*, 2019; Pentina *et al.*, 2016; Sun *et al.*, 2015; Xu *et al.*, 2011). For the context of this research, this means, how consumers evaluate benefits of anthropomorphised interaction and personalisation versus privacy risks and the question how this assessment influences their attitudes and information disclosure intentions. PPP and privacy calculus offer therefore a useful theoretical foundation to examine how consumers evaluate the benefits of personalisation against the risks of privacy concerns and its implications on consumer information disclosure.

3.2 Proposed conceptual model and research propositions

Based on the discussion of PCT and the concept of anthropomorphism, a conceptual research model is proposed that examines consumer interaction with AI-based digital assistants and their information disclosure towards AI-based digital assistants in the light of privacy concerns. The conceptual model is depicted in Figure 1 below. The model builds upon PCT and anthropomorphism to explain consumer intentions to disclose information and includes eight RPs. In the following paragraphs, the RPs will be discussed and presented.

3.2.1 Anthropomorphism of artificial intelligence. Anthropomorphism has received considerable attention in the marketing and consumer behaviour literature because it represents an opportunity for marketers to affect consumption or affect consumer behaviour related to consumption (Epley, 2018). Anthropomorphism occurs when humans perceive other things as like themselves (Hume, 1757/1957) or “imbue real or imagined behaviour of nonhuman agents with humanlike characteristics, motivations, intentions or emotions” (Epley *et al.*, 2007, p. 864) which will influence how humans react to those objects. The concept of anthropomorphism is relevant in the context of AI because companies try to humanise their technology by assigning them humanoid traits, e.g. looks, name and voice, which has the aim to encourage customers to converse and bond with them (Novak and Hoffman, 2019; Schweitzer *et al.*, 2019; Steinhoff *et al.*, 2019; van Doorn *et al.*, 2017). Across academic literature, there is a debate to whether anthropomorphism positively affects consumer attitudes, intentions and use of technology, or whether it serves as an impeding variable. For instance, previous studies find that anthropomorphism has negative effects on consumer attitudes towards AI and is an impeding determinant of consumers’ acceptance of service robots due to the reason that they pose a threat to users’ identity (Gursoy *et al.*, 2019; Lu *et al.*, 2019). Here, reference to the uncanny valley is made (Mori, 1970) which describes the effects of how more humanlike features lead to positive evaluations, until too humanlike features result in eeriness and anxiety in response to the technology. In contrast to that, it has been suggested that anthropomorphism can improve levels of engagement, collaboration and interaction (Steinhoff *et al.*, 2019; Yang *et al.*, 2022).

For this study, it is assumed that anthropomorphism of AI technology has the potential to nudge consumers to greater self-disclosure of data due to the circumstance that it will transmit social cues to consumers that activate social scripts (Thomaz *et al.*, 2020). Previous research has proven that consumers treat computers like social actors if they display a minimum of social cues, such as asking questions or sharing information with the consumer and that consumers feel obliged to respond with also sharing information due to learned social scripts (Nass and Moon, 2000). Based on this and the insights derived from existing

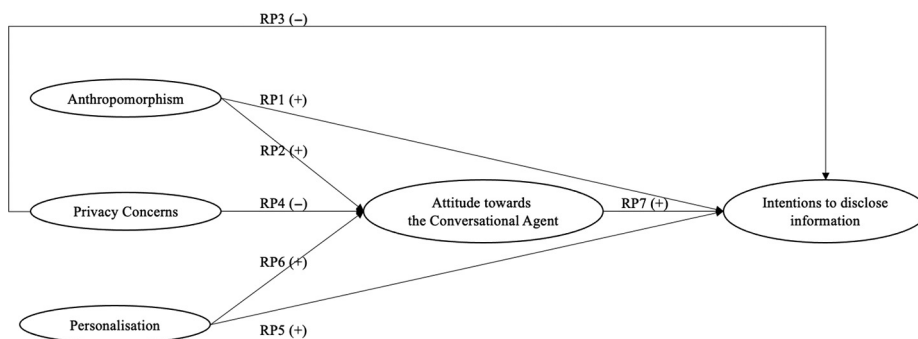


Figure 1.
Proposed research model

research, it is proposed that anthropomorphism of AI will affect consumer information disclosure positively, as summarised in the first RP as follows:

RP1. Anthropomorphism of AI positively affects consumers' willingness to disclose information.

Anthropomorphism is a critical construct to better understand human interactions with technology (van Doorn *et al.*, 2017). The authors point out that a product with a smiley face is perceived as friendlier than a product that looks techy. To make AI appear friendlier, designers can assign anthropomorphic appearances, and even create an identity for AI-systems (Ene *et al.*, 2019). Moreover, anthropomorphism can influence consumers to perceive AI as more vivid and potentially treat AI like a sentient being, which has been proven to increase psychological warmth and positively affects consumers attitudes (Kim *et al.*, 2019). Thus, it is proposed that:

RP2. Anthropomorphism of AI positively affects consumers' attitudes towards the digital assistant.

3.2.2 Privacy concerns. Privacy is defined as “the ability of the individual to control the terms under which personal information is acquired and used” (Westin, 1967, p. 7) and privacy in the online environment as “an individual’s control and awareness of the collection and usage of personal data” (Hann *et al.*, 2007). In the marketing context, discussions around information disclosure and privacy have in the past been influenced by an understanding of privacy as personal responsibility, which requires individuals to exercise control over the collection, use and distribution of their personal data (Pomfret *et al.*, 2020), what contrasts with a philosophical approach to data privacy and data protection which assumes that individuals have a fundamental right to “be left alone”.

A plethora of studies across a variety of academic disciplines has examined the relationship between privacy concerns and privacy-related behaviours (Acquisti *et al.*, 2015; Baruh and Popescu, 2017; Martin and Murphy, 2019). In the e-commerce context, it has been verified that perceived privacy concerns negatively affect usage behaviour (Vilmakumar *et al.*, 2021). Moreover, privacy concerns are a major hindrance to data sharing in an online environment and limit the potential for e-commerce to grow; Angst and Agarwal (2009) and Buchanan *et al.* (2007) highlight that. In addition, it is argued that when consumers have privacy concerns or perceive threats to their personal information, consumers will withhold personal information, refuse participation in the online environment or refuse to disclose their personal information.

Consumer perceptions of privacy are an important influence on his or her information disclosure when consumers interact with a website (Lowry *et al.*, 2012; Shah *et al.*, 2014). Doubts about consumers' privacy result in consumer hesitancy to transact in e-commerce while privacy assurances are positively affecting consumers' behavioural intentions towards a website (Lowry *et al.*, 2012). It has been suggested that consumers have a more positive perception towards information disclosure if privacy risks are low (Sun *et al.*, 2015). A meta-analysis on 166 studies between 1990 and 2016 on privacy concerns found that privacy concerns predict information sharing (Baruh and Popescu, 2017). However, researchers have yet not adequately explained how consumers' attitudes around privacy influences the types of information disclosed and the level of disclosure (Pomfret *et al.*, 2020). Another study finds that people who believe technology to be a potential threat to their privacy also demonstrate higher concerns about the technology itself, while people who believe it to be useful, will care less about privacy concerns (Vilmakumar *et al.*, 2021). These

findings are in line with PCT. Consumers who have higher privacy concerns will perceive greater risks associated with their personal information being compromised or misused, which will affect their intentions to disclose private information negatively. Consequently, it is proposed that:

RP3. Privacy concerns negatively affects consumers' intentions to disclose information.

Apart from that, privacy has been found to be an important variable regarding the adoption of innovative technologies (Kumar *et al.*, 2016; Gutierrez *et al.*, 2019). Privacy concerns also have a negative impact on consumers' attitude and intention to use an innovation (Müller-Seitz *et al.*, 2009; Mani and Chouk, 2017) due to perceived intrusiveness. It can be observed that privacy concerns are negative attitudes or beliefs that influence an individual's attitudes, for instance, towards a technology, and usually centre around the collection of personal data, data errors, unauthorised access of personal data and unauthorised secondary use of personal data (Dinev *et al.*, 2016). Thus, it is proposed that:

RP4. Privacy concerns negatively affect consumers' attitude towards the digital assistant.

3.2.3 Personalisation. AI agents such as Siri have become rapidly embraced and integrated into daily life by consumers because they enable individuals to access timely and useful information (Canbek and Mutlu, 2016). These agents meet customer demand for contextually relevant and highly personalised content that is delivered in real time (Brill *et al.*, 2019). It is argued that companies use AI to collect user details with the aim to improve the user experience and enhance lifetime value of customers (Shankar, 2018; Wilson and Daugherty, 2018). Due to the circumstance, that with AI, data about every individual consumer can be stored and analysed at unprecedented scale, marketers can now personalise their marketing mix for each individual consumer. With the potential offered by AI, the goal of organisations is shifting now towards personalising interactions, delighting its audience and understanding each individual customer's unique challenges (Pansari and Kumar, 2017).

Data sharing is an opportunity for consumers to participate in an exchange of data for retail value and personalized services (Barth and de Jong, 2017) Consequently, it is suggested that consumers react positively to personalisation because of improved experience and perceptions of being better understood by a company. It is hypothesized that this understanding will lead to:

RP5. Personalisation positively affects consumers' intentions to disclose information.

Personalisation has also led to higher click-through rates of advertisements (Aguirre *et al.*, 2015; Bleier and Eisenbeiss, 2015). Personalisation results in more positive attitudes and higher click through rates. However, it should be noted that these studies also found that too much personalisation will impede trust and raise privacy concerns, which again reflects and highlights the relevance of the PPP. Nonetheless, it is proposed that:

RP6. Personalisation positively affects consumers' attitude towards the digital assistant.

3.2.4 Attitude towards AI-based digital agents. As suggested by the theory of planned behaviour (Ajzen, 1991), attitudes influence behavioural intentions. Above discussion has highlighted, how it is expected that privacy concerns, personalisation and

anthropomorphism affect consumers' attitude towards a conversational agent. Combining those arguments with Ajzen's theory, it is expected that attitudes towards AI has a mediating effect on the relationship between antecedents and intentions to disclose information to the conversational agent. Thus, it is proposed:

RP7. Attitude towards the digital assistant mediates the effect of privacy concerns, personalisation and anthropomorphism on consumers' intention to disclose information.

4. Discussion

The review of existing literature has shown that consumers use AI technology in a variety of forms and for a variety of different tasks in their daily life (Brill *et al.*, 2019). However, the success of AI depends on the availability of vast amounts of consumer data to offer benefits such as personalised content or discounts (Zhu *et al.*, 2017). The PPP and PCT offer a valuable theoretical foundation in order to assess how AI can influence consumer information disclosure. The proposed research model and seven RPs suggest positive effects of anthropomorphism and personalisation on consumer attitude towards an intelligent digital assistant and positive effects on consumer information disclosure. Despite a lack of consensus across academic literature regarding the effects of anthropomorphism, it is argued that anthropomorphising AI will have positive effects such as encouraging consumers to like it more (Kim *et al.*, 2019). Anthropomorphising AI by assigning it a name or character can nudge consumers to connect with them on a more personal level. This implies that if marketing managers are able to anthropomorphise their AI technology, consumers will evaluate them more favourably (Epley, 2018; Kim *et al.*, 2019; Novak and Hoffman, 2019; Schweitzer *et al.*, 2019). Anthropomorphism promises to overcome consumer hesitancy towards technology and engage with AI-based digital assistants on a personal level, offering companies opportunities for data collection and data curation for more meaningful value exchange and personalised offerings.

The next two RPs addressed the topic of privacy concerns relating to the collection, storage and analysis of consumer data through AI. Based on existing literature, it is suggested that privacy concerns negatively affect consumers evaluations of digital assistants, and negatively influence consumer intentions towards information disclosure to the digital assistant (Kumar *et al.*, 2016; Gutierrez *et al.*, 2019). It becomes evident that the topic of privacy can form a critical barrier to the success of AI-based digital assistants due to the circumstance that they depend on the presence and provision of personal and behavioural data in order to assist the consumer with personalised information during an interaction. Thomaz *et al.* (2020) content that society will witness a shift in the nature of the internet as privacy concerns and awareness about the use of private data is becoming more prevalent, which will significantly impact marketing as it benefits of wide availability of customer data as source of information for marketing strategy. Because marketing AI applications such as conversational agents are based on the use of personal information (Rai, 2020), it becomes necessary to examining the relationship of internet privacy concerns on consumer attitudes and consumer behaviour in this context of AI.

In addition to this, this study has drawn upon PPP and PCT to consider how personalisation offers benefits such as personalised content or discounts (Zhu *et al.*, 2017) can potentially outweigh the perceived risks around personal data and privacy concerns and positively affect attitudes and intentions to disclose information. It is argued that through the provision of real-time, personalised and contextually relevant curation of information,

consumers evaluate digital assistants more positively and provide their information (Brill *et al.*, 2019; Canbek and Mutlu, 2016).

Finally, this research highlights several gaps in academic literature relating to the effects of AI and the potential of AI to encourage consumer information disclosure. A detailed presentation of avenues for future research will be presented in Table 2 in the following section.

5. Conclusions, limitations and future research

Research into the effects of AI in a consumer context is still developing and sparse (Davenport *et al.*, 2020). This research has addressed this gap and considered consumer information disclosure in the context of AI. A conceptual model with seven RPs has been developed, which can serve as foundation for future research. The following section will summarise insights from this paper and present a table with avenues for future research.

5.1 Conclusions

This study advances our understanding of the potential that AI offers in encouraging consumers to share their private information, which is critical for further advancements in AI that can only continue if companies have access to large amounts of data and computational capabilities to analyse them (Mazurek and Malagočka, 2019). Re-considering the benefits offered through increased personalisation against privacy concerns for the purpose of information disclosure in the light of AI-based digital assistants is critical due to the increasing integration of AI into marketing strategy and peoples' lives. Research pertaining to the effects of AI and AI-based technology is still at early stages and focuses heavily on technology adoption. Understanding the implications of AI in marketing and its impact on consumer behaviour becomes increasingly important to examine by researchers due to the circumstance that AI will systematically and effectively change the way in which companies connect and interact with their customers (Davenport *et al.*, 2020; Grewal *et al.*, 2020; Yadav and Pavlou, 2020). This research has developed a conceptual model and seven RPs that promise to a research gap and contribute to a better understanding of the implications of AI in the consumer sphere.

Area for future research	Potential research questions
Personalisation-privacy paradox	<ul style="list-style-type: none"> • How much personalisation is acceptable before it becomes too intrusive? • What variables (e.g. gender, age, culture) affect an individual's acceptance level of personalisation? • Does personalisation influence privacy concerns?
Privacy regulations and legislation, e.g. GDPR	<ul style="list-style-type: none"> • How does legislation to protect privacy affect consumers' information disclosure? • What effect does the introduction of legislation such as GDPR have on consumers' privacy evaluations? • Are consumers aware of regulation to protect their privacy?
The "dark" side of AI invading privacy	<ul style="list-style-type: none"> • How can AI encourage consumers to share their data against their intentions? • Can AI elicit information consumers are only subconsciously aware of?
Complimentary AI technology (e.g. Siri as digital assistant) vs purchased AI technology (e.g. Amazon Echo)	<ul style="list-style-type: none"> • How does consumer attitudes and use differ for complimentary AI technology vs purchased AI technology? • Do consumers perceive AI as invading their privacy?

Table 2.
Areas for future research and potential research questions

5.2 Limitations and future research

As with any research, this study is also subject to limitations that must be acknowledged and taken into consideration. Firstly, this research is conceptual in nature and has developed a research model (Ismagilova *et al.*, 2020; Hughes *et al.*, 2020; Kumar *et al.*, 2018; Mathivathanan *et al.*, 2022; Mishra *et al.*, 2017; Rana *et al.*, 2011, 2012) and RPs on an extant review of academic literature relating to AI, privacy calculus and consumer information disclosure. While this paper has offered new insights into the potential effects of AI on consumer attitudes and consumer information disclosure, it is even more important to test the proposed research model and its RPs. Hence, future research should consider the propositions presented in this research and test the conceptual model empirically. In addition, Table 2 presents areas for future research and potential research questions for future studies to consider.

Above table outlines three areas for future research. Firstly, future research can further investigate the PPP for the context of AI. For instance, research could ask how far personalisation can go before it becomes too intrusive and whether there are individual consumer characteristics, such as age, gender or culture, that influence this evaluation. Secondly, the European Union introduced GDPR (General Data Protection Regulation) in 2018, which aims to limit the way in which personal information can be stored and processed (Haenlein and Kaplan, 2019). The main task of this regulation is to strengthen the rights of the individual, making the expression of informed consent to disclose information mandatory as well as giving the opportunity to withdrawing consent (Mazurek and Malagocka, 2019). However, it is not clear whether consumers are actively aware of such legislation, or whether it influences their privacy and disclosure behaviour. Moreover, the potential “dark side” of AI and AI integration into marketing strategy is a research area that remains less studied (Grewal *et al.*, 2021; Rana *et al.*, 2022), consequently, there are opportunities for future research to investigate how AI could undermine consumer privacy. Finally, future research could differentiate between different types of AI technology. Finally, the future researchers can also review the literature (Alalwan *et al.*, 2017; Alryalat *et al.*, 2017; Dwivedi *et al.*, 2017a, 2017b, 2021; Kizgin *et al.*, 2020; Patil *et al.*, 2017; Rana *et al.*, 2014) on the role of AI on consumers’ information disclosure.

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