

# From Novelty to Inclusion: How AR Shapes Gendered Consumer Outcomes and Public Value in Egypt

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## Abstract

*This study examines how three core attributes of augmented reality (AR)—interactivity, vividness, and novelty—impact consumer purchase intention in the context of Egypt’s growing digital marketplace, while also considering gender as a moderating factor. Drawing on Uses and Gratifications Theory (UGT), the study conceptualizes AR as a technology that simultaneously fulfills utilitarian and hedonic needs, providing consumers with functional support, immersive experiences, and stimulation through innovation. Data were collected from 200 Egyptian online shoppers with prior AR experience, and the hypothesized model was tested using Partial Least Squares Structural Equation Modeling. The findings reveal that all three AR features significantly enhance purchase intention, with novelty emerging as the strongest predictor of this effect. Moreover, gender moderated the effects of interactivity and novelty, with male consumers responding more strongly to these attributes, while vividness influenced both genders equally. Theoretically, the research extends UGT by highlighting how gratifications derived from AR are contingent on demographic characteristics and contextual factors, particularly within an emerging economy. Practically, the study underscores AR’s potential not only as a strategic retail tool but also as a driver of digital inclusion, offering guidance for businesses, policymakers, and nonprofit organizations seeking to design equitable, engaging, and confidence-building AR experiences for diverse consumer groups.*

**Keywords:** Augmented Reality, Purchase Intention, Uses and Gratification Theory, Gender Moderation, Online Retail, Egypt, AR characteristics

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## INTRODUCTION

Digital technologies are reshaping retail by transforming how consumers search for, evaluate, and purchase products. Among these innovations, AR has emerged as a powerful tool that enriches shopping experiences by merging digital information with physical environments. Unlike conventional e-commerce, AR allows consumers to visualize products in their own context, reducing uncertainty and enhancing both enjoyment and decision confidence. Global retailers such as IKEA and L’Oréal have already reported success in leveraging AR to increase engagement, trust, and sales conversion. Nevertheless, despite this growing momentum, AR adoption and its consumer impact remain uneven across countries, particularly between developed and emerging markets.

Existing studies on AR adoption and consumer behavior have primarily focused on technologically advanced economies, where digital infrastructure, consumer readiness, and organizational resources are relatively robust. These findings may not be directly applicable to developing contexts, where infrastructural limitations, cost sensitivity, and cultural dynamics influence both retailer adoption and consumer responses. Moreover, although prior research emphasizes AR’s ability to enhance decision-making and create immersive experiences, much less attention has been paid to how demographic factors condition these effects. Gender represents a critical yet underexplored moderator in AR research. Evidence from consumer behavior studies suggests that men and women differ in their responses to novelty, interactivity, and risk when shopping online; however, little is known about how these differences operate in AR-enabled retail environments, particularly in emerging markets where digital transformation is still in its early stages.

To address these gaps, the present study applies UGT as a guiding framework. UGT posits that individuals actively engage with media and technologies to satisfy a variety of informational, functional, and hedonic needs. This makes it particularly suitable for studying AR, which is both a decision-support tool and a

source of enjoyment, novelty, and emotional engagement. By conceptualizing AR as a technology that fulfills both utilitarian and hedonic gratifications, UGT helps explain why consumers adopt it, and how gratifications may differ across demographic groups. Applying this lens in a developing market context provides an opportunity to advance theory while also generating practical insights into how AR can be more inclusively designed and implemented.

The objective of this study is to examine how three key AR characteristics—interactivity, vividness, and novelty—influence purchase intention among Egyptian online consumers, and to assess whether gender moderates these relationships. Egypt presents a compelling setting for this investigation: it is the largest consumer market in the Arab world, with a rapidly expanding digital economy; yet AR adoption remains limited and under-researched. By focusing on this context, the study makes a significant contribution to AR and digital retail literature in three main ways. First, it offers empirical evidence from a developing economy, where consumer responses to AR may differ significantly from those in Western markets. Second, it extends UGT by showing how gratifications sought from AR vary not only by technological features but also by demographic characteristics such as gender. Third, it generates actionable insights for retailers and policymakers seeking to promote digital inclusion, enhance consumer confidence, and leverage AR as a strategic tool for engagement and profitability.

## **2. Theoretical Background**

### **2.1 Augmented Reality and the Future of Digital Commerce**

The retail industry has undergone a profound digital transformation in recent years, reshaping both consumer behavior and firm strategies. AR has emerged as one of the most significant innovations, enabling consumers to visualize and interact with products in immersive, real-world contexts. Unlike conventional e-commerce, which often limits sensory engagement and makes it challenging to accurately assess products, AR bridges this gap by allowing consumers to virtually “try on” products, place furniture in their homes, or simulate product usage before making a purchase. Numerous studies have highlighted AR’s ability to enhance decision-making, reduce product uncertainty, and foster enjoyment during the shopping process (Huang & Liao, 2014; Rauschnabel et al., 2022). Additionally, AR applications have been demonstrated to enhance consumer engagement, foster brand attachment, and even reduce product return rates (Bonetti & Quinn, 2017; Ibáñez et al., 2022). These findings suggest that AR is not only a technological add-on but also a strategic marketing tool capable of shaping consumer perceptions and behavior.

Despite this global momentum, the adoption and impact of AR remain uneven across contexts. Most existing research has been conducted in developed markets, where consumers are digitally literate, retailers invest heavily in technological infrastructure, and AR is relatively mainstream in the fashion, cosmetics, and home furnishings sectors (Roxo & Brito, 2018). By contrast, developing economies face unique challenges. Barriers, including infrastructural constraints, low consumer awareness, and cost sensitivity, limit both consumer usage and retailer investment in AR (Nazir, 2019; Yoo, 2022). In Egypt, for instance, AR applications are only beginning to enter mainstream retail, and both businesses and consumers are still in the process of building familiarity with the technology (Negm, 2024). This raises the question of whether insights from developed markets can be generalized to these emerging contexts, where consumer expectations, risk perceptions, and digital readiness may differ substantially. Addressing this gap, the present study focuses on the Egyptian online retail environment, where AR is a novel and underexplored concept. It examines the specific consumer motivations and responses that drive adoption.

### **2.2 Uses and Gratifications Theory (UGT) as Theoretical Lens**

To understand how consumers engage with AR, this study applies UGT as its primary theoretical lens. UGT posits that individuals actively select media and technologies to satisfy their needs, whether cognitive, affective, or social (Katz et al., 1974). Unlike models such as the Technology Acceptance Model (TAM) or the Theory of Planned Behavior (TPB), which primarily explain adoption through perceived usefulness, ease of use, or attitudes, UGT emphasizes the active role of consumers in aligning technology usage with diverse gratifications. This makes UGT particularly well suited to AR, which uniquely blends utilitarian benefits (e.g., decision support, product knowledge) with hedonic benefits (e.g., entertainment, immersion, playfulness).

Research applying UGT to digital technologies shows that consumers derive gratifications such as enjoyment, social connection, identity expression, and curiosity from platforms like mobile apps, social media, and virtual reality (Breves, 2020; Masood & Egger, 2020). AR extends these dynamics by offering interactivity, vivid imagery, and novel experiences, thereby satisfying informational, functional, and

emotional needs simultaneously. For example, consumers may use AR for practical evaluation of fit and function, while also enjoying the novelty and immersion it provides. This dual utility is difficult to capture through TAM or TPB, which often overlook affective and experiential gratifications. By framing AR adoption through UGT, this study provides a richer understanding of the motivations underlying consumer responses to AR-enabled retail, directly linking gratifications to behavioral outcomes such as purchase intention.

### 2.3 Conceptual Model and Hypothesis Development

#### Interactivity

Interactivity refers to the degree of control, responsiveness, and mutual communication afforded to consumers within a mediated environment (Yim et al., 2017). In AR-enabled retail, interactivity is expressed through features that allow users to rotate, manipulate, or customize digital objects, as well as receive real-time feedback in response to their actions. This quality transforms consumers from passive observers into active participants, giving them autonomy over their shopping journey and reinforcing perceptions of agency and control. Unlike traditional e-commerce platforms, where product information is largely static, AR enables dynamic two-way exchanges that mirror the exploratory nature of offline shopping.

From a cognitive perspective, interactivity enhances consumers' ability to test, evaluate, and compare alternatives, thereby reducing perceived risk and uncertainty (Sundar et al., 2015). By offering decision support through interactive trials—such as virtually trying on clothing or visualizing furniture in one's home—AR applications provide diagnostic information that strengthens consumer confidence in their judgments. Affectively, interactivity also fosters enjoyment, curiosity, and deeper engagement, aligning with hedonic gratifications central to UGT. In this sense, AR's interactivity addresses both utilitarian gratifications (e.g., control, problem-solving, decision support) and hedonic gratifications (e.g., playfulness, entertainment, immersion).

Empirical research has consistently highlighted the value of interactivity in digital media. Studies show that interactive features increase consumer satisfaction, strengthen brand attitudes, and drive purchase intentions by fostering a sense of co-creation and involvement (Javornik, 2016; Masood & Egger, 2020). In emerging markets such as Egypt, interactivity may play an even more pronounced role, as consumers are still building trust in online retail systems and often seek reassurance through active engagement with products before committing to a purchase. Based on this reasoning, the following hypothesis is proposed: H1: Interactivity has a positive effect on purchase intention.

#### Vividness

Vividness describes the sensory richness, realism, and level of detail conveyed by mediated environments (Kim et al., 2014). In AR retail contexts, vividness is achieved through lifelike overlays of visual, auditory, and sometimes tactile elements, creating immersive product simulations that closely approximate real-world experiences. Unlike static product photos in traditional e-commerce, vivid AR representations allow consumers to mentally project products into their own environments, bridging the experiential gap between online and offline shopping.

Cognitively, vivid presentations enhance diagnosticity by providing detailed and reliable product information, which facilitates mental imagery, elaboration, and recall (Petrova & Cialdini, 2005). For example, when consumers can visualize furniture in their own living space with accurate scale and texture, uncertainty about fit and aesthetics is reduced, leading to more confident purchase decisions (Javornik, 2016). Affectively, vivid AR environments evoke imagination, pleasure, and enjoyment, stimulating both curiosity and emotional attachment to the brand (Phillips et al., 1995). This dual pathway aligns with UGT, as vividness provides informational gratifications (accurate evaluation and knowledge) alongside experiential gratifications (immersion and enjoyment).

Prior studies consistently demonstrate that vivid AR content enhances consumer engagement, strengthens brand attitudes, and positively influences purchase intentions compared to less immersive media formats (Yoo, 2022; Negm, 2024). In developing markets such as Egypt, where trust in online purchases is often fragile, vividness may be particularly crucial because it reduces perceived risks while simultaneously creating a compelling and emotionally engaging experience. Accordingly, the following hypothesis is proposed:

H2: Vividness has a positive effect on purchase intention.

#### Novelty

Novelty refers to the extent to which technology offers fresh, surprising, and engaging experiences that differ from routine encounters (McLean & Wilson, 2019). In AR retail, novelty manifests in features such

as real-time product customization, immersive storytelling, and dynamic 3D interactions that cannot be replicated in traditional e-commerce. These innovations capture consumer attention, satisfy curiosity, and stimulate exploration, making novelty a powerful determinant of engagement and behavioral intention. The appeal of novelty operates through both hedonic and utilitarian channels. Hedonically, novel AR interactions provide excitement, pleasure, and enjoyment, creating memorable shopping experiences that strengthen consumer-brand relationships (Masood & Egger, 2020). Functionally, novelty also enhances decision-making by presenting unconventional but practical ways to evaluate products—such as dynamic visualizations or gamified product exploration—which improve elaboration, memory, and confidence (Kumar, 2022; Attri et al., 2024). Thus, novelty satisfies UGT's gratifications of entertainment, stimulation, and problem-solving simultaneously.

Empirical studies consistently highlight the positive influence of novelty on technology adoption and purchase intention, showing that consumers are more likely to engage with innovative, surprising, and unique experiences (Rauschnabel et al., 2022). In emerging markets like Egypt, where AR is still relatively unfamiliar, its novelty may exert an amplified effect, as consumers perceive it not only as functional but also as a futuristic and prestigious shopping tool that differentiates retailers from competitors. Based on this reasoning, the following hypothesis is proposed:

H3: Novelty has a positive effect on purchase intention.

#### **2.4 Gender as a Moderating Variable**

While AR characteristics such as interactivity, vividness, and novelty directly influence purchase intention, these effects are unlikely to be uniform across all consumer groups. Gender has long been identified as a critical factor shaping technology adoption behaviors, cognitive processing styles, and motivational orientations (Kanungo & Jain, 2012; Sobarna, 2024). Drawing on Uses and Gratifications Theory (UGT), which emphasizes that media and technology use is goal-directed and shaped by individual needs, gender represents a meaningful lens for understanding how consumers interpret and respond to AR-enabled retail experiences.

Prior research indicates that men are generally more enthusiastic about technological innovations, often deriving gratification from features that emphasize functionality, autonomy, and exploration. Accordingly, AR's interactivity and novelty are expected to resonate more strongly with male consumers, as these features provide opportunities for control, manipulation, experimentation, and stimulation—gratifications traditionally associated with masculine orientations toward technology and playfulness (Sobarna, 2024). Women, in contrast, have been found to place greater emphasis on relational and affective gratifications, valuing emotional engagement, aesthetic richness, and social validation. In this respect, vivid AR environments—offering lifelike product simulations, sensory detail, and immersive experiences—may be particularly appealing to female consumers, as they help reduce uncertainty, foster reassurance, and enhance confidence in purchase decisions (Du et al., 2022; Hoffmann & Mai, 2022).

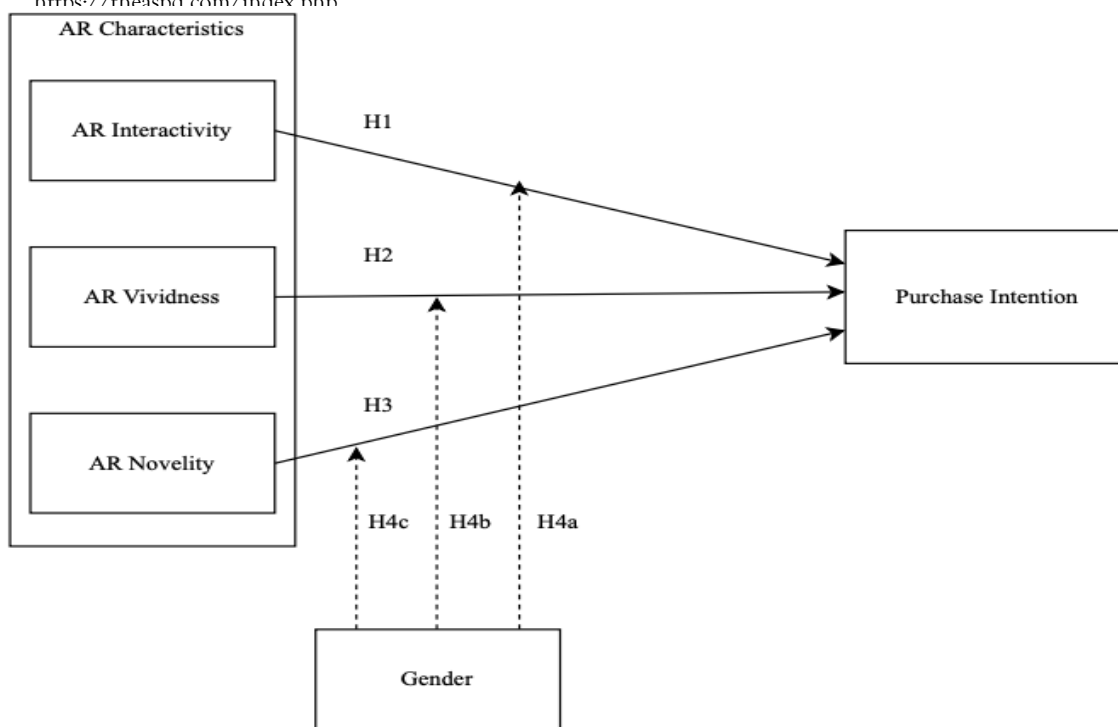
These differences are especially salient in online retail contexts, where women often perceive higher risks in purchasing due to concerns about product quality, seller credibility, and potential dissatisfaction (Kanungo & Jain, 2012). In the Egyptian cultural context, studies suggest that women's online shopping behaviors are influenced by caution, social expectations, and the need for reassurance, whereas men are more likely to experiment with new technologies and prioritize utilitarian benefits such as efficiency, novelty, and control (Negm, 2024; Taha et al., 2023). Thus, AR applications that emphasize vividness may play a greater role in mitigating women's perceived risks, while men may be more strongly motivated by the stimulating, gamified aspects of interactivity and novelty.

From a theoretical perspective, incorporating gender as a moderating variable extends UGT by showing that gratifications are not only shaped by the type of technology used but also filtered through demographic lenses. This approach highlights that AR-driven gratifications are contextually contingent—varying across groups rather than being universally experienced. Practically, this insight highlights the importance of designing gender-sensitive AR retail strategies that strike a balance between exploratory, gamified features and vivid, emotionally engaging simulations, thereby appealing inclusively to diverse consumer segments. Based on these considerations, the following hypotheses are proposed:

**H4a:** Gender moderates the relationship between AR interactivity and purchase intention.

**H4b:** Gender moderates the relationship between AR vividness and purchase intention.

**H4c:** Gender moderates the relationship between AR novelty and purchase intention.



**Figure 1:** Conceptual Framework

This study conceptualizes AR as a technology that integrates both utilitarian and hedonic values, fulfilling consumers’ informational, functional, and emotional needs in retail contexts. Drawing on the UGT, the framework highlights three core AR attributes—interactivity, vividness, and novelty—as key drivers of consumer purchase intention. While AR has been increasingly adopted in global markets, empirical research on its effectiveness in emerging economies such as Egypt remains scarce. Addressing this gap, the current study examines how these AR features influence consumer purchasing decisions in a market where digital transformation is still in its early stages of development. Furthermore, the framework incorporates gender as a moderating variable, recognizing its critical role in shaping technology adoption and consumer responses. By doing so, the study provides a more nuanced understanding of how AR influences purchase intention, offering valuable insights for both theory and practice in the field of digital retailing.

**Table 1:** Summary of Previous Studies on AR and Consumer Behavior

Author	Findings
Negm (2024)	AR enhances utilitarian value through its vividness, interaction, and informativeness, while its interactivity boosts hedonic value, leading to increased purchase intentions.
Yang & Lin (2024)	A comparison of AR-based and traditional media, analyzing functional capabilities and comparing appeal differences, concluded that users are delighted with the improved capabilities of AR-based media. These outperform traditional media in several areas, including media search, virtual design, immersive experience, real-time interaction, and user communication.
Attri et al. (2024)	Findings indicate that vividness, novelty, and interactivity have a significant impact on customers' evaluations of the utilitarian and hedonic value of AR experiences in physical stores. Utilitarian value influenced purchase intention but not continuity, whereas hedonic value influenced both.
Yoo (2023)	According to the research, AR has a positive impact on consumer attitudes, purchase intentions, and satisfaction regarding mobile shopping. Customers viewed AR as a helpful tool for making informed decisions, which in turn increased their sense of control and trust. AR also has the potential to improve consumers' mobile shopping experiences.
Tan et al. (2022)	According to the study, implementing AR in retail environments can enhance consumer satisfaction, increase purchase intent, and improve sales conversion rates.

- Chen & Lin (2022) According to the research, AR and technological fluidity enhance customer flow in AR settings, influencing consumers' purchasing intent.
- Nikhashemi et al. (2021) According to the study, customers' intention to use AR consistently while shopping online was positively influenced by their perception of its utility and enjoyment. The study also emphasizes the importance of businesses offering top-notch AR experience and relevant, interesting information to ensure that customers utilize AR.
- Riar et al. (2021) AR has great potential for in-person and remote (online) commerce because it may evoke hedonistic and utilitarian experiences.
- Whang et al. (2021) In retail, AR experience increases purchase intention, behavioral control, and cognitive control. Cognitive control is the only aspect that increases a customer's intention to buy. Peers' judgments moderate the effect of an AR encounter on cognitive control, affecting purchase intention.
- Watson et al. (2018) The study illustrates how an experienced AR retail application (app) can positively impact purchase intention. The findings indicate that a positive affective response mediates this impact. Additionally, the association between augmentation and the pleasant affective response is moderated by hedonic purchasing incentives.
- Yim et al. (2017) It was discovered that immersion mediates the relationship between interactivity/vividness and two outcome variables: usefulness and enjoyment.
- Poushneh & Vasquez-Parraga (2017) AR-enriched user experience fosters purchase intention and satisfaction.
- Papagianni et al. (2017) A virtual store experience that incorporates both emotional and rational values can positively impact purchase intention, enjoyment, engagement, and overall satisfaction.
- Bilgihan et al. (2016) AR-enriched online platforms that have perceived usability, utility, ease of use, and enjoyment and offer social interaction positively impact consumers' online shopping experience.
- (Papagianni et al., 2013) A virtual store simulation experience can enhance user engagement, enjoyment, and satisfaction.

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### 3. METHODOLOGY

#### 3.1 Sample and Data Collection

Egypt was selected as the research context due to its rapidly expanding digital marketplace and status as the largest consumer market in the Arab world, with over 100 million inhabitants (Kotb & Adel, 2020). Despite the global diffusion of AR in retail, its application in Egypt remains underexplored, offering a suitable setting for theory development. The target population consisted of Egyptian online shoppers with prior experience using AR applications. To ensure ecological validity, three brands known for their active use of AR in retail were introduced as reference points: IKEA (virtual product visualization), Adidas (virtual try-ons), and Hadia Ghaleb (immersive brand experiences).

Data was collected through an online self-administered questionnaire distributed via social media platforms, online retail communities, and university networks between September and November 2024. A screening question ("Have you ever used AR applications from IKEA, Adidas, or Hadia Ghaleb?") ensured only relevant respondents continued. Supporting visuals and descriptions were included to facilitate recall accuracy. Of the 230 initial responses, 200 valid cases were retained after excluding incomplete or ineligible surveys, resulting in a usable rate of 87%. The sample consisted of 66% females and 34% males, with the majority aged 21–35 years (41.5%). Educational attainment was relatively high, with 30.5% holding a bachelor's degree and 23.5% a master's degree.

**Table 2.** Participants' demographic data

Demographics	No. of respondents	Total	%
Gender			
Women	132	200	66
Men	68		34
Age			
Below 15 years	2	200	1
16-20 years	46		23
21-35 years	83		41.5
36-40 years	31		15.5
41-45 years	15	200	7.5
46-50 years	12		6
51-55 years	6		3
56 and above	5		2.5
Level of education			
High school	39		19.5
Diploma	22		11
Bachelor	61	200	30.5
masters	47		23.5
doctorate	31		15.5
Income Level			
less 10k	36		18
10k-20k	34		17
20k-30k	42		21
30k-40k	23	200	11.5
40k-50k	30		15
50k-60k	23		11.5
Above 60k	12		6

Although a non-probability approach was employed, steps were taken to mitigate bias. Respondents were recruited from multiple channels to enhance diversity in socioeconomic background and digital familiarity. In addition, an a priori sample size check using the “10 times rule” in PLS-SEM (Hair et al., 2019) confirmed adequacy: with three predictors of purchase intention, a minimum of 30 cases would be required; our sample of 200 well exceeds this threshold, ensuring sufficient statistical power for model testing.

### 3.2 Measurement

The survey instrument was developed in English, translated into Arabic, and verified using a back-translation procedure (Brislin, 1980) to ensure conceptual equivalence. Two bilingual academic experts reviewed the questionnaire for content validity, and a pilot test with 15 bilingual respondents confirmed clarity and cultural appropriateness.

All constructs were measured using established scales and assessed on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree). Interactivity was measured with four items adapted from Yim et al. (2017). Vividness and novelty were measured using items adapted from McLean and Wilson (2019), while purchase intention was measured with items from Overby and Lee (2006). In total, 18 items captured the latent constructs, supplemented with demographic and screening questions. A complete list of items and their sources is provided in Table 3.

Although many prior AR studies employ seven-point scales, a five-point format was chosen here to increase accessibility for a broader respondent base, including younger and less digitally experienced consumers, which aligns with best practices in emerging market contexts.

**Table 3.** Measurement scales

S.No	Consturct	Source
1	Interactivity	Yim et al. (2017)
2	Vividness	McLean & Wilson (2019)

3	Novelty	McLean & Wilson (2019)
4	Purchas intention	Overby and Lee (2006)

### 3.3 Common Method Bias

Since all variables were measured using self-reports, procedural remedies were applied to reduce common method bias (CMB). Respondents were assured of anonymity and confidentiality; items were randomized; and predictor and criterion blocks were separated within the questionnaire to minimize priming effects. Ex post statistical checks were also conducted. Harman’s single-factor test revealed that the first factor accounted for less than 40% of the variance, below the 50% threshold (Podsakoff & Organ, 1994). In addition, complete collinearity tests in SmartPLS showed that all VIF values were below 3.3 (Kock, 2015), indicating that CMB was not a critical concern in this study.

### 3.4 Data Analysis

Data were analyzed using SmartPLS 4.0, employing Partial Least Squares Structural Equation Modeling (PLS-SEM). This approach is appropriate for theory extension, predictive modeling, and handling relatively small to medium sample sizes in emerging research domains such as AR (Hair et al., 2016).

The analysis proceeded in two stages. First, the measurement model was evaluated by examining indicator reliability (factor loadings), internal consistency reliability (Cronbach’s alpha and composite reliability), convergent validity (average variance extracted, AVE), and discriminant validity (Fornell–Larcker criterion and HTMT). Second, the structural model was assessed to test hypothesized direct and moderating effects. Model quality was further examined using  $R^2$  and adjusted  $R^2$  for explanatory power,  $f^2$  effect sizes, predictive relevance ( $Q^2$ ) through blindfolding, and PLSpredict for out-of-sample predictive validity. Multicollinearity was checked through inner VIF values (<3).

Moderating effects of gender were tested using PLS multi-group analysis (MGA) and interaction modeling. Bootstrapping with 5,000 resamples and two-tailed significance testing was employed to derive path coefficients,  $t$ -values, and bias-corrected confidence intervals. Descriptive statistics, normality checks, and preliminary data screening were conducted in SPSS 27.

## 4. RESULTS

### 4.1 Measurement model: confirmatory factor analysis

Preliminary diagnostics in SPSS indicated no major data quality issues (missing values and outliers were addressed prior to analysis; early-late response comparisons showed no significant differences,  $p > .05$ ). The reflective measurement model (SmartPLS 4) demonstrated strong reliability and validity. As reported in **Table 4**, all standardized loadings exceeded 0.70, Cronbach’s alpha ranged from 0.843 to 0.941, and Composite Reliability (CR) ranged from 0.872 to 0.958, all surpassing the recommended thresholds. Convergent validity was supported with all Average Variance Extracted (AVE) values above .50.

**Table 4.** Item loadings and scale reliability

Construct	Items	Loading	Composite Reliability $\rho_a$	Composite Reliability $\rho_c$	Rho_A	Average Variance Extracted (AVE)	Cronbach's Alpha ( $\alpha$ )
AR Interactivity	IA1	0.839	0.903	0.924	0.900	0.753	0.891
	IA2	0.858					
	IA3	0.932					
	IA4	0.827					

	N1	0.908					
AR Novelty	N2	0.904					
	N3	0.828	0.921	0.928	0.912	0.764	0.898
	N4	0.846					
	V1	0.943					
AR Vividness	V2	0.934					
	V3	0.931	0.959	0.966	0.96	0.851	0.956
	V4	0.883					
	V5	0.918					
	PI1	0.957					
Purchase intention	PI2	0.910					
	PI3	0.952	0.972	0.975		0.885	0.968
	PI4	0.932			0.97		
	PI5	0.948					

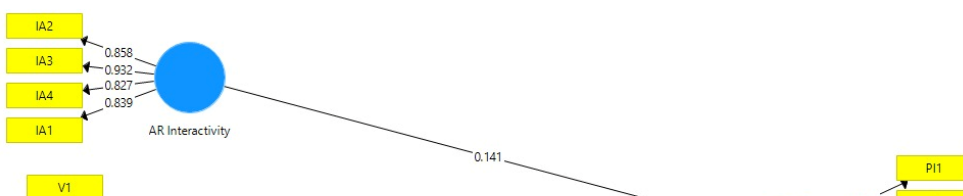
Discriminant validity was confirmed using multiple criteria. First, the Fornell–Larcker criterion showed that the square root of each construct’s AVE was greater than its inter-construct correlations. Second, cross-loadings indicated that each item loaded highest on its intended construct (**Table 5**). Third, HTMT values ranged from 0.416 to 0.820, remaining below the conservative cutoff of 0.85 (**Table 6**). Collinearity diagnostics for indicators and constructs revealed no concerns (all VIFs < 3.0; maximum = 2.314). The complete measurement model is visualized in **Figure 2**.

**Table 5.** Fornell and Larcker cross-loading

	AR Interactivity	AR Novelty	AR Vividness	Purchase intention
AR Interactivity	0.812			
AR Novelty	0.787	0.774		
AR Vividness	0.820	0.814	0.722	
Purchase intention	0.710	0.797	0.729	0.741

**Table 6.** Heterotrait-Monotrait Ratio (HTMT)

	ARI	ARN	ARV	Purchase intention
ARI				
ARN	0.865			
Vividness	0.761	0.864		
Purchase intention	0.749	0.838	0.752	



**Figure 2.** Results from PLS\_SE

#### 4.2 Structural Model

Following measurement validation, the structural model was evaluated. Model explanatory power was satisfactory: **Table 7** reports **R<sup>2</sup>** and **Adjusted R<sup>2</sup>** for Purchase Intention, indicating substantial variance explained by Interactivity, Vividness, and Novelty. Multicollinearity among predictors was not an issue (inner VIFs < 3.0). We used bootstrapping with 5,000 resamples (two-tailed tests; bias-corrected confidence intervals) to test the hypotheses. Results (see **Table 8** and **Figure 3**) show that all three AR attributes positively and significantly influence Purchase Intention, supporting H1–H3: Interactivity → Purchase Intention ( $\beta = 0.480, p < .05$ ), Vividness → Purchase Intention ( $\beta = 0.597, p < .05$ ), and Novelty → Purchase Intention ( $\beta = 0.747, p < .05$ ). To complement significance tests, **Table 8** also reports **f<sup>2</sup>** effect sizes (small = .02, medium = .15, large = .35) and **Q<sup>2</sup>** (blindfolding) for predictive relevance; values > 0 support predictive utility.

**Table 7.** Model estimations

Model summary <sup>b</sup>					
Model	R	R-squared	Adjusted R-squared	Std. error of estimate	Durbin-Watson
1	0.831	0.691	0.637	0.421	1.88

Note: a. Predictors: (constant), IV, VV, PU, NOV. b. Dependent variable: PI

**Table 8.** Path analysis and hypothesis testing

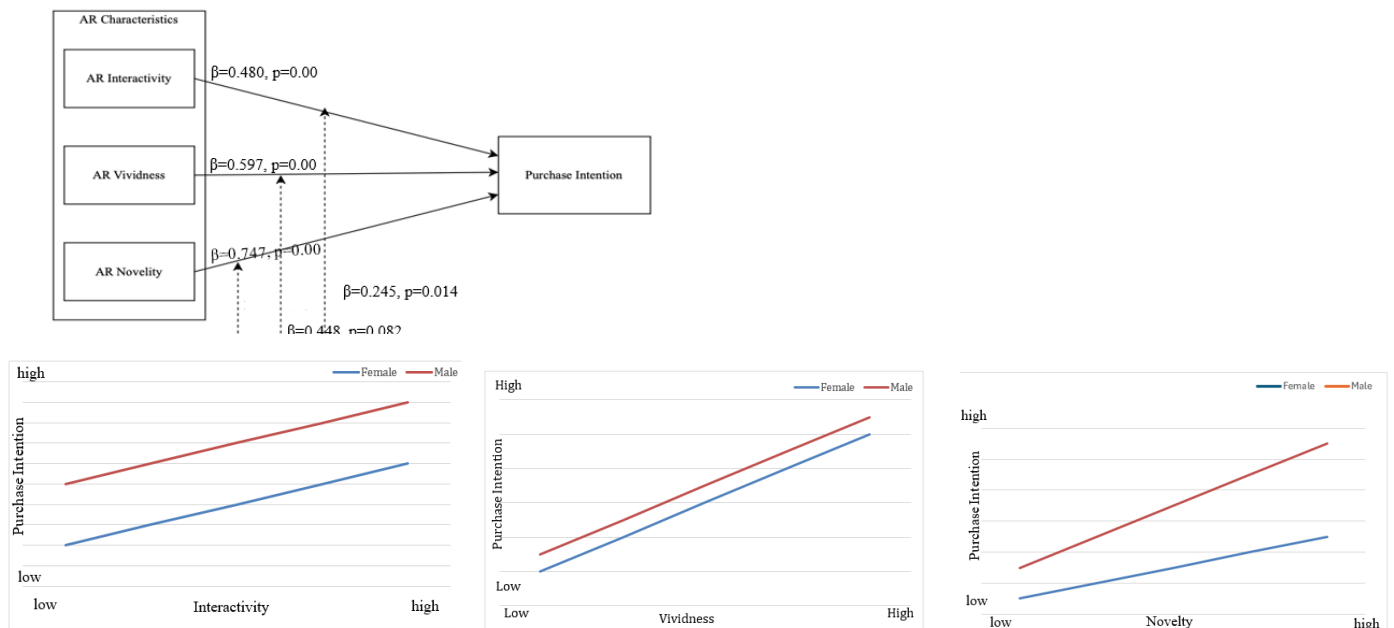
Hypotheses	IV	DV	Std.Beta	T-value	P-Value	f <sup>2</sup>	Q <sup>2</sup>	R <sup>2</sup>
H1	ARI	PI	0.480	12.834	0.000	0.358	0.536	0.881
H2	ARV	PI	0.597	3.416	0.000	0.058	0.584	0.743
H3	ARN	PI	0.747	5.324	0.000	0.115	0.741	0.435
Hypotheses	IV*moderator	DV	$\beta$ -value	T-value	P-Value			
H4a	Gender x ARI	PI	0.245	0.868	0.014			
H4b	Gender x ARV	PI	0.448	1.824	0.082			
H4c	Gender x ARN	PI	0.175	3.10	0.002			

**Figure 3. Structural Model**  
**4.3 Moderating Effect Test**

The moderating role of gender was tested using interaction terms in SmartPLS. Results indicate significant interactions for Interactivity × Gender ( $\beta = 0.245, p = .014$ ) and Novelty × Gender ( $\beta = 0.175, p = .002$ ), whereas the Vividness × Gender interaction was not significant ( $\beta = 0.448, p = .082$ ). Thus, H4 received partial support. To aid interpretation, simple-slope plots are shown in **Figure 4**: the positive slopes of Interactivity and Novelty on Purchase Intention are steeper for men than for women, while the slope for Vividness is comparable across genders. For descriptive triangulation, independent-samples t-tests showed that male respondents reported higher purchase intentions conditional on Interactivity ( $M_{\text{male}} = 4.20, SD = 0.85; M_{\text{female}} = 3.80, SD = 0.90; t = 2.50, p = .014$ ) and Novelty ( $M_{\text{male}} = 4.30, SD = 0.75; M_{\text{female}} = 3.85, SD = 0.88; t = 3.10, p = .002$ ), with no significant difference for Vividness ( $t = 1.82, p = .072$ )

**(Table 9).Table 9 Gender differences in purchase intention through AR**

AR Characteristics	Gender	Mean Purchase Intentions	Standard Deviation	t	p
Interactivity	Male	4.2	0.85	0.868	0.014
	Female	3.8	0.90		
Vividness	Male	4.15	0.80	1.824	0.082
	Female	3.9	0.85		
Novelty	Male	4.3	0.75	3.10	0.002
	Female	3.8	0.88		



**Figure 2. Interaction plot of H4a, H4b, and H4c**

## 5. DISCUSSION AND THEORETICAL IMPLICATIONS

This study advances understanding of how augmented AR attributes shape consumer purchase intentions by contextualizing them within an emerging market and through a gendered lens. Beyond confirming direct effects, the findings shed light on the mechanisms through which AR operates in low-experience and high-uncertainty settings such as Egypt. Novelty functions not only as a stimulus for attention capture but also as a self-efficacy cue, signaling to consumers that they can navigate digital environments in innovative ways. Interactivity, meanwhile, enhances perceptions of control and competence, enabling users to feel actively engaged in their consumption decisions. Vividness provides diagnostic value by simulating sensory-rich product information, thereby reducing uncertainty and risk and fostering greater

confidence in online transactions. Together, these mechanisms underscore AR's capacity to overcome both informational and emotional barriers in digital commerce.

The study also contributes to UGT by demonstrating that gratifications derived from AR are neither uniform nor universal. Instead, they are contingent upon demographic and contextual factors. Gendered patterns reveal that men are more responsive to novelty and interactivity, reflecting motivations rooted in exploration and autonomy. In contrast, vividness has cross-gender appeal as a baseline expectation for trust and risk reduction. These findings illustrate that UGT should be extended to recognize how gratifications are moderated by consumer characteristics and contextual conditions, particularly in developing economies where uncertainty and technological literacy vary widely.

Importantly, the results have public and nonprofit relevance, positioning AR as a tool for digital inclusion. For women in particular, vivid AR experiences help mitigate perceived risk and provide safer, more confident online trial experiences. This demonstrates that AR has potential not only as a retail strategy but also as a medium for empowering broader segments of society to engage in digital participation. The Egyptian case underscores that AR adoption is shaped by infrastructural and cultural boundary conditions, including device quality, internet bandwidth, and institutional trust in brands. Addressing these constraints will be essential to realizing the full societal value of AR.

## 5.2. Managerial, Policy, and Social Implications

For retailers, the findings emphasize that AR should be treated as a strategic component of the consumer journey rather than an experimental add-on. Novelty is especially valuable for onboarding and capturing attention, interactivity enhances consumer control and competence, and vividness is a non-negotiable baseline for reducing uncertainty and fostering trust. Segmenting AR experiences by demographic characteristics can enhance their impact. Gamified and exploratory features may be emphasized for younger male consumers, while vivid, immersive product visualizations appeal broadly across genders and risk-averse audiences. By strategically integrating these features, retailers can reduce return rates, strengthen satisfaction, and differentiate themselves in competitive digital markets.

Beyond commercial contexts, AR can generate significant public and nonprofit value. Public agencies and NGOs can adopt AR in service delivery—such as virtual museum tours, health campaigns, or citizen service demonstrations—to enhance comprehension and trust. Policymakers may provide incentives or grants to small and medium-sized enterprises (SMEs) for implementing inclusive AR solutions, thereby expanding access to innovative tools across various sectors. Ensuring accessibility standards—such as providing text alternatives, offering low-bandwidth modes, and incorporating disability-friendly design—would expand the inclusivity of AR technologies. In addition, digital literacy initiatives, particularly those targeting women, could leverage AR's immersive “try-before-you-buy” functions to reduce risk perceptions and encourage participation in digital commerce. Finally, ethical guidelines must be established to ensure transparency regarding the use of simulated content and consumer data, thereby safeguarding trust as AR adoption accelerates.

## 5.3 Limitations and Future Research

Several limitations should be acknowledged. First, the study employed convenience sampling and focused on three brands (IKEA, Adidas, and Hadia Ghaleb), which may constrain the generalizability of results. Future studies should broaden the range of industries and include brand familiarity as a control to disentangle brand-specific effects. Second, while gender was examined as a moderator, other demographic and psychographic factors, such as age, cultural orientation, or lifestyle, may also shape responses to AR and warrant exploration. Third, measurement invariance across groups was not formally assessed; future studies should apply MICOM procedures to ensure construct comparability before conducting multi-group analyses. Fourth, the cross-sectional design limits causal interpretation; longitudinal designs and field experiments would provide deeper insight into AR's long-term influence on loyalty, trust, and repurchase behavior.

Future research should also extend the analysis to nonprofit and public domains, assessing the cost-benefit implications of AR adoption for cultural institutions, healthcare services, and government agencies. Exploring accessibility across device types, bandwidth constraints, and for consumers with disabilities would provide valuable insights into AR's inclusivity. Comparative cross-cultural research between developed and developing markets could further clarify whether the gratifications derived from AR are universally applicable or shaped by contextual and infrastructural conditions.

## 5. CONCLUSION

This study demonstrates that interactivity, vividness, and novelty are critical AR attributes that significantly influence purchase intention, with gender playing a meaningful role in shaping these effects. By situating the findings within a developing market, the research extends Uses and Gratifications Theory to highlight that gratifications are not universal but contingent on demographic and contextual factors. Theoretically, the study highlights AR's dual role in providing both utilitarian and hedonic benefits, while also serving as a mechanism for digital inclusion. Practically, AR represents a transformative opportunity not only for retailers but also for public and nonprofit actors seeking to expand access, reduce uncertainty, and enhance participation in digital environments. By tailoring AR experiences to meet consumer needs while addressing infrastructural and ethical boundaries, both scholars and practitioners can advance AR as a tool that delivers private value to firms and public value to society.

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### Declarations

Conflict of interest: The authors declare that there is no conflict of interest regarding the publication of this manuscript. Ethical approval and consent to participate. This study was conducted in accordance with the ethical guidelines for research. Participation was voluntary, and informed consent was obtained from all respondents prior to data collection. No personally identifiable information was collected, and all responses were kept strictly confidential, ensuring adherence to policies against plagiarism and misconduct: The authors affirm that this manuscript is original, has not been published previously, and is not under consideration elsewhere.

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