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Article

Emotional banking with a digital avatar: A PLS-SEM based study based on para-social relationship theory

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Abstract: Purpose: The major objective of this study is to measure the impact of various attributes, such as social attraction, physical attraction, and task attraction on para-social relationships. The study also seeks to measure how the para-social relationship mediates the association between the three attributes (above-mentioned) on perceived credibility and informational influence, and consumers' intention to purchase banking products. **Study design/methodology**: PLS-SEM has been used as it is believed to be most suited for the study due to the multivariate non-normality in the data, and the small sample size. Data has been collected using the 5-point Likert scale from approximately 151 respondents, who were selected using the non-random sampling method based on purposive sampling coupled with convenience-based sampling. The data was collected from January 2023 to August 2023. **Findings:** Largely, the findings reveal that both social and physical attractions do have a positive impact on the para-social relationship, further leading to perceived credibility and informational influence. Notably, this perceived credibility and informational influence lead to consumers' intentions to purchase banking products, albeit with the use of artificial intelligence-based chatbots and digital assistants. **Originality:** This is possibly among the first-ever studies extending the para-social theory for purchasing banking products and services using artificial intelligence-based chatbots and virtual assistants.

Keywords: para-social theory; task attraction; social attraction; physical attraction; chatbots and virtual assistants
JEL Code: O3; R0

1. Introduction

Artificial Intelligence has increasingly been used for online banking and for availing financial services. Its major benefit is that it helps to provide personalized services to consumers. In other words, Artificial intelligence-based chatbots and interactive voice assistants help in enabling more customer-centric banking (Indriasari et al., 2019). Personalization of banking services has become an important strategic move to leverage customer engagement and retention, besides a great avenue to attract new customers (Mittal and Lassar, 1996). Within the Indian context, the government in recent times has vigorously promoted consumer rights through greater importance and relevance to customer service and care (Gorry and Westbrook, 2011). This is possibly the main reason owing to which, service organizations including banks and financial institutions are increasingly moving to Artificial intelligence-based tools (e.g. chatbots and voice assistants) for superior customer service and experience, along with product marketing (Janarthanam, 2017). A McKinsey report, (McKinsey and

Company, 2021) suggests that the potential revenue for using Artificial intelligence-based tools in banking has grown to be worth more than 1 trillion USD. To overcome the challenges in the form of legacy systems, data silos, asset quality, and limited budgets, banks are increasingly using Artificial intelligence Know your customers, and chatbots for providing 24 × 7 services to provide personalized customer services. Some of the common examples from Indian banks include the likes of Sia by State Bank of India, Amazon Alexa and Google Assistant by ICICI Bank, and the virtual assistant Aha! by Axis Bank. Notably, extant research has shown that when consumers have greater confidence in Artificial intelligence-driven chatbots and interactive voice assistants, their purchase probability increases manifold (Rzepka et al., 2022).

Interestingly however, literature exploring the impact of such technologies, like artificial intelligence in terms of understanding and assessing the purchase intentions of banking customers seems to be limited, specifically for ones belonging to developing nations (Kulathunga, 2018). Many studies in the past have thereby highlighted the need for exploring the factors that impact the contribution of artificial intelligence tools in persuading bank customers to purchase goods and services or transact online (Tulcanaza-Prieto et al., 2023). Advertising also seems to be losing its sheen in promoting the increased use of banking services, including 24 × 7 customer care, owing to which, access to customer grievances is becoming the differentiating factor in promoting banking among consumers (Saxena and Kaur, 2018). This study thereby focuses on some of the key factors that help banks boost banking through the use of Artificial intelligence tools.

Further, within the scope and context of this study, parasocial relationship refers to the consumer's non-face-to-face psychological relationship with the Artificial intelligence-driven chatbots and voice assistants (Noor et al., 2022). Several studies, for instance, have highlighted that parasocial relationship is an important factor that impacts consumers' purchase intention through the use of Artificial intelligence-based agents (i.e. both chatbots and voice assistants). Drawing upon the above-mentioned limitation, it may be noted that no study has specifically explored the impact of artificial intelligence-based tools on consumers' purchase intention through various attributes of parasocial relationships, impacted in turn, by both the physical and tangible dimensions of the application.

Previous studies have indeed established the role of interpersonal attraction that enables banking customers to build social relationships with digital characters, such as chatbots and voice assistants (Beattie et al., 2020). The study (Sokolova and Kefi ,2020) hypothesizes that task attraction enhances the *para-social relationship*, which in turn, leads to enhanced purchase intention through informational influence and perceived credibility. Task attraction herein refers to the desire of a customer to finish a task well, using Artificial intelligence-based tools like chatbots, or voice assistants (Edwards et al., 2019). Since 24 × 7 voice assistants and chatbots promote access to important information around the clock, it enables the user or the consumer to achieve task goals with ease and enhances the consumers' purchase intention in the process (Aamodt and Nygård, 1995). Access to information provided by the voice assistant and the chatbots further strengthens the para-social relationship. Apart from the para-social relationship, perceived credibility in artificial intelligence-led technology and digital assistants also enhances the consumers' purchase intention.

Perceived credibility herein, refers to the trust that a consumer has in the digital version of the customer assistant and/or chatbots, (Pornpitakpan, 2004). Interestingly, even physical attraction and the appearance of digital assistants have an important impact on para-social relationships. Finally, social attraction and conformity to social values, along with gender stereotypes also impact the parasocial relationship between the digital avatar of bank services and the consumer (Yuan et al.,2016) Thus, this study aims to explore various factors that impact consumers' purchase of banking goods and services, using the theoretical constructs of parasocial relationships and interpersonal relationships in the form of task attraction, social attraction, and physical attraction of digital interfaces through artificial intelligence-based tools.

Largely, we focus on the following research questions:

1) Does artificial intelligence used by banks in form of the chatbots and voice assistants impact the para-social relationships of the banks with customers?
2) Do the interactions with technology in form of the task attraction, along with physical and social attraction impact the adoption of banking and financial services?

What is the key variable that mediates the relationship between parasocial relationships and purchase intentions in the banking and FinTech space?

2. Literature review and hypotheses

A chatbot or an artificial intelligence-driven virtual assistant helps enhance conversation and engagement with humans. It is based on a computer program or even an algorithm technology that includes the likes of Machine Learning (ML), or Natural Language Processing (NLP) (Crolic et al., 2022). Chatbots are largely classified based on existence as physical or virtual and/or disembodied and embodied. They could also be based on communication as text-based, video-based, mechanical chatbots, or decision-making cognitive and thinking chatbots (Huang et al., 2021; Sheehan et al., 2020). Therefore, with rapid technological advancement, the ability of chatbots to provide personal, instant, and convenient information has increased manifold (Go and Sundar, 2019).

Within the context of the study, aim is to explore factors impacting consumers' purchase intention of banking goods and services, using the theoretical constructs of para-social relationships, it may be noted that para-social relationship/interaction is defined as the affiliation and intimacy between the digital virtual assistants and interactive chatbots (Horton and Wohl, 1956). In the context of this study, the parasocial relationship is a one-way interaction between the customer and the digital Avtar leading to deep psychological connections between the customer and brand. This relationship is extremely complex as it originates because of task attraction, physical attraction, or social attraction. As per the various studies task attraction refers to the ability of media to facilitate task completion and social attraction refers to the social recognition gained through affiliation to the digital Avtar (Hellweg and Andersen, 1989). Physical attraction refers to the attributes (gender, language, physical attributes, attire) of the digital Avtar (McCroskey et al., 2006). Parasocial relationship theory propagates that the relationship with the digital Avtar leads to access to higher information and informational influence and raises the perceived

credibility of the brand leading to higher purchase intention.

The first module of our conceptual framework thereby comprises task attraction, social attraction physical attraction, and parasocial relationships, which we propose to be part of interpersonal relationships.

2.1. Parasocial relationship

Parasocial relationship refers to the emotional bonding that people develop with virtual assistants and interactive chatbots. Therefore, through the theoretical lens of parasocial relationships, we look to investigate how the use of virtual agents and interactive chatbots affects the social outlook and users' welfare (Rust, 2019). Further, we attempt to highlight that consumer anthropomorphism can lead to an increase in parasocial relationships, especially among the users of interactive chatbots and virtual agents (Han and Yang, 2018). It may be noted herein that users of technology tend to develop a parasocial relationship that is similar to social friends. In other words, users feel more comfortable with others, who are of the same personality type and likeliness (Rubin and Rubin, 1985). Studies in the past have referred to it as a sense of friendship and an emotional involvement, which a user feels with a virtual assistant and/or an interactive chatbot (Auter, 1992; Conway and Rubin, 1991; Grant et al., 1991; Kim and Rubin, 1997).

Given the consumers' non-human connection with chatbots and voice assistants, brands globally, tend to harness these potent tools through their customer service, which in turn, enhances their connection with their customers, and in the process, builds an enduring relationship (Conway and Rubin, 1991; Fournier, 1998). Besides, the use of artificial intelligence can also play an important role by serving as a partner in the production of benefits (Kim and Kramer, 2015). Further, it may be noted that the para-social theory also explains the brand-consumer relationship, which it believes to be inanimate and anthropomorphic (Fetscherin, 2014). Based on this parasocial relationship theory we propagate that a parasocial relationship refers to a deep relationship with somebody who is not known in person, (Aw and Labrecque, 2020). Moreover, as per the study, the para-social relationships are driven by decreased social involvement, loneliness, and their effect on shopping decisions, (Lee and Park, 2017).

Various studies highlight that the adoption of artificial Intelligence service agents is impacted by anthropomorphism and hedonic experiences. Anthropomorphism is defined as the attribution of human capacities to the non-human agent. Similar to the television characters, digital or virtual assistants create the illusion of intimacy through gestures and communication (Kepuska and Bohouta, 2018).

2.2. Task attraction

Task attraction refers to the charms of digital and virtual assistants on the buyers and consumers (Kim, 2018). Task attraction indicates whether the tasks that the audience wants the virtual assistants can be achieved with ease (Hellweg and Andersen, 1989). Chatbots and digital assistants can help consumers gain important information. With the suggestions of chatbots and digital assistants, the task will be easier to achieve (Han and Yang, 2018). Task attraction is the key factor that reflects whether the audience perceives that the digital assistants and the virtual chatbots can complete

the given task (McCroskey et al., 1974). Social attraction and task attraction are the factors that determine the level of parasocial relationship with the virtual assistants and chatbots (Zheng et al., 2020). The virtual assistant and the digital assistant, chatbots can enable gathering of the valuable and efficient information for the accomplishment of business-related tasks (McCroskey et al., 1981). Digital assistants and virtual chatbots that provide accurate information about the tasks enable the achievement of business-related goals. There is a lot of literature, in the domain of the impact of task attraction on the Parasocial relationship. Still, there is a lack of literature in the field of the impact of task attraction, social attraction, and physical attraction of Artificial intelligence chatbots and virtual assistants on Parasocial relationships as the first part of the conceptual framework. The study hypothesizes that task attraction is a major factor that drives the purchase intention on digital assistants or interactive chatbots through parasocial relationships.

2.3. Social attraction

Social attraction refers to the feeling of similarity among the people and the members of a group or fraternity (McCroskey et al., 2006). The process of social attraction refers to the social force that encourages friendship formation and leads to the feeling of liking among the members of a group or fraternity towards each other. The physical attraction is often based on the physical attraction of the virtual agents and the interactive chatbots. The literature highlights that the anonymity that comes with virtual relationships with digital characters makes people feel socially attracted through reduced cue communication (Antheunis et al., 2012). The literature highlights that artificial intelligence and chatbots are mainly social companions that provide social contact and offer a solution to social loneliness. To understand the process of parasocial relationships with artificial intelligence and chatbots, this study will examine the process of social attraction (Croes and Antheunis, 1972). The phenomenon of social attraction has various characteristics According to the literature, relationship formation takes place in various stages. Moreover, the placid static continuation leads to the deterioration of the relationship. A social relationship is a cooperative, supportive, and caring bond between two or more people (Foster, 2005). Much literature defines a friend or a social companion as somebody to talk to, to depend on, and rely on for help, support, and care (Rawlins, 2017). Moreover, friendships are formed through similar understandings and acceptance (Tillmann-Healy, 2003). It is important for friendship that people appreciate and like each other and are socially attracted or have a positive liking towards each other (McCroskey et al., 2006). As per the stage model given by (Levinger, 1980). When people have the desire to form friendly relationships a friendship is more likely to emerge. Thus, social attraction is crucial to building social relationships. Chatbots and Artificial intelligence are increasingly taking a social role and researchers are trying to understand how human beings interpret the behaviour of the chatbots and the virtual assistants. While interacting with human beings, the users generally use social rules and expectations while interacting with technological tools, chatbots, and virtual assistants, the human beings and the users assign social values and associate personally with the artificial intelligent agents (Mou, 2017; Nass and Moon, 2000; Xu and Lombard, 2016). The

literature highlights the need for understanding the perceptions of chatbots, and voice assistants in determining human behavior, (Heider, 1958; Miller et al., 1998; Tesser, 1988) and social attraction as the important factors forming parasocial relationships between human users and the chatbots, artificial intelligence-driven voice assistant. Social attraction is discussed as a process and is often characterized by the perceptions of persuasiveness, credibility, and trust (McCroskey et al., 1974). The literature highlights that people are increasingly attracted to interactional partners and that impacts the communication quality (McCroskey and McCain, 1974). Thus, the existing literature mainly explores the impact of social attraction on how much the users want or like the company of another individual or digital companion. However, it does not discuss the impact of social attraction on a parasocial relationship or the intention to use technology in the case of artificial intelligence-driven chatbots and virtual assistants. In the service literature, there is no consensus on whether consumers' anthropomorphism of artificial intelligence-driven chatbots and virtual assistants impacts the intention to use the technology. Anthropomorphism refers to the extent to which the users or the consumers perceive Artificial Intelligence and robots as human-like. Perception refers to the attribution of human characteristics to nonhuman agents and Artificial intelligence-driven agents such as chatbots and virtual assistants (Epley et al., 2007). This study synthesizes the parasocial relationship and its antecedents in the form of task, attraction, social attraction, and physical attraction, and the consequences in the form of informational influence and perceived credibility on the purchase intention in the banking sector (Blut et al., 2021). Accordingly, to address this gap and lack of knowledge in the domain of the impact of social attraction on purchase intention through the use of artificial intelligence-driven chatbots and virtual assistants, through parasocial relationships by enhancing the perceived credibility and informational influence on the purchase intention has been explored. The literature highlights that people use Artificial Intelligence driven chatbots and technology for online banking due to social pressure, social influence, and the intention of people to comply with social norms (Price et al., 1987). The existing literature highlights two kinds of social norms i.e., normative and confirmatory. The normative social norms are aimed at reducing the negative impact of the non-confirmation of the social norms. Conformance is aimed at avoiding punishments.

2.4. Physical attraction

Physical attraction refers to the charm and the attraction of the media and digital characters (McCruskeyMcCain, 1974). The existing literature highlights that it is intuitive that artificial intelligence-driven chatbots and virtual assistants can affect the extent to which the artificial-driven) the agent is anthropomorphized and results in parasocial relationships. The research highlights that presence of the human features, forms, and attributes increases parasocial relationships and the perceived credibility and influence of the digital agent (Erebak and Turgut, 2019; Zhang et al., 2010). The physical attributes of the digital agents and assistants can change the attitude of the consumer about the digital characters and intention to use the technology. The previous research highlights the importance of interpersonal attraction as an important variable that impacts the social relationship between users and digital agents such as

chatbots and virtual assistants (Joseph, 1982; McCroskey and McCain, 1974; Rubin and McHugh, 1987). The physical attraction of digital assistants is enumerated as physical and nonphysical characteristics. The physical features refer to the human-like appearance, physical outlook, demeanor, and other attributes. The nonphysical refers to the behavioral characteristics such as gaze, gesture, voice, and mimicry. It also refers to abilities such as eye contact, use of gestures, locomotion, interactive features, and other attributes. The literature highlights that the higher the number of features that digital assistants and chatbots possess more anthropomorphic it is perceived (Kompatsiari et al., 2019; Salem et al., 2013; Zhang et al., 2010). Besides the physical features, as part of the nonphysical features, the emotional connection and expression of an artificial agent also leads to anthropomorphism and parasocial relationships (Novikova, 2016). The literature further highlights that virtual agents are capable of interaction and communication through modalities such as voice, facial expression, and body movements (Pelachaud, 2009). The appearance of virtual agents such as chatbots, and virtual assistants has a vast impact on the degree of user acceptance of the technology and his intention to use it. Further, the physical features, social features, and appearance include the face, voice, gender, dressing style, and personality (Díaz-Boladeras et al., 2013; Esposito et al., 2021). The literature specifically highlights the impact of voice and face on the intention to use technology and purchase of banking products (Gong and Nass, 2007). The different age groups of consumers have shown different preferences for the use of Artificial intelligence-driven agents. Some age groups prefer human and cartoon forms of appearances of the virtual agents (Straßmann and Krämer, 2017; Ring et al., 2014). For young adults, voice seems to be a feature that impacts the intention to use the technology or the digital assistant (Kong, 2013). Gender also has an impact on the intention to use technology or the virtual agents (Niculescu et al., 2010). Yet other studies highlighted that female digital agents improved learning outcomes and increased interest among the students. Also, the dressing style impacts the user's attitudes toward the adoption of virtual agents (Lunardo, 2016). The literature highlights that the female virtual agents with corporate attire were more appealing to the users and had a positive impact on user behavior. The agents were emotional and expressed joy in the event of acceptance of a purchase proposition and were always exhibiting accommodating and positive emotions were preferred over the agents that showed anger and blame in negative situations. The users also showed disdain for the unemotional virtual agents (Gobron et al., 2013). The features include appearance, voice, and dressing style (Burleigh et al., 2013; Mori, 1970). The lexicon and ethnicity of the chatbot or interactive agent also impacted the adoption of the technology and purchase intention. In some cases, females with Asian traits and males with Causican traits were preferred for the purchase of the goods and services (Sparrow, 2020). The literature highlights that the physical attraction of the chatbots and artificial intelligence virtual agents leads to interpersonal influence on the behavior and attitudes and behaviors of the users of the digital agents (Rubin and McHugh, 1987). The authors further highlight that social and task attraction leads to social interactions and perceived relationships with virtual assistants and interactive chatbots. Thus, in the case of the virtual agents appearance, gender, behavior, personality, realism, and emotional expressions were the important characteristics that impacted the adoption of the virtual agent. There is not much research in the domain

of the impact of the physical attraction of chatbots and virtual agents on the acceptance of technology and the intention to use artificial intelligence-driven agents.

Consequently, the study seeks to examine how social attraction, task attraction, and parasocial relationship explain the two outcomes of the process or intention to purchase, which comprises of formation of perceived credibility and informational influence.

2.5. Perceived credibility

Artificial intelligence is an algorithm-driven virtual and interactive assistant. The question regarding the credibility of algorithmic trust is gaining a lot of interest in the context of artificial intelligence. As more and more people rely on artificial intelligence and algorithms for the news and decisions the question of credibility is gaining increased importance. While using algorithm-based chatbots and interactive virtual assistants, the users have to make decisions as to what extent the algorithm-based services are to be trusted (Shin, 2021). Credibility is about the belief in the information provided through algorithm-based digital agents and chatbots. When the information comes from a trusted source, then the perceived credibility of the digital agent is very high. And the research by (Ng et al., 2020) highlights that chatbot users are keen to use chatbots if instill a sense of credibility among the users. Moreover, the level of satisfaction increases the likelihood of using the chatbot and interactive digital agents again (Huang and Chueh, 2021). The existing research highlights that credibility is the degree to which a person believes a message or information provided by artificial intelligence and digital assistants is believable (Andersen and Clevenger, 1963; McCroskey and Young, 1981). The literature has defined the concept of credibility across three different dimensions namely competence, goodwill, and trustworthiness in using artificial intelligence-driven chatbots and interactive virtual assistants. The non-verbal cues such as the pleasant demeanor of the chatbots and digital assistants serve as online immediacy in contexts such as business and lead to positive impacts such as credibility (Darics, 2017; Dixson et al., 2017; Lo, 2008). There is a lack of research in the domain of impact of the artificial intelligence-led chatbots and digital or virtual assistants on the intention to purchase.

2.6. Informational influence

Informational influence refers to the perception of users regarding the information value of chatbots and artificial intelligence-driven virtual agents (Bhattacharjee and Sanford, 2006). If the information is perceived as trustworthy and accurate the users posit more trust and integrity in the use of the chatbots and virtual agents (Thomas et al., 2019; Zhou, 2021). If the customers find the content to be poor, the users will pay less attention, leading to lesser credibility (Thomas et al., 2019). Hence, the information value of the chatbots determines the purchase intentions. There is not much research in the domain of the impact of information influence on the purchase intention of users (Xuan, 2003). Interpersonal influence is defined as either informative or normative. Informative influence refers to the acceptance from others about reality (Deutsch et al., 1955). At the same time, the normative influences are referred to as value expressive and utilitarian. Value expressiveness refers to the

intention of the users to enhance their self-image and refer to their needs in terms of association with the reference groups and utilitarian influence refers to the expectation to comply with others to avoid punishments and earn rewards (Burnkrant et al., 1975). Thus, either the informational influence or utilitarian influence, the use of interactive chatbots, and virtual assistants plays an important role in improving the informational influence. There is not much research in the domain of the impact of the informational influence use of artificial intelligence-driven interactive chatbots and virtual assistants. This study aims to highlight the impact of the use of chatbots on the informational influence and thus the parasocial relationship leading to better purchase intention. The informational influence refers to the feeling of being informed by the virtual assistant and the interactive chatbots (Rubin and Mary, 2000).

2.7. Purchase intention

The purchase intention is the extent to which the user, using the interactive chatbots and the virtual agents are willing to purchase the products through online banking (Montaño and Kasprzyk, 2015). Existing literature highlights that the social attraction of the interactive chatbots and the digital agents impact the purchase behavior of the people (Newberry et al., 2003). Thus, this study assumes that the purchase intentions have an impact on the purchase behavior of the members using online banking (Winterich and Nenkov, 2015). Further, the literature highlights that the ability of the interactive chatbots and the virtual agents to provide the information has an impact on the purchase decision of the consumers that are buying through the interactive chatbots and the virtual agents. This is because as part of the product search and purchase, digital assistants and interactive chatbots provide beneficial and relevant information that is useful for the users (Bearden et al., 1989).

Hypothesis

For the study, the hypotheses to be tested are given below:

1) Informational influence positively impacts purchase intention
2) Parasocial relationship positively influences the informational influence
3) Parasocial relationship positively impacts perceived credibility
4) Perceived credibility positively impacts the purchase intention
5) Physical attraction positively impacts the parasocial relationship
6) Social attraction positively impacts the parasocial relationship
7) Task attraction positively impacts the parasocial relationship
8) Parasocial relationship mediates the relationship between social attraction and perceived credibility
9) Parasocial relationship mediates the relationship between physical attraction and informational influence
10) Parasocial relationship mediates relationship between the social attraction and informational influence
11) Parasocial relationship mediates relationship between the task attraction and perceived credibility
12) Parasocial relationship mediates the relationship between task attraction and informational influence

13) Perceived credibility mediates the relationship between parasocial relationship and purchase intention
14) Informational influence mediates the relationship between the parasocial relationship and purchase intention
15) Perceived credibility mediates the relationship between physical attraction and purchase intention
16) Parasocial relationship and informational influence serially mediate the relationship between physical attraction and purchase intention
17) Parasocial relationship and informational influence serially mediate the relationship between task attraction and purchase intention
18) Parasocial relationship and informational influence serially mediate the relationship between social attraction and purchase intention
19) Parasocial relationship and perceived credibility serially mediate the relationship between physical attraction and purchase intention
20) Parasocial relationship and perceived credibility serially mediate the relationship between purchase intention and task attraction
21) Parasocial relationship and perceived credibility serially mediate the relationship between social attraction and purchase intention

3. Conceptual framework

The conceptual framework for this study is based on the theoretical framework of parasocial relationships (Horton and Wohl, 1956). The parasocial relationship is the focal construct and the main objective of the study is to assess the impact of this parasocial relationship on intention to purchase. This study has 3 sets of antecedents and 3 sets of consequences variables. These antecedents include task attraction, social attraction, and physical attraction, and the consequences are perceived credibility and informational influence leading to the purchase intention. For this study, the conceptual framework is shown in the figure below. The conceptual framework propounds that task attraction, social attraction, and physical attraction lead to parasocial relationships. The parasocial relationship further leads to the perceived credibility, informational influence, and thus the intention to purchase. The conceptual framework for the study is given below in **Figure 1**.

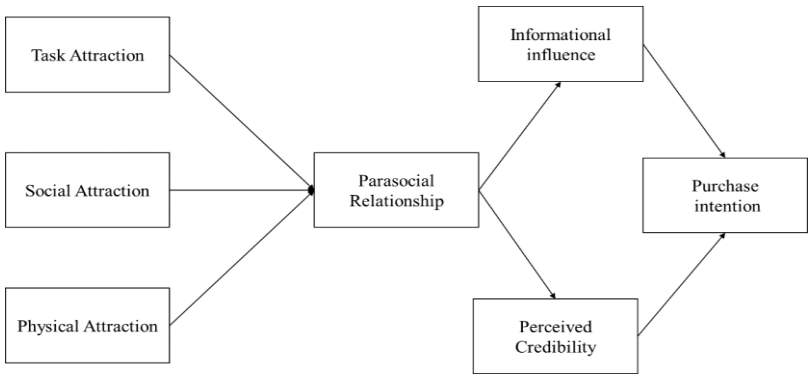

Figure 1. Conceptual framework; Source: Author's survey (2023).

4. Research methodology

4.1. Data collection

The study is a quantitative empirical study and the data is collected using the cross-section data survey questionnaire. The sampling is done using the purposive sampling method (Cheah et al., 2021; Sarstedt et al., 2018). To collect the data, the respondents were contacted personally through negotiating access with the prospects, who were selected through the convenience sampling method due to the superiority of the method in collecting the data (Yao et al., 2015). The data was collected using the questionnaire and the sample was selected from the rural regions of New Delhi and Rajasthan. The respondents were selected based on the question of whether they use artificial intelligence-based interactive chatbots and virtual assistants for digital banking. The study aims to study the impact of task attraction on the parasocial relationship between chatbots and interactive virtual assistants. Task attraction refers to the impact of virtual assistants and interactive chatbots on task accomplishment. The questionnaire for the study is adapted from the earlier research study (McCluskey and McCain, 1974; Su et al., 2021). Besides, social attraction refers to the social role played by chatbots, and digital virtual assistants in combating loneliness through human touch and socialization. It also refers to the perception of individuals regarding the similarity, likes, and compatibility of the chatbots and virtual agents with the users' preferences (McCluskey and McCain, 1974). The third antecedent of the parasocial relationship is physical attraction, which refers to the likability of the interactive chatbots and the interactive virtual agents due to the appearance, gender, voice, and personality of the virtual agent. The research establishes that physically attractive chatbots and virtual agents have a far greater positive impact on the attitude of the purchase intention and disposition of the users. Physical attraction is measured through four indicator variables adapted from (McCluskey and McCain, 1974). The study was based on a 5-point Likert Scale, with (1) as strongly disagree and (5) as strongly agree. A pilot study was conducted with 50 respondents to ensure that the study is accurate (Hertzog, 2008; Hulland et al., 2018).

During the period from January 2023 to August 2023, 151 surveys were conducted, based on sample size calculated using G power v3.1.9.2 software to calculate the minimum sample size based on statistical power (Faul et al., 2009). With an effect size of 0.15, a sample size of 74 is require to achieve the statistical power of 0.95. Thus, the sample size of 151 was adequate to conduct the statistical analysis (Putri, 1998). The responses were collected from approximately 151 respondents, from the people who are using artificial intelligence, chatbots, and digital or virtual agents for banking. The respondents were asked to answer the question regarding whether they use the artificial intelligence driven chatbots and virtual assistants for online banking. The majority of the respondents, 66.8%, were males and 33.1% were females. 58.9% of the respondents are in the age group 20–30 years of age, 35.09% are in the age group 30–40 years of age and 5.90% are in the age group 40–50 years of age. The respondent's demographic profile is given below in **Table 1**.

Table 1. Demographic details of respondents (Source: Author's own work).

Gender	**Percentage**	**Frequency**
Male	66.88%	101
Female	33.11%	50
Age group		0
20–30 years	35.09%	53
30–40 years	58.90%	89
40–50 years	5.90%	9
Education		0
Graduation	5.29%	8
Post Graduation	94.70%	143
Marital Status		0
Married	52.31%	79
Unmarried	47.68%	72

4.2. Data analysis

4.2.1. Measurement model

To empirically validate the conceptual framework given earlier, most of the indicator items in the questionnaire have been adapted from the existing literature on the use of artificial intelligence. For this study, the conceptual model adopted in this study mainly comprises the reflective construct.

The operational definition for the various reflective indicators of the constructs is provided in **Table 2** below along with the questions, as part of the questionnaire. There are 3 antecedents to the parasocial relationship, which comprise task attraction, social attraction, and physical attraction.

Table 2. Description of reflective indicators (Source: Author's own work).

Variable	**Code**	**Measurement**
Task Attraction	TA1	If I want to get a reply to a query (regarding bank accounts, or banking products) I could depend on the voice assistants and the chatbots, whom I approach regularly
	TA2	AI Chatbots and voice assistants by banks would be an asset in any kind of customer grievance
	TA3	I am confident about the ability of the AI chatbots and voice assistants on banking websites to resolve my customer complaint
	TA4	I could rely on the AI chatbots and voice assistants whom I approach frequently to get my tasks done
Social Attraction	SA1	I would like to have a friendly chat with the AI chatbot and voice assistant whom I approach frequently on banking websites
	SA2	I feel the human touch in my interactions with the AI Chatbots and Voice Assistants whom I approach frequently on banking websites
	SA3	Some of the voice assistants and chatbots are pleasant to be with

Table 2. (*Continued*).

Variable	Code	Measurement
Physical Attraction	PA1	I think that the voice assistants and chatbots that I approach on banking websites are quite attractive
	PA2	I find that the voice assistants that I approach most frequently on banking websites have extremely pleasant personalities
	PR1	The persona of the voice assistants and the chatbots that I approach on banking websites
Parasocial Relationship	PR2	I could have a warm relationship with the chatbot voice assistant whom I approach most frequently on the banking websites
	PR3	I feel that the chatbot voice assistant whom I approach on the banking website gives immense emotional support
	PR4	While talking to the AI chatbot or voice assistant whom I approach on the banking website, I feel that they portray the emotions
	PR5	During the chat sessions whom I approached on the bank website
Informational Influence	II1	I seek information from the AI chatbot or voice assistant since I consider than an expert
	II2	I frequently gather information about a banking product from the AI Chatbot or voice assistant whom I approach most frequently on the banking websites before I buy the products
	II3	AI chatbots and voice assistants whom I approach on the bank websites are knowledgeable
Perceived Credibility	PC1	The influencers whom I approach most frequently on the banking website are trustworthy and alike
	PC2	The influencers whom I approach most frequently on banking are all credible
	PC3	I can easily identify with the AI chatbot and voice assistant on banking website
Purchase Intention	PI1	Information sought from the AI Chatbot or voice assistant increases the propensity to bank
	PI2	I am certain to buy products from banks that provide AI chatbots or voice assistants
	PI3	Consulting an AI chatbot or voice assistant increases the intention to bank
	PI4	AI chatbots or voice assistants increase the propensity to bank

4.2.2. PLS-SEM methodology

To study the impact of interpersonal interaction on the social relationship between the interactive chatbot and the purchase behavior of consumers, the PLS-SEM method has been used. PLS-SEM method is preferred due to the small sample size and the ability of the technique to maximize the variance of the endogenous constructs/indicators. Since in this study, the objective is to test the sequential mediation relationships (Nitzl et al., 2016) as well as the moderator relationships (Becker et al., 2018) again the PLS-SEM model is found to be more suitable (Hair et al., 2017; Sarstedt, 2017b). This PLS-SEM technique is also preferred over covariance-based structural modeling and ordinary least squares regression due to the nonnormality in the data. Another reason for the choice of the PLS-SEM model is the complex nature of the research model (Hair et al. 2017). SmartPLS V.4. software (Ringle et al., 2015) has been used for studying the measurement and the structural model. The two-step approach suggested by (Hair et al., 2019) has been used for analysis. The measurement model is evaluated followed by the structural model in the second step.

5. Findings and discussion of results

5.1. Normality test

From the descriptive statistics generated by the SmartPLS software, there is no univariate normality issue in the data. The skewness and kurtosis values are well within ±2, which shows that there is no multivariate normality issue in the data, (Field, 2009; George and Mallery, 2010). Another criterion for the accurate model prediction is the multivariate normality. The analysis of the multivariate analysis shows that Mardia's parameters of multivariate skewness (β = 8.26; p < 0.000) and multivariate kurtosis (β = 70.56; p < 0.000) suggest the multivariate nonnormality in the data. The multivariate nonnormality is another reason for using the PLS-SEM method of data analysis (Hair et al., 2019). The descriptive statistics and results of the normality tests are given in **Table 3**.

Table 3. Descriptive statistics and normality tests (Source: Author's own work).

Items	**Descriptive Statistics**					**Normality test**	
Name	Mean	Median	Minimum	Maximum	Standard deviation	Excess kurtosis	Skewness
TA1	3.775	4	1	5	0.991	−0.069	−0.646
TA2	3.695	4	1	5	1.003	−0.187	−0.668
TA3	3.735	4	1	5	0.995	−0.095	−0.669
TA4	3.715	4	1	5	0.993	0.141	−0.755
SA1	3.762	4	2	5	0.981	−0.734	−0.481
SA2	3.788	4	2	5	0.953	−0.631	−0.489
SA3	3.801	4	2	5	0.983	−0.7	−0.519
PA1	3.689	4	1	5	0.957	−0.444	−0.528
PA2	3.748	4	1	5	0.964	−0.37	−0.593
PA3	3.781	4	1	5	1.009	−0.618	−0.525
PA4	3.808	4	1	5	0.954	−0.325	−0.576
PA5	3.841	4	1	5	0.977	−0.365	−0.621
PR1	3.768	4	1	5	0.98	0.116	−0.757
PR2	3.815	4	1	5	0.945	0.447	−0.809
PR3	3.874	4	1	5	0.985	0.338	−0.876
PR4	3.861	4	1	5	0.997	−0.126	−0.729
II1	3.775	4	1	5	0.964	0.199	−0.743
II2	3.808	4	1	5	1.001	−0.591	−0.524
II3	3.755	4	1	5	0.99	−0.028	−0.69
PC1	3.808	4	1	5	0.988	−0.105	−0.728
PC2	3.834	4	1	5	0.986	0.121	−0.749
PC3	3.868	4	1	5	1.027	−0.065	−0.767
PI1	3.748	4	1	5	0.957	0.515	−0.846
PI2	3.788	4	1	5	0.994	−0.055	−0.665
PI3	3.742	4	1	5	1.032	−0.319	−0.631
PI4	3.682	4	1	5	0.972	−0.063	−0.633

5.2. Common method bias

The common method bias refers to the data that is being derived from a single source (Avolio et al., 1991) that could lead to problems in the analysis of the quantitative data The Common method bias adversely impacts the validity of the data and affects the structural relationship (MacKenzie et al., 2012). The common method bias in a study can be reduced through statistical control and procedural control. The procedural control is achieved by allowing the respondents to anonymously respond to the questionnaire, positioning the demographic question at the end of the questionnaire, and piloting the questionnaire before the last stage of data collection. For the statistical control, two different methods were used namely, the Harman one-factor test. Moreover, the study used the pathologic Variance Inflation Factor below 5, thus there is no Common Method Bias in the data (Anshuman et al., 2021; Ned Kock, 2015).

5.3. Measurement model

As per (Hair et al., 2017) the evaluation of the measurement model highlighted that there is a high degree of convergent validity and internal consistency in the data as the outer loading, composite reliability, and average variance extracted are all above the threshold of 0.708 and below 0.95. To measure the discriminant validity, the Fornell Larcker criterion and Hetrotrait Monotrait criterion were used. The Hetrotrait Monotrait Ratio was far below the threshold of 0.85 which shows that there is enough discriminant validity in the data (Henseler et al., 2015). The measurement model results are shown below in **Table 4**. The results for discriminant analysis are presented in **Table 5** (HTMT) and **Table 6** (Fornell and Larcker analysis). **Figure 2** represents the graphic presentation of the measurement model.

Table 4. Measurement model (Source: Author's own calculation).

Item	Scale	Outer loadings/Weight	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	AVE—Average variance extracted
II1	Reflective	0.871***	0.855	0.855	0.912	0.775
II2		0.882***				
II3		0.888***				
PA1	Reflective	0.814***	0.906	0.907	0.934	0.78
PA2		0.883***				
PA3		0.863***				
PA4		0.829***				
PA5		0.853***				
PC1	Reflective	0.896***	0.882	0.883	0.927	0.81
PC2		0.893***				
PC3		0.911***				
PI1	Reflective	0.87***	0.903	0.903	0.928	0.72

Table 4. (*Continued*).

Item	Scale	Outer loadings/Weight	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	AVE—Average variance extracted
PI2		0.882***				
PI3		0.901***				
PI4		0.88***				
PR1	Reflective	0.879***	0.906	0.907	0.934	0.781
PR2		0.893***				
PR3		0.885***				
PR4		0.875***				
SA1	Reflective	0.888***	0.854	0.854	0.911	0.774
SA2		0.893***				
SA3		0.857***				
TA2	Reflective	0.878***	0.906	0.906	0.934	0.78
TA3		0.89***				
TA4		0.855***				
TA1		0.91***				

Note: Average Variance Extracted (AVE), Composite Reliability (CR), Outer Loading (λ). All the values of AVE, CR, Cronbach Alpha, and rho_A are significant at $p < 0.001$ AVE (Average Variance Extracted) values for the data are all more than 0.5 and hence there is no issue of discriminant validity in the data. PA refers to physical attraction, PR refers to perceived relationship, II refers to informational influence, PI refers to the purchase intention, SA refers to social attraction, TA refers to task attraction and PC refers to perceived credibility. *** signifies 5% significance level.

Table 5. Discriminant validity (Source: Author's own work).

	IR	PR	PC	PA	PI	SA	TA
IR							
PR	0.837						
PC	0.958	0.862					
PA	0.807	0.842	0.829				
PI	0.897	0.826	0.926	0.768			
SA	0.837	0.861	0.829	0.903	0.802		
TA	0.827	0.802	0.848	0.888	0.795	0.942	

Note: The off-diagonal values (bold) in the above matrix are the squares correlations between the latent constructs and diagonals are AVEs. HTMT <0.85 (Kline, 2005). PA refers to physical attraction, PR refers to perceived relationship, II refers to informational influence, PI refers to the purchase intention, SA refers to social attraction, TA refers to task attraction and PC refers to perceived credibility.

Table 6. Fornell Larcker criterion (Source: Author's own work).

	II	PR	PC	PA	PI	SA	TA
II	0.88						
PR	0.736	0.883					
PC	0.832	0.772	0.9				
PA	0.709	0.764	0.741	0.849			

Table 6. (*Continued*).

	II	PR	PC	PA	PI	SA	TA
PI	0.79	0.75	0.828	0.696	0.883		
SA	0.714	0.758	0.72	0.792	0.705	0.88	
TA	0.727	0.728	0.758	0.803	0.72	0.828	0.883

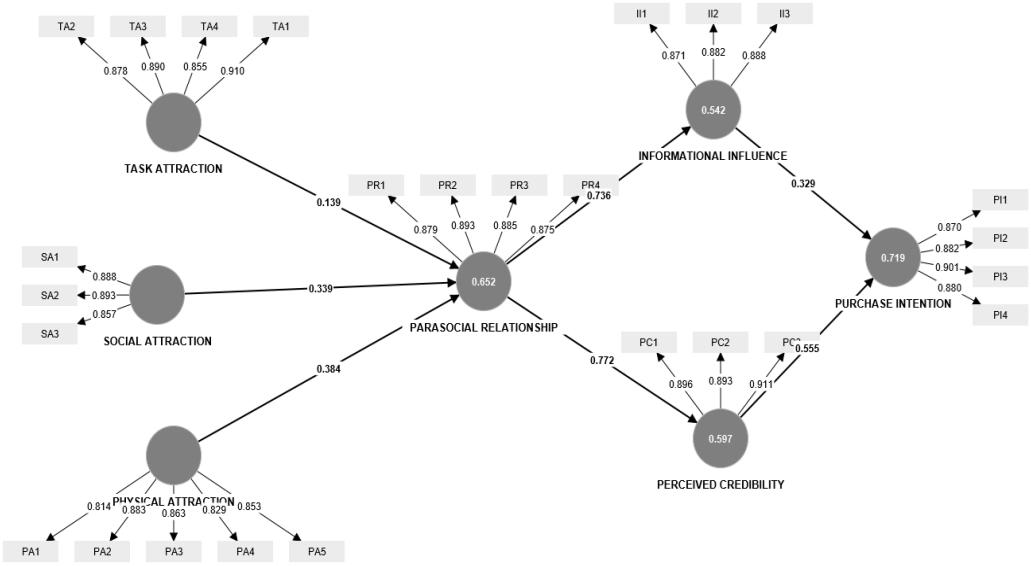

Figure 2. Measurement model (Source: Author's own work).

5.4. Assessment of the structural model

The next step in the assessment of the structural model is to validate the hypothesized relationship (Hair et al., 2017). The data showed that there is no multi-collinearity issue in the data, with the Variance Inflation Factor all below the value of 5. At the same time, the significance of the path coefficients, the R square, and the predictive relevance of the Q square were calculated. The data from the bootstrap analysis shows that the direct relationship between the informational influence and the purchase intention (β = 0.329; t = 3.95; p = 0.00)*;* parasocial relationship and the informational influence (β = 0.736; t = 16.673; p = 0.000); parasocial relationship and the perceived credibility (β = 0.772; t = 20.03; p = 0.00); perceived credibility and purchase intention (β = 0.555; t = 6.608; t = 0.000); physical attraction and parasocial relationship (β = 0.384; t = 4.508; p = 0.000) and social attraction and parasocial relationship (β = 0.339; t = 3.181; p = 0.000) and the relationship between task attraction and parasocial relationship is not significant. The results of the structural model are presented in **Table 7**.

Table 7. Structural model (Source: Author's own work).

Path	Beta	SE	T statistics	P Val	LLCI	ULI		R Sq.	F Sq.	VIF
II - PI	0.329	0.083	3.95***	0.000	0.172	0.497	Sig	0.542/0.719	0.118	
PR - II	0.736	0.044	16.673***	0.000	0.639	0.811	Sig	0.652	1.183	1
PR - PC	0.772	0.039	20.038***	0.000	0.684	0.836	Sig		1.479	
PC - PI	0.555	0.084	6.608***	0.000	0.381	0.709	Sig	0.597	0.336	3.254

Table 7. (*Continued*).

Path	Beta	SE	T statistics	P Val	LLCI	ULI		R Sq.	F Sq.	VIF
PA - PR	0.384	0.085	4.508***	0.000	0.219	0.555	Sig		0.124	3.295
SA - PR	0.339	0.106	3.181***	0.001	0.129	0.547	Sig		0.088	3.719
TA - PR	0.139	0.101	1.376	0.169	−0.064	0.331	Non-Sig		0.014	3.896

Note: *** refers to the 5% significance level. Note: PA refers to physical attraction, PR refers to perceived relationship, II refers to informational influence, PI refers to the purchase intention, SA refers to social attraction, TA refers to task attraction and PC refers to perceived credibility. "-" refers to leads to.

5.5. Mediation analysis

The transmittal approach is used for evaluating the mediation relationship (Rungtusanatham et al., 2014). The transmittal approach mainly aims to develop the hypothesis that M mediates the effect of X on Y or that X has an indirect effect on Y through M without needing to articulate hypotheses relating to X to M and M to Y, (Rungtusanatham et al, 2014). As suggested by (Hair et al., 2017), a bootstrapping with 10,000 subsamples was used to estimate the 95 percent bias-corrected confidence interval of the indirect effect. Further, the decision tree suggested by (Nitzl et al. ,2016) has been used for the mediation classification. The study contributes immensely to the literature in the domain of banking through artificial intelligence by introducing higher order construct of para social relationship in banking through digital Avtar based on artificial intelligence. The decision tree displays the parasocial relationship as outcome of task attraction, physical attraction and social attraction. The results validate the transmittal impact of parasocial relationship on perceived credibility and informational influence. But points out that in current context the social and physical attraction of the digital Avtar leads to transmittal impact, and due to lack of operational efficiency, task attraction is yet not an important constituent of a parasocial relationship. The decision tree is depicted in **Figure 2** and results of Mediation analysis are presented in **Table 8**.

The results of the mediation analysis show that parasocial relationship mediates the relationship between social attraction and perceived credibility (β = 0.262; t = 3.087; p = 0.002)*;* physical attraction and information influence (β = 0.283; t = 4.577; p = 0.002); social attraction and informational influence (β = 0.249; t = 3.088; p = 0.002). The parasocial relationship does not mediate the relationship between task attraction and perceived credibility (β = 0.108; t = 1.36; p = 0.173) and task attraction and informational influence (β = 0.103; t = 1.352 and p = 0.176). However, the relationship between parasocial relationships and purchase intention through perceived credibility is significant (β = 0.428; t = 6.147; p = 0.000). The serial relationship between physical attention and purchase intention through the parasocial relationship and informational influence is significant (β = 0.093; t = 2.69; p = 0.007)*;* the relationship between social attraction and purchase intention serially mediated through the parasocial relationship and informational influence (β = 0.082; t = 2.46; p = 0.014)*;* the relationship between physical attraction and purchase intention serially mediated through parasocial relationship and informational influence is significant (β = 0.093; t = 2.69; p = 0.007), the relationship between physical attraction and purchase intention through parasocial relationship and perceived credibility is significant (β =

0.165; t = 3.996; p = 0.00). However, the relationship between task attraction and purchase intention is not significant (β = 0.034; t = 1.194; p = 0.232). Next, to assess the structural model, it is important to determine the Coefficient of determination (R^2), effect size (f^2), and the predictive significance (Q^2 predict). Overall, the model has explanatory power as the informational influence has an explained variance of 54.2% and the purchase intention has an explained variance of 71.9%. The parasocial relationship has an explained variance of 65.2%, while the perceived credibility has an explained variance of 59.7%. In terms of the effect size, the parasocial relationship has the highest effect size. Perceived credibility has the medium effect size, personal attraction, and informational influence have the medium effect size, and social attraction and task attraction have the lowest effect size (Cohen, 2013; Geisser, 1974; Stone, 1974). The f square and Q square predictions show that the model has predictive validity (Shmueli et al., 2019).

Table 8. Mediation analysis (Source: Author's own work).

Parameters	**Beta**	**SE**	***t* value**	***p*-value**
PA - PR - II - PI	0.093	0.035	2.69	0.007
SA - PR - PC	0.262	0.085	3.087	0.002
PA - PR - II	0.283	0.062	4.577	0
SA- PR - II	0.249	0.081	3.088	0.002
SA - PR - II- PI	0.082	0.033	2.46	0.014
TA - PR - II - PI	0.034	0.028	1.196	0.232
PA - PR - PC - PI	0.165	0.041	3.996	0
PR - II - PI	0.242	0.067	3.597	0
TA - PR - PC	0.108	0.079	1.361	0.173
TA - PR - PC - PI	0.06	0.045	1.334	0.182
SA - PR - PC - PI	0.145	0.055	2.622	0.009
TA - PR - II	0.103	0.076	1.352	0.176
PA - PR - PC	0.297	0.064	4.599	0
PR - PC - PI	0.428	0.07	6.147	0

Note: PA refers to physical attraction, PR refers to perceived relationship, II refers to informational influence, PI refers to the purchase intention, SA refers to social attraction, TA refers to task attraction and PC refers to perceived credibility. "-"refers to leads to.

Artificial intelligence, virtual assistants, and interactive chatbots are changing the paradigm of online banking. With the advent of the digital Avtar, the relationship between the digital assistant and the customer has become much more interactive and reciprocal. Our study found that consumers are using artificial intelligence based digital assistants or digital Avatars for purchasing banking products due to the increased perceived credibility and informational influence. The study is based on the theoretical model of para-social relationships, in context of the artificial intelligence based virtual assistants and chatbots.

The findings of the study indicate that an intimate and physically attractive Avtar or assistant can induce a parasocial relationship which can in turn lead to better trust and perceived credibility and informational influence which can positively impact the

purchase intention. The findings are also consistent with the earlier studies that have hypothesized the impact of social attributes and human-like features on the relationship between the digital assistant and the customer. In addition, this study for the first time extends this relationship to a parasocial relationship with the virtual assistant that leads to higher credibility and informational influence, cognitively and affectively motivating the consumer to purchase the products. Thus, the study extends the Parasocial relationship theory in the context of digital assistants and asserts that the social benefits of the relationships between virtual assistants and digital assistants or chatbots are immense. These relationships buffer the social isolation, social well-being and need for socializing. Further, the studies propagate that as AI becomes more sophisticated the tendency and inclination of human beings to turn to Artificial intelligence -driven chatbots to meet their relationship needs will rise tremendously (Chow, 2023). This phenomenon is even more visible in the case of neobanks and digital banks. Thus, the results prove that if the digital Avatars are socially and physically attractive, the customers will perceive them as credible and further perceive them to have higher informational influence. Task-oriented digital Avatars or task attraction which refers to the utility of the chatbot to complete a particular task also leads to higher purchase intention (Ashfaq et al., 2020; Sienkiewicz, 2021; Xie et al., 2023). The study indicates that informational influence and perceived credibility have a positive impact on purchase intention

Most importantly if the Avtar is attractive (physically and socially) through the parasocial relationships it enhances the perceived credibility and informational influence and further intention to purchase banking products. However, the study establishes that task orientation and task attraction do not have a positive impact on purchase intention.

This implies that banking tasks such as the transfer of money, quick transfer advantages such as time savings, security and privacy, and economic advantage are not the motivations to purchase banking products using digital modes such as Artificial intelligence and chatbots. Rather, it is the social attraction social belongingness, and physical attraction that leads to a relationship that is based on credibility, trust, and the information provided that leads to the purchase intention. Hence the banking institutions are not doing enough to promote the benefits of a virtual assistant and the chatbots that lead to more personalized, informed banking while saving the time of the clients. In today's fast-paced world the emotional connection that a consumer develops with an Avtar, which is socially and physically attractive, leads to higher credibility, and through greater informational influence, it leads to higher purchases.

6. Conclusions

The study concludes that in a world with increasing use of Artificial intelligence and virtual chatbots, banks and financial institutions are finding it extremely useful. The study propagates through the lens of the parasocial relationship theory, that increased physical attraction, task attraction, and social attraction leads to increased perceived credibility and informational influence, which further increases the purchase intention of the banking consumers.

7. Limitations and future research

This research suffers from various limitations such as the study was conducted through the survey-based questionnaire, which made use of convenience-based sampling and purposive sampling. This type of sampling suffers from various limitations of the nonrandom sampling. In the future, further research can be conducted using the random sampling method. In this study, the parasocial theory has been used for analysis. In the future, more research can be conducted to analyze the impact of gender on Artificial intelligence users and their purchase intention towards banking products.

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References

Aamodt, A., & Nygård, M. (1995). Different roles and mutual dependencies of data, information, and knowledge—An AI perspective on their integration. Data & Knowledge Engineering, 16, 191-222.

Adam, A., & Sizemore, B. (2013). Parasocial Romance: A Social Exchange Perspective. Interpersona: An International Journal on Personal Relationships, 7(1), 12–25. https://doi.org/10.5964/ijpr.v7i1.106

Aggarwal, P., & McGill, A. L. (2012). When Brands Seem Human, Do Humans Act Like Brands? Automatic Behavioral Priming Effects of Brand Anthropomorphism. Journal of Consumer Research, 39(2), 307–323. https://doi.org/10.1086/662614

Alan M. R., Mary M. S. (2000). Impact of motivation, attraction and parasocial interaction on talk radio listening. Journal of broadcasting and electronic media, 44(4), 635-652. https://doi.org/10.1207/s15506878jobem4404_7

Andrew R. C. (2023). AI-Human Romances Are Flourishing—And This Is Just the Beginning. TIME. Available online: https://time.com/6257790/ai-chatbots-love/ (accessed on 23 February 2023).

Antheunis, M. L., Valkenburg, P. M., & Peter, J. (2012). The quality of online, offline, and mixed mode relationships among the users of social networking site. Cyberpsychology: Journal of Psychological Research on Cyberspace, 6(3). https://doi.org/10.1016/j.chb.2021.106919

Ashfaq, M. (2020). I, Chatbot: Modeling the determinants of users' satisfaction and continuance intention of AI-powered service agents. Telematics and Informatics, 54, 101473. https://doi.org/10.1016/j.tele.2020.101473

Athapaththu, J.C., & Kulathunga, D. (2018). Factors Affecting Online Purchase Intention: Effects of Technology and Social Commerce. International Business Research., https://doi.org/10.5539/IBR.V11N10P111

Auter, P. J. (1992). Psychometric: TV that talks back: An experimental validation of a parasocial interaction scale. Journal of Broadcasting & Electronic Media, 36(2), 173–181. https://doi.org/10.1080/08838159209364165

Avolio, B. J., Yammarino, F. J., & Bass, B. M. (1991). Identifying Common Methods Variance With Data Collected From A Single Source: An Unresolved Sticky Issue. Journal of Management, 17(3), 571–587. https://doi.org/10.1177/014920639101700303

Aw, E.C.X.; Labrecque, L.I. (2020). Celebrity endorsement in social media contexts: Understanding the role of parasocial interactions and the need to belong. Journal of Consumer Marketing, 37, 895-908. https://doi.org/10.47191/jefms/v6-i10-14

Bartneck, C., Kulić, D., Croft, E., et al. (2008). Measurement Instruments for the Anthropomorphism, Animacy, Likeability, Perceived Intelligence, and Perceived Safety of Robots. International Journal of Social Robotics, 1(1), 71–81. https://doi.org/10.1007/s12369-008-0001-3

Bearden, W. O., Netemeyer, R. G., & Teel, J. E. (1989). Measurement of Consumer Susceptibility to Interpersonal Influence. Journal of Consumer Research, 15(4), 473. https://doi.org/10.1086/209186

Beattie, A., Edwards, A. P., & Edwards, C. (2020). A Bot and a Smile: Interpersonal Impressions of Chatbots and Humans Using Emoji in Computer-mediated Communication. Communication Studies, 71(3), 409–427. https://doi.org/10.1080/10510974.2020.1725082

Becker, J., Ringle, C.M., & Sarstedt, M. (2018). Estimating moderating effects in pls-sem and plsc-sem: interaction term generation*data treatment. Journal of applied structural equation modeling; https://doi.org/10.47263/jasem.2(2)01

Becker, J.-M., Klein, K., & Wetzels, M. (2012). Hierarchical Latent Variable Models in PLS-SEM: Guidelines for Using Reflective-Formative Type Models. Long Range Planning, 45(5–6), 359–394. https://doi.org/10.1016/j.lrp.2012.10.001

Bhattacharjee A and Sanford C. (2006). Influence processes for information technology acceptance: an elaboration likelihood model. MIS Quarterly, 30(4), 805-825. https://doi.org/10.2307/25148755

Blut, M., Wang, C., Wünderlich, N.V. et al. (2021). Understanding anthropomorphism in service provision: a meta-analysis of physical robots, chatbots, and other AI. Journal of academic marketing sciences, 49(4), 632-658. https://doi.org/10.1007/s11747-020-00762-y

Bond, B. J. (2021). he development and influence of parasocial relationships with television characters: A longitudinal experimental test of prejudice reduction through parasocial contact. Communication Research, 48(4), 573-593. https://doi.org/10.1177/0093650219900632

Bonus, J. A., Matthews, N. L., & Wulf, T. (2021). The impact of moral expectancy violations on audiences' parasocial relationships with movie heroes and villains. Communication Research, 48(4), 550-572. https://doi.org/10.1177/0093650219886516

Burleigh, T. J., Schoenherr, J. R., and Lacroix, G. L. (2013). Does the uncanny valley exist? An empirical test of the relationship between eeriness and the human likeness of digitally created faces. Comput. Hum. Behav., 29, 759–771. https://10.1016/j.chb.2012.11.021

Burnkrant, R. E., Ain C. (1975). Informational and Normative Social Influence in Buyer Behavior. Journal of Consumer Research, 2(3), 206-215.

Cheah, J. H., Roldán, J. L., Ciavolino, E., et al. (2021). Sampling weight adjustments in partial least squares structural equation modeling: guidelines and illustrations. Total Quality Management & Business Excellence, 32(13-14), 1594-1613. https://doi.org/10.1002/mar.21640

Ciechanowski, L., Przegalinska, A., Magnuski, M., & Gloor, P. (2019). In the shades of the uncanny valley: An experimental study of human-chatbot interaction. Future Generation of Computer Systems, 92, 539-548. https://doi.org/10.1016/j.future.2018.01.055

Cohen, J. (2013). Statistical Power Analysis for the Behavioral Sciences. Academic Press.

Conway, J. C., & Rubin, A. M. (1991). Psychological predictors of television viewing motivation. Communication Research, 18(4), 443–463. https://doi.org/10.1177/009365091018004001

Croes, E. A., & Antheunis, M. L. (1972). Can we be friends with Mitsuku? A longitudinal study on the process of relationship formation between humans and a social chatbot. Journal of Social and Personal Relationships. 38(1), 279. https://doi.org/10.1177%2F0265407520959463

Crolic, C., Thomaz, F., Hadi, R., & Stephen, A. T. (2022). Blame the bot: Anthropomorphism and anger in customer–chatbot interactions. Journal of marketing, 86(1), 132-148; https://doi.org/10.1177/00222429211045687

Dai, Y., & Walther, J. B. (2018). Vicariously Experiencing Parasocial Intimacy with Public Figures Through Observations of Interactions on Social Media. Human Communication Research, 44(3), 322–342. https://doi.org/10.1093/hcr/hqy003

Darics, E. (2017). E-Leadership or "How to Be Boss in Instant Messaging?" The Role of Nonverbal Communication. International Journal of Business Communication, 57(1), 3–29. https://doi.org/10.1177/2329488416685068

De Cicco, R., Silva, S. C., & Alparone, F. R. (2020). Millennials' attitude toward chatbots: an experimental study in a social relationship perspective. International Journal of Retail & Distribution Management, 48(11), 1213–1233. https://doi.org/10.1108/ijrdm-12-2019-0406

Deutsch, M., & Gerard, H. B. (1955). A study of normative and informational social influences upon individual judgment. The Journal of Abnormal and Social Psychology, 51(3), 629–636. https://doi.org/10.1037/h0046408

Diaz, M., Saez-Pons, J., Heerink, M., et al. (2013). Emotional factors in robot-based assistive services for elderly at home. 2013 IEEE RO-MAN. https://doi.org/10.1109/roman.2013.6628396

Dixson, M. D., Greenwell, M. R., Rogers-Stacy, C., et al. (2016). Nonverbal immediacy behaviors and online student engagement: bringing past instructional research into the present virtual classroom. Communication Education, 66(1), 37–53. https://doi.org/10.1080/03634523.2016.1209222

Donghee, S. (2021). The effects of explainability and causability on perception, trust, and acceptance: Implications for explainable AI. International Journal of Human Computer Studies, 146. https://doi.org/10.1016/j.ijhcs.2020.102551

Edwards, C., Edwards, A., Stoll, B., et al. (2019). Evaluations of an artificial intelligence instructor's voice: Social Identity Theory in human-robot interactions. Computers in Human Behavior, 90, 357–362. https://doi.org/10.1016/j.chb.2018.08.027

Epley, N., Waytz, A., & Cacioppo, J. T. (2007). On seeing human: A three-factor theory of anthropomorphism. Psychological Review, 114(4), 864–886. https://doi.org/10.1037/0033-295x.114.4.864

Erebak, S., & Turgut, T. (2018). Caregivers' attitudes toward potential robot coworkers in elder care. Cognition, Technology & Work, 21(2), 327–336. https://doi.org/10.1007/s10111-018-0512-0

Esposito, A., Amorese, T., Cuciniello, M., et al. (2019). Elder user's attitude toward assistive virtual agents: the role of voice and gender. Journal of Ambient Intelligence and Humanized Computing, 12(4), 4429–4436. https://doi.org/10.1007/s12652-019-01423-x

Faul, F., Erdfelder, E., Buchner, A., et al. (2009). Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. Behavior Research Methods, 41(4), 1149–1160. https://doi.org/10.3758/brm.41.4.1149

Ferrario, A., Loi, M., & Viganò, E. (2019). In AI We Trust Incrementally: a Multi-layer Model of Trust to Analyze Human-Artificial Intelligence Interactions. Philosophy & Technology, 33(3), 523–539. https://doi.org/10.1007/s13347-019-00378-3

Fetscherin, M. (2014). What type of relationship do we have with loved brands? Journal of Consumer Marketing, 31(6/7), 430–440. https://doi.org/10.1108/jcm-05-2014-0969

Field, A. (2009). Discovering statistics using SPSS. Sage publications Ltd.

Foster, G. (2005). Making friends: A nonexperimental analysis of social pair formation. Human relations, 58(11), 1443-1465. https://doi.org/10.1177/0018726705061313

Fournier, S. (1998). Consumers and Their Brands: Developing Relationship Theory in Consumer Research. Journal of Consumer Research, 24(4), 343–353. https://doi.org/10.1086/209515

Geisser, S. (1974). A predictive approach to the random effect model. Biometrika, 61(1), 101-107. https://doi.org/10.2307/2334290

George, D., & Mallery, M. (2010). SPSS for Window Step by Step: A Simple Guide and Referenc17.0 update, 10 ed. Pearson.

Giles, D. C. (2002). Parasocial interaction: A review of the literature and a model for future research.Media Psychology, 4(3), 279-305. https://doi.org/10.1207/S1532785XMEP0403_04

Go, E., & Sundar, S. S. (2019). Humanizing chatbots: The effects of visual, identity and conversational cues on humanness perceptions. Computers in human behavior., 97, 304-316; https:// 10.1016/JCHB.2019.01.020

Gobron, S., Ahn, J., Thalmann, D., et al. (2013). Impact study of nonverbal facial cues on spontaneous chatting with virtual humans. J. Virtual Reality Broadcast, 19, 1-17.

Gong, L., Nass, C. (2007). When a talking-face computer agent is half-human and half-humanoid: Human identity and consistency preference. Human research communication, 93, 163-193. https://doi.org/10.1111/j.1468-2958.2007.00295.x

Gorry, G. A., Westbrook, R. A. (2011). Once more, with feeling: Empathy and technology in customer care. Business Horizons, 125-134. Business Horizons, 54(2), 125-134.

Grant, A. E., Guthrie, K. K., & Ball-Rokeach, S. J. (1991). Television Shopping: A Media System Dependency Perspective. Communication Research, 18, 773-798. https://doi.org/10.1177/009365091018006004

Hair, J. F., Hult, G. T. M., Ringle, C., & Sarstedt, M. (2017). A primer on partial least squares structural equation modeling (PLS-SEM). California, Sage Publications.

Hair, J.F., Risher, J.J., Sarstedt, M. and Ringle, C.M. (2019). When to use and how to report the results of PLS-SEM. European Business Review, 31(1), 2-24. https://doi.org/10.1108/EBR-11-2018-0203

Han, S., & Yang, H. (2018). Understanding adoption of intelligent personal assistants. Industrial Management & Data Systems, 118(3), 618–636. https://doi.org/10.1108/imds-05-2017-0214

Heider, F. (1958). The psychology of interpersonal relations. Wiley.

Hellweg, S. A., Andersen, P. A. (1989). An analysis of source valence instrumentation in the organizational communication literature. Management Communication Quartely, 3, 132-159. https://doi.org/10.1177/0893318989003001009

Henkel, A. P., Čaić, M., Blaurock, M., Okan, M. (2020). Robotic transformative service research: deploying social robots for consumer well-being during Covid-19 and beyond. J Serv Management, 31(6), 1131-1148. https:// 10.1108/JOSM-05-2020-0145

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. https://doi.org/10.1007/s11747-014-0403-8

Hertzog, M. (2008). Considerations in Determining Sample Size for Pilot Studies. Research in Nursing & Health, 31, 180-191. http://doi.org/10.1002/nur.20247

Horton, D., & Richard Wohl, R. (1956). Mass Communication and Para-Social Interaction. Psychiatry, 19(3), 215–229. https://doi.org/10.1080/00332747.1956.11023049

Huang, D.-H., & Chueh, H.-E. (2021). Chatbot usage intention analysis: Veterinary consultation. Journal of Innovation & Knowledge, 6(3), 135–144. https://doi.org/10.1016/j.jik.2020.09.002

Huang, M.-H., & Rust, R. T. (2020). A strategic framework for artificial intelligence in marketing. Journal of the Academy of Marketing Science, 49(1), 30–50. https://doi.org/10.1007/s11747-020-00749-9

Hulland, J., Baumgartner, H., & Smith, K. M. (2017). Marketing survey research best practices: evidence and recommendations from a review of JAMS articles. Journal of the Academy of Marketing Science, 46(1), 92–108. https://doi.org/10.1007/s11747-017-0532-y

Indriasari, E., Gaol, F. L., & Matsuo, T. (2019). Digital Banking Transformation: Application of Artificial Intelligence and Big Data Analytics for Leveraging Customer Experience in the Indonesia Banking Sector. 2019 8th International Congress on Advanced Applied Informatics (IIAI-AAI). https://doi.org/10.1109/iiai-aai.2019.00175

Janarthanam, S. (2017). ands-on chatbots and conversational UI development: build chatbots and voice user interfaces with Chatfuel, Dialogflow, Microsoft Bot Framework, Twilio, and Alexa Skills. Packt Publishing Ltd.

Joseph, W.B. (1982). The credibility of physically attractive communicators: A review. Journal of advertising, 11(3), 15–24. https://doi.org/10.1080/00913367.1982.10672807

Keller, E., Berry, J. (2003). The Influentials: One American in Ten Tells the Other NINE how to Vote, Where to Eat, and What to Buy. Simon and Schuster.

Kepuska, V., & Bohouta, G. (2018). Next-generation of virtual personal assistants (Microsoft Cortana, Apple Siri, Amazon Alexa and Google Home). 2018 IEEE 8th Annual Computing and Communication Workshop and Conference (CCWC). https://doi.org/10.1109/ccwc.2018.8301638

Kim, H. C., & Kramer, T. (2015). Do Materialists Prefer the "Brand-as-Servant"? The Interactive Effect of Anthropomorphized Brand Roles and Materialism on Consumer Responses. Journal of Consumer Research, 42(2), 284–299. https://doi.org/10.1093/jcr/ucv015

Kim, J., Rubin, AM. (1997). The variable influence of audience activity on media effects. Communication Research, 24(2), 107-135. https://doi.org/10.1177/009365097024002001

Kim, J., Song, H. (2016). Celebrity's self-disclosure on Twitter and parasocial relationships: A mediating role of social presence. Comput. Hum. Behav., 62, 570-577. https://doi.org/10.1016/j.chb.2016.03.083

Kim, K. S. (2018). The effects of interpersonal attraction on service justice. Journal of service marketing, 32, 728-738. https://doi.org/10.1108/JSM-06-2017-0200

Kompatsiari, K., Ciardo, F., Tikhanoff, V., et al. (2019). It's in the eyes: the engaging role of eye contact in HRI. International Journal of Social Robotics, 1-11. https://doi.org/10.1007/s12369-019-00565-4

Kong, H. (2013). Face interface will empower employee. IJACT, 5, 193-199.

Labrecque, L. I. (2014). Fostering Consumer–Brand Relationships in Social Media Environments: The Role of Parasocial Interaction. Journal of Interactive Marketing, 28(2), 134–148. https://doi.org/10.1016/j.intmar.2013.12.003

Lee, M.-S., & Park, J. (2017). Television Shopping at Home to Alleviate Loneliness Among Older Consumers. ASIA MARKETING JOURNAL, 18(4), 139. https://doi.org/10.15830/amj.2017.18.4.139

Lee, M.-S., & Park, J. (2017). Television Shopping at Home to Alleviate Loneliness Among Older Consumers. Asia Marketing Journal, 18(4). https://doi.org/10.53728/2765-6500.1439

Levinger, G. (1980). Toward the analysis of close relationships. Journal of Experimental Social Psychology, 6, 510-544. https://doi.org/10.1016/0022-1031(80)90056-6

Lim, C. M., & Kim, Y.-K. (2011). Older consumers' TV home shopping: Loneliness, parasocial interaction, and perceived convenience. Psychology & Marketing, 28(8), 763-780. https://doi.org/10.3390/su14159476

Lo, S. K. (2008). The nonverbal communication functions of emoticons in computer-mediated communication. Cyberpsychology and behaviour, 11, 595-597. http://doi.org/10.1089/cpb.2007.0132

Lunardo, R. (2016). The interacting effect of virtual agents' gender and dressing style on attractiveness and subsequent consumer online behavior. Journal of retail consumer services, 30, 59-66. https://doi.org/10.1016/j.jretconser.2016.01.006

MacKenzie, S. B., & Podsakoff, P. M. (2012). Common method bias in marketing: Causes, mechanisms, and procedural remedies. Journal of retailing, 88(4), 542-555. https:// doi.org/10.1016/j.jretai.2012.08.0

McCarthy, J., & Hayes, P. J. (1981). Some Philosophical Problems from the Standpoint of Artificial Intelligence. Readings in Artificial Intelligence, 431–450. https://doi.org/10.1016/b978-0-934613-03-3.50033-7

McCroskey, J. C., & McCain, T. A. (1974). The measurement of interpersonal attraction. Speech Monographs, 41(3), 261–266. https://doi.org/10.1080/03637757409375845

McCroskey, J. C., & Young, T. J. (1981). Ethos and credibility: The construct and its measurement after three decades. Communication studies, 24-34. https://doi.org/10.1177/089331898900300100 9

McCroskey, J. C., Hamilton, P. R., & Weiner, A. N. (1974). Human Communication Research, 42-52. https://doi.org/10.1111/j.1468-2958.1974.tb00252.x

McCroskey, J.C., Larson, C.E., Knapp M.L. (1981). An introduction to Interpersonal Communication. Prentice Hall.

McCroskey, L. L., McCroskey, J. C., & Richmond, V. P. (2006). Analysis and improvement of the mesaurement of interpersonal attraction and homophily. Communication quarterly, 54(1), 1-31. https://doi.org/10.1080/01463370500270322

McCroskey, L., McCroskey, J., & Richmond, V. (2006). Analysis and Improvement of the Measurement of Interpersonal Attraction and Homophily. Communication Quarterly, 54(1), 1–31. https://doi.org/10.1080/01463370500270322

McCruskey, J.C., McCain, T.A. (1974). The measurement of interpersonal attraction. Speech monograph, 41, 261-266. https://doi.org/10.1080/03637757409375845

McKinsey & Company. (2021). Building the AI Bank of the future. McKinsey.

Miller, D. T., Downs, J. S., & Prentice, D. A. (1998). Minimal conditions for the creation of a unit relationship: The social bond between birthmates. European Journal of Social Psychology, 28, 475-481.

Mittal, B. (1999). The Advertising of Services: Meeting the Challenge of Intangibility. Journal of Service Research, 2(1), 98-116. https://doi.org/10.1177/109467059921008

Montano, D.E., Kasprzyk, D. (2015) Theory of Reasoned Action, Theory of Planned Behavior, and the Integrated Behavioral Model. In: Karen, G., Barbara, R. and Viswanath, K. (editors). Health Behavior: Theory, Research and Practice book, 5th ed. Jossey-Bass, San Francisco, pp. 95-124.

Mori, M. (1970). The uncanny valley. Energy, 7, 33-35.

Mou, Y., & Xu, K. (2017). The media inequality: Comparing the initial human-human and human-AI social interactions. Computers in Human Behavior, 72, 432–440. https://doi.org/10.1016/j.chb.2017.02.067

Nass, C., & Moon, Y. (2000). Machines and Mindlessness: Social Responses to Computers. Journal of Social Issues, 56(1), 81–103. Portico. https://doi.org/10.1111/0022-4537.00153

Ned Kock. (2015). Common method bias in PLS-SEM: A full collinearity assessment approach. International Journal of e Collaboration, 11(4), 1-10; https://doi.org/10.4018/ijec.2015100101

Newberry, C.R.; Klemz, B.R.; Boshoff, C. (2003). Managerial implications of predicting purchase behavior from purchase intentions: A retail patronage case study. J. Serv. Mark, 17, 609-620. https://doi.org/10.1108/08876040310495636

Ng, M., Coopamootoo, K.P., Toreini, E., et al. (2020). Simulating the Effects of Social Presence on Trust, Privacy Concerns & Usage Intentions in Automated Bots for Finance. 2020 IEEE European Symposium on Security and Privacy Workshops (EuroS&PW), 190-199.

Niculescu, A., Hofs, D., van Dijk, B., and Nijholt, A. (2010). How the agent's gender influences users' evaluation of a QA system. Proceedings of the International Conference on User Science and Engineering (i-USEr 2010). Shah Alam, Selangor, Malaysia: IEEE. https://doi.org/10.3389/fcomp.2023.1138501

Nitzl, C., Roldan, J. L., & Cepeda, G. (2016). Mediation analysis in partial least squares path modeling. Industrial Management & Data Systems, 116(9), 1849–1864. https://doi.org/10.1108/imds-07-2015-0302

Noor, N., Rao Hill, S., & Troshani, I. (2021). Artificial Intelligence Service Agents: Role of Parasocial Relationship. Journal of Computer Information Systems, 62(5), 1009–1023. https://doi.org/10.1080/08874417.2021.1962213

Novak, T. P., & Hoffman, D. L. (2018). Relationship journeys in the internet of things: a new framework for understanding interactions between consumers and smart objects. Journal of the Academy of Marketing Science, 47(2), 216–237. https://doi.org/10.1007/s11747-018-0608-3

Novikova, J. (2016). Designing emotionally expressive behaviour: Intelligibility and predictability in human-robot interaction. University of bath.

Pelachaud, C. (2009). Modelling multimodal expression of emotion in a virtual agent. Philosophical Transactions of the Royal Society B: Biological Sciences, 364, 3539-3548. https:// doi.org/10.1098/rstb.2009.0186

Pornpitakpan, C. (2004). The effect of celebrity endorsers' perceived credibility on product purchase intention: The case of Singaporeans. Journal of international consumer marketing, 16(2), 55-74. https://doi.org/10.1300/J046v16n02_04

Putri, A. (1998). What sample size is "enough" in internet survey research? Interpersonal Computing and Technology: An Electronic Journal for the 21st Century AECT. 6. AECT.

Rawlins, W. K. (1992). Friendship matters: communication, dialectics, and the life course. (1992). Choice Reviews Online, 30(01), 30-0615-30–0615. https://doi.org/10.5860/choice.30-0615

rice, L.L., Feick, L.F. and Higie, R.H. (1987). Preference heterogeneity and co-orientation as determinants of referent influence in the choice of service providers. University of Pittsburgh.

Rihl, A., & Wegener, C. (2017). YouTube celebrities and parasocial interaction: Using feedback channels in mediatized relationships. Convergence: The International Journal of Research into New Media Technologies, 25(3), 554–566. https://doi.org/10.1177/1354856517736976

Ring, L., Utami, D., and Bickmore, T. (2014). The right agent for the job? The effects of agent visual appearance on task domain. Proceedings of International Conference on Intelligent Virtual Agents (IVA 2014). Springer International Publishing. pp. 374-384.

Ringle, C. M., Wende, S., Becker, J.-M. (2015). SmartPLS 3. Boenningstedt: SmartPLS GmbH. Germany.

Rubin, A. M., & Rubin, R. B. (1985). Interface of personal and mediated communication: A research agenda. Critical Studies in Mass Communication, 2(1), 36–53. https://doi.org/10.1080/15295038509360060

Rubin, R. B., & McHugh, M. P. (1987). Development of parasocial interaction relationships. Journal of Broadcasting & Electronic Media, 31(3), 279–292. https://doi.org/10.1080/08838158709386664

Rungtusanatham, M., Miller, J. W., & Boyer, K. K. (2014). Theorizing, testing, and concluding for mediation in SCM research: tutorial and procedural recommendations. Journal of Operations Management, 32(3), 99-113. https://doi.org/10.1016/j.jom.2014.01.002

Rust, R. T. (2019). The future of marketing. Int J Res Mark., 7(1), 15-26. https://doi.org/10.1016/j.ijresmar.2019.08.002

Rzepka, C., Berger, B., & Hess, T. (2022). Voice assistant vs. Chatbot–examining the fit between conversational agents' interaction modalities and information search tasks. Information Systems Frontiers, 24(3), 839-856. https://doi.org/10.1007/s10796-021-10226-5

Salem, M., Eyssel, F., Rohlfing, K., et al. (2013). To Err is Human(-like): Effects of Robot Gesture on Perceived Anthropomorphism and Likability. International Journal of Social Robotics, 5(3), 313–323. https://doi.org/10.1007/s12369-013-0196-9

Sarstedt, M., Ringle, C. M., & Hair, J.F. (2017). Treating Unobserved Heterogeneity in PLS-SEM: A Multi-method Approach. in Noonan R and Latan H (editors). Partial Least Squares Structural Equation Modelling: Basic Concepts, Methodological Issues and Applications. pp. 199-217.

Sarstedt, M., Bengart, P., Shaltoni, A. M., et al. (2017). The use of sampling methods in advertising research: a gap between theory and practice. International Journal of Advertising, 37(4), 650–663. https://doi.org/10.1080/02650487.2017.1348329

Saxena, C., & Kaur, V. (2018). Identification of limiting factors of customer complaint redressal system of banks: A study of banks of Punjab from bankers' perspective. International Journal of Creative Research Thoughts, 6(2), 583-589.

Sharma, A., Dwivedi, Y. K., Arya, V., et al. (2021). Does SMS advertising still have relevance to increase consumer purchase intention? A hybrid PLS-SEM-neural network modelling approach. Computers in Human Behavior, 124, 106919. https://doi.org/10.1016/j.chb.2021.106919

Sheehan, B., Jin, H. S., & Gottlieb, U. (2020). Customer service chatbots: Anthropomorphism and adoption. Journal of business research, 115, 14-24. https:// 10.1016/j.jbusres.2020.04.030

Shmueli, G., Sarstedt, M., Hair, J.F., et al. (2019). Predictive model assessment in PLS-SEM: guidelines for using PLSpredict. European Journal of Marketing, 53(11), 2322-2347. https://doi.org/10.1108/EJM-02-2019-0189

Sienkiewicz, A. (2021). Chatbot Statistics and Trends You Need to Know in 2021. Available online: https://www.tidio.com/blog/chatbot-statistics/ (accessed on 16 January 2021).

Simons, H. W., Berkowitz, N. N., & Moyer, R. J. (1970). Similarity, credibility, and attitude change: A review and a theory. Psychological Bulletin, 73(1), 1–16. https://doi.org/10.1037/h0028429

Sokolova, K., & Kefi, H. (2020). Instagram and YouTube bloggers promote it, why should I buy? How credibility and parasocial interaction influence purchase intentions. Journal of Retailing and Consumer Services, 53, 101742. https://doi.org/10.1016/j.jretconser.2019.01.011

Sparrow, R. (2020). Do Robots Have Race?: Race, Social Construction, and HRI. IEEE Robotics & Automation Magazine, 27(3), 144–150. https://doi.org/10.1109/mra.2019.2927372

Stone, M. (1974). Cross-Validatory Choice and Assessment of Statistical Predictions. Journal of the Royal Statistical Society: Series B (Methodological), 36(2), 111–133. Portico. https://doi.org/10.1111/j.2517-6161.1974.tb00994.x

Straßmann, C., and Krämer, N. C. (2017). A categorization of virtual agent appearances and a qualitative study on age-related user preferences. Proceedings of International Conference on Intelligent Virtual Agents (IVA 2017). Springer International Publishing. pp. 413-422.

Stroessner, S. J., & Benitez, J. (2019). The social perception of humanoid and non-humanoid robots. International Journal of Social Robotics, 11(2), 305-315. https://doi.org/10.1007/s12369-018-0502-7

Su, B.-C.; Wu, L.-W.; Chang, Y.-Y.-C.; Hong, R.-H. (2021). Influencers on Social Media as References: Understanding the Importance of Parasocial Relationships. Sustainability, 13, 10919. https://doi.org/10.3390/su131910919

Tesser, A. (1988). Toward a self-evaluation maintenance model of social behavior. Advances in Experimental Social Psychology, 21, 181-227. https://doi.org/10.1016/S0065-2601(08)60227-0

Thomas MJ, Wirtz B.W. and Weyerer J.C. (2019). Determinants of online review credibility and its impact on consumers purchase intention. Journal of Electronic Commerce Research, 20(1), 1-20.

Tillmann-Healy, L. M. (2003). Friendship as Method. Qualitative Inquiry, 9(5), 729–749. https://doi.org/10.1177/1077800403254894

Tulcanaza-Prieto, A. B., Cortez-Ordoñez, A., & Lee, C. W. (2023). Influence of Customer Perception Factors on AI-Enabled Customer Experience in the Ecuadorian Banking Environment. Sustainability, 15(16), 12441. https://doi.org/10.3390/su151612441

Winterich, K. P., & Nenkov, G. Y. (2015). Save Like the Joneses. Journal of Service Research, 18(3), 384–404. https://doi.org/10.1177/1094670515570268

Wünderlich, N.V., and Paluch, S. (2017). A nice and friendly chat with a bot. 38th International conference on information systems, Association for Information Systems. pp. 1-11.

Xiang, L., Zheng, X., Lee, M. K. O., et al. (2016). Exploring consumers' impulse buying behavior on social commerce platform: The role of parasocial interaction. International Journal of Information Management, 36(3), 333–347. https://doi.org/10.1016/j.ijinfomgt.2015.11.002

Xie T, Yang X, Rose D. (2023). Converse Task-Oriented Dialogue System Simplifies Chatbot Building, Handles Complex Tasks. Salesforce AI Research. Available online: https://blog.salesforceairesearch.com/converse-task-oriented-dialogue-system/ (accessed on 1 November 2023).

Xu, K, & Lombard, M. (2016). Media are social actors: Expanding the CASA paradigm in the 21st Century . Presented at the Annual Conference of the International Communication Association, Fukuoka, Japan, (pp. Presented at the Annual Conference of the International Communication Association, Fukuoka, Japan); https://doi.org/10.1177/1461444819851479

Xuan, C. L. (2003). Inducing AI powered chatbots use for customer purchase: the role of information value and innovative technology. Journal of systems and information technology; https://doi.org/10.47672/ejt.1561

Yao, W., Baumann, C., Tan, L.P. (2015). Wine Brand Category Choice and Confucianism: A Purchase Motivation Comparison of Caucasian, Chinese and Korean Consumers. In: Martínez-López, F., Gázquez-Abad, J., Sethuraman, R. (editors). Advances in National Brand and Private Label Marketing. Proceedings in Business and Economics. Springer.

Yuan, C. L., Kim, J., & Kim, S. J. (2016). Parasocial relationship effects on customer equity in the social media context. Journal of business research, 69(9), 3795-3803. https://doi.org/10.1016/j.jbusres.2015.12.071

Zhang, T., Kaber, DB., Zhu, B., et al. (2010). Service robot feature design effects on user perceptions and emotional responses. Intelligent service robotics, 3(2), 73-88. https://doi.org/10.1177/1541931213571285

Zheng, X., Men, J., Xiang, L., Yang, F. (2020). Role of technology attraction and parasocial interaction in social shopping websites. International Journal of Information Management, 51, 102-104. https://doi.org/10.1016/j.ijinfomgt.2019.102043

Zhou, T. (2021). Understanding online health community users information adoption intention: an elaboration likelihood model perspective. Online Information Review, 46(1), 134-146; https://doi.org/10.1108/oir-09-2020-0412