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Context in augmented reality marketing: Does the place of use matter?

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Abstract

Augmented reality (AR) integrates virtual content into a consumer's perception of the real world. While academic interest in AR is growing, most prior research has focused on consumer evaluations of AR content and neglected the physical context in which AR content is consumed. Addressing this research gap, two experimental studies showed that context (e.g., experiencing a virtual sofa at home vs. in a university classroom) impacts consumer judgments and evaluations. The results reveal two primary effects of context. First, contexts in which virtual objects meet users' personal and cultural expectations associated with a specific location (e.g., a sofa in a living room) increase plausibility. However, such functionally appropriate contexts (counterintuitively) decrease local presence (i.e., the perception that the virtual product is "here"). Study 2 extends this model by showing that plausibility (a rational and deliberate assessment of AR content) and local presence both impact utilitarian benefits, whereas local presence has a stronger effect on perceived physical tangibility. The findings extend prior theory on the psychological mechanisms impacting judgment and presence in AR, and they provide managers with important insights regarding the influence of context on downstream variables in their AR and metaverse marketing strategies.

KEYWORDS

augmented reality, context, local presence, marketing, metaverse, plausibility

1 | INTRODUCTION

Augmented reality (AR), which integrates virtual content into a user's perception of the real world (Rauschnabel, Babin, et al., 2022), has been identified as a technology with substantial growth potential for marketing and related areas (Grand Vision Research, 2022; Statista, 2022). Prior studies suggest that—compared to traditional visualization formats—AR content is perceived as more interactive (Yim et al., 2017), inspirational (Arghashi, 2022; Rauschnabel et al., 2019; Zanger et al., 2022), useful (Gatter et al., 2022), and hedonic (Flavián et al., 2021b; Hilken et al., 2017). AR also facilitates access to the metaverse, which refers to an immersive three-dimensional environment that is able to integrate physical and virtual worlds (Dwivedi et al., 2022, 2023). At the same time, AR faces important challenges, such as privacy and security concerns (S. Chen et al., 2018; Cowan et al., 2021) and the need to create a visually convincing and accurate integration of virtual objects with the physical environment (Slocum et al., 2021; tom Dieck & Jung, 2018).

Despite the breadth of existing research on this topic, a core aspect of AR has been widely neglected: the physical context in

which AR content is experienced. While context as a construct was first explored in the marketing discipline decades ago (e.g., Meyers-Levy & Tybout, 1997), these studies typically focused on atmospheric context factors, such as olfactory (Morrin, 2010) and auditory variables (Zhu & Meyers-Levy, 2005) or the presence of other people (e.g., Kim et al., 2016). Initial research on context positioned both the context and the consumer variables of interest in the physical world. This has changed with the advent of new computer technologies. In virtual worlds, multisensory simulations have utilized aroma content in the context of the virtual experience (Flavián et al., 2019, 2021a). Yoo and Eastin (2017) explored context when they assessed how digital marketing materials are displayed in specific digital environments using in-game advertisements. AR experiences, however, are neither only virtual nor only physical; they are a hybrid of the two (i.e., "phygital"). Here, the physical context represents the actual location where a user is present in the real world when they engage in the AR experience. While one might initially consider the physical context to be outside the control of the firm, this is not necessarily true. For example, brick-and-mortar retailers, such as furniture or department stores, have some control over the physical environment in which a customer uses an AR app. In addition, specific AR advertising campaigns can be triggered in specific settings based on geolocation data. Social media algorithms are sufficiently sophisticated to know when an individual is at home or at work, and this information will certainly be available in AR applications. Hence, we argue that context constitutes a managerially relevant variable with important implications for practitioners.

Against this backdrop, the current research articulates two experimental studies that explore how the context regarding the location of AR use determines a consumer's experience. In other words, this research assesses how identical content (e.g., a virtual couch) is perceived and evaluated in different physical settings (e.g., in a university classroom vs. in an individual's living room). More formally, we explored how the physical location in which AR is experienced or its context influences individuals' evaluations of an AR marketing experience.

2 | THEORY AND PRIOR RESEARCH

2.1 | Augmented reality and marketing

Although not consistently defined in the literature, AR can be simply described as the integration of a virtual context into a user's perception of the real world through the application of digital technologies (Flavián et al., 2019; Peddie, 2017; Rauschnabel, Babin, et al., 2022). AR can range on a continuum from very simplistic (e.g., assisted reality) to highly sophisticated (e.g., mixed reality) forms in which consumers might have difficulties distinguishing virtual objects from real ones (Dwivedi et al., 2021). A fundamental aspect of augmented and virtual reality is perceived presence, which relates to the immersive qualities of the user experience (He et al., 2018; Orús et al., 2021; Tussyadiah et al., 2018). As outlined in the xReality framework (Rauschnabel, Babin, et al., 2022), a core distinctive factor on the AR continuum is the local presence (Lavoye et al., 2021). J. V. Chen et al. (2021) use the term "local presence" to describe an AR user's perception that an AR element is "here". Y. Chen and Lin (2022) position local presence as part of realism's nomenclature, and others argue that high levels of local presence enable "deeper experiences" (Spangenberger et al., 2022; p. 246) and that the digital can even replace physical products (Dwivedi et al., 2021). Hence, we define local presence as the extent to which a user perceives AR content as being "in" their local physical environment (Rauschnabel, Babin, et al., 2022; Verhagen et al., 2014).

While many current AR marketing use cases are designed for smartphones or tablet computers, AR is generally independent of the hardware on which it is displayed (Flavián & Barta, 2022; Peddie, 2017). To achieve very high levels of local presence and more natural human–computer interfaces (e.g., gesture control), specific AR hardware (e.g., AR smart glasses) is required (Flavián et al., 2019; Hoyer et al., 2020). Technological innovations may soon enable mass markets to experience a more consistently augmented real world, or what is increasingly being called the metaverse (Dwivedi et al., 2022, 2023).

The concept of AR is a significant area for new research in the marketing discipline, as shown through recent literature reviews (e.g., Du et al., 2022; Kumar et al., 2023; Rejeb et al., 2021). Broadly speaking, these studies have focused on defining AR marketing and its characteristics (Hilken et al., 2018; Javornik, 2016; Rauschnabel, Felix, et al., 2022) or assessed strategic (Hilken, Chylinski, et al., 2022; Javornik, Duffy, et al., 2021; Rauschnabel, Babin, et al., 2022) and consumer-related (e.g., Kumar et al., 2023; Sung et al., 2021; tom Dieck & Han, 2022) research questions. Overall, prior research finds that consumers typically perceive AR content as useful (Gatter et al., 2022) and inspirational (Arghashi, 2022; Rauschnabel et al., 2019; Zanger et al., 2022). Furthermore, AR may clarify the perceived similarity between products, which in turn reduces consumer confusion and cognitive dissonance (Barta et al., 2023). However, prior research has also identified challenges associated with AR, including privacy issues, security threats, and technical barriers. For example, Cowan et al. (2021) found that consumers' intentions to use AR and to provide positive word-of-mouth decreases substantially for individuals who are concerned about privacy issues. AR applications produce large amounts of behavioral consumer data that can be used to generate precise personality profiles that can be used to manipulate consumers (Kosinski et al., 2013). AR applications and devices are also susceptible to security breaches and attacks (S. Chen et al., 2018). From the user's perspective, AR depends on accurate and world-stable content in which virtual objects are rendered appropriately in relation to the real world (Keil et al., 2019). Some current technologies are plagued by "AR drift" (i.e., virtual objects that shift unrealistically), which leads to a largely diminished user experience (Slocum et al., 2021; tom Dieck & Jung, 2018).

The mix of benefits and challenges associated with AR may explain consumer hesitance in adopting these technologies. Nevertheless, consumer benefits currently appear to outweigh these drawbacks, and research has identified a number of positive outcomes of AR marketing, such as brand perception (Rauschnabel et al., 2019; Zanger et al., 2022), purchase intention (Zanger et al., 2022), sales (Tan et al., 2022), customer satisfaction (Dacko, 2017), loyalty (Dacko, 2017), and a willingness to pay (Heller et al., 2019a; for a review, see Du et al., 2022; and Kumar et al., 2023).

From a broader perspective, Kumar et al. (2023) conducted a meta-analysis of AR marketing articles and highlighted the role of four variables in shaping behavioral intentions: hedonic value, utilitarian value, interactivity, and augmentation. Hedonic and utilitarian benefits have been shown to determine consumer reactions to a variety of technologies (e.g., King & He, 2006; Venkatesh et al., 2012). Research on interactivity has gained momentum with the rise of digital consumer platforms, such as smartphones and social media, and interactivity has also been studied in AR marketing (e.g., Yim et al., 2017). Augmentation, however, is unique to AR because it reflects the perception that virtual content is embedded in the real world.

2.2 | Context in augmented reality

Extant research has shown that both augmented content and the way it is integrated into the physical environment are crucial for shaping consumer reactions to AR experiences, but it does not explore the concept of context in AR use in detail. For example, Scholz and Duffy (2018) conducted an ethnographic study among users of the Sephora AR app that highlighted the role of interaction with the brand in their personal spaces but did not explore other contexts. Rauschnabel (2018) showed that the factors that determine the intended adoption of AR technology differ between the intended use in personal and public contexts, without studying specific content. Finken et al. (2021) showed that AR can reduce the psychological distance between a user and an object. This effect is stronger when consumers experience an AR object in a matching physical context. However, previous research has not focused, in particular, on how the context of AR use aligns with specific content.

3 | CONTEXT FRAMEWORK

3.1 | Context as the independent variable

We argue that the context in which a virtual product is used matters. More specifically, based on Hilken et al. (2017) and Schmidt et al. (1999), our study conceptualizes context as the place or location where an individual uses AR, which includes the behavioral appropriateness as well as personal and cultural expectations associated with this location. For instance, perceiving a virtual couch on a train would likely conflict with both personal and cultural user expectations, whereas experiencing the same virtual couch in a living room would be consistent with these expectations. Appendix A shows the construct definitions, examples, and the corresponding literature for each construct.

3.2 | The effect of context on plausibility

Plausibility has been defined as the "coherence of concepts based on prior knowledge" (Connell & Keane, 2006, p. 96). Consumers are constantly confronted with judgments of plausibility, for example, when deciding whether to believe advertising claims or communication from another individual (Johar et al., 2006; Roggeveen & Johar, 2002). Narrative communication theory argues that plausibility is achieved through the coherence and internal consistency of a story (Busselle & Bilandzic, 2008). Plausible is not synonymous with factual (Skarbez et al., 2021); individuals can perceive fictional stories (e.g., taking place on an alien planet or in a fairyland) as plausible as long as they are coherent and internally consistent. The concept of plausibility typically includes the evaluation of a narrative and the relationships in the narrative, not the entities involved in the narrative per se (Busselle & Bilandzic, 2008).

For virtual environments, Slater (2009) posited that plausibility is driven by the coherence between external events and an individual's own sensations. For example, if avatar eye contact causes a physiological response, such as an increased heart rate, then the avatar will likely be perceived as plausible. Furthermore, extending the spectrum of experiences to any XR environment (one that includes both VR and AR), Latoschik and Wienrich (2022) suggest that plausibility depends on congruence between the different elements and layers of the experience. Drawing on these insights, we argue that in an AR environment, plausibility is an evaluation of the relationships between virtual objects and the physical environment. For example, when an AR furniture app is used in a consumer's living room, the relationship between the elements would likely be evaluated as plausible, whereas using the same app outside on a soccer field would result in a perceived mismatch because furniture on a soccer field would be implausible. Hence, the following hypotheses were formulated:

Hypothesis 1a. *A context that is typical for a product will have a positive influence on plausibility. Specifically, augmented content presented in a typical place of use will lead to higher levels of perceived plausibility compared to an atypical place of use.*

Hypothesis 1b. *Plausibility will mediate the relationship between context and (a) purchase intention and (b) expected usage congruence.*

3.3 | The effect of context on local presence

The concept of presence is relevant to both computer-generated (VR) and computer-mediated (AR) environments (Latoschik & Wienrich, 2022; Tussyadiah et al., 2018). In a VR context, presence refers to a feeling of

"being there", and it has been labeled telepresence in the extant literature (C. Chen & Yao, 2022; Moriuchi & Murdy, 2022; Steuer, 1992). Conversely, the focus of presence in AR environments relies on the user's perception of an object "being here" (i.e., at their location), and this phenomenon has been called local presence or spatial presence in the extant research (Rauschnabel, Babin, et al., 2022; Verhagen et al., 2014; Vonkeman et al., 2017). Following Rauschnabel, Felix, et al. (2022), we define local presence as the degree to which consumers experience AR objects as being present in their own physical environment.[1]

Empirical research investigating factors that increase local presence is relatively scarce. Smink et al. (2020) reported that the use of an AR app (as compared to not using an AR app) increases spatial (i.e., local) presence. Furthermore, Hilken et al. (2017) found that simulated physical control and environmental embedding influence perceived spatial presence. However, additional research is needed to understand how local presence is affected by environmental factors. The current research addresses this gap by investigating the psychological mechanisms that impact how context influences consumer reactions and judgments in AR use.

We identified two alternative and opposing mechanisms for the potential effect of context on local presence. First, projecting a virtual object in an expected or typical physical environment (i.e., location) may amplify the perception that the experience is real, thereby increasing local presence. However, prior research has suggested that a conceptual mismatch can elevate cognitive elaboration and positively influence managerially relevant outcome variables, such as brand attitudes and purchase intentions (Heckler & Childers, 1992; Mandler, 1982). For example, in terms of product evaluations, Hoegg et al. (2010) found that a mismatch between aesthetic and functional appeals (i.e., a product with high functionality but low aesthetics) may lead to more positive product evaluations because the mismatch causes consumers to cognitively elaborate on a product, which in turn makes the advantages of the product more salient. We posit that in the context of a congruent product–environment combination, such as virtual furniture displayed in a living room rather than on a soccer field, the positive effect of context will increase consumers' perceptions that the virtual object is "here". Hence, the following hypotheses were formulated:

Hypothesis 2a. *A context that is typical for a product will have a positive influence on local presence. Specifically, augmented content presented in a typical place of use will lead to higher levels of local presence compared to an atypical place of use.*

Hypothesis 2b. *Local presence will mediate the relationship between context and (a) purchase intention and (b) expected usage congruence.*

[1]We concur with prior research suggesting that spatial presence (Heller et al., 2021; Hilken et al., 2017; Tan et al., 2022) and local presence refer to the same concept and can be used interchangeably (Smink et al., 2020). However, to maintain conceptual consistency, we use the term "local presence" throughout this paper.

3.4 | The influence of plausibility on local presence

While local presence is the result of unconscious mental processing driving the perception that virtual objects are "here" in the real world (Schubert, 2009), plausibility is based on the judgment that implies elaboration and cognitive effort (Connell & Keane, 2006). Hence, Kahneman's (2011) distinction between System 1 and System 2 thinking provides a meaningful framework for establishing the relationship between the two constructs. Whereas System 1 thinking is fast and intuitive, System 2 thinking is comparatively slow and deliberative (Evans & Stanovich, 2013). Figure 1 shows the characteristics, descriptors, and outcomes of System 1 and System 2 thinking.

We posit that local presence, representing an intuition or feeling, is driven by System 1 thinking, whereas plausibility, as a cognitive judgment, is driven by System 2 thinking. In general, human beings strive to minimize cognitive effort, with the result that fast and intuitive System 1 becomes dominant. However, when encountering novel and/or unusual stimuli, consumers process inputs through the more deliberative System 2 in attitude formation and decision-making. Extant research has shown that plausibility is related to both consistency and the degree to which an experience is perceived as unexceptional or meets a user's expectation (Skarbez, 2016). While System 2 is necessarily activated to determine plausibility, if an experience is not perceived as novel, it will likely be processed primarily using System 1. Applied to an AR environment, if augmented content is consistent with the user's context and coheres with the user's expectations, then this input is unlikely to continue to demand expensive System 2 processing. However, if an experience is not perceived to be novel and is deemed plausible, further evaluation is likely returned to System 1. This suggests that plausibility influences perceived local presence, which is consistent with prior research (e.g., Hofer et al., 2020). Hence, the following hypothesis was formulated:

Hypothesis 3. *Plausibility will positively influence local presence.*

3.5 | Influence of plausibility and local presence on managerially relevant outcome variables

Given the essence of plausibility as a positive consequence of cognitive evaluations of the coherence of the overall narrative (Connell & Keane, 2006), we posit that increased levels of perceived plausibility will positively influence purchase intentions. Individuals engage in System 2 processing to evaluate relationships and the complete story. When the story coheres and does not violate user expectations, they are more likely to accept the product as it is presented through the AR medium (Skarbez, 2016). This same logic leads to the hypothesis that plausibility will have a positive influence on expected usage congruence. Drawing on visual product evaluation research (McDonagh et al., 2002), we define expected usage congruence as the extent to which consumers perceive that an

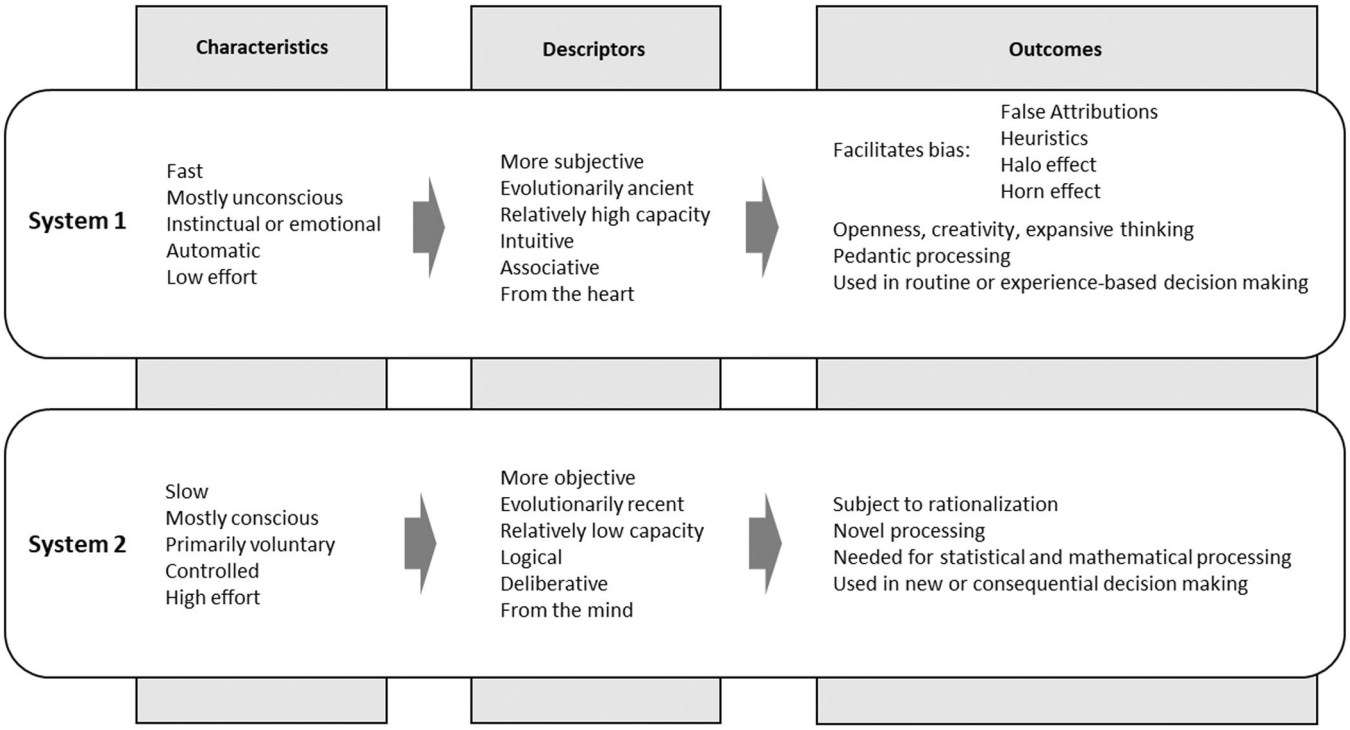

FIGURE 1 Characteristics, descriptors, and outcomes of System 1 and System 2 thinking.

AR-rendered product harmonizes with the physical environment. Whereas context refers to the place where AR is used and includes the behavioral appropriateness and personal and cultural expectations associated with a location, expected usage congruence refers to a consumer's perception that this product harmonizes with their instrumental and symbolic desires.

Both social psychology and consumer behavior research suggest a dual path toward the creation of value through consumables (e.g., Belk, 1988; Goffman, 1959; Lam et al., 2012). Consumable objects and products have instrumental value in the capabilities they convey to their possessors or users. These objects also provide symbolic value that facilitates social status and relations with others. The concept of expected usage congruence is an overall evaluation that reflects both instrumental and symbolic value. AR marketers seek to create situations in which a user perceives congruence between a product and both their behaviors (e.g., "I will use that product") and their image (e.g., "This matches my desired presentation of self"). Hence, the following hypothesis was formulated:

Hypothesis 4. *Plausibility will positively influence (a) purchase intention and (b) expected usage congruence.*

In a similar vein, local presence (i.e., the feeling that virtual objects "are here") relates to a positively valanced perception that should elicit higher purchase intentions. Numerous studies have shown that high levels of presence can solidify perceptions of product attributes and mitigate the risks associated with purchasing or acquiring a product (Hilken et al., 2017; Smink et al., 2020). Because local presence reduces ambiguity and cements perceptions in a user's mind, we expect that local presence will also have a positive influence on expected usage congruence. Hence, the following hypothesis was formulated:

Hypothesis 5. *Local presence will positively influence (a) purchase intention and (b) expected usage congruence.*

3.6 | The mediating role of utilitarian benefits and perceived physical tangibility

Hypotheses 4 and 5 establish the importance of plausibility and local presence driven by context on purchase intentions and expected usage congruence. However, to explore the underlying psychological drivers of this linkage, we introduce utilitarian benefits as a mediator connecting the conscious System 2 evaluation of plausibility and expected usage congruence. Utilitarian benefits have been identified as a major driver of consumer judgments and behaviors in this domain (Chitturi et al., 2008; Morgan & Townsend, 2022). Common synonyms for utilitarian benefits in the literature include performance expectancies (e.g., Venkatesh et al., 2012), perceived usefulness (e.g., King & He, 2006), and functional/instrumental benefits (e.g., Schuir & Teuteberg, 2021). Utilitarian benefits are subjective and predominantly cognitive, functional, and instrumental (Chandon et al., 2000), and they allow consumers to conduct tasks or reach goals with greater ease and/or increased effectiveness (Bridges & Florsheim, 2008). Prior AR research suggests that perceiving higher

levels of utilitarian benefits increases consumers' intentions to use AR glasses (Rauschnabel, 2018). Ibáñez-Sánchez et al. (2022) demonstrated that utilitarian benefits increase the satisfaction and intention of consumers to engage in word-of-mouth communication when using AR filters. This complements Kumar et al.'s (2023) meta-analysis showing that utilitarian benefits mediate the relationship between augmentation quality and behavioral intentions in AR. Therefore, we formulated the following:

Hypothesis 6a. *Perceived utilitarian benefits will mediate the relationship between plausibility and expected usage congruence. Specifically, plausibility will increase perceived utilitarian benefits, which in turn will increase expected usage congruence.*

Hypothesis 6b. *Perceived utilitarian benefits will mediate the relationship between local presence and expected usage congruence. Specifically, local presence will increase perceived utilitarian benefits, which in turn will increase expected usage congruence.*

In addition to utilitarian benefits, we argue that more sensory-driven appeals are also important for consumers engaging with AR technology (Heller et al., 2019b). Prior research shows that AR can address the shortcomings of many service encounters that lack true physical tangibility (Heller et al., 2021). Perceived physical tangibility refers to the degree to which the senses can access an object (Laroche et al., 2001; Mazaheri et al., 2014). In an AR context, this relates to the haptic properties of products and the extent to which consumers feel that products and services can be touched (Wirtz et al., 2021). Drawing on these insights, we argue that local presence increases the perceived physical tangibility of consumers engaging with AR applications. Furthermore, prior research has shown that perceived physical tangibility positively influences consumers' attitudes toward online stores and services (Mazaheri et al., 2014), and we expect that a similar positive effect for perceived physical tangibility will also occur for expected usage congruence. While prior AR research has often contrasted utilitarian benefits with hedonic benefits (Flavián et al., 2021b; Gatter et al., 2022; Ibáñez-Sánchez et al., 2022), we argue that perceived physical tangibility represents a more focused mediator than the very broad umbrella concept of hedonic benefits. Gatter et al. (2022) explored the need for touch in an AR context and found that tangibility impacts both product attitudes and purchase intentions, highlighting the importance of touch and tangibility in the consumption process. Because consumers are unlikely to purchase products that are incongruent with their instrumental needs and/or desired symbolic value, we posit that perceived physical tangibility mediates the link between local presence and expected usage congruence. Therefore, the following hypotheses were formulated:

Hypothesis 7a. *Perceived physical tangibility will mediate the relationship between local presence and expected usage congruence. Specifically, local presence will increase perceived physical tangibility, which in turn will increase expected usage congruence.*

Hypothesis 7b. *Perceived physical tangibility will mediate the relationship between plausibility and expected usage congruence. Specifically, plausibility will increase perceived physical tangibility, which in turn will increase expected usage congruence.*

The above hypotheses reflect a thinking fast and slow perspective on AR processing (Kahneman, 2011). Drawing on these insights, we posit that cognitive (System 2) assessments (such as plausibility judgments) and spontaneous (System 1) intuitions (such as perceived local presence) complement each other. While each path is uniquely defined, the holistic outcome (in this case, expected usage congruence) is driven by a combination of both types of thinking. Figure 2 shows our theoretical framework, including the hypotheses, for Study 1 (using the IKEA AR app) and Study 2 (using the Sage AR app).

4 | PRETEST FOR CONTEXT MANIPULATION

To assess the context manipulation in the main studies, we conducted a pretest among 118 German undergraduate students. We asked them to rate how typical the products used in the studies (Study 1: sofa; Study 2: kettle) were for various contexts on a 7-point scale (ranging from 1 = "very untypical" to 7 = "very typical"). For each product, we conducted paired *t*-tests to compare the means. As expected, the sofa received a significantly higher score (M = 6.80; SD = 0.80) for the living room/living area in a dorm than for all other contexts (green space on campus: M = 1.73; SD = 1.01; kitchen: M = 2.22; SD = 1.19; in the street: M = 1.70; SD = 0.99; all $p < 0.001$), indicating an effective manipulation for Study 1. Furthermore, the kettle received significantly higher scores for the kitchen (M = 6.86, SD = 0.67) than for the other contexts (living room/living area in a dorm: M = 3.58; SD = 1.69; green space on campus: M = 1.25; SD = 0.83; in the street: M = 1.29; SD = 0.81; all $p < 0.001$), supporting the effectiveness of Study 2's manipulation.

5 | STUDY 1

5.1 | Objectives and research design

Study 1 tested the meditating effect of plausibility and local presence on the relationship between context and purchase intention. A total of 99 students at a university in Germany were invited to participate in a study in early 2022 that asked them to use the *IKEA Place* app to preview the positioning of a sofa. Students were a good fit for this study because students are one of

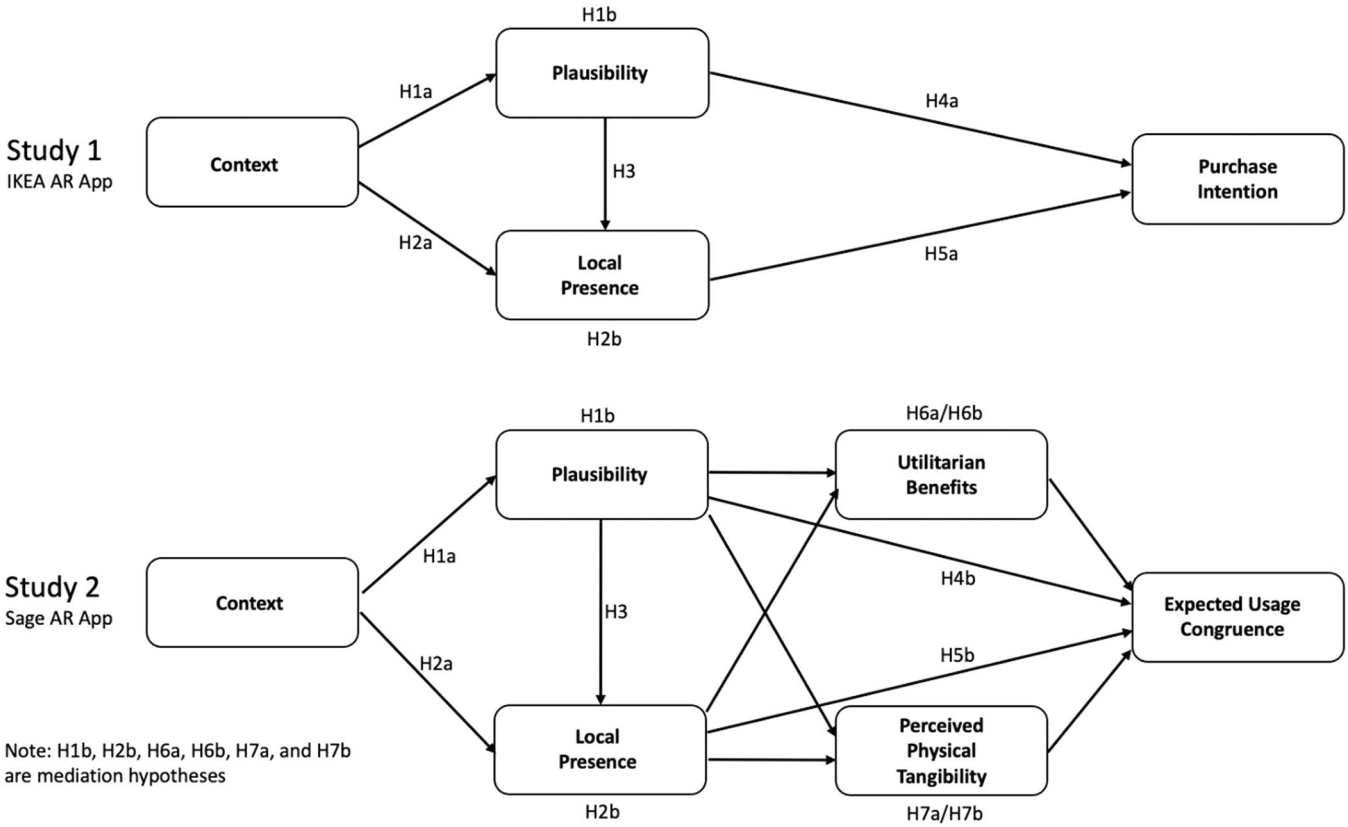

FIGURE 2 Theoretical framework and hypotheses.

the main target segments for IKEA's products, and the *IKEA Place* app has been used in many previous studies with students (e.g., Alimamy & Gnoth, 2022; Kowalczuk et al., 2021). Furthermore, IKEA has a strong market presence in Germany, both through online shopping and physical stores (one in the immediate vicinity of the university). We manipulated the context by contacting students at different locations in their dormitories (a typical location for the target product) and in various other locations on campus (i.e., atypical locations for the target product). Respondents used the AR *IKEA Place* app on a research assistant's iPad before completing an online questionnaire. Nineteen respondents failed the attention check questions and were removed from the data set. The final sample included 80 respondents (22.5% female, mean age = 24.49 years, SD = 3.49). A total of 42 students participated in their dormitory rooms, and 38 participated at a location on campus. This sample size conformed to a common heuristic guideline for experimental designs, which recommended a minimum of 30 participants per cell (Stoner et al., 2022). We measured plausibility with three items adapted from Canter et al. (2003) and Desai and Keller (2002). Local presence was measured with four items from Schein et al. (2022), and purchase intention was measured with two items based on Verhagen et al. (2014). All items were based on univariate reflective (as opposed to formative) measurement models, which implies that the items represent the underlying construct rather than forming it (Diamantopoulos & Winklhofer, 2001). Following established guidelines in the literature (cf. Casalegno et al., 2022), items were translated into German, and the items were then back-translated by researchers fluent in both English and German; the back translations were compared with the originals to ensure proper translation was performed.

Before hypothesis testing, we assessed the factor structure, reliability, and validity of our scales at both the global and local levels (i.e., for each construct). As shown in Web Appendix C, the composite reliability (CR) was above 0.7 and the average variance extracted (AVE) was above 0.5 for all scales, indicating good reliability and convergent validity for our constructs (Bagozzi & Yi, 1988, 2012). All inter-construct correlations were smaller than the corresponding square root values of AVE, and discriminant validity based on the Fornell–Larcker criterion was achieved (Fornell & Larcker, 1981). We also conducted a heterotrait-monotrait (HTMT) test, which showed that all the HTMT values remained below both the commonly used $HTMT_{0.85}$ and the $HTMT_{0.90}$ criterion (Henseler et al., 2015; Voorhees et al., 2016). Thus, discriminant validity according to the HTMT criterion was achieved. Based on these tests, we concluded that the measurement model was reliable and valid. All items, references, psychometric properties, descriptive statistics, and a correlation matrix are displayed in the Web Appendix C.

5.2 | Results

To test the proposed relationships, we applied covariance-based structural equation modeling in Mplus using a maximum likelihood estimator (Muthén & Muthén, 2017). Before assessing the proposed relationships, we began with an assessment of the overall model fit. The results indicated a nonsignificant χ^2 value ($\chi^2 = 29.2$; df = 31; $p = 0.557$) with an excellent χ^2/df ratio (χ^2/df = 0.94). The Tucker-Lewis- Index (TLI = 1.0), comparative fit index (CFI = 1.0), root mean square error of approximation (RMSEA = 0.000), and standardized root mean square residual values (SRMR = 0.033) indicated an overall excellent model fit (Bagozzi & Yi, 2012). We then examined the standardized beta coefficients to evaluate the hypotheses.

Consistent with H1a, the results showed a positive effect of context on plausibility ($\beta = 0.356$; $p = 0.001$). To formally test for mediation (H1b), we followed the recommendations in the mediation literature (e.g., Hayes, 2022) and estimated the indirect effect using a bootstrapping procedure with 10,000 replication samples. We then examined the magnitude ($b_{ind} = 0.230$) and confidence intervals (CIs) ($95\%_{low} = 0.067$; $95\%_{high} = 0.523$) of the unstandardized indirect effect. Because the CI did not cross zero, mediation was established, supporting H1b.

We used the same procedure to test the mediating effect of local presence, as suggested in H2. Our findings revealed significant direct effects of context on the local presence ($\beta = -0.352$; $p < 0.001$). Hence, contrary to our expectation, the effect of context on local presence was negative; thus, H2a was rejected. The mediation analyses confirmed a negative indirect effect ($b_{ind} = -0.394$; CI: $95\%_{low} = -0.819$; $95\%_{high} = -0.153$), rejecting H2b. Moreover, and in support of H3, we found a positive effect of plausibility on local presence ($\beta = 0.563$; $p < 0.001$). Finally, in line with H4a and H5a, we found positive effects from plausibility ($\beta = 0.346$; $p = 0.005$) and local presence ($\beta = 0.601$; $p < 0.001$) on purchase intention (Figure 3).

To further assess the robustness of the results, we included control variables (age, gender, and familiarity with AR) in the model. In addition, including a direct effect of context on purchase intention in the model (which was not significant) did not change the results. We also repeated the analyses using a maximum likelihood estimator with robust error terms (multiple linear regression [MLR]) with lower sampling distribution requirements. The conclusions remained the same, indicating the robustness of the results.

5.3 | Discussion of Study 1

Study 1 demonstrated that context influences plausibility and local presence; however, contrary to our expectations, the effect of context on local presence was negative rather than positive. Thus, consumers tend to perceive a virtual target product in a typical location as plausible, yet they do not perceive that the content is "actually here". Importantly, both plausibility and local presence drive purchase intention. In addition, the observed effect of local presence on purchase intentions was stronger than the effect of plausibility on purchase intention (0.60 vs. 0.35). This highlights the importance of context, plausibility, and local presence in driving purchase intention. However, Study 1 did not show how and why local presence and plausibility influence consumer responses. Study 2 built upon Study 1 and addressed these shortcomings by exploring both potential mediators and the construct of expected usage congruence. In addition, students (as used in this study) are a relevant informant group, as many of them recently faced situations similar to our scenarios when they set up their dorm rooms. Furthermore, students are often early adopters of new technologies and display increased aptitudes for innovative methods of digital consumption (Rice & Pearce, 2015). However, because Study 1 utilized a homogeneous sample, Study 2 was conducted with a more diverse sample to increase the ability to generalize the results.

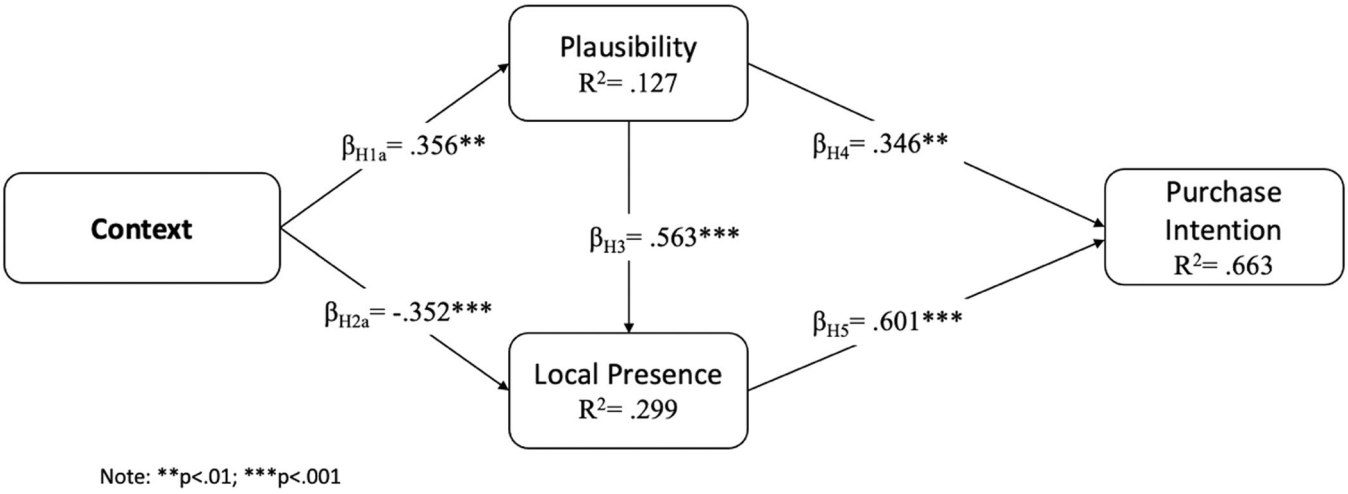

FIGURE 3 Results of Study 1.

6 | STUDY 2

6.1 | Objectives and research design

Study 2 aimed to confirm and extend the results of Study 1 by exploring the drivers of perceptions of expected usage congruence. Expected usage congruence can be described as the degree to which users perceive that a product (in this case, an electric kettle) fits into their physical environment (here, the user's kitchen). We chose expected usage congruence as the outcome variable for two reasons. First, not all consumers may be willing to purchase a particular item simply based on a first impression derived from using an AR app, and therefore, an evaluation of the product may reflect the underlying psychological mechanisms more adequately than purchase intentions. Second, expected usage congruence is more appropriate than attitudes toward a product because consumers may like a specific product, but they may still think that it would not work well in their physical environment.

To further increase the generalizability of our results, we also chose a different product category and data collection method for Study 2. We used an electric kettle as the focal product because this product is an item present in most European households, and the use of this product is typically limited to specific areas (e.g., the kitchen). Moreover, several retailers (e.g., Amazon, IKEA, etc.) have already used AR apps in marketing communications to promote household goods. We chose the Sage AR app for Apple's iOS[2] because it offers high-quality content and an intuitive user interface.

Respondents were recruited through a commercial, ISO-certified online access panel in 2022. Following previous research (Gatter et al., 2022; Zanger et al., 2022), we limited the sample to iPhone users to ensure greater consistency, as Android-based AR apps may vary in their representation of virtual objects depending on the device and tracking technology. We manipulated the context by asking respondents in the invitation email to go to a specific location (kitchen, living room, or workspace), use the AR app, search for a specific kettle in the app, take several screenshots of how they used the app, return to the email, and complete the questionnaire. This procedure followed the recommendations described by Gatter et al. (2022) and Zanger et al. (2022).

To assess the quality of the data, we included attention checks and asked respondents to upload a screenshot showing how they used the app. Respondents who did not follow the instructions (e.g., uploaded a random photo or did not use the app in the correct location) were excluded. The final sample included 264 German-speaking respondents with a wide range of demographic characteristics (45.8% female; mean age = 43 years, SD = 13; 5% students, 5% managers, 67% employees, and 24% other). We used the same measures for local presence and plausibility as in Study 1. In addition, we measured perceived physical tangibility with two items from Verhagen et al. (2014), perceived utilitarian benefits with three items from Venkatesh et al. (2012), and expected usage congruence with three items based on McDonagh et al. (2002). The evaluation of the measurement model using confirmatory factor analysis and tests of discriminant validity (Fornell–Larcker and HTMT) indicated satisfying properties of our measurement scales (cf. Web Appendix for details).

[2]https://apps.apple.com/de/app/sage-ar/id1471935095.

6.2 | Results

We modeled the proposed relationships as a covariance-based structural equation model in Mplus. An inspection of common fit indices ($\chi^2 = 200.18$; df = 95; $p < 0.001$; $\chi^2/df = 2.11$; CFI = 0.976; Tucker–Lewis index = 0.970; RMSEA = 0.065; SRMR = 0.035) indicated a very good model fit (Bagozzi & Yi, 2012).

As in Study 1, context positively impacted plausibility ($\beta = 0.140$; $p = 0.014$) and negatively impacted local presence ($\beta = -0.179$; $p = 0.001$). Furthermore, plausibility had a positive impact on local presence ($\beta = 0.613$; $p < 0.001$), hence replicating the findings from Study 1. The results also indicated significant effects from plausibility ($\beta = 0.492$; $p < 0.001$) and local presence ($\beta = 0.426$; $p < 0.001$) to utilitarian benefits. In addition, we found a significant direct effect for local presence ($\beta = 0.853$; $p < 0.001$), but not for plausibility ($\beta = -0.066$; $p = 0.341$) on perceived physical tangibility.

Finally, we assessed the drivers of expected usage congruence. Here, utilitarian benefits ($\beta = 0.466$; $p < 0.001$) and local presence ($\beta = 0.237$; $p = 0.001$) both displayed significant effects. As in Study 1, we conducted additional analyses in which we added control variables, such as age, gender, and familiarity with AR, with no change. Furthermore, we re-estimated the models using an alternative estimation algorithm (MLR). We also estimated a revised model with a direct effect of context on utilitarian benefits, however, this effect was not significant. These analyses replicated the findings displayed above, indicating their robustness (Figure 4).

6.3 | Additional analyses

To better understand the effects of plausibility and local presence on expected usage congruence, we assessed several indirect (i.e., mediating) effects, and we also calculated total effects. More specifically, and in line with our hypothesis development, we expected that plausibility represents a more "cognitive" construct and thus should be particularly relevant for utilitarian benefits. In contrast, local presence enables fluid experiences (in line with Gatter et al., 2022), and we, therefore, expected it to trigger a hedonically associated perception of physical tangibility. Table 1 lists the corresponding unstandardized total effects of plausibility and local presence on utilitarian benefits and perceived physical tangibility. We also estimated the 95% bias-corrected bootstrapping intervals based on 10,000 resamples for these estimates, and these differences were statistically significant if the CIs did not overlap.

The results show that plausibility has a stronger effect on utilitarian benefits than local presence (0.766 vs. 0.433), and local

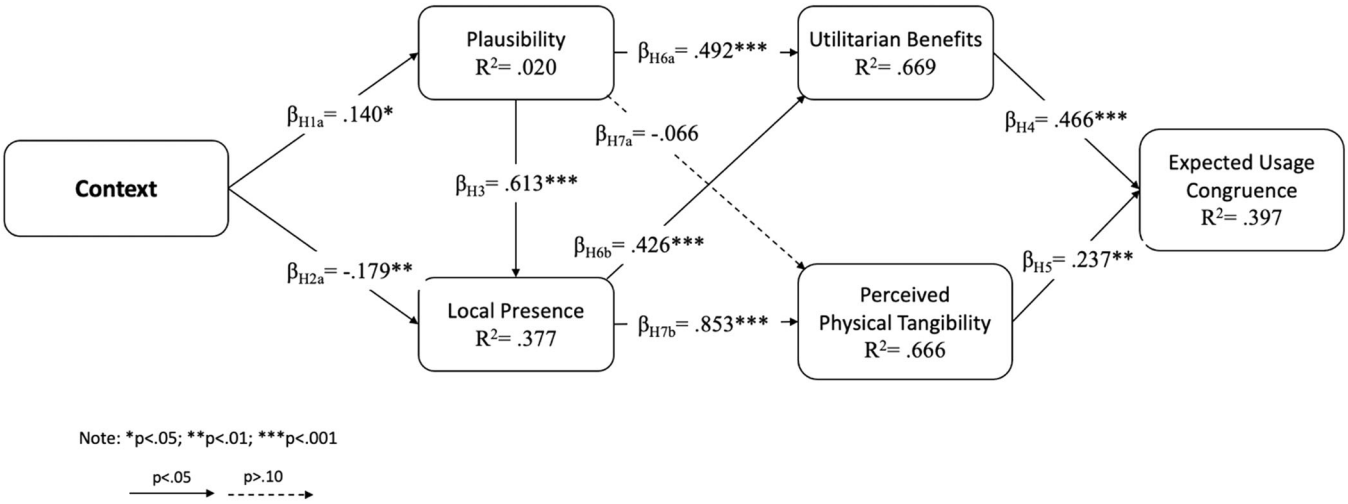

FIGURE 4 Results from Study 2.

TABLE 1 Total effects of plausibility and local presence (unstandardized effects).

From/to	Utilitarian benefits	Perceived physical tangibility
Plausibility	0.766 [0.640; 0.890]	0.506 [0.367; 0.653]
Local presence	0.433 [0.299; 0.566]	0.944 [0.756; 1.135]

Note: Total effects represent the sum of the direct and indirect effects. For example, the total unstandardized effect of plausibility on utilitarian benefits includes a direct effect ($b_0 = 0.501$) and an indirect effect through local presence ($b_1 = 0.613$; $b_2 = 0.433$; $b_1 \times b_2 = 0.265$; i.e., in sum, $b = 0.766$).

presence has a stronger effect on perceived physical tangibility than plausibility (0.944 vs. 0.506; see Table 1). Likewise, local presence has a stronger effect on perceived physical tangibility than on utilitarian benefits (0.944 vs. 0.433). Plausibility's effect tends to be higher on utilitarian benefits than on perceived physical tangibility (0.766 vs. 0.506); however, here, the 95% CIs overlap. When looking at 90% intervals, the overlap disappears, indicating a significant difference with a less conservative criterion. This analysis aligns with the hypothesis suggesting that plausibility is a more cognitive System 2 judgment, which is more aligned with utilitarian benefits. In contrast, local presence is more emotionally driven, and in line with System 1 thinking, perceived physical tangibility is more strongly influenced by this variable.

6.4 | Discussion of Study 2

Study 2 provides additional empirical evidence for the effects found in Study 1 as context increases plausibility and decreases local presence. Furthermore, an increase in local presence leads to higher levels of utilitarian benefits and higher levels of perceived physical tangibility, whereas plausibility tends to only affect utilitarian benefits. This suggests that plausibility indeed represents a more cognitive assessment, whereas local presence may include both cognitive and affective evaluations. Even though the nonsignificant path from plausibility to perceived physical tangibility did not support our initial prediction for this relationship (H7b), this finding is congruent with insights from the extant literature on plausibility, which contends that plausibility is based on a cognitively driven evaluation of logical coherence (Busselle & Bilandzic, 2008; Connell & Keane, 2006) rather than a construct relating to sensory input, such as perceived tangibility.

7 | GENERAL DISCUSSION

The use of AR in marketing has gained increased attention over the years, and its impact is expected to increase substantially in the near future. While prior research has made important contributions toward understanding the impact of consumers' evaluations of content factors, this study supplements the extant literature by investigating the physical context in which AR is consumed.

Across two studies using different products, samples, and models, we showed that consuming AR in a physical location that is typical for a virtual AR target product leads to an increase in plausibility and a decrease in local presence. In other words, while a typical location for a virtual product is perceived as more plausible, consumers also tend to perceive content as not really being "here". A potential explanation for this counterintuitive finding is that in situations with a context consisting of a typical location for the product, consumers can make realistic comparisons with actual physical products in their immediate environment. In a situation with an atypical location for the product, such comparisons are often not possible (e.g., when viewing a virtual sofa on an AR app on a university campus walkway, similar pieces of furniture for comparison are usually not present). The requirements for a realistic representation of the product are

far higher in a product's typical location than in an atypical location. Moreover, evaluating a virtual representation of a product in a typical location likely engages System 1 thinking, which is much faster and entails fewer restraints than System 2 thinking. This may result in the detection of inconsistencies that may be interpreted as signs of inauthenticity. However, a conceptual mismatch between product type and physical location may elevate cognitive elaboration (Heckler & Childers, 1992; Hoegg et al., 2010; Mandler, 1982), which may positively affect product assessments and purchase intentions. The cognitive focus engaged through System 2 may cause the user to either ignore or explain inconsistencies that might be considered red flags if processed using System 1 thinking.

While the current research represents the first study of context with respect to AR in the marketing domain, our results can be influential in the interpretation of a number of extant studies in this field. Perhaps the most significant takeaway from this research is that the context in which AR is being consumed matters, and context should be measured in AR experiments for its potential use as a control variable. Second, our research focused on how context drives important outcomes, but it might also interact with other variables to drive alternative outcomes. For example, Brannon Barhorst et al. (2021) examined the influence of flow on the AR experience. Context impacts perceptions of flow, potentially in a counterintuitive way. Our results suggest that a flow condition while using an AR product might occur more frequently in a divergent context than when consumed in a context that matches typical product use. In a similar vein, Barta et al. (2023) examined cognitive load in the AR experience. Our studies counterintuitively suggest that matching context with augmented content might backfire, as realism may present a higher bar to clear in these situations.

Our findings are particularly important in industries where the place of use is fixed. For example, some applications in the tourism and hospitality industries are designed to augment specific physical locations or backgrounds (He et al., 2018; Orús et al., 2021; tom Dieck & Jung, 2018). Applications attempting to augment tourism destinations with related virtual content may face challenges in terms of perceived presence when compared to applications that conceptually disjoint augmented content and context. In these instances, the question may revolve around whether augmenting the physical environment is the most appropriate approach when compared to a purely virtual representation (Hilken, Chylinski, et al., 2022). This question is especially applicable to the emergence of XR as a burgeoning research domain (Rauschnabel, Felix, et al., 2022).

7.1 | Theoretical contribution

First, our study contributes to the emerging AR literature in marketing, retailing, and related fields. Prior research has investigated consumers' evaluations of AR content and the extent to which consumers feel that content is adequately embedded in the physical environment. Most studies have focused more on how "well" (i.e., realistic) AR content has been integrated and probed technical augmentation qualities from a user perspective (e.g., Hilken, Chylinski, et al., 2022; Javornik, 2016; Rauschnabel et al., 2019; Schein et al., 2022; Smink et al., 2020). For instance, shadows or sound effects may indicate a higher quality of augmentation, whereas two-dimensional (2D) content may lead to evaluations of the content as unrealistic. The current article extends prior research by assessing the impact of the physical consumption context in which AR content is consumed. Specifically, our research focuses on the location of a focal product (e.g., a sofa or kitchen table) when compared to the physical environment (e.g., being in a living room vs. being in a park or at the mall when using the AR app). Hence, the current research addresses Stremersch et al's (2023) recent call to consider the context in consumer and marketing research.

Second, there has been an increasing interest in the role of local presence (Y. Chen & Lin, 2022; Lavoye et al., 2021; Rauschnabel, Felix, et al., 2022; Schein et al., 2022; Spangenberger et al., 2022) and related constructs (e.g., Daassi & Debbabi, 2021; Javornik, Marder, et al., 2021; Tussyadiah et al., 2018). However, these studies typically assessed how the evaluation of the augmentation impacts various outcomes, such as hedonic benefits (Rauschnabel et al., 2019), flow (Javornik, 2016), and attitudes (Daassi & Debbabi, 2021). Rauschnabel, Felix, et al. (2022) conceptualized—but did not empirically test—several content factors that may determine local presence. Hilken et al. (2017) manipulated AR (vs. non-AR) by changing simulated physical control (i.e., allowing consumers to perform natural movements to adjust virtual products) and showed its influence on local presence. Furthermore, Schein et al. (2022) found three content qualities—design, interaction, and embeddedness—that affect local presence. The current research adds to this literature by showing that local presence has a stronger effect on emotionally driven variables that are processed using System 1, such as perceived physical tangibility, as compared to more cognitive variables that are processed with System 2.

Third, the concept of plausibility has received attention in the VR literature (e.g., Slater, 2009), whereas it remains under-researched in AR. In the current study, we show that plausibility can have a substantial impact on consumers' AR experiences and managerially relevant downstream variables. In particular, our research demonstrates that plausibility triggers more cognitive downstream consequences, as shown in Study 2.

Fourth, we propose that expected usage congruence is a relevant construct for AR research. Prior studies have mostly focused on purchase intentions (e.g., Smink et al., 2020; Whang et al., 2021; Yim et al., 2017; Zanger et al., 2022) and, to a lesser extent, actual purchase behaviors (e.g., Tan et al., 2022). Modeling consumer behavior by studying actual sales provides externally validated insights, yet it often does not illuminate the underlying mechanisms driving these variables. In contrast, studying behavioral intentions may not reflect actual behaviors, especially if consumers—in an experimental setting—may not have an actual desire or the resources

needed to purchase a product. Hence, our research complements prior studies by assessing both purchase intention and expected usage congruence. This construct differs from current measurement practices by focusing on the evaluation of a product in a context where it might be used in the future—independent of a respondent's actual purchase plans.

7.2 | Managerial implications

Our findings show that when marketers focus on AR content to be used in a specific situation, they should pay particular attention to the effects that context might have on plausibility and local presence. First, if a firm has reason to believe that high levels of perceived plausibility or local presence will facilitate its goals for the AR app, it might direct users to the best place to use the app (e.g., in the living room, outdoors, etc.). For example, because plausibility relates to a more rational and deliberate assessment of AR content and local presence is driven by intuition and feelings (Hofer et al., 2020), companies may try to increase plausibility for products with more utilitarian benefits, whereas they should focus on local presence for more hedonic products.

Furthermore, because marketers cannot fully control the specific physical surroundings in which consumers use AR apps, they may employ additional strategies for increasing local presence that are independent of the context. For example, AR content should be realistically designed, and the level of detail should be maximized (Rauschnabel, Felix, et al., 2022; Schein et al., 2022). This includes not only the graphics but also how AR content reacts to user commands and the methods of embedding augmented content in the physical environment. Hence, managers should define the minimum technological requirements for their AR apps. However, it is important to note that such decisions should not be made without considering other factors, such as the devices (e.g., smartphones vs. tablets or laptops) typically owned by a brand's target group.

7.3 | Limitations and future research

As with any research, this study has specific limitations that future research may address. The focus of this research was to assess the effect of usage context on psychological outcomes—in particular, local presence and plausibility. In both studies, we identified similar patterns of context for these psychological constructs central to AR. Furthermore, by studying their role as mediators, we show how these psychological variables drive further evaluations (Study 2) and intentions (Study 1). Since the current research establishes the role of context in the consumption of AR, future studies should address the degree to which these relationships extend to actual behaviors to increase the managerial relevance of our findings. As previous research has shown a positive relationship between AR and actual purchases (e.g. Tan et al., 2022) and other research has found similar effects between AR and both purchase intentions and actual purchases (e.g. Hilken, Heller, et al., 2022), we expect our effects to extend to actual behavior.

In addition to addressing these limitations, future research can also extend our work. For instance, the current study focuses on the mediating effects of plausibility and local presence on variations in context. Future research could assess the boundary conditions for these effects by investigating how the role of context changes in specific situations and for different consumer characteristics. For example, the physical context might be less relevant for specific products (e.g., a photo camera); furthermore, consumers with analytical versus holistic thinking styles might react differently to the same AR content in different contexts (Hilken, Heller, et al., 2022).

In addition, we call for a broader investigation of shopping behaviors in AR. Especially under the vision of an all-encompassing "metaverse", it is highly likely that AR will become a ubiquitous and omnipresent tool for consumers. We expect that consumers will constantly fluctuate between online and offline and between AR and VR (Dwivedi et al., 2022). Thus, AR content might—and most likely will—go beyond a brand's products and include any content relevant to audiences, including branded and nonbranded information. Furthermore, while the focus of the current research is on AR, we acknowledge that VR, although different, has a similar potential in engaging consumers. Although VR is based on telepresence rather than local presence (Rauschnabel, Felix, et al., 2022), future research should explore whether similar relationships hold in VR apps. For instance, researchers could investigate the extent to which the context of an individual 3D model of one's kitchen in VR may affect plausibility and telepresence.

Finally, the current research complements the extant research on congruence and consistency in the digital domain. For example, Javornik, Marder, et al. (2021) found that AR can affect a user's self-concept. While our studies do not address self-concept directly, they do explore elements in the surrounding context that users largely control (e.g., furniture) that can be used to both communicate and inform self-concept (Belk, 1988). More recent studies suggest that digital domains are influential in the formation of self-concept (Belk, 2013), and our findings, which shed light on the process of attitude formation in these domains, may also apply to how conceptions of self are formed. Humans seek consistency and congruence in their sense-making activities, and it is no surprise that these matter in a digital world where "reality" is exceptionally fluid.

In a similar vein, Barta et al. (2023) explored how AR can be used to reduce cognitive dissonance and increase purchase intention. Theoretically, AR can reduce the inconsistency that drives cognitive dissonance by allowing for a more realistic experience with a product than would be experienced in a typical online shopping experience. While our results did not explore cognitive dissonance directly, context is almost certainly influential in driving perceptions that can either align or conflict with an individual's core beliefs. As such, our findings on the influence of context in the process of behavioral intentions will likely translate to dissonance perceptions, and this should be explored in future research.

8 | GENERAL CONCLUSION

AR is powerful because it combines digital content with the real world. This research shows that the physical context in which AR is consumed affects the overall AR experience, although these "context effects" are not as simple as one might think. Going forward, we hope that this research will inspire academics and industry professionals to incorporate context into their work as a variable in research studies or as an element in their applications.

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DATA AVAILABILITY STATEMENT

Data are available on request.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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APPENDIX A: CONSTRUCT DEFINITIONS

Table A1

TABLE A1 Construct definitions, examples, and relationships with prior marketing research.

Construct label	Definition	Example	Source
Context	The place or location where one uses AR. It includes the behavioral appropriateness as well as personal and cultural expectations associated with this location.	A kitchen is a room in a house with a dedicated purpose and is equipped to perform certain tasks. It has a shared cultural and social meaning. This creates a special context in which an AR application can be used.	Hilken et al. (2017); Schmidt et al. (1999)
Plausibility	The coherence between and among virtual objects and the physical environment.	High plausibility: Inspecting a virtual couch in a living room seems logical because a user is used to sofas in a living room. Low plausibility: Inspecting a couch in a subway train seems illogical because one would not expect a sofa there.	Connell and Keane (2006); Desai and Keller (2002); Slater (2009); Skarbez et al. (2021)
Local presence	The degree to which consumers experience AR objects as being actually present in their own physical environment.	High LP: A user perceives virtual objects as being actually "here". Low LP: A user perceives virtual objects disconnected from the physical environment.	Verhagen et al. (2014); Rauschnabel, Babin, et al. (2022); Rauschnabel, Felix, et al. (2022); Schein et al. (2022)
Utilitarian benefits	The degree to which using a technology will provide benefits to consumers in performing certain activities.	Using an appropriately sized AR representation of a couch to predict performance attributes of the product in a living room.	Ibáñez-Sánchez et al. (2022); Morgan and Townsend (2022); Venkatesh et al. (2012)
Perceived physical tangibility	The degree to which the senses can access an object.	The representations of virtual objects in an AR store appear so compelling that consumers feel they can actually manipulate them.	Laroche et al. (2005); Mazaheri et al. (2014); Verhagen et al., (2014)
Expected usage congruence	The extent to which consumers perceive that a product, displayed through AR, harmonizes with the physical environment.	Product attributes (such as the size and color of a virtual couch) harmonize with the user's living room.	McDonagh et al. (2002)