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I am attracted to my *Cool* Smart Assistant! Analyzing Attachment-Aversion in AI-Human Relationships

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ABSTRACT

The conversation between humans and Artificial Intelligence (AI)-enabled intelligent voice assistants (IVA) can create bonds that go beyond a mere utilitarian purpose. The emotional cues in a Human-AI conversation can lead consumers to feel connected with the AI-agents and even consider such a relationship as *cool*. Although brand coolness is known to affect consumer behavior, little is known about how consumers perceive a close relationship with IVAs and what the drivers of their use or avoidance are. Therefore, the current paper adds to the literature by analyzing how AI-enabled voice assistant experience affects IVA coolness and customer-brand relationships using the attachment-aversion (A-A) theory. A total of 308 consumers showed that affective, behavioral, and intellectual experiences with the intelligent voice assistant affect IVA coolness. IVA coolness was also found to affect A-A relationships positively, influencing consumers' motivational strength to adopt, maintain and enhance the relationship in the future.

1. Introduction

Numerous examples of AI systems incorporated in self-driving cars and intelligent voice assistants (IVA) can be found in the market, and customers are expected to spend over $150 billion per year on intelligent home assistants by 2023 (Statista, 2020a). Companies such as Google (Google Home), Amazon (Alexa), and Apple (Siri) have focused on extending their offering to IVAs that are able to interact with their consumers and handle daily activities such as ordering food or controlling the Internet of Things (IoT) enabled devices. In fact, the total installed base of IoT-connected devices is expected to reach 50 billion, all connected to the Internet and ranging from TV screens to kitchen appliances (Statista, 2020b).

Most IoT objects will have embedded AI-agents or be controlled by AI-agents to help users' daily activities. AI-enabled voice assistants have a specific "tone of voice" and represent the brands that own those assistants or a partner brand. For example, Walmart has recently partnered with Google to have a Walmart specific voice assistant embedded in Google Home to offer a grocery shopping experience (CNBC, 2019). Such Human-AI interactions, particularly if filled with anthropomorphic and emotional cues, may lead consumers to feel connected with the AI-agents and even label the relationship with brands via IVAs as *cool* – a state that conveys an energetic, extraordinary, aesthetically appealing, high status, original, authentic, rebellious, subcultural, iconic, and popular relation with a brand (Warren, Batra, Loureiro, & Bagozzi, 2019). Indeed, qualitative studies show that consumers express feelings of coolness in their relationship with service robots (Huang, Chen, Huang, Kong, & Li, 2021; Cha, 2020).

Despite being regarded as a product, IVAs are also perceived as having human characteristics, in a way that is similar to what Fournier (1998) and Park, Eisingerich, and Park (2013) define in their relationship theories concerning brands and consumers. In the current paper, we argue that IVA coolness can be an important mediator in the relationship between the consumer's experience and how they become attached to or create an aversion to the IVA. When consumers relate with an IVA, they can find the relation useful, original, authentic, and of high status – all characteristics of coolness (Warren et al., 2019). This coolness effect can affect satisfaction and intentions to use technology (Bogicevic, Liu, Seo, Kandampully, & Rudd, 2021).

Although brand coolness can be associated with luxury brands (Loureiro, Jiménez-Barreto, & Romero, 2020), musical instrument manufacturers and technology developers such as Apple (Warren et al., 2019), the current paper is the first to contribute to the literature on voice assistants by applying the coolness scale to IVAs and by exploring how the AI-enabled voice assistant experience affects IVA coolness and customer-brand relationships using Attachment-Aversion (A-A) theory. Specifically, our study addresses the following objectives: first, it analyzes how brand experiences with voice assistants (sensorial, affective,

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behavioral, and intellectual) affect IVA coolness. Second, we explore the moderating role of past experience on the relationship between IVA experience and IVA coolness, and third, the study shows how A-A relationships affect the motivation to continue the relationship with the IVA (motivational strength).

Therefore, the contributions to the literature are threefold: first, we adapted the coolness scale so that it can be used by future researchers to measure how *cool* intelligence voice assistants are. Although previous studies have confirmed that brands can have *cool* features (Warren et al., 2019), there is still a lack of knowledge about how brands with an intelligent anthropomorphic presence can be perceived as *cool* by consumers. Indeed, this is the first time that such an effect is measured in IVAs. *Cool* factor is vital to advance the existing knowledge in relationship marketing because customers are increasingly using AI-based systems, such as digital assistants, chatbots, and other types of intelligent devices to interact with organizations (Statista, 2022).

Second, we adopted the A-A theory (Park, 2013; Schmitt, 2013), adapted to the effects of human-IVA relationships, and demonstrated that (1) experiences with IVAs can affect how *cool* this voice assistant is perceived to be, (2) *cool* IVAs can lead to stronger human-AI relationships and (3) such strong relationships lead to a desire to continue using the IVA in the future. The use of the A-A theory in the current scope is a valuable contribution to the Marketing academia in explaining why and how consumers are attracted to or distanced themselves from interactions with machines. Finally, we explore the role of past experience in moderating human-IVA relationships. Past experience is an important element of close relationships because, as time progresses, so do our bonds with those with whom we interact (Simpson, 1987; Cavanaugh, 2016). Our findings show that not all dimensions of experience affect coolness from the outset (Brakus, Schmitt, & Zarantonello, 2009; Warren et al., 2019), but that human-AI sensorial experiences only affect coolness after six months of usage.

In terms of managerial contributions, the current paper can be used by companies that develop their own IVAs to measure how *cool* their assistants are when perceived by potential consumers. We suggest that IVA manufacturers should (i) differentiate the aesthetic features and tone of voice depending on the target user and (ii) develop gamification skills to create IVAs that establish affective bonds through empathic relationships with consumers (Martinengo, Lum, & Car, 2022).

In the following sections (1) we review the literature on voice-controlled IVAs and (2) present a conceptual model that hypothesizes how A-A theory can be used to explain how brand experience and IVA coolness can affect customer-brand relationships. We then present the methodology and findings. The final sections discuss the results and conclude by highlighting contributions to both the literature and managerial practice, together with the limitations and suggestions for further research.

2. Theoretical framework and hypotheses

2.1. The Attachment-Aversion (A-A) theory

Broad research in the social psychology field has focused on the close relationship and attachment behaviors between individuals, uncovering the factors affecting human relationships (e.g., Ainsworth, 1991; Aron, Aron, Tudor, & Nelson, 1991; Davis & Rusbult, 2001). A-A theory, first proposed by Park et al. (2013) and extended by Schmitt (2013), suggests that consumers' motivational strength – adopting, maintaining, or enhancing a close relationship with a brand – depends on their experience with the brand and on the A-A degree of the relationship established between consumers and brands. A-A theory is based on Fournier (1998) anthropomorphic view of customer-brand relationships. Fournier (1998) perspective lies on interdependency theory (Thibaut & Kelley, 1959) and theories of attraction (Aron & Aron, 1986). A-A theory is also grounded on the attachment theory, which comes from studies of parent-child relationships and continues through adulthood to romantic relationships, kinships, and friendships (Loureiro, 2015).

Several studies suggest that emotional attachment is formed between human beings and animals, places, destinations, special objects, brands (e.g., Ahuvia, 2005; Yuksel, Yuksel, & Bilim, 2010), and even human brands or celebrities (Thompson, Rindfleisch, & Arsel, 2006). Anthropomorphized products, such as IVAs, create a sense of loyalty in consumers that can be compared to the human-to-human relationship (Schweitzer, Belk, Jordan, & Ortner, 2019). IVAs are more than a mere product, possessing the same anthropomorphic characteristics as a brand. So, we argue that emotional attachment can also be present in consumer-IVA relationships.

The A-A theory suggests that experiencing a brand is a prerequisite for establishing a consumer-brand relationship in the future. Brand experience conceptualization aggregates four dimensions (Brakus et al., 2009), namely, sensory (related to aesthetics), affective (associated with emotions), behavioral (related to actions), and intellectual (connected with functionality and cognitive thinking). In the human-IVA relationships, the sensory experience is represented by the sign and appearance of the object. Although with limited aesthetics, the IVAs in the market today are designed to be visually appealing. The relationship with IVAs can also be represented by an affective dimension (the emotions people feel while interacting with the intelligent assistant), an intellectual dimension (the utility and degree of cognitive involvement with the assistant), and a behavioral experience which concerns the actions carried out by the human induced by IVA.

The A-A theory also suggests that brand experience can lead to attachment-aversion relationships with a brand. Attachment-aversion relationships are dependent on the degree of brand-self distance (meaning how close or far away the consumer feels from an IVA) and brand prominence (whether thoughts about the IVA come naturally and automatically). Finally, A-A relationships affect motivational strength, representing the motivation to adopt the IVA, maintain the relationship with it over time, and even enhance the relationship in the future.

2.2. Intelligent voice assistants (IVAs) and IVA coolness

The usage of in-home IVAs is flourishing in the market as consumers find them useful for performing daily activities (e.g., ordering food or playing music) (CNET, 2019). IVAs are becoming more than task-oriented assistants and are important for performing social tasks and promoting interactivity (Chattaraman, Kwon, Gilbert, & Ross, 2019). So, consumers are outsourcing some of their decisions to IVAs to perform tedious or repetitive tasks more conveniently (Klaus & Zaichkowsky, 2022; Klaus & Zaichkowsky, 2020; Labecki, Klaus, & Zaichkowsky, 2018).

Intelligent voice assistants, which started on smartphones (Google Assistant and Siri), are now available on chatbots, Google Home, Amazon Alexa, and Apple Siri external assistants (Reviews, 2020). However, such assistants are expected to be readily incorporated into multiple devices connected to the Internet as they become integrated into an IoT environment.

Users build a rapport with the IVA as they become more involved in the conversation, forgetting that they are talking to a machine (Cerekovic, Aran, & Gatica-Perez, 2016). This rapport derives from the assistant's level of intelligence, from their agency skills (Rijsdijk & Hultink, 2009), and from the anthropomorphized features of the assistant, such as their voice, and the possibility to call them by name (e.g., Alexa, Google, Siri) (Schweitzer et al., 2019). Anthropomorphized objects lead to increased vividness (Noble, Bing, & Bogoviyeva, 2013), likeability (Wan, Chen, & Jin, 2017), perceived value (Hart, Jones, & Royne, 2013), and loyalty (Chandler & Schwarz, 2010), due to emotional bond that the consumer can establish with the assistant. Strong bonds are only possible when the IVA develops a unique identity and personality (Schweitzer et al., 2019). AI-agents embedded in IVAs have a specific "tone of voice" and human-like characteristics, which can induce perceptions of brand coolness and consequent positive outcomes

(Warren et al., 2019).

A *cool* brand is perceived as hip, awesome, and chill and one that has "a subjective and dynamic, socially constructed positive trait attributed to cultural objects inferred to be appropriately autonomous" (Warren & Campbell, 2014, p.544). *Cool* brands are usually considered useful (Sundar, Tamul, & Wu, 2014), excellent (Mohiuddin, Gordon, Magee, & Lee, 2016), and filled with positive hedonic value (Im, Subodh, & Yikuan, 2015). Initially associated with hippie cultures in the US 1996 communities (Frank, 1998), coolness has recently emerged as an important trait of brands that are able to establish closer and long-term relationships with their consumers, even creating bonds that go beyond traditional market exchanges, such as brand love (Tiwari, Chakraborty, & Maity, 2021).

Although IVAs are still framed in what Schweitzer et al. (2019) consider a servant relationship – one that is merely restricted to following the user's orders – the future is expected to evolve to IVAs with AI-agents that can engage in a partner type of relationship. Instead of just waiting for instructions, a partner IVA engages in a bi-directional relationship that can start from the object side (for example suggesting breakfast ideas when the user wakes up in the morning). Despite the early stage of "intelligence", consumers have already become attached to the types of voice assistants currently in the market and even consider them as socially attractive, friends, conversation partners, or family members (Rhee & Choi, 2020; Wang, Molina, & Sundar, 2020; Zhao & Rau, 2020; Choi & Drumwright, 2021; Ferreira, Correia, & Pereira, 2022).

Humans still exert a strong agency over IVAs. Yet, such systems are becoming highly social in the sense that they collect information from multiple sources (e.g., the Internet, external sensors) and adapt this information to the user via AI-based machine learning techniques (Shang, Zhang, & Chen, 2012). As IVAs powered by AI become more information aware, they also gain the ability to recommend and sometimes even decide (e.g., deciding the next best music to play on Spotify). Such intelligence driven from customer data allows the AI-agent to establish a close relationship with the user and consequently with the brand that the AI-agent represents.

We suggest that AI-enabled IVAs can be perceived as *cool* as they evolve from a servant (slave) type of relationship to a more partner type of engagement with consumers. Although today Alexa or Google Home are designed to be aesthetically appealing, more aesthetical elements will be incorporated and other important dimensions of coolness can be (e.g., rebellious, original, authentic, subcultural, iconic, popular, and extraordinary) used to classify IVAs with embedded AI-agents, particularly if based on a partner type of relationship. For example, rebellious refers to the tendency to combat conventions and social norms, original reflects the tendency to be creative and different, and subcultural refers to the perception of being associated with a group that operates outside of mainstream society (Bruun, Dimitrios, Jesper, & Skov, 2016; Belk, Tian, & Paavola, 2010; Sundar, Tamul, & Wu, 2014).

Therefore, consumers can perceive the IVA as rebellious, original, and subcultural if it is perceived as able to surprise them with choices that lie outside conventional norms and are perceived outside the traditional mainstream. Extraordinary is a positive quality that reflects the superiority of functional value (Belk et al., 2010; Sundar, Tamul, & Wu, 2014). Thus, an IVA that can perform according to functional expectations can be perceived as extraordinary. IVAs are still seen as high-status – high prestige, high sophistication, and esteem – a type of technology that is limited to a small number of consumers.

Cool relationships with brands are known to create strong, long-term bonds (Escalas & Bettman, 2003; Belk et al., 2010). Therefore, we find support in attachment-aversion (A-A) theory (Park et al., 2013; Schmitt, 2013) to go further in understanding the role of artificial intelligence enabled-assistants in customer-brand relations.

2.3. IVA experience

Smart objects have a degree of autonomy, authority, and agency, and possess the ability to affect and be affected (Hoffman & Novak, 2018). This close consumer-object experience can exist in relationships with smart objects which convey a human-like characteristic of the AI-agent communicating with the user (anthropomorphizing) (Hoffman & Novak, 2018). During the experience, the AI-agent establishes high/low levels of emotional bonds with the user, allows for higher/lower interactive experiences, and promotes (or does not) intellectual thinking (Kang & Kim, 2020). Therefore, AI-agents are representative of the brand and convey all the brand's characteristics to the consumer.

Brand experience affects satisfaction, loyalty, and brand personality perceptions (Brakus et al., 2009). While brand experience is real sensations, affections, intellectual cognitions, and behavioral responses, brand personalities are perceptions of human-like characteristics such as sincerity, excitement, competence, sophistication, and ruggedness that consumers project onto the brands (Aaker, 1997; Johar, Sengupta, & Aaker, 2005). Brand experience not only affects personality perceptions (Brakus et al., 2009) but they are highly correlated with brand coolness, albeit representing different constructs (Warren et al., 2019). While brand personality is the group of human-like characteristics of a brand (Aaker, 1997), those human-like characteristics of brand personality can make the brand seem more, or less *cool* (Warren et al., 2019). Therefore, brand personality predetermines how *cool* a brand is perceived by consumers. Hence, given the strong relationship between (1) brand experience and brand personality and (2) brand personality and brand coolness, we suggest that brand experience will also affect the perception of IVA coolness.

More particularly, we argue that this relationship between the construct of brand experience – from now on called IVA experience – and IVA coolness should prevail regarding all the dimensions of the experience between humans and intelligence voice assistants, namely sensorial, affective, behavioral, and intellectual. The sensory dimension of an experience aggregates aesthetics and sensory quality (e.g., touch, smell, tone of voice, visual appeal) (Schmitt, 1999). Having a pleasant visual appearance and an attractive voice can lead IVA users to regard these AI-agents as *cool* (Sundar, Tamul & Wu, 2014; Bruun et al., 2016). The aesthetic appeal of the IVA experience may be what influences the *cool* attitude among users. Therefore, we suggest that:

H1a: IVA sensory experience positively affects IVA coolness.

On the affective experience (associated with the emotions the consumer feels while interacting with the IVA), past studies propose that hedonism and excitement are related to coolness (Bird & Tapp, 2008; Nancarrow, Nancarrow, & Page, 2003; Pountain & Robins, 2000). In fact, the interaction between an AI-agent embedded in a voice assistant is known to produce hedonic benefits (McLean, Osei-Frimpong, & Barhorst, 2021). Anthropomorphism makes human-to-object interactions very similar to human-to-human relationships (Hermann, 2021; Wan & Chen, 2021). So, as consumers feel attached to an IVA, they are expected to develop feelings of friendship and love (Hernandez-Ortega & Ferreira, 2021; Ki, Cho, & Lee, 2020; Ramadan, Farah, & El Essrawi, 2021), all characteristics of close relationships (Fournier, 1998). Given that feelings of love are known to be related to brand coolness (Warren et al., 2019), we expect the affective experience to drive IVA coolness. Hence, we suggest that:

H1b: IVA affective experience positively affects IVA coolness.

On the behavioral experience (related to actions performed using the IVA), IVAs are known to provide utilitarian benefits due to their ability to perform functional tasks (McLean, Al-Nabhani, & Wilson, 2018; McLean & Osei-Frimpong, 2019). Assistants are usually task-oriented to perform specific on-demand tasks (Chattaraman et al., 2019), and this

usefulness increases consumer attitudes toward using IVAs (Hsieh & Lee, 2021). The literature also suggests that *cool* brands are often seen as useful and extraordinary (Warren et al., 2019). Therefore, we suggest that *cool* IVAs are also affected by consumers' perceived behavioral experiences. Thus, we suggest:

H1c: IVA behavioral experience positively affects IVA coolness.

Regarding intellectual experience (the degree to which the IVA is able to stimulate consumer curiosity and problem-solving), consumers consider IVA as intelligent due to their professional attitudes (Sundar, Jung, Waddell, & Kim, 2017). AI-agents are known to have unique agency and autonomy characteristics that allow them to search for solutions that can go beyond human abilities (Hoffman & Novak, 2018; Verhoef et al., 2017). These autonomous skills are also characteristics of *cool* brands (Warren et al., 2019). Therefore, we suggest that consumers' intellectual experience with IVAs positively affects their perception of how *cool* the IVA is. Therefore, we propose:

H1d: IVA intellectual experience positively affects IVA coolness.

The second layer of A-A theory suggests that experiences lead to Attachment-Aversion relationships, measured by brand-self distance and brand prominence. Brand prominence refers to the perceived memory accessibility of a brand to an individual. By contrast, brand-self distance refers to the perceived self-relevance of the brand to the consumer. More specifically, "if brand memories are highly relevant to one's self, one will feel closer to or farther from a brand than the indifference point, depending on the valence of the memories" (Park et al., 2013, p. 231). Given that *cool* brands are known to gain more exposure than non-*cool* brands (Warren et al., 2019), we suggest that AI-enabled IVAs that are perceived as *cool* will also reveal higher prominence and approach to the human who uses it.

Cool people or things tend to attract other people or consumers, which helps to enhance the relationship between them (what is seen as *cool* and who admire others or objects as *cool*) (Dar-Nimrod, Ganesan, & MacCann, 2018). The *cool* factor can develop bonds of passion between a brand and a consumer (e.g., Aron & Aron, 1986; Warren et al., 2019).

A positive *cool* attitude toward an IVA is expected to develop an attractive relationship between the IVA and the user. In such a relationship, the user is expected to be personally connected to the IVA (the connection between the self of the user and the IVA) and have the IVA always in the thoughts and feelings of the user (prominence in the user's memory) (Aron, Mashek, & Aron, 2004; Park et al., 2013). Given the anthropomorphized relationship established with AI-enabled IVAs, which may elicit different levels of coolness and close relationships, we suggest that different coolness experiences can influence brand-self distance and therefore A-A relationships. Hence, we suggest:

H2: IVA coolness positively affects A-A relationships.

The A-A model conceptualizes motivational strength as a result of A-A relationships. In the original theory, motivational strength refers to the forces that drive consumers to approach/avoid the brand, maintain/terminate the current relationship, and enhance/destroy the relationship (Park et al., 2013). Strong A-A relationships (high brand prominence and high brand self-distance) lead consumers to approach (rather than avoid) the relationship with the IVA, maintain (rather than terminate) the relationship in the future and enhance (rather than destroy) the bond that is established.

We suggest that the same will occur in the case of AI-enabled IVAs. Indeed, the relationship between consumers and objects (IVAs) is known to be affected by the perceived sense of connectedness between the consumer and the IVA (Kang & Kim, 2020). Thus, we propose:

H3: A-A relationships with intelligent voice assistants affect motivational strength.

2.4. The moderating effect of prior experience

Despite the aforementioned relationship between IVAs and motivational strength, past usage experience can lead to a higher resistance to accepting the use of smart conversational agents (Gnewuch, Morana, Adam, & Maedche, 2022; Kasilingam, 2020). Indeed, consumers that are more experienced in dealing with chatbots also develop higher expectations of the benefits of such exchange (Moussawi & Benbunan-Fich, 2021; Grimes, Schuetzler, & Giboney, 2021). For example, an experienced user of an AI-agent voice assistant is someone who has used the technology for some time and knows how to communicate with the IVA to achieve his or her goals.

As past experience increases so does the close relationship the user establishes with the IVA. Close relationships are known to influence both thoughts and feelings. So, people become more attached and dependent as the relationship progresses, which is known to influence their sensory and enjoyment perceptions (Simpson, 1987; Cavanaugh, 2016). In H1a we argued that sensory experience affects IVA coolness. Therefore, we expect that as consumers become more experienced with the IVA, they will also increase their perceptions of IVA coolness due to a closer sensory experience. Hence, we suggest:

H4a: A longer usage of IVAs strengthens the relationship between sensory experience and IVA coolness.

A more in-depth relationship is also connected to a higher degree of intimacy and affection (Fournier, 1998). As people become more involved in a relationship, they become more willing to self-disclose, listen, trust, and care for others (Fournier, 1998; Thorbjørnsen, Supphellen, Nysveen, & Egil, 2002; Giovanis & Athanasopoulou, 2018). In the case of IVAs, we argue that as the relationship progresses, consumers also create a higher affectional bond with the voice assistant. Users of IVAs are willing to express their feelings and emotions and become attached to voice assistants, particularly people with special needs (Ramadan et al., 2021). *Cool* is often associated with affective states behind an unemotional mask (Belk et al., 2010; Nancarrow et al., 2003). The affective facet of an experience can create excitement, and enthusiasm in individuals leading them to claim that they are living a *cool* experience (Warren et al., 2019) with an object, a brand, or an IVA. Thus, we argue that more experienced users will also develop a higher emotional involvement with the IVA, which moderates the relationship between affection and coolness, suggesting:

H4b: A longer usage of IVAs strengthens the relationship between affective experience and IVA coolness.

Past experiences can also play a role in the relationship between behavioral experience and brand coolness. However, in this case, we expect that, as the relationship progresses, the effect of behavioral experience on IVA coolness will decrease. Prior studies suggest that novelty is an important factor in explaining consumers' behavior toward voice-controlled artificial intelligence devices. For example, Hasan, Shams, and Rahman (2021) show that loyalty toward brands that have IVAs is affected by novelty value. As time passes, novelty value decreases because of learning experience effects. Fryer, Ainley, Thompson, Gibson, and Sherlock (2017) and later Fryer, Nakao, and Thompson (2019) confirm that as time progresses people become more tired of engaging with an IVA partner. Therefore, we suggest that novelty – through original and novel characteristics of *cool* brands – can also affect brand coolness effects (Warren et al., 2019; Im et al., 2015). Hence, we expect that as consumers become more experienced with the IVA, their perception of coolness will decrease due to progress limitations. Hence, we propose:

H4c: A longer usage of IVAs weakens the relationship between behavior experience and IVA coolness.

Finally, although still a servant type, IVAs have many abilities, such as searching the weather online or scheduling a meeting on the consumer's calendar. To attain higher levels of human-object interaction, the user must be skilled in communicating effectively with the IVA. To perform such activities, the user must be cognitively active with the IVA. During the exchange, it is expected that users stimulate their curiosity and problem-solving skills – all characteristics of intelligent experience (Brakus et al., 2009). We expect that experienced users will be able to progress much faster, and therefore, perceive the relationship as more *cool* than those adopting the IVA more recently. Thus, we suggest:

H4d: A longer usage of IVAs strengthens the relationship between intellectual experience and IVA coolness.

2.5. Control variables

The proposed model also includes two variables that can affect the relationships in the model, namely user gender and the type of assistant used. Past research about the acceptance of technology (UTAUT, UTAUT2) (Venkatesh, Morris, Davis, & Davis, 2003; Venkatesh, Thong, & Xu, 2012) warns that user gender may moderate the relationship between performance expectancy, effort expectancy, and social influences on behavioral intention. Men rely less on facilitating conditions than women. On the contrary, women put more emphasis on external support when using technology than men (Venkatesh et al., 2012).

Regarding the assistant used, past experience and technological expertise can have an effect on acceptance (Venkatesh et al., 2012; McLean & Osei-Frimpong, 2019). Although most IVAs in the market have similar characteristics, the experience with each of them can lead to a different perception of IVA coolness or attachment-aversion relationships due to the brand itself (e.g., Google, Amazon, Apple). Fig. 1 shows the conceptual model suggested.

3. Research method

A total of 389 respondents who owned an IVA were recruited on Amazon Mechanical Turk (MTurk) for a paid online survey between December 2019 and January 2020. The selection criterion of owning an IVA was used to ensure that participants were able to express their real experiences with IVAs. However, 81 participants failed to complete the survey or did not meet the requirement of owning an IVA and were dropped from the final dataset (79.2% response rate).

A total of 308 respondents (30.5% women and 69.5% men) with an average age of 32, who owned an IVA, were included in the study. To ensure that the sample was representative and not biased toward a specific device, 52.6% had an Amazon Alexa, while 47.4% owned a Google Home. The sample was also stratified by past experience with the device, with 42.5% having used the IVA for up to 6 months and 57.5% from 6 months to more than a year.

MTurk was used because it can capture a very wide, diversified sample of people (Berinsky, Huber, & Lenz, 2012; Buhrmester, Kwang, & Gosling, 2011). Here, this was particularly important because of the need to target consumers with at least some degree of experience with IVAs. MTurk samples are also considered valid and reliable as a psychological data source (Buhrmester et al., 2011; Hasan, Jha, & Liu, 2018; Paolacci, Chandler, & Ipeirotis, 2010).

3.1. Measurements

Participants were asked to think about the regular relationship they had with their IVA (regardless of its voice gender). The survey measured IVA coolness using the brand-coolness dimensions of Warren et al. (2019), which consider a *cool* brand one that is aesthetically appealing, extraordinary, exciting, subcultural, rebellious, high-status, authentic, original, iconic, and subcultural. Although IVAs are a product and not a brand, we used brand coolness because IVAs are anthropomorphized products that can be compared to a human-brand relationship (Fournier, 1998; Park et al., 2013; Schweitzer et al., 2019). Hence, we argue that IVAs are more than mere products and can be perceived as more or less *cool*.

A-A relationships were measured by items related to IVA-self distance and IVA prominence adapted from Park et al. (2013), and motivational strength was measured through the Park et al. (2013) overall measure for approach, maintenance, and strengthening of relationships over time. Past experience was measured by asking participants "for how long have you been using the intelligent voice assistant", ranging from "up to 6 months" to "from 6 months to more than a year". Other control measures were also collected such as user gender and the device used. Only participants that had any form of IVA were considered.

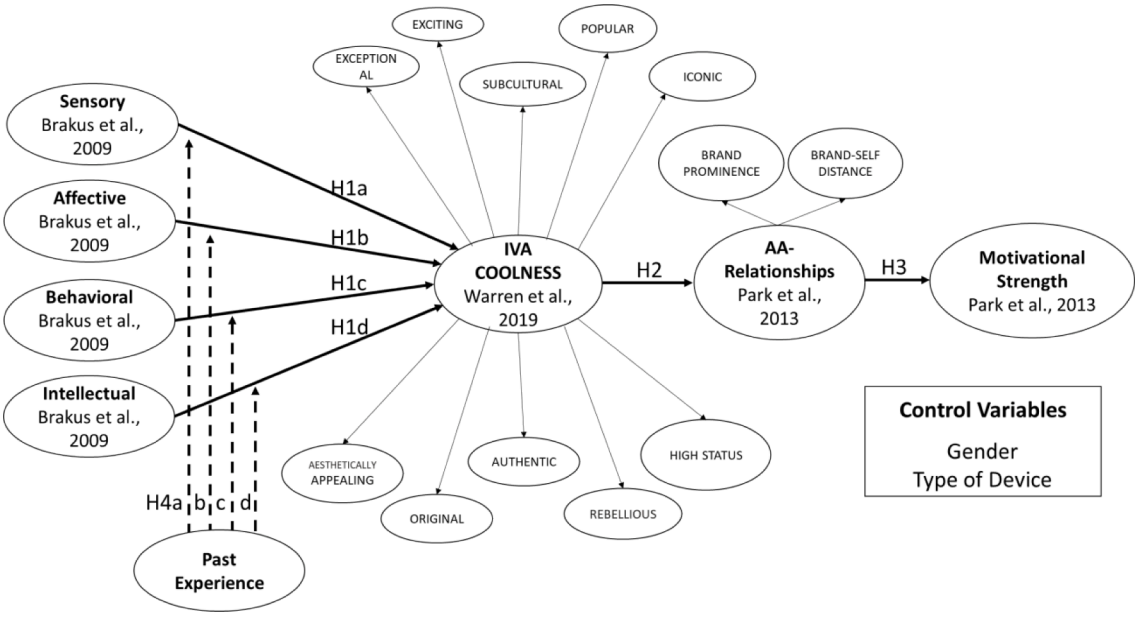

Fig. 1. Conceptual Model.

Finally, the blue attitude marker, based on Lindell and Whitney (2001) and Malhotra, Kim, and Patil (2006) recommendations, was also measured to analyze the common-method bias (Simmering, Fuller, Richardson, Ocal, & Atinc, 2015).

4. Results

4.1. Reliability and validity tests

A reflective PLS-SEM model was estimated with IVA Coolness and A-A relationships as a second-order construct. PLS-SEM was used due to its ability to model latent constructs in non-normality conditions and particularly its suitability to handle categorial moderations across multiple relationships such as past experience moderation (Hair, Ringle, & Sarstedt, 2011; Hair, Sarstedt, Ringle, & Mena, 2012).

According to Hair et al. (2012), there should be a minimum number of participants of at least ten times the maximum number of arrowheads pointing to a latent variable in the path model (Hair et al., 2012). The 308 participants are therefore an acceptable number of subjects to use the PLS-SEM technique. After treating all the reverted items, a first analysis of the outer loadings revealed that some items had outer loadings below the minimum threshold of 0.7 (Hair, Black, Babin, & Anderson, 2010) and were removed from the model. After removing those items (highlighted in Table 1), all the constructs met the minimum thresholds in terms of Composite Reliability and Average Variance Extracted (AVE) (Hair et al., 2010; Bagozzi & Yi, 1988) Table 1 shows the scales used in the study and the final model reliability and validity tests.

Given the second-order characteristics of IVA coolness and A-A relationships, a three-step approach based on Van Riel, Henseler, Kemény, and Sasovova (2017) was followed. The final model achieved discriminant validity, accessed using the Heterotrait-Monotrait Ratio (HTMT) criterion. According to the literature, HTMT values should be below 0.9 to confirm discriminant validity (Henseler, Ringle, & Sarstedt, 2015) (see Table 2).

4.2. Common method variance

Following the recommendations of Podsakoff, MacKenzie, Lee, and Podsakoff (2003), we implemented a set of procedures to minimize the possibility of common method variance in the study. Constructs were measured in separate steps and presented in random order to obtain a psychological separation of measurement. The response scales also differed between the constructs.

Common method bias was assessed using Harman's one-factor test (1976) and a full collinearity assessment approach (Kock, 2015). Recent studies suggest that Harman's one-factor test is a powerful way to identify common method bias (Hair, Hult, Ringle, & Sarsted, 2017; Fuller, Simmering, Atinc, Atinc, & Babin, 2016), namely if "the first eigenvalue accounts for less than 40% of all data variance" (Babin, Griffin, & Hair, 2016, pp.3136). A full collinearity test was proposed by Kock and Lynn (2012) as a proper way to measure common-method bias in variance-base SEM. There is no evidence of common method bias when the variance inflation factors (VIFs) are lower than 3.3 (Kock, 2015). Harman's one-factor test conducted on the seven conceptually crucial variables in the study revealed that the first eigenvalue accounted for only 31.35% of all data variance. Table 3 also shows that all the VIFs fell below the 3.3 maximum thresholds. Therefore, the results suggest that common method variance is not a pervasive issue in the current study.

To further confirm the absence of common method bias, we used a latent marker variable following suggestions from Lindell and Whitney (2001), Malhotra et al. (2006), and Simmering et al. (2015). The blue attitude scale that measures participants' preference for blue was used. The latent scale was linked to each construct in the study. The results revealed no significant effects of the marker variable on any of the constructs, confirming a very low probability of common-method bias affecting the data (Farooq, Zhang, Talwar, & Dhir, 2021).

4.3. Structural model

An analysis of the structural model fit reveals that the proposed model fits the data with an SRMR = 0.08 and NFI = 0.93 (Henseler, Hubona, & Ray, 2016). The structural model values of R^2, Q^2, path coefficients (β), f^2, and p-values are depicted in Fig. 2 and Table 4. R^2 values of 0.67, 0.33, and 0.19 are considered substantial, moderate, and weak respectively (Sarstedt, Ringle, Smith, Reams, & Hair, 2014; Hair et al., 2011). A Q^2 value above zero shows that the model has predictive relevance. An f^2 of at least 0.02 is considered a small effect, an f^2 of at least 0.15 a medium effect and an f^2 above 0.35 a large effect (Cohen, 2013).

The results show that affective ($\beta = 0.28$, $p < .01$), behavioral ($\beta = 0.20$, $p < .01$) and intellectual ($\beta = 0.23$, $p < .01$) experience with IVAs positively affect IVA coolness, thus supporting H1b, H1c and H1d. However, there was no significant relationship between sensorial experience with the IVA and IVA coolness ($\beta = 0.09$, $p > .05$). Therefore, H1a was not supported in the current study.

The structural model also shows that IVA coolness has a positive relationship with AA-Relationships ($\beta = 0.74$, $p < .01$), thus supporting H2. A-A Relationships also positively affect motivational strength (the desire to continue the relationship with the IVA) ($\beta = 0.54$, $p < .01$), which supports H3. The brand experience constructs explain 46% of the variance in IVA coolness, while IVA coolness explains 54% of the variance in A-A relationships, and finally, A-A relationships explain 29% of the variance in motivational strength.

Table 4 shows the path analysis results.

4.4. Multi group analysis (MGA)

An MGA analysis was conducted to test the hypothesis related to the moderating effect of past experience between the dimensions of IVA experience and IVA coolness, given the categorical nature of the scale ranging from (1) up to 6 months to (2) 6 months to more than a year.

To test the validity of the moderation prior to applying the MGA, a MICOM (measurement invariance of composite models) was assessed in three steps (Henseler, Ringle, & Sarstedt, 2016). In the first step – configural invariance – we ensured that the basic factor structure existed for both groups. There was an identical number of indicators per measurement model, an identical data treatment procedure, and identical algorithm settings. The questionnaire was the same for both groups and the sample size for each group complies with sample size recommendations for PLS-SEM (Hair et al., 2017; Henseler et al., 2016). Therefore, configural invariance was achieved.

Second, to access compositional invariance (step 2), we performed the MICOM procedure on SmartPLS with 5000 permutations. Results showed that the correlations had values close to 1 and that the permutation p-values were non-significant, which confirms compositional invariance. Finally, we tested scalar invariance (step 3) using the same procedure. The permutation results show that not all means and variances for measures were equal. However, the sensory construct and the intellectual construct have both the means and variance equal, while the IVA coolness construct attained equal variances. Therefore, we attained a partial measurement invariance, which allows for the structural model to be compared across groups using MGA for these constructs (Henseler et al., 2016; Blommerde-Winters, 2022). Table 5 shows the full MICOM results.

The MGA results show that there are only significant multi-group differences in the effect of sensorial experience on IVA coolness. Although the relationship between sensorial experience and IVA coolness was found to be non-significant in the overall model, the MGA analysis shows that the effect of sensorial experience on IVA coolness starts to be significant after consumers have the assistant for more than

Table 1
Adapted Scales, reliability and validity test for the complete data.

Construct		Adapted Item	ID	Outer Loadings	Composite Reliability	AVE	Scale	Authors
IVA EXPERIENCE	Sensorial	The voice assistant makes a strong impression on my visual sense or other senses	SENSE1	0.89	0.81	0.69	Likert scale 1–5 (strongly disagree to strongly agree)	Adapted from Brakus et al., 2009
		I find this voice assistant interesting in a sensory way.	SENSE2	0.79				
		This voice assistant does not appeal to my senses (RE)	SENSE3 *					
	Affective	This voice assistant induces feelings and sentiments.	AFF1	0.88	0.88	0.78		
		I do not have strong emotions for this voice assistant (RE)	AFF2 *					
		This voice assistant is an emotional voice assistant	AFF3	0.89				
	Behavioral	I engage in physical actions and behaviors when I use this voice assistant	BEH1	0.84	0.85	0.74		
		This voice assistant results in bodily experiences.	BEH2	0.88				
		This voice assistant is not action oriented. (RE)	BEH3 *					
	Intellectual	I engage in a lot of thinking when I encounter this voice assistant.	INTEL1	0.87	0.85	0.74		
		This voice assistant does not make me think (RE)	INTEL2 *					
		This voice assistant stimulates my curiosity and problem solving	INTEL3	0.84				
IVA COOLNESS	Iconic	Is a cultural symbol	COOL1	0.89	0.82	0.69	Likert scale 1–5 (strongly disagree to strongly agree)	adapted from Warren et al., 2019
		Is iconic	COOL2	0.83				
	Subcultural	Makes people who use it different from other people	COOL3	0.85	0.92	0.74		
		If I were to use it, it would make me stand apart from others	COOL4	0.87				
		Helps people who use it stand apart from the crowd	COOL5	0.84				
		People who use this voice assistant are unique	COOL6	0.88				
	Popular	Is liked by most people	COOL7	0.74	0.78	0.55		
		Is in style	COOL8	0.74				
		Is popular	COOL9 *					
		Is widely accepted	COOL10	0.74				
	High Status	Is chic	COOL11	0.77	0.88	0.64		
		Is glamorous	COOL12	0.82				
		Is sophisticated	COOL13	0.78				
		Is ritzy	COOL14	0.84				
	Rebellious	Is rebellious	COOL15	0.91	0.94	0.80		
		Is defiant	COOL16	0.90				
		Is not afraid to break rules	COOL17	0.87				
		Is nonconformist	COOL18	0.89				
	Original	Is innovative	COOL19 *		0.76	0.62		
		Is original	COOL20	0.72				
		Does its own thing	COOL21	0.84				
	Authentic	Is authentic	COOL22 *		0.81	0.58		
		Is true to its roots	COOL23	0.73				
		Doesn't seem artificial	COOL24	0.80				
		Doesn't try to be something it's not	COOL25	0.76				
	Aesthetically Appealing	Looks good	COOL26 *		0.82	0.60		
		Is aesthetically appealing	COOL27	0.76				
		Is attractive	COOL28	0.75				
		Has a really nice appearance	COOL29	0.82				
	Exciting	Is energetic	COOL30	0.75	0.85	0.59		
		Is outgoing	COOL31	0.80				
		Is lively	COOL32	0.78				
		Is vigorous	COOL33	0.75				
	Extraordinary	Is exceptional	COOL34	0.80	0.87	0.63		
		Is superb	COOL35	0.80				
		Is fantastic	COOL36	0.73				
		Is extraordinary	COOL37	0.84				
AA-RELATIONSHIPS	IVA-SELF DISTANCE	−4="The voice assistant is very far away from me and who I am",4="The voice assistant is very close to me and who I am", with mid-points "indifferent"=0)	BSD1	0.88	0.87	0.77	−4 to 4	adapted from Park et al., 2013

(*continued on next page*)

Table 1 (*continued*)

Construct		Adapted Item	ID	Outer Loadings	Composite Reliability	AVE	Scale	Authors
		(−4="I am personally disconnected from the voice assistant",4="I am personally connected to the voice assistant"	BSD2	0.88			−4 to 4	
	IVA PROEMINENCE	To what extent are your thoughts and feelings toward the voice assistant often automatic, coming to mind seemingly on their own?	BP1	0.81	0.91	0.72	(1)="not at all" to (11)= "completely."	
		To what extent do your thoughts and feelings toward the voice assistant come to mind so naturally and instantly that you don't have much control over them?	BP2	0.84				
		To what extent are your negative thoughts and feelings toward the voice assistant often automatic, coming to mind seemingly on their own?	BP3	0.85				
		To what extent do your negative thoughts and feelings toward the voice assistant come to you so naturally and instantly that you don't have much control over them?	BP4	0.88				
MOTIVATIONAL STRENGTH **	OVERALL	Please summarize your overall relationship with the voice assistant	–	–	–	–	(−4)="avoid relationship," (0)= "maintain relationship" and (4)="strengthen relationship"	adapted from Park et al., 2013
PAST EXPERIENCE **		For how long have you been using the voice assistant?	–	–	–	–	"Up to 6 months", "6 months to more than a year"	Author's own elaboration
CONTROL VARIABLES	GENDER	What is your gender?	–	–	–	–	"male", "female", "other"	Author's own elaboration
	TYPE OF ASSISTANT	What is the voice assistant that you have?	–	–	–	–	"Amazon Echo (Alexa)", "Google Home", "other", "I don't have a voice assistant"	Author's own elaboration

Note: (*) items removed due to having loadings below the 0.70 threshold (Hair et al., 2017) (**) Motivational Strength and Past Experience are single item measures.

Table 2
Heterotrait-Monotrait Ratio (HTMT) Results for Discriminant Validity.

	SENSE	AFF	BEH	INTL	IC	A-A R.
SENSE						
AFF	0.59					
BEH	0.59	0.73				
INTL	0.61	0.56	0.55			
IC	0.51	0.61	0.58	0.55		
A-A R.	0.43	0.58	0.55	0.41	0.74	
MS	0.35	0.37	0.38	0.42	0.63	0.54

Note: SENSE = Sensorial Experience; AFF = Affective Experience; BEH = Behavioral Experience; INTL = Intellectual Experience; IC = IVA Coolness; AA R. = A-A Relationships.

Table 3
Inner VIF Results.

	SENSE	AFF	BEH	INTL	IC	A-A Rel.	MS
SENSE		1.88	1.87	1.73	1.93	1.94	1.94
AFF	2.60		2.14	2.62	2.64	2.59	2.66
BEH	2.39	1.97		2.44	2.46	2.44	2.47
INTL	1.74	1.91	1.93		1.89	1.93	1.92
IC	3.11	3.08	3.10	3.03		2.45	2.73
A-A Rel.	2.44	2.36	2.42	2.41	1.92		2.37
MS	1.74	1.72	1.74	1.71	1.52	1.69	

Note: The inner VIF values represent the multicollinearity between the constructs. SENSE = Sensorial Experience; AFF = Affective Experience; BEH = Behavioral Experience; INTL = Intellectual Experience; IC = IVA Coolness; AA R. = A-A Relationship; MS = Motivational Strength.

6 months. Therefore, H4a is supported.

The MGA analysis found no significant differences across the two experience groups (up to 6 months and more than 6 months). The effects of affective experience, behavioral experience, and intellectual experience on IVA coolness are not significantly different across the two experience groups. Therefore, H4b, H4c, and H4d are not supported. Table 6 shows the MGA results for past experience moderation.

Regarding the control variables, a multi-group analysis (MGA) revealed no differences between the gender groups (Table 7) and the type of assistant used (Table 8).

The model was also tested regarding the mediating role of the variables in the study to add more insights. Therefore, a post-hoc test was conducted to show the mediating effects. Table 9 shows the results of the direct effects and Table 10 the specific indirect effects.

Results show that the direct effect of the sensorial experience with the IVA to A-A relationship is not significant. The same non-significant effect occurs when adding the mediating variable of IVA coolness between sensorial experience with the IVA and A-A relationships. Therefore, there is no direct or indirect effect in the current case. Affective sensorial experiences have a significant and direct effect on A-A relationships. The specific indirect effect of IVA coolness as a mediator is also significant. Therefore, IVA coolness has a partial mediating effect. Regarding behavior and intellectual experiences, both have non-significant direct effects on A-A relationships. However, there is a significant effect on the specific indirect relationship, therefore IVA coolness acts as a mediator in this case. Finally, A-A relationships has a partial mediating effect on the relationship between IVA coolness and motivational strength, given that both the direct and specific indirect effects are significant.

5. Discussion

A voice assistant, embedded with an AI-system that has its own agency skills, its own "tone of voice" and its own ability to guide consumers in their decision-making, represents the brands, conveying the message, and therefore, may be embedded with its own personality and coolness characteristics (Hoffman & Novak, 2018; Kang & Kim, 2020; Warren et al., 2019). For example, Alexa has a specific "voice", language, and ability skills, which although similar, are different from other IVAs such as Google Home. Given that IVAs engage in conversation with consumers, the brand experience established during this relationship

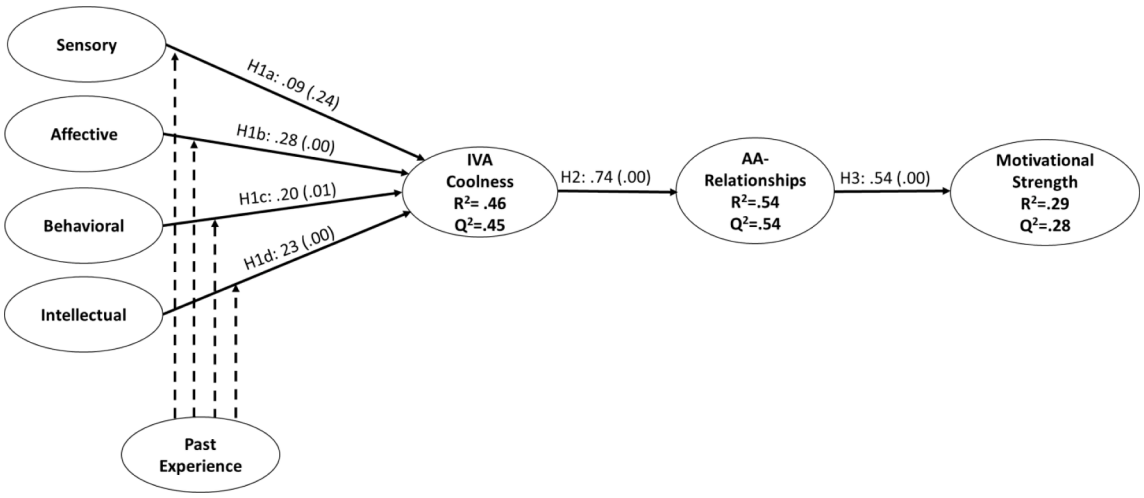

Fig. 2. Research model with PLS-algorithm and bootstrapping results Note: The values correspond to the path coefficients. P-values are in parentheses.

Table 4
PLS-SEM Bootstrapping results.

				Confidence Interval			
Hypothesis	**Relationship**	**Std β**	**p-value**	**2.5%**	**97.5%**	**f^2**	**Decision**
H1a	SENSE → IC	0.09	0.25	−0.07	0.23	0.01	Not Supported
H1b	AFF → IC	0.28	0.00***	0.15	0.41	0.06	Supported
H1c	BEH → IC	0.20	0.01*	0.06	0.32	0.03	Supported
H1d	INTL → IC	0.23	0.00***	0.11	0.36	0.06	Supported
H2	IC → AA R.	0.74	0.00***	0.67	0.79	1.18	Supported
H3	AA R. → MS	0.54	0.00***	0.46	0.61	0.42	Supported

***p < 0.001 **p < 0.01 *p < 0.05.
Note: SENSE = Sensorial Experience; AFF = Affective Experience; BEH = Behavioral Experience; INTL = Intellectual Experiences; IC = IVA Coolness; AA R. = A-A Relationship; MS = Motivational Strength.

Table 5
Tests for Measurement Invariance.

Composite	Past Experience (up to 6 months-6 months to more than a year)		
Step 2 (compositional invariance)	c value (=1)	95% confidence interval	Compositional invariance?
Sensory	1.00	[1.00;1.00]	Yes
Affective	1.00	[1.00;1.00]	Yes
Behavioral	1.00	[1.00;1.00]	Yes
Intellectual	1.00	[1.00;1.00]	Yes
IVA Coolness	0.99	[0.99;1.00]	Yes
Step 3 (scalar invariance-means)	Difference of the composites' mean value	95% confidence interval	Equal mean values?
Sensory	−0.02	[−0.26;0.24]	Yes
Affective	0.53	[−0.20;0.24]	No
Behavioral	0.42	[−0.22;0.23]	No
Intellectual	0.12	[−0.24;0.23]	Yes
IVA Coolness	0.43	[−0.21;0.23]	No
Step 3 (scalar invariance-variances)	Logarithm of the composite's variances ratio	95% confidence interval	Equal variances?
Sensory	0.15	[−0.40;0.41]	Yes
Affective	−0.57	[−0.34;0.35]	No
Behavioral	−0.50	[−0.32;0.35]	No
Intellectual	−0.10	[−0.40;0.47]	Yes
IVA Coolness	−0.41	[−0.42;0.41]	Yes

Table 6
MGA Results for Moderation Effects.

Moderating effect between	Up to 6Mβ (*p-value*)	6M to >than 1Yβ (*p-value*)	MGA β Dif.	MGA *p-value*
SENSE → IC	−0.04 (0.74)	0.31 (0.00)	0.35	0.01
AFF → IC	0.20 (0.02)	0.30 (0.00)	0.10	0.44
BEH → IC	0.24 (0.02)	0.06 (0.54)	−0.18	0.20
INTL → IC	0.22 (0.03)	0.29 (0.00)	0.07	0.60

can lead to a more enduring connection in the future (Park et al., 2013).

A-A theory suggests that brand experience has an impact on the attachment-aversion relationship with a brand (measured by brand prominence and brand-self distance). The experience of a brand can entice the customers through the sensory and/or aesthetic pleasures provided by the use of an AI-agent embedded in IVAs. The symbolic meaning of a brand mirrored by the AI-agent enriches the customer's self because it delights the customer's spiritual self, leading to high levels of attachment. However, the experience with AI-agents can also enable customers to exercise control over their environment, increasing customer knowledge and confidence and creating a desire to approach the brand (Aron et al., 1991). Thus, the way customers live the experience with the brand influences their approach or avoidance towards the brand. This A-A relationship then affects the motivation to continue (or not) the relationship in the future (motivational strength) (Park et al., 2013; Schmitt, 2013).

Exploring the role of IVA experience on IVA coolness, we found that affective, behavioral, and intellectual experiences with IVAs positively affect IVA coolness. Indeed, previous studies suggest that brand experience influences brand personality perceptions (Brakus et al., 2009). Although coolness goes beyond mere personality, they are correlated. Brand personality predetermines whether a brand is perceived as more, or less *cool*, which supports the current findings (Warren et al., 2019). Specifically, affective experience has the highest effect on IVA coolness. In fact, an anthropomorphized relationship – such as the one established

Table 7
MGA Results for Gender.

Relationship	Coef.-Diff	p-value
SENSE → IC	−0.16	0.25
AFF → IC	−0.05	0.69
BEH → IC	0.02	0.89
INTEL → IC	−0.03	0.83
IC → A-A R.	−0.01	0.80
A-A R. → MS	−0.00	0.96

Note: SENSE = Sensorial Experience; AFF = Affective Experience; BEH = Behavioral Experience; INTL = Intellectual Experience; IC = IVA Coolness; AA R. = A-A Relationship; MS = Motivational Strength.

Table 8
MGA Results for Type of Assistant used (Alexa vs. Google Home).

Relationship	Coef.-Diff	p-value
SENSE → IC	0.29	0.06
AFF → IC	-0.12	0.39
BEH → IC	0.09	0.50
INTEL → IC	0.00	0.99
IC → A-A R.	0.01	0.89
A-A R. → MS	−0.01	0.92

Note: SENSE = Sensorial Experience; AFF = Affective Experience; BEH = Behavioral Experience; INTL = Intellectual Experience; IC = IVA Coolness; AA R. = A-A Relationship; MS = Motivational Strength.

by humans and IVAs – can lead to the development of feelings of friendship and love (affective bounds), which supports our findings (Hernandez-Ortega & Ferreira, 2021; Ki et al., 2020; Ramadan et al., 2021). Emotional ties between IVAs and humans creates in humans a certain fascination leading them to consider that IVAs are *cool*.

However, sensorial experience shows no significant effect on IVA coolness in the first 6 months. For Brakus et al. (2009), sensorial experience is based on items related to how the IVA appeals to consumers' visual and other senses. Our results suggest that existing IVAs' sensorial experience (e.g., Alexa, Google Home) only affects IVA coolness when users have a long relationship with the IVA. Although there was no significant effect overall, after having the IVA for more than 6 months, consumers consider the sensorial stimuli as *cool*. This effect is in line with studies suggesting that as people become attached to a relationship their enjoyment and sensory perceptions increase (Simpson, 1987; Cavanaugh, 2016).

IVA coolness is a strong influencer of A-A relationships. This result agrees with the studies of Warren et al. (2019), which suggest that *cool* brands gain more exposure than non-*cool* brands. Thus, they are able to affect brand prominence and the distance consumers perceive between them and the brand. The *cool* factor works as a catalyst accelerating the attraction process between the IVA and the consumer.

Finally, A-A relationships affect motivational strength (approach-maintenance-enhancement) positively, showing that A-A relationships also affect the long-term desire to continue the relationship with the IVA in the future, according to the relationship previously suggested by Park et al. (2013) under different circumstances. When customers are cognitively linked with the IVAs – thinking about IVAs and how important IVAs are to their lives – they will tend to decide to continue their relationship with the IVAs.

5.1. Theoretical contributions and implications

The current paper contributes to the relationship marketing literature and extends the A-A theory in three main ways. First, IVAs are products, but they are also perceived by consumers as having human characteristics due to their agency skills. IVAs are endowed with "intelligent" qualities that enable them to have a dialog with humans (Kang & Kim, 2020). Therefore, we added to the A-A theory – which measures attachment-aversion in human-brand relationships – the extension to AI-agents, such as IVA, and developed for the first time to human-IVA relationships (Park et al., 2013; Schmitt, 2013). Overall, the conceptualization of the A-A theory shows that experiences affect attachment or aversion toward the brands, which can lead consumers to approach or avoid future relationships. The user's experience with an IVA can also generate an approach or avoidance. When the relationship is benefic and emotionally rewarding for the user, he/she will feel close and will devote his/her thoughts and feelings toward IVA. When human-IVA develop a bad relationship and there is a gap between the human self and the IVA, the human element in the relationship will tend to avoid the IVA and develop negative thoughts and feeling.

Second, the *cool* factor performs a relevant role in developing the human-IVA relationship. The interaction human-IVA through the experience of using the AI-agent (IVA) can affect the IVA coolness

Table 9
Direct Effects.

Relationship	Original Sample (O)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values	Bias Corrected Confidence Interval	
					2.5%	97.5%
SENSE → A-A R.	0.00	0.01	0.01	0.99	−0.11	0.10
AFF → A-A R.	0.18	0.06	3.15	0.00	0.05	0.28
INTL → A-A R.	-0.08	0.06	1.47	0.14	−0.19	0.02
BEH → A-A R.	0.11	0.01	1.93	0.06	0.00	0.22
IC → MS	0.51	0.07	7.10	0.00	0.35	0.62

Note: SENSE = Sensorial Experience; AFF = Affective Experience; BEH = Behavioral Experience; INTL = Intellectual Experiences; IC = IVA Coolness; AA R. = A-A Relationship; MS = Motivational Strength.

Table 10
Specific Indirect Effects.

Relationship	Original Sample (O)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values	Bias Corrected Confidence Interval	
					2.5%	97.5%
SENSE → IC → A-A R.	0.05	0.05	1.14	0.25	−0.04	0.14
AFF → IC → A-A R.	0.17	0.05	3.85	0.00	0.10	0.27
BEH → IC → A-A R.	0.12	0.04	3.04	0.00	0.05	0.21
INTL → IC → A-A R.	0.14	0.04	3.63	0.00	0.07	0.22
IC → A-A R. → MS	0.10	0.04	2.75	0.01	0.04	0.18

Note: SENSE = Sensorial Experience; AFF = Affective Experience; BEH = Behavioral Experience; INTL = Intellectual Experience; IC = IVA Coolness; AA R. = A-A Relationship; MS = Motivational Strength.

perceptions and *cool* IVAs can promote better human-AI relationships. Thus, when an IVA is perceived by the user as having *cool* characteristics (e.g., original, authentic, and useful features), the user more easily develops strong emotional bonds, which contribute to a strong human-IVA attachment, than in the case of being uncool.

Finally, moderating analyses demonstrated a significant effect in the strength of the relationship between experience with IVAs and IVA coolness, depending on the duration of past experience. Thus, contrary to what the literature suggests (Brakus et al., 2009; Warren et al., 2019), affective, behavioral, and intelligent experiences affect IVA coolness from the beginning of the experience with IVAs. However, human-AI sensorial experience only affects coolness after a longer period of using the IVA.

5.2. Implications for practice

In terms of managerial implications, four aspects are suggested. First, managers should develop IVAs that are perceived as *cool*. The IVA coolness scale is a tool to be used by firms to measure how cool their assistants are. IVAs should be able to be perceived as having an attractive and appealing appearance, with an elegant design, and eventually with a more humanized shape. At the same time, they should be able to give creative suggestions when customers ask for entertainment events, for example. IVAs should demonstrate empathy while attending the requests of the customers and enthusiasm while searching for suggestions that solve those requests. IVAs should be authentic – not perceived as fake or untrustworthy – meaning that the information provided must be genuine and meaningful to the customers.

Second, although the human-IVA on-going experience is paramount to developing the *cool* perception and consequently contributes to the emotional bonds, the assistants' sensorial experience of the IVA currently on the market does not affect coolness in all conditions, but only after more than 6 months using IVA. Thus, IVA manufacturers should give more attention to sensory and aesthetic features, such as color, smell, size, and shape. Yet, improved aesthetic features should attract the IVA at the first sight. Aesthetic features of the IVAs should be designed so that they are able to generate interest and curiosity in the customers' minds.

Third, of the four components of experience, affective experience has the highest effect on IVA coolness. Therefore, IVA manufacturers can enhance their AI-agents' ability to forge strong emotional bonds with users, which will increase their desire to continue the relationship in the future. For instance, the characteristics of the voice of the IVA (e.g., pitch, timbre, and intensity) can operate positively/negatively in the human-IVA relationship. Voices that are more intense and exciting can serve better very busy humans. Older humans may prefer voices that convey a sense of calm and relaxation. The voice of the IVAs can thus be used to create a differentiation effect in the services provided to customers. IVA should be designed with the ability to adapt to the needs of the customers. For instance, IVAs should be able to capture the mood of the customers through the tone and vibration of the customeŕs voice. Based on that, IVAs should adapt their voice to become more emphatic to humans. For example, if the human is sad, the IVA should be able to perceive it and use a calmer tone of voice in a way that comforts the consumer. If the human shows a busy tone, the IVA should respond in a professional way, giving the information as fast as possible with short and precise words. IVAs should thus be created to continually adapt to circumstances encountered over the course of the customer relationship.

Finally, higher behavioral experience – more action-oriented – helps consumers perceive the relationship as *cool*. Thus, managers should invest in creating engaging dialogs with their consumers via the IVA, for example, by using some gamification strategies. Managers should also take steps to ensure that their IVAs engage in cognitive thinking with their consumers, for instance, by creating IVAs with high *agency* skills to increase coolness.

5.3. Limitations and future research direction

Despite the care taken in the current study to control for all confounding effects, some limitations should be acknowledged, providing opportunities for further research. First, although the study explores the role of experience in IVA coolness, the type of experience is somewhat limited by the type of IVA in the market. Schweitzer et al. (2019) classify IVA relationships into (1) servants – the user is in control - (2) friends – engage in a dialog with the user - or (3) master – the assistant is in control of the relationship. Assistants currently in the market have limited agency skills. Therefore, future research can explore if more advanced types of IVAs produce the same effects on IVA coolness and A-A relationships.

Another opportunity for further research lies in the dynamic type of relationship users tend to establish with smart objects. For example, privacy concerns can change over time due to cybersecurity concerns. According to Novak and Hoffman (2019), consumer-object relationships evolve over time in a circumplex model that considers assistants' agentic and communal roles. A longitudinal study analyzing how IVA coolness is affected by the relationship with IVAs over time and how those dynamic effects affect A-A relationships could extend the knowledge of how consumers interact with AI-enabled IVAs. Although IVAs are now an innovative product, their coolness could change over time as they become commodities. For example, Warren et al. (2019) suggest that brands can be more niche cool (more innovative and rebellious) and more mass cool. Exploring these dynamics can be an interesting avenue for future research. Finally, the current study lets users think about the latest relationship they had with their IVA (regardless of the IVA's voice gender). However, male users may have a different experience when interacting with female IVAs and vice-versa. Therefore, future research can explore this user-IVA gender interplay and how it can affect IVA coolness and A-A relationships.

6. Conclusions

Artificial Intelligence agents and particularly IVAs are changing how consumers interact with technology and it is anticipated that they will become much more engaging in the years to come. First, they reduce the need for excessive screen use and free up consumers to engage in more enjoyable activities by enabling them to complete tasks conveniently and hands-free. Second, IVAs can provide personalized experiences by collecting data on consumer behavior. Finally, they are accessible to consumers with disabilities who frequently struggle with technology. However, the relationship established between humans and IVAs depends on the emotional attachment created during the conversation, much like in human-to-human relationships (Schweitzer et al., 2019).

The current paper uses the A-A theory (Park, 2013; Schmitt, 2013) to study how IVA coolness can mediate the relationship between consumer-IVA experiences and attachment. The paper shows that affective, behavioral, and intellectual experiences with the IVAs have a positive influence on how consumers perceive the relationship as *cool*. Consequently, *cool* experiences established between consumers and IVAs increase consumers' attachment and motivation to continue such relationships in the future.

CRediT authorship contribution statement

João Guerreiro: Writing – review & editing, Writing – original draft, Validation, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Sandra Maria Correia Loureiro:** Writing - review & editing, Validation, Methodology, Investigation, Funding aquisition, Conceptualization.

Declaration of Competing Interest

The authors declare that they have no known competing financial

interests or personal relationships that could have appeared to influence the work reported in this paper.

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