The effects of augmented reality mobile app advertising: Viral marketing via shared social experience

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ABSTRACT

Augmented reality (AR) tools can increase the effectiveness of traditional marketing approaches. This study tests the effectiveness of AR advertising in the specific context of holiday mobile app marketing. Applying the experience economy framework to the AR marketing response process, this study investigates consumer responses to AR mobile app advertising by measuring shared social experience (which is associated with user-generated viral marketing behavior) and purchase intentions. Results show that immersive new brand experiences enabled by AR positively influence consumer responses. These findings suggest that practitioners should consider combining AR marketing tools with existing marketing approaches to facilitate shared social experience (i.e., unpaid brand endorsement) and increase purchase intentions. Doing so could help marketing campaigns stand out, particularly during competitive holiday marketing periods.

1. Introduction

New mobile technologies have brought the virtual and real worlds closer together than ever before (Rauschnabel, 2018). Some of the most disruptive new technologies in the marketing and advertising industries are augmented reality (AR) and virtual reality (VR) tools, coupled with artificial intelligence (Hackl & Wolfe, 2017). AR, in particular, has become ubiquitous due to the widespread use of smartphones and tablets (Hackl & Wolfe, 2017). AR technologies enhance the user experience by using computer vision and object recognition to superimpose digital content (i.e., graphics, video, audio) onto users' real environments (Flavián, Ibáñez-Sánchez, & Orús, 2019; Georgiou & Kyza, 2017; Hackl & Wolfe, 2017). Rather than disconnecting users from reality, AR enhances it (Craig, 2013). Users interact with AR via applications installed on devices that are stationary (e.g., AR mirrors), mobile (e.g., smartphones), or wearable (e.g., AR smart glasses) (Rauschnabel, 2018).

Marketers consistently strive to improve engagement between consumers and brands. Engaged consumers make more transactions per purchase, purchase more frequently, and are more passionate about brands (Rosetta Consulting, 2014). Moreover, effective consumer engagement strategies move beyond monetary transactions to develop long-term relationships with consumers (Venkatesan, 2017), thereby providing firms with sustainable competitive advantages (Kumar & Pansari, 2016). Technology marketing is becoming more effective and engaging, as it is now widely used and accepted by consumers. A recent study revealed that technology is useful for increasing consumer engagement (tom Dieck, Jung, & Rauschnabel, 2018). According to *Forbes*, 90% of U.S. consumers obtain information effectively through videos (Templemen, 2017) and visual marketing; thus, AR technology could be an important new tool for U.S.-based companies (Craig, 2018). AR technology can be integrated into established marketing approaches to increase their effectiveness (Augment, 2015; BCG, 2018; Hilken, de Ruyter, Chylinski, Mahr, & Keeling, 2017; Rese, Baier, Geyer-Schulz, & Schreiber, 2017). For example, firms could easily combine mobile app marketing, an established marketing approach, with AR app marketing to target consumers on their hand-held devices (Augment, 2015; Rese et al., 2017).

AR marketing can shape consumer behavior by integrating digital information or objects into individuals' perceptions of the physical world to support branding, sales, and customer service delivery strategies (BCG, 2018; Hinsch, Felix, & Rauschnabel, 2020; Rauschnabel, Felix, & Hinsch, 2019). "AR marketing can build on and extend established marketing approaches, ranging from advertising to content marketing to storytelling" (Rauschnabel et al., 2019, p. 44). Especially during fiercely competitive holiday marketing periods, AR marketing tools may be particularly effective for fostering a sense of shared holiday spirit, thereby helping campaigns to stand out (Close & Zinkhan, 2009; Sung, 2020).

AR technology has had a profound impact on the marketing landscape (Wedel, Bigné, & Zhang, 2020), with research assessing it from a variety of angles. For example, studies have examined consumer

motivation to use AR apps (Scholz & Duffy, 2018), AR quality (Rauschnabel et al., 2019), the utility of AR for social connection (tom Dieck et al., 2018), the effect of AR on consumer purchase behavior in the cosmetics context (Hilken et al., 2017), differences between AR and e-commerce applications (Yim & Park, 2019; Yim, Chu, & Sauer, 2017), and the effects of AR on a store's atmosphere (Poncin & Mimoun, 2014). Although previous studies on AR have revealed how consumers use AR and the effects of AR on store operations, empirical evidence regarding consumer responses to mobile AR advertising/marketing is lacking. To address this gap, this study evaluates consumer responses to mobile AR app advertising in the food/beverage industry during a holiday marketing period, and examines the effects of AR technology on purchase intentions and unpaid brand endorsement behavior (i.e., consumers' intentions to share AR experiences with their social groups).

This study contributes to the literature by shedding light on the effectiveness of mobile AR advertising as a marketing tool. Consumers who have immersive experiences with AR technology often share their experiences and promote the brand to members of their social networks, thereby enabling firms to benefit from unpaid brand endorsement. This finding has practical implications for firms considering implementing mobile AR app advertising campaigns, because it reveals how the shared social experience facilitated by AR can stimulate user-generated viral marketing behavior to provide a competitive edge, particularly during critical holiday marketing periods.

Drawing from the literature on experience economy theory, this study develops a structural model to answer the following research question: Can immersive experiences of mobile AR advertising increase consumers' purchase intentions and unpaid brand endorsement activities? The preliminary study with a young consumer sample confirms that immersive experiences can lead to AR satisfaction and increase both purchase intentions and shared social experience via viral marketing. The main study investigates the theoretical mechanisms with a broader sample and extends the structural model to determine whether the authentic experience of mobile AR app advertising influences new brand experience, which in turn influences consumer behavior. The results are discussed with regard to the effects of AR mobile app marketing on consumer responses and which factors (e.g., consumer experiences) drive the effectiveness of promotional advertising messages in AR (e.g., promotion perspective; Dwivedi et al., 2020).

2. Literature review, theory, and hypotheses

AR technology may be particularly effective as a consumer engagement tool because it enables sensory marketing, or "marketing that engages the consumers' senses and affects their perception, judgement and behavior" (Krishna, 2012, p. 333). Recent research reveals that AR technology has important visual impacts in marketing contexts (tom Dieck et al., 2018), particularly when videos are employed (Craig, 2018). AR technology, which contains sensory marketing elements of audio, visual graphics, and touchpoints to initiate human–computer interaction (Biswas, Szocs, & Abell, 2019; Petit, Velasco, & Spence, 2019; Satti, Babar, & Ahmad, 2019), can increase consumer engagement. One prominent way sensory marketing is applied to AR is through sensory interfaces such as mobile touchscreens with virtual and augmented solutions. Such forms of human–computer interaction engage more senses, particularly those that evoke emotional reactions (e.g., touch/haptics, olfaction) (Petit et al., 2019). Marketing that capitalizes on these elements is called *AR marketing*, an interdisciplinary concept that involves the use of 3D visualization and technologies that promote human–computer interaction to promote user response (Rauschnabel et al., 2019). Among sensory elements (e.g., augmented visual graphics with audio and touchscreen elements) in AR marketing associated with the promotion mix (Dwivedi et al., 2020), the virtual element (augmented visual graphics) supported by AR technology could build brand awareness (BCG, 2018), eventually leading to revenue generation. Sensory elements are extremely important in AR

marketing. AR applications with immersive and impressive virtual graphics and audio can capture consumers' attention. Prominent examples include Burger King's promotional AR app that enables the user to virtually burn other companies' ads to obtain a free burger, Pepsi's bus shelter promotion that displays virtual monsters, animals, and meteors on a virtual window via applied technology (Dwivedi et al., 2020), and IKEA's 3D-augmented graphical furniture items (Hilken, Keeling, de Ruyter, Mahr, & Chylinski, 2020). As these examples demonstrate, technological innovativeness with sensory elements enables AR to provide consumers with authentic, impressive, and memorable brand marketing experiences.

The current study extends the AR literature by exploring the role of *shared social experience* in consumers' responses to holiday mobile app campaigns. Shared social experience in this study is defined as consumers' positive word-of-mouth behavior in response to impressive or immersive AR advertising experiences, which in turn yields unpaid brand endorsement benefits for the firm. Specifically, this study measures consumers' voluntary intentions to share their unusual advertising experiences with members of their social groups and/or followers on social media. Individuals who are exposed to impressive AR marketing/advertising experiences may share these experiences directly or indirectly, thereby potentially influencing cognitive and emotional shifts in others (Dixon, Durrheim, & Tredoux, 2005) that could motivate them to seek similar stimulating experiences that can be shared with their own networks (Seidman, 2013). From the perspective of firms, shared social experiences after consumers experience AR can yield benefits, whether experiences are shared within social circles or with followers on social media, as evidenced by the power of endorsements from social empowerment. Enabling customers to exchange product recommendations through social AR has a positive effect on consumer response by promoting social empowerment; in turn, consumers who are socially empowered tend to exhibit increased positive purchase intentions (Hilken et al., 2020). As a new applied technology, AR supports consumer engagement and even shared behavior in the consumer decision-making process (Hilken et al., 2018; Scholz & Smith, 2016). Consumer behavior that stimulates engagement by sharing experiences with their own networks (Seidman, 2013) is explained by socially situated cognition theory, which states that people tend to share their everyday experiences and incorporate feedback from others as they make decisions (Smith & Collins, 2009). Often, this feedback is communicated via comments posted in online communities or product reviews (Villarroel Ordenes et al., 2018). Thus, firms should enable consumers to share their experiences via social AR (Scholz & Smith, 2016), because such functionality often helps customers embrace a technology, leading to a favorable return on investment (Hilken et al., 2020).

Especially during the holidays, competition for consumers' attention is fierce, and creative mobile technology marketing strategies can provide competitive advantages (Brendan, 2013; Sung, 2020). AR mobile apps have the potential to provide consumers with authentic, interactive holiday advertising experiences that could become shared social experiences through user-generated viral marketing, thereby driving consumer engagement during crucial holiday shopping periods. This is because consumers tend to experience feelings of excitement around holidays (Close & Zinkhan, 2009; Sung, 2020) and AR technology is proven to be effective and immersive, thereby supporting consumer experience and engagement (Dwivedi et al., 2020; Hilken et al., 2020). In response to the sense of social empowerment stimulated by AR technology (Hilken et al., 2020), consumers may share their AR holiday advertising experiences with their social networks and even drive engagement with AR apps (Hilken et al., 2018; Scholz & Smith, 2016).

Building on the literature review, this section proposes a conceptual framework for understanding how AR marketing influences consumer responses in the form of purchase intentions and unpaid brand endorsement through shared social experience. The study model is illustrated in Fig. 1. Applying the experience economy framework to the
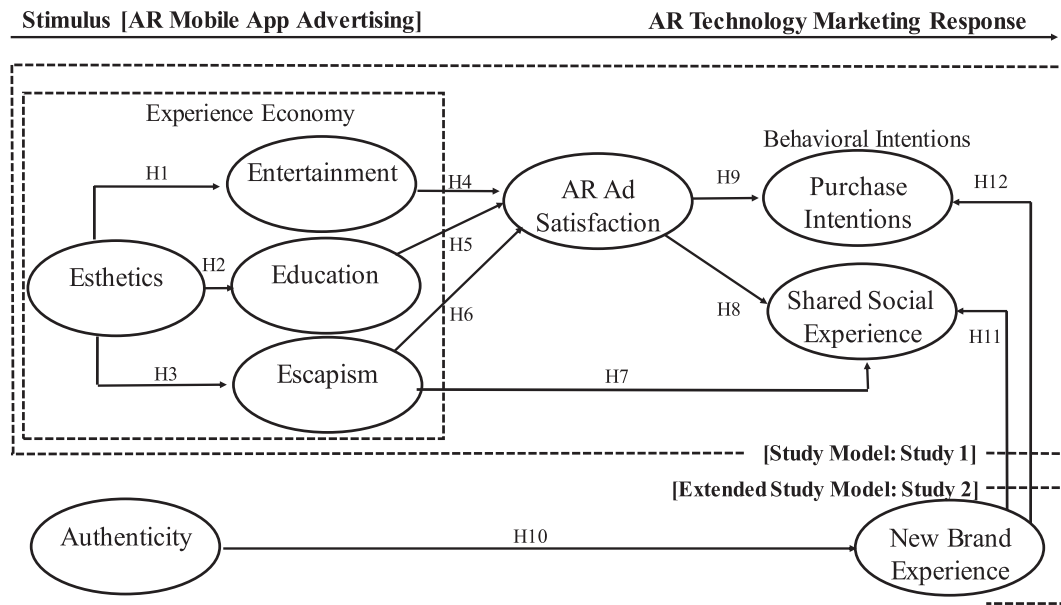
Fig. 1. Study model.

AR app marketing response process reveals the theoretical mechanism (i.e., shared social experience) that explains how AR increases the effectiveness of traditional mobile marketing campaigns.

2.1. Experience economy theory

Drawing on experience economy theory (Pine & Gilmore, 1998), tom Dieck et al. (2018) investigated four motives that drive consumer engagement in AR experiences: esthetics, entertainment, education, and escapism. These motives reflect the importance of developing marketing campaigns that create memorable experiences for consumers (Kang & Gretzel, 2012). Applying the theoretical framework of experience economy theory, this study predicts that the four motives drive consumer engagement with an AR-promoted brand or product in response to an AR mobile app holiday marketing campaign.

Esthetics refers to users' complete and pleasurable immersion in the authentic AR experience (Pine & Gilmore, 1998). In the AR mobile app context, researchers have found that the esthetic motive is an antecedent of the other three motives (tom Dieck et al., 2018). Esthetics are a fundamental component of AR advertising, because AR advertising must first attract consumers in order to provide immersive AR ad experiences that lead to perceptions of entertainment, education, and escapism. That is, when users are attracted to esthetically pleasing AR advertising, the other motives follow. In addition, individuals use visual cues to form their initial evaluations of things (e.g., fashion, human-technology interface) and people (Hosany & Witham, 2009; Jung & Lee, 2006; Jung, 2016; Lee, Chung, & Jung, 2015; Mykletun & Rumba, 2014; Pallud & Straub, 2014; tom Dieck et al., 2018). Thus, esthetics play a critically important role in driving the experience economy (Hosany & Witham, 2009; Mykletun & Rumba, 2014). In other words, poor esthetics likely have negative effects on entertainment, escapism, and educational experiences (tom Dieck et al., 2018).

The entertainment motive invites a more passive form of content. Jung (2016) found that participants use AR apps simply because they want to have an enjoyable experience. In retail contexts, hedonic shopping is a type of enjoyable experience often linked to the entertainment motive and a desire for escapism (Babin, Darden, & Griffen, 1994; Childers, Carr, Peck, & Carson, 2001; Hilken et al., 2017). The escapism motive refers to a desire to momentarily forget the real world as consumers become immersed in the impressive AR experience (Song, Lee, Park, Hwang, & Reisinger, 2015). Oh, Fiore, and Jeoung (2007)

described the educational motive as a desire to increase knowledge and skills. Other researchers also found that a desire for education is an effective motive (Moorhouse, 2017; tom Dieck et al., 2016).

Based on findings in the literature on the strong influence of esthetics on individuals' entertainment, escapism and education experiences, the following hypotheses are proposed in the mobile app holiday marketing context:

H1: Esthetic experience is positively related to entertainment.
H2: Esthetic experience is positively related to education.
H3: Esthetic experience is positively related to escapism.

2.2. Experience economy motivations and consumer satisfaction

Consumer satisfaction reflects the extent to which a product/service consumption experience was pleasurable (Srivastava & Kaul, 2014). Satisfaction is one of the most important factors affecting behavioral intentions in technology adoption, especially AR technology (Quadri-Felitti & Fiore, 2013; tom Dieck et al., 2018; tom Dieck, Jung, Kim, & Moon, 2017). Consumer experiences are critical for establishing consumer satisfaction and perceptions of brands, products, and services (Mehmetoglu & Engen, 2011). Among the four motives highlighted in experience economy theory, previous findings indicate that only two —entertainment and education — lead to satisfaction among young consumers (Park, Oh, & Park, 2010; tom Dieck et al., 2018). This might be attributable to demographic characteristics, or the fact that escapism may require more intense stimuli than other experiences. This study tests the effects of all three motives (entertainment, education, and escapism) on satisfaction to determine whether previous findings hold in the AR advertising context. Moreover, in retail contexts, experiences with hedonic value (i.e., those that are enjoyable and enable escapism) are associated with higher consumer satisfaction, positive word-of-mouth, greater purchase intentions, and positive consumer responses (Babin et al., 1994; Carpenter, 2008; Dacko, 2017; Hilken et al., 2017; Jones, Reynolds, & Arnold, 2006; Shiv & Huber, 2000). Thus, in the context of AR holiday marketing responses, the following hypotheses are proposed:

H4: Entertainment experience is positively related to AR advertising satisfaction.
H5: Education experience is positively related to AR advertising

satisfaction.

H6: Escapism experience is positively related to AR advertising satisfaction.

2.3. Effects of escapism and satisfaction on shared social experience

Escapism refers to the avoidance of aspects of daily life that are perceived as boring, unpleasant, or routine. Because escapism helps users forget reality and immerse themselves in an alternate experience (Song et al., 2015), they may perceive AR experiences that enable escapism as more impressive than experiences provided by traditional advertising. People escape their daily lives by exploring their fantasies through movies, books, music, games, and sports, and by telling stories, eating food, and engaging in other imaginative departures from reality (Allan, 2015). Escapism is not necessarily good or bad; ideally, it can be a tool to enjoy the moment and find relief from life's stresses without becoming alienated from one's social circle (Allan, 2015). From a psychotherapy perspective (Allan, 2015), escapism can be understood as a sort of refueling, a psychological recharging of one's spirit (or body) through fantasy and entertainment. Escapism is thus a defense mechanism against the negative aspects of life (Allan, 2015) that goes beyond mere entertainment and education. By providing consumers with experiences of temporary escape, AR marketing creates a strong impression that can motivate individuals to share their unusual experiences with members of their social groups and followers on social media. In this way, AR can drive consumer-initiated viral brand marketing. Driven by the motives underlying self-expression in social groups, people tend to share their experiences (Bloch & Richins, 1983; Engel & Blackwell, 1982; Zaichkowsky, 1985), which in the AR marketing context manifest as unpaid brand endorsement.

Viral marketing generated by consumers who are opinion leaders or influencers in their social groups can be an effective form of positive word-of-mouth behavior (Laudon & Traver, 2014). People often share their experiences on social media via pictures or videos as forms of self-expression, because these media are more memorable than words; Edell and Staelin (1983) called this the picture (visual) superiority effect. For example, people often post pictures of ordinary activities on social media to share what they are doing, seeing, or experiencing (Seidman, 2013). Applying this concept to the model, the current study proposes that consumers share their unusual or impressive experiences with highly memorable AR advertising (e.g., immersive escapism) to fulfill their need for self-expression. These shared experiences, in turn, could motivate others to seek similar stimulating experiences and share them with their own networks (Seidman, 2013). That is, the shared experiences resulting from viral brand marketing can generate common feelings among members of social groups (Hinsch et al., 2020; Lawler, Thye, & Yoon, 2014).

Optimal contact theory (Dixon et al., 2005) and the influence corridor concept (Borah, 2019) emphasize the importance of shared social experience. Optimal contact theory helps explain the process of shared social experience, whereby "cognitive and emotional shifts [occur] within the individuals in contact" (Dixon et al., 2005, p. 703). The current study applies optimal contact theory to the AR marketing response process by explaining consumer contact (social group) intentions in light of the desire to share authentic AR brand marketing experiences. Social influencers can change consumers' prior brand perceptions by sharing their authentic AR experiences. Patterned after the five steps of the traditional social (media) marketing process — fan acquisition → engagement → amplification → community → brand strength (Laudon & Traver, 2014) — the process of shared social experience in the current study is as follows: fan acquisition through AR experiences → engagement through authentic experiences → amplification in social groups (shared experiences) → social groups (community) → brand endorsement. During the amplification stage, influencers who use AR apps to view AR advertising share their authentic experiences with both close (i.e., personal friends) and distant (i.e., followers

on social media) members of their social networks. For companies, the user-generated brand marketing that occurs through shared social experience during the amplification stage is the key mediating mechanism in the consumer AR marketing response process. Mobile app users who have authentic AR experiences create optimal contact in their social networks by sharing these experiences. These influence corridors may be powerful seeding targets for future unpaid endorsements (Borah, 2019).

In the technology adoption literature, researchers have measured consumer responses by measuring behavioral intentions (Prayag, Hosany, Muskat, & Del Chiappa, 2017; Rauschnabel & Ro, 2016; tom Dieck et al., 2017). Findings show that satisfaction positively influences behavioral intentions (Ali, Ryu, & Hussain, 2016; Hosany & Witham, 2009; tom Dieck et al., 2017; Wixom & Todd, 2005). Likewise, findings in retail contexts show that escapism has a positive influence on consumer responses (Babin et al., 1994; Carpenter, 2008; Jones et al., 2006; Shiv & Huber, 2000). Notably, few scholars have directly compared the influence of escapism and satisfaction and tested their interaction effects on consumer responses.

Based on findings from other contexts such as those revealing how social AR apps influence social empowerment (Hilken et al., 2018, 2020; Scholz & Smith, 2016), it can be hypothesized that when consumers share their AR marketing experiences with their social groups (i.e., engage in user-generated brand marketing), members may develop shared feelings about the brand. This form of optimal contact ultimately creates influence corridors, which represent high potential for further brand seeding (Borah, 2019). Because they foster interactivity that entertains and immerses consumers and eventually leads to positive affective consumer responses (Fiore, Jihyun, & Hyun-Hwa, 2005; Gaberli, 2019), AR experiences that enable escapism or satisfaction through the stimulation of multiple senses (Li, Daugherty, & Biocca, 2002) can lead to unpaid brand endorsement behavior in the form of viral brand marketing, which positively influences consumers' responses (e.g., purchase intentions). Thus, in marketing contexts, AR positively influences consumer behavior through the mechanism of shared social experience. This study extends the experience economy literature, particularly in the AR marketing context, by exploring the escapism experience of AR advertising as an authentic, immersive experience. The following hypotheses are tested:

H7: The escapism experience of AR positively influences shared social experience.
H8: AR advertising satisfaction positively influences shared social experience.
H9: AR advertising satisfaction positively influences purchase intentions.

2.4. Authenticity and new brand experience

Given the powerful effects of authentic AR marketing, which imposes images onto the physical world via an AR app, this study suggests that AR marketing can create more immersive brand experiences for consumers. AR is becoming a new way to interact with products and services (Kunkel, Soechtig, Miniman, & Stauch, 2016), and AR marketing provides new opportunities for firms to increase brand awareness, promote product features, and stimulate market demand. The interactive nature of AR generates experiential value (van Noort, Voorveld, & van Reijmersdal, 2012), as consumers become highly absorbed in their activities when using interactive features (Javornik, 2016). AR marketing campaigns that enable authenticity in the moment may create new kinds of immersive brand experiences by superimposing graphics or sounds onto the physical world. Moreover, the AR advertising medium enables consumers to interact with the brand, thereby increasing consumer engagement, and enables consumers to have new brand experiences with brands they already know. Consumers may have a strong desire to voluntarily share these new brand

experiences with others. This form of unpaid brand endorsement could yield significant benefits for firms.

These findings in the literature suggest that the new brand experience provided by interactive AR ads may positively influence purchase intentions. As explained previously, this could be due to the nature of AR marketing, which combines sensory stimulation (Krishna, 2012) and interactive technology to enable authentic, immersive new experiences (tom Dieck et al., 2018). Thus:

> H10: Authenticity of AR positively influences new brand experience.
> H11: New brand experience via AR positively influences shared social experience.
> H12: New brand experience via AR positively influences purchase intentions.

3. Research methodology

Two studies were conducted to test the effects of AR mobile app advertising (Fig. 1). In Study 1, elements of the experience economy and their relationships were tested to identify their effects on consumer responses (satisfaction, shared social experience, and purchase intentions). In Study 2, an extended structural model with two additional constructs (authenticity and new brand experience) was tested to develop a better understanding of AR's effects in a broader sample.

3.1. Stimulus

The free software program UNITY was used to develop the AR app for this study and a beta version was made (for test purposes only) available for download on Google Play for Android phones and the App Store for iPhones. Because AR technology is frequently combined with other media and integrated into existing marketing strategies (BCG, 2018; Rauschnabel et al., 2019), particularly for campaigns viewed on mobile platforms such as cell phones, tablets, and laptops (Augment, 2015; Rese et al., 2017), this study tested AR marketing using the well-established platform of mobile app advertising. According to Sung (2020), 76.7% of contemporary mobile ads are in the food/beverage product category. Thus, the stimulus developed for this study, a holiday-themed mobile AR app advertisement for Heineken beer, was appropriate.

AR marketing is well-suited to build on the effectiveness of established holiday mobile app marketing approaches that capitalize on the excitement surrounding holiday periods (Brendan, 2013; Sung, 2020). Thus, the stimulus was chosen to examine the effectiveness of implementing AR into a holiday mobile app advertisement. The importance of holiday marketing is well established. Holiday periods are opportune times to build relationships with consumers to derive benefits from increased consumer spending and sales spikes (Close & Zinkhan, 2009; Sung, 2020). Because AR's interactive features create experiential value (Javornik, 2016; van Noort et al., 2012) and consumers tend to experience feelings of excitement around holidays (Close & Zinkhan, 2009; Sung, 2020), authentic, immersive, sensory, and interactive AR advertisements could help capture consumers' attention amid fierce holiday competition. Mobile marketing strategies such as m-coupons, mobile location targeting, and holiday mobile app marketing (Danaher, Smith, Ranasinghe, & Danaher, 2015; Fong, Fang, & Luo, 2015; Ketelaar et al., 2018; Sung, 2020) are all effective because contemporary mobile apps enable GPS targeting, hand-held customized individual targeting, and instant holiday promotional discounts. The study stimulus is presented in Figs. 2 and 3.

4. Study 1

Study 1 was designed to test the model shown in Fig. 1. The purpose of Study 1 is to investigate the effects of AR mobile app advertising (experience economy elements) on consumer responses (AR
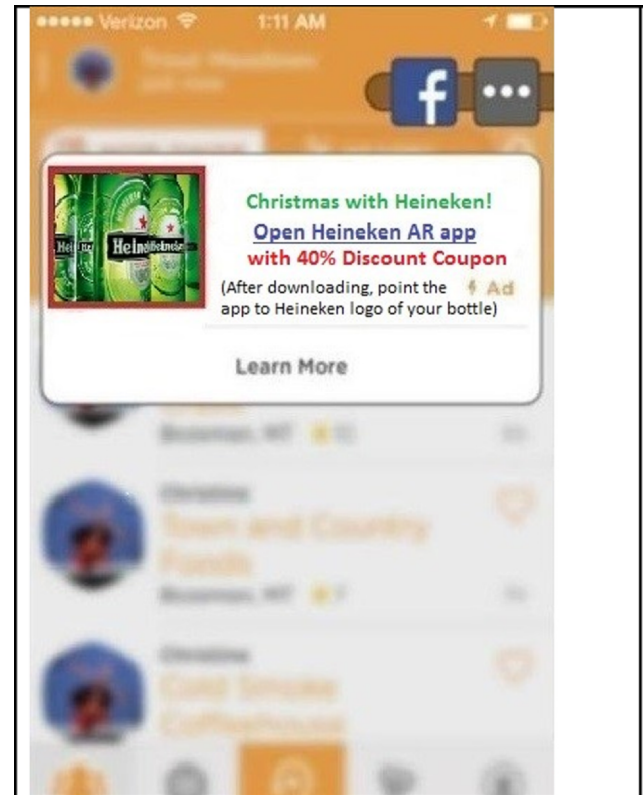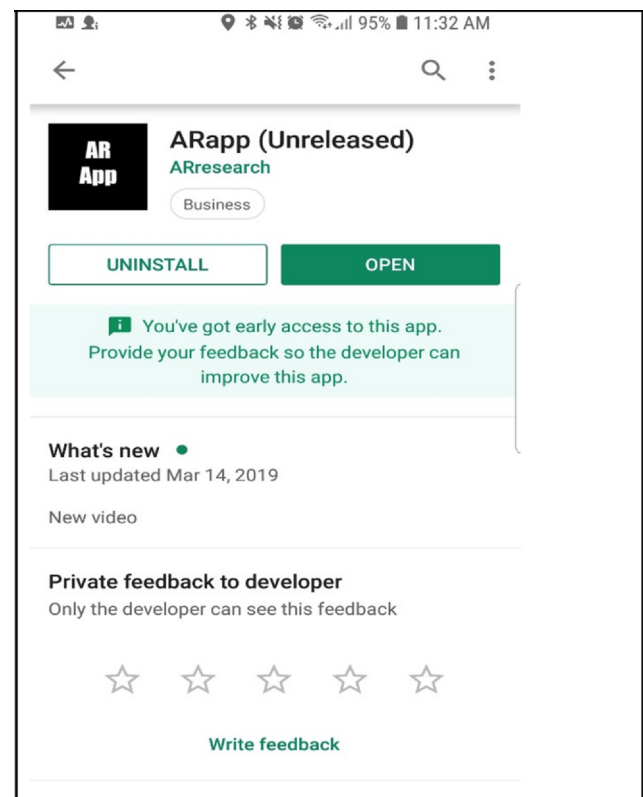
Fig. 2. Study stimulus.

Fig. 3. Study stimulus.

satisfaction, purchase intentions, shared social experience).

4.1. Research design

Data were collected from 62 undergraduate students at a U.S. university who were majoring in business (48.4% female) in 2019. In a lab environment, participants were introduced to the study and given a definition and description of AR before they read the following scenario and instructions:

You are being asked to download an AR (augmented reality) mobile app to evaluate AR holiday (Christmas) advertising. Imagine you receive a mobile app ad promoting a 40% discount on Heineken (see below [i.e., Fig. 2]). Using your own smartphones, please follow these instructions:

(1) Click the link:
  (a) Open the Heineken AR app for Android phone users, or
  (b) Open the Heineken AR app for iPhone users.
(2) After you finish installing the AR app, open the AR app.
(3) Point the app at the Heineken brand logo on the bottle.

After participants successfully completed all three steps, the AR digital content appeared on their screens along with a visual rendering of the real environment (i.e., a digital dance club scene with both visual and audio content).

4.2. Measurement

After using the AR app, participants responded to items using 7-point Likert scales (1 = *strongly disagree*, 7 = *strongly agree*) adapted from previous studies to measure the motivations outlined in experience economy theory (Loureiro, 2014; Manthiou, Lee, Tang, & Chiang, 2014; Mehmetoglu & Engen, 2011; Oh et al., 2007; Quadri-Felitti & Fiore, 2013). The 14 items, which were modified to fit the current context, measured esthetics (3 items), entertainment (3 items), education (4 items), and escapism (4 items). Participants also responded to three items designed to measure overall advertising satisfaction (Mehmetoglu & Engen, 2011; Quadri-Felitti & Fiore, 2013), and two items designed to measure purchase intentions (Yoo & Donthu, 2001). The measurement items are presented in Table 1.

SmartPLS was used to test the measurement model. Table 1 provides the values for convergent and discriminant validities, composite reliability (CR), and average variance extracted (AVE). The convergent and discriminant validities of the constructs are acceptable. For convergent construct validity, all CR factor loadings are greater than 0.90, well exceeding the threshold of 0.50 (Bagozzi & Yi, 1988). Each indicator matched each expected latent construct, with factor loadings between 0.79 and 0.95 ($p < .05$) (Anderson & Gerbing, 1988). For discriminant validity, the heterotrait-monotrait (HTMT) and Fornell-Larker criteria were used. Regarding the HTMT criterion, most values for constructs were lower than the conservative cutoff value 0.85 (Henseler, Ringle, & Sarstedt, 2015; around 0.90 for two constructs). AVE values are between 0.769 and 0.906, indicating that values for all constructs are greater than the squared correlations between constructs; thus, no relationships exist between the constructs that would jeopardize the validity of the results (Fornell & Larcker, 1981). The correlations among constructs are provided in Table 2. A common method bias test also was conducted for Study 1. In the results of VIF tests conducted in SmartPLS, some inner VIF values among experience economy elements are greater than 10, indicating multicollinearity (Kock, 2015). One possible explanation is that the four experience economy elements pertain to similar experiences at purposefully different levels. Nevertheless, these four experience elements are theoretically distinct.

4.3. Results

Considering the complexity of the structural model, partial least squares structural equation modeling (PLS-SEM) was used to test the hypotheses to avoid inadmissible solutions (Hair, Hult, Ringle, & Sarstedt, 2017). Researchers often use PLS-SEM to explore or test new models and paths for theory building based on existing findings and theories (Hair et al., 2017). Estimated path coefficients show that the sample size was acceptable. When PLS-SEM is employed, (a) "10 times the largest number of formative indicators [should be] used to measure a single construct," and (b) "10 times the largest number of structural paths [should be] directed at a particular construct in the structural model" (Hair et al., 2017, p. 24). The SEM results for the preliminary study (Fig. 4) are based on the results of a bootstrapped sample of 5,000 cases to estimate path coefficients. Acceptable f^2 values exceed 0.02 (Cohen, 1992; Henseler, Ringle, & Sinkovics, 2009).

In support of H1–H3, the results show that esthetics has a significant positive impact on consumers' entertainment ($\beta = 0.834$, $t = 17.976$, $p = .000$, $R^2 = 0.696$, $f^2 = 2.290$), education ($\beta = 0.759$, $t = 12.320$, $p = .000$, $R^2 = 0.576$, $f^2 = 1.356$), and escapism ($\beta = 0.661$, $t = 8.021$, $p = .000$, $R^2 = 0.436$, $f^2 = 0.774$) experiences when interacting with an AR mobile app ad in the context of holiday promotions. These results confirm previous findings about the important role of esthetics in driving the other elements of experience economy theory (tom Dieck et al., 2018).

The results also provide support for H4 and H5; entertainment ($\beta = 0.693$, $t = 9.113$, $p = .000$, $f^2 = 1.283$) and education ($\beta = 0.267$, $t = 3.253$, $p = .010$, $f^2 = 0.192$) positively influence AR advertising satisfaction. R^2 is 0.815, indicating that 81.5% of the variance for AR advertising satisfaction is explained by the variance in consumers' entertainment and education experiences when exposed to AR mobile advertising. The results indicate that escapism does not influence AR advertising satisfaction among young college students ($\beta = 0.031$, $t = 0.397$, $p = .691$, $f^2 = 0.003$); thus, H6 is not supported.

H7–H9 pertain to the new construct, shared social experience. The results indicate a positive relationship between escapism and shared social experience ($\beta = 0.386$, $t = 3.915$, $p = .000$, $f^2 = 0.249$), in support of H7. The results also provide support for H8, indicating that AR advertising satisfaction influences shared social experience ($\beta = 0.488$, $t = 6.254$, $p = .000$, $f^2 = 0.399$). R^2 is 0.608, indicating that 60.8% of the variance for shared social experience is explained by the variance in consumers' escapism and AR satisfaction when exposed to AR mobile advertising. The results also show that satisfaction with AR advertising influences purchase intentions ($\beta = 0.717$, $t = 4.302$, $p = .000$, $f^2 = 1.383$, $R^2 = 0.514$); thus, H9 is supported.

5. Study 2

The purpose of Study 2 was to verify the results of Study 1 using data from a broader sample and to test an extended structural model which included two additional constructs, authenticity and new brand experience, to test H10–H12.

5.1. Stimuli and research design

In the main study, the stimulus from Study 1 (see Fig. 2) was used to superimpose a digital dance club scene with both visual and audio content onto the physical environment. A marketing research firm was hired to collect data from a broader sample in the United States in 2020. Participants were instructed to download the beta version of either the Android or iPhone version of the AR app onto their mobile smartphones and then to point the app at the Heineken logo on the bottle in the picture. The firm ensured that participants successfully downloaded the AR app and viewed the mobile AR ad by asking five detailed filtering questions about the content of the ad. Participants who answered these

Table 1
Measurement items for Study 1.

Final items	Factor loading	Composite reliability	Average variance extracted
Entertainment			
The AR advertising experience was amusing.	0.952		
The AR advertising experience was entertaining.	0.957	0.967	0.906
The AR advertising experience was fun.	0.947		
Education			
I learned new promoted product information during the AR advertising.	0.891		
The AR experience made me more knowledgeable about the product/brand.	0.925	0.938	0.836
The AR experience stimulated my curiosity to learn about the new promoted product	0.925		
Esthetics			
The AR advertising experience was very attractive.	0.867		
The AR advertising experience was very pleasant.	0.920	0.902	0.754
I felt a real sense of harmony from the AR advertising experience	0.814		
Escapism			
I felt I was playing a different character while using the AR app to watch the ad.	0.881		
I felt like I was living in a different time or place while watching the AR app ad.	0.942	0.953	0.835
The AR experience let me imagine being someone else.	0.883		
I completely escaped from reality while watching the AR app advertising.	0.947		
AR advertising satisfaction			
I was satisfied with the overall AR advertising experience.	0.902		
I was content with the overall AR advertising experience.	0.943	0.941	0.843
I was delighted with the overall AR advertising experience.	0.909		
Shared social experience			
I would like to talk to my friends about this AR marketing/advertising experience.	0.830		
I would like to post on social media about this AR marketing/advertising experience.	0.908	0.930	0.769
I would like to share this AR ad with my friends.	0.868		
I would like to share this AR ad on my social media.	0.901		
Purchase intentions			
Seeing the AR advertising encourages me to try the product sometime in the near future.	0.940	0.941	0.894
After seeing the AR advertising, I am likely to try the product sometime in the near future.	0.951		

questions correctly were invited to complete the survey and received monetary compensation. Among the 146 people who correctly answered the filtering questions, 130 (50% female, M_{age} = 45 years) completed the survey and correctly answered an attention check question. The final analysis is based on data from these 130 participants.

5.2. Measurement

Using a 7-point Likert scale (1 = *strongly disagree*, 7 = *strongly agree*), participants responded to items from Study 1 plus two additional items related to authenticity (i.e., "The AR ad content looked real" and "The club environment in the AR app advertisement seemed real"), and one item related to new brand experience (i.e., "This AR experience changes the way I experience Heineken").

The results of the measurement test are presented in Table 3, indicating acceptable values for convergent and discriminant validity, composite reliability (CR), and average variance extracted (AVE). Convergent construct validity was evaluated by matching each expected latent construct (Anderson & Gerbing, 1988); all CR factor loadings are greater than 0.90, well exceeding the threshold of 0.50

(p < .05) (Bagozzi & Yi, 1988). In discriminant validity tests, the heterotrait-monotrait (HTMT) and Fornell-Larker criteria were used; most values of the HTMT for constructs are lower than the conservative cutoff value of 0.85 (Henseler et al., 2015; around 0.90 for four constructs). AVE values are between 0.809 and 0.971, indicating that values for all constructs are greater than the squared correlations between constructs (Fornell & Larcker, 1981). Table 4 provides the correlations among constructs. A common method bias test was also conducted for Study 2. The results of inner VIF tests show that some VIF values among experience economy elements and outputs are greater than 10, indicating multicollinearity (Kock, 2015). As in Study 1, this result could be explained by the fact that the four experience economy elements pertain to similar experiences at purposefully different levels.

5.3. Results

The SEM results in Fig. 5 are based on the results of a bootstrapped sample of 5,000 cases to estimate path coefficients. Acceptable f^2 values exceed 0.02 (Cohen, 1992; Henseler et al., 2009).

The results for the broader sample show that esthetics has a positive influence on consumers' entertainment (β = 0.893, t = 44.215,

Table 2
Correlations for Study 1.

Construct	Mean	SD	1	2	3	4	5	6	7
1 Education	4.74	1.54	**0.914**						
2 Entertainment	5.51	1.24	0.710	**0.952**					
3 Escapism	3.96	1.73	0.704	0.554	**0.914**				
4 Esthetics	4.96	1.23	0.759	0.834	0.660	**0.868**			
5 Purchase intentions	4.84	4.84	0.671	0.624	0.669	0.605	**0.945**		
6 AR advertising satisfaction	5.17	5.17	0.759	0.883	0.587	0.770	0.717	**0.918**	
7 Shared social experience	4.31	1.53	0.783	0.705	0.672	0.750	0.691	0.715	**0.877**

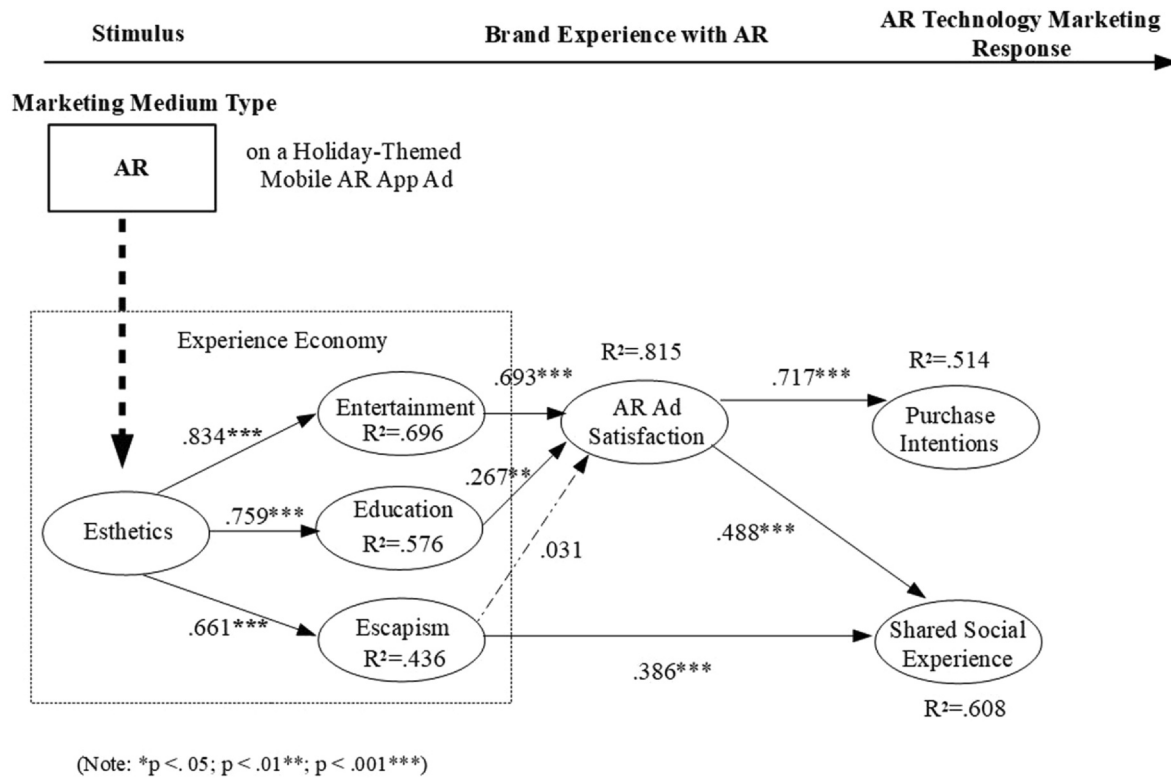*Note:* Diagonal elements in bold are the square roots of AVE.

Fig. 4. Structural model for Study 1.

$p = .000, R^2 = 0.797, f^2 = 3.932$), education ($\beta = 0.855, t = 32.890, p = .000, R^2 = 0.731, f^2 = 2.714$), and escapism ($\beta = 0.803, t = 28.894, p = .000, R^2 = 0.644, f^2 = 1.811$) experiences, supporting H1–H3. In line with the findings from the preliminary study, esthetics is the antecedent of the other three elements (entertainment, education, and escapism) outlined in experience economy theory.

H4 and H5 are also supported. The results show that entertainment ($\beta = 0.445, t = 5.048, p = .000, f^2 = 0.274$) and education ($\beta = 0.268, t = 2.676, p = .007, f^2 = 0.070$) influence AR advertising satisfaction. However, in contrast with the results for the younger student sample, the relationship between escapism and AR advertising satisfaction is positive and significant ($\beta = 0.222, t = 2.40, p = .016, f^2 = 0.062$) for the broader sample, in support of H6. R^2 is 0.750, indicating that 75% of the variance of AR advertising satisfaction is explained by the variance in consumers' entertainment, education, and escapism experiences when exposed to AR mobile advertising.

H7 and H8 regarding shared social experience are supported as well. The results show a significant relationship between escapism and shared social experience ($\beta = 0.510, t = 5.658, p = .000, f^2 = 0.258$) and between AR advertising satisfaction and shared social experience ($\beta = 0.299, t = 3.450, p = .001, f^2 = 0.089$). R^2 is 0.583, indicating that 58.3% of the variance of shared social experience (i.e., unpaid brand endorsement behavior) is explained by the variance in consumers' escapism experiences and satisfaction when exposed to AR mobile advertising. Finally, H9 is supported; the results indicate that satisfaction with AR advertising influences purchase intentions ($\beta = 0.744, t = 17.342, p = .000, f^2 = 1.237, R^2 = 0.553$).

Furthermore, although all paths tested in Study 2 regarding the effects of AR mobile app advertising are significant, multiple group analysis was conducted to compare the path strengths of samples between Study 1 and Study 2 to identify which paths are stronger between two groups. PLS-MGA (multiple group analysis) was conducted with a bootstrapped sample of 5,000 cases. Among paths, the path between entertainment and AR satisfaction is significantly stronger for Sample 1 (Study 1) than for Sample 2 (Study 2). The path-coefficient difference is 0.245 ($p = .043$). This means that the effect between entertainment and AR advertising satisfaction is stronger for young consumers than for general consumers.

The extended SEM model results shown in Fig. 6 are based on a bootstrapped sample of 5,000 cases. The results indicate that the authenticity of AR advertising influences the new brand experience ($\beta = 0.569, t = 9.734, p = .000, R^2 = 0.324, f^2 = 0.479$), supporting H10. The results also support H11. The new brand experience facilitated by AR influences shared social experience (i.e., unpaid brand endorsement behavior) ($\beta = 0.364, t = 4.08, p = .000, R^2 = 0.641, f^2 = 0.166$). For shared social experience, 64% of the variance is explained by the variance of escapism, the new brand experience via AR, and AR advertising satisfaction. H12 is also supported, as the results show that the new brand experience facilitated by AR influences purchase intentions ($\beta = 0.433, t = 5.719, p = .000, R^2 = 0.663, f^2 = 0.326$). Moreover, 66% of the variance for purchase intentions is explained by the variance of the new brand experience via AR and AR advertising satisfaction.

6. Discussion

6.1. Theoretical contributions

This study makes several important theoretical contributions. First, this study contributes to the emerging field of AR marketing by providing a structured model of consumer responses to AR mobile app advertising that reveals the roles of antecedents drawn from experience economy theory (i.e., AR experience motivations) and mediators (i.e., AR advertising satisfaction and new brand experience) on shared social experience and purchase intentions. PLS-SEM was used to analyze data from two groups: young people in the preliminary study and a broader sample in the main study. Generally confirming the results of the preliminary study, the main study shows that esthetics in AR mobile app advertising has a positive impact on consumers' entertainment, education, and escapism experiences, in line with previous findings (Pallud

Table 3
Measurement items for Study 2.

Final items	Factor loading	Composite reliability	Average variance extracted
Entertainment			
The AR advertising experience was amusing.	0.845		
The AR advertising experience was entertaining.	0.955	0.939	0.838
The AR advertising experience was fun.	0.943		
Education			
I learned new promoted product information during the AR advertising.	0.880		
The AR experience made me more knowledgeable about the product/brand.	0.910	0.927	0.809
The AR experience stimulated my curiosity to learn about the new promoted product.	0.908		
Esthetics			
The AR advertising experience was very attractive.	0.953		
The AR advertising experience was very pleasant.	0.959	0.961	0.891
I felt a real sense of harmony from the AR advertising experience.	0.919		
Escapism			
I felt I was playing a different character while using the AR app to watch the ad.	0.945		
I felt like I was living in a different time or place while watching the AR app ad.	0.955	0.971	0.895
The AR experience let me imagine being someone else.	0.938		
I completely escaped from reality while watching the AR app advertising.	0.945		
AR advertising satisfaction			
I was satisfied with the overall AR advertising experience.	0.961		
I was content with the overall AR advertising experience.	0.973	0.970	0.915
I was delighted with the overall AR advertising experience.	0.935		
Shared social experience			
I would like to talk to my friends about this AR marketing/advertising experience.	0.917		
I would like to post on social media about this AR marketing/advertising experience.	0.922	0.959	0.855
I would like to share this AR ad with my friends.	0.927		
I would like to share this AR ad on my social media.	0.933		
Purchase intentions			
Seeing the AR advertising encourages me to try the product sometime in the near future.	0.985	0.985	0.971
After seeing the AR advertising, I am likely to try the product sometime in the near future.	0.985		
Authenticity			
The club environment in the AR app advertisement seemed real.	0.937	0.938	0.883
The AR ad content looked authentic	0.943		
New brand experience			
This AR experience changes the way I experience Heineken.	1.00	1.00	1.00

**Table 4**
Correlations for Study 2.

Construct	Mean	SD	1	2	3	4	5	6	7	8	9
1 Education	5.39	1.54	**0.900**								
2 Entertainment	5.58	1.50	0.799	**0.915**							
3 Escapism	4.66	1.89	0.819	0.728	**0.946**						
4 Esthetics	5.49	1.56	0.855	0.893	0.803	**0.944**					
5 Purchase intentions	5.09	1.85	0.849	0.747	0.770	0.798	**0.985**				
6 AR advertising satisfaction	5.83	1.41	0.805	0.820	0.765	0.881	0.743	**0.956**			
7 Shared social experience	4.82	1.73	0.781	0.731	0.739	0.780	0.778	0.688	**0.925**		
8 Authenticity	5.83	1.35	0.700	0.719	0.683	0.794	0.673	0.788	0.645	**0.940**	
9 New brand experience	4.89	1.75	0.746	0.649	0.731	0.709	0.733	0.644	0.728	0.569	**1.000**

Note: Diagonal elements in bold are the square roots of AVE.

& Straub, 2014; tom Dieck et al., 2018). Esthetics is a foundational element for immersive advertising experiences (entertainment, education, and escapism) and is a key to making AR advertising more attractive. In other research contexts, visible cues (e.g., clothing, interface design, appearance) play an important role in determining first impressions (Hosany & Witham, 2009; Jung & Lee, 2006; Jung, 2016; Lee et al., 2015; Mykletun & Rumba, 2014; Pallud & Straub, 2014). Results of both the preliminary study and the main study show that esthetics is an antecedent of the other three motives of the experience economy framework. This study contributes to experience economy theory as well as the applied technology and AR marketing and advertising literatures by confirming that these four elements are not on the same level.

Second, whereas the findings reveal that entertainment and educational experiences positively influence overall AR advertising satisfaction for both the student sample and the broader sample, the result for the influence of escapism experience on AR advertising satisfaction differs. Specifically, the relationship between escapism and AR advertising satisfaction is not significant for the student sample, but is significant for the broader sample. The result for the student sample confirms a finding in a previous study based on data from a sample in which 83% of participants were between the ages of 18 and 34 (tom Dieck et al., 2018). This difference might be attributable to age as a demographic characteristic. Members of Generation Y tend to be tech-savvy (Lee, Rothenberg, & Xu, 2020; Smith, 2017). Because they are more familiar with technology or similar digital (video) advertising media, AR advertising might not provide a sense of escapism that influences satisfaction for young consumers the way it does for older
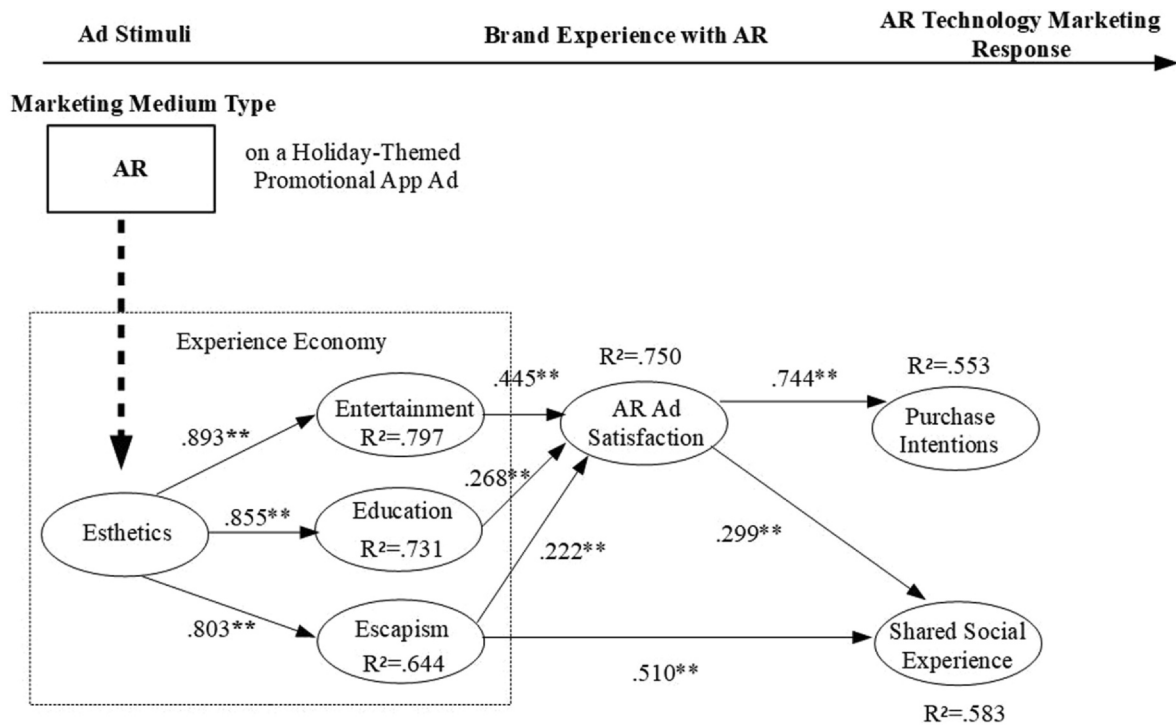
(Note: *p <. 05; p < .01**)

Fig. 5. Structural model for Study 2.
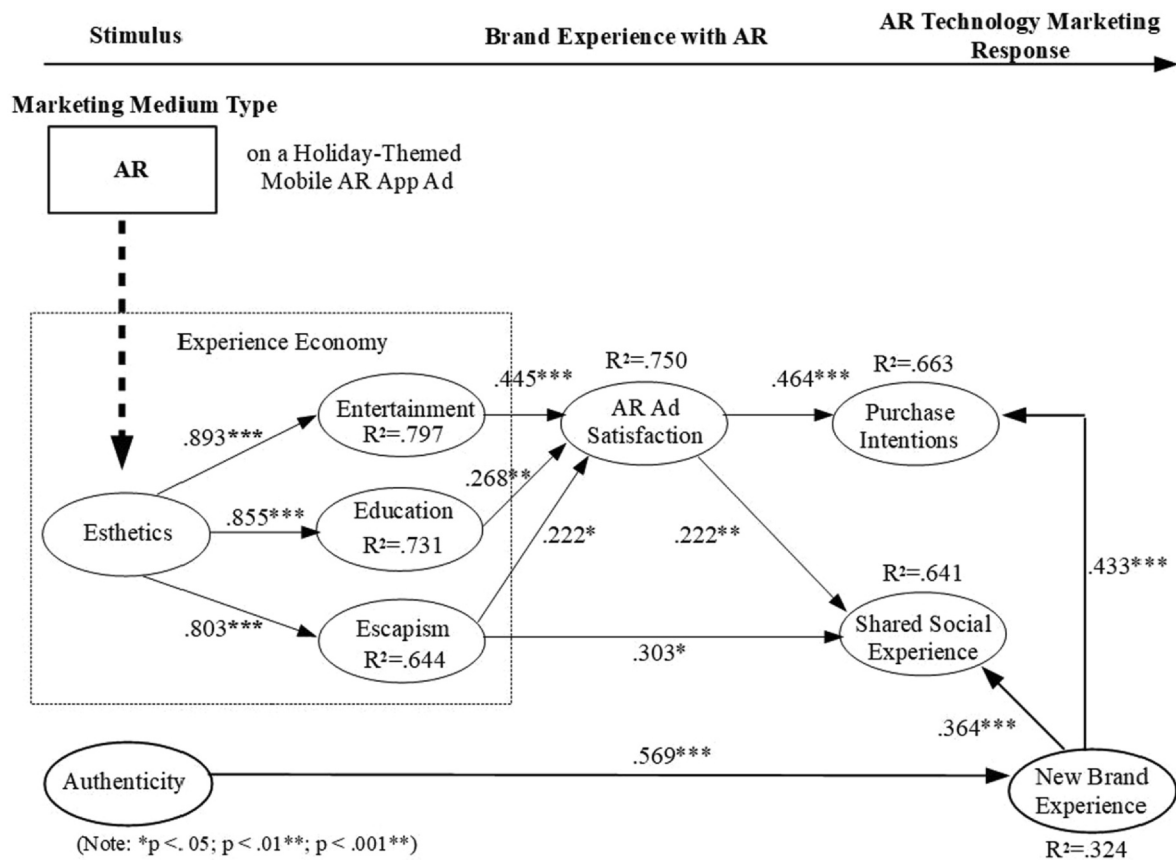
(Note: *p <. 05; p < .01**; p < .001**)

Fig. 6. Extended structural model for Study 2.

consumers. Members of Generation Y may require a stronger level of stimulation to promote escapism for AR advertising satisfaction. Passive delivery of AR digital content — the pop-up of a dance club on a mobile screen along with a visual rendering of the user's real environment — may not be novel enough to promote escapism to the extent that it improves overall AR advertising satisfaction for young consumers compared to older consumers. The insight that the relationship between escapism experience and AR advertising satisfaction likely is affected by age constitutes an important contribution to experience economy theory in the AR advertising context.

Third, the findings from the main study also shed light on how escapism operates at a different level than the other elements of experience economy theory. Results from previous studies and the preliminary study show that a sense of escapism resulting from an immersive AR experience positively influences shared social experience (i.e., unpaid brand endorsement intentions); in other words, consumers who have immersive AR experiences that enable feelings of escape are likely to engage in unpaid brand endorsement in their social groups. Consumers who are satisfied with AR ads also engage in viral marketing by sharing these experiences with their social groups. The prominent role of escapism may be linked to a desire to temporarily disconnect from reality as a defense mechanism (Freud, 2018). People might try to alleviate boredom and fulfill their needs for self-expression by sharing unusual or impressive experiences with AR advertising with members of their social groups or followers on social media (Edell & Staelin, 1983)

Fourth, results for the extended structural model of the main study indicate that the new brand experience facilitated by authentic AR advertising promotes shared social experience (i.e., viral brand marketing) as well as purchase intentions. Authentic, immersive experiences provided by AR ads are important to achieving user-generated marketing behavior. The use of PLS-SEM (Hair et al., 2017) to explore paths related to the new constructs (i.e., shared social experience, authenticity, new brand experience) is another contribution to the applied technology and AR marketing fields. This study also contributes to the consumer engagement literature by showing how AR advertising promotes consumer interaction with previously known brands by providing new brand experiences.

6.2. Managerial implications

Due to the lack of evidence about and knowledge of current AR marketing effectiveness, firms question the value and potential uses of AR advertising and are concerned about their return on investment when adopting these strategies (BCG, 2018). This study addresses firms' questions and concerns by demonstrating that AR ads not only have a positive influence on consumer purchase intentions, but also yield benefits by promoting shared social experience (i.e., user-generated viral brand marketing). By providing consumers with impressive AR advertising experiences, AR marketing can be beneficial to both consumers and firms.

In particular, the findings from this study can help marketing managers incorporate AR marketing into existing marketing approaches to maximize customers' purchase intentions. This study demonstrates that using authentic, stimulating mobile app ads can be an effective way to capture consumers' attention during highly competitive holiday periods. The quantitative results show that the most effective AR ads focus on escapism and provide authentic, immersive experiences.

In addition, the results of this study show that AR marketing is particularly important during crucial holiday periods when consumers tend to increase their spending; as a short-term strategy, AR marketing may further increase holiday sales spikes (Close & Zinkhan, 2009; Sung, 2020). Moreover, an important effect of AR marketing is consumers' motivation to engage in viral brand marketing by sharing their authentic AR advertising experiences with members of their social groups

and followers on social media. From this perspective, AR could support long-term branding strategies.

The results of the study inform several recommendations for managers who are considering AR marketing as a complementary promotion strategy. Marketers should design AR mobile app ads with the goal of providing esthetically pleasing experiences for consumers. In the context of holiday promotions, consumers are likely to perceive authentic, immersive, and memorable ads that help provide a sense of escapism while being entertaining and educational, resulting in AR advertising satisfaction. Well-designed AR advertising can arouse consumers' curiosity to learn about the product or promotion via mobile apps and entertain them at the same time. Moreover, managers should incorporate unique, creative, and stimulating elements into AR ads to promote escapism among consumers of all ages, even tech-savvy members of Generation Y. Boosting consumers' AR advertising satisfaction in this way can increase their purchase intentions and motivate them to share their experiences with others. To further encourage shared social experience, managers should emphasize escapism in AR ads to provide consumers with a new brand experience. This could be a great way for firms to increase consumer engagement with brands they already know. Moreover, the effect of entertainment experience on AR advertising satisfaction is stronger for young consumers than for general consumers. To appeal to Generation Y (i.e., young, tech-savvy consumers), managers can emphasize the AR entertainment factor when targeting that market segment during the holidays.

Furthermore, by incorporating sensory interfaces and elements (mobile touchscreens/haptics with virtual and augmented solutions) into AR mobile app advertising, managers can increase consumer engagement by promoting human–computer interaction during exciting holiday periods. Sensory AR marketing can be used to generate excitement among young, tech-savvy members of Generation Y, as well as general consumers.

Overall, this study demonstrates the effectiveness of integrating AR marketing into firms' existing marketing approaches. Doing so can provide benefits for both consumers and firms, especially during intensely competitive holiday marketing periods. This study reinforces the idea that positive new brand experiences enabled by AR significantly and positively affect consumer behavior. Evidence also suggests that AR marketing may be particularly effective for food/beverage products consumed in social settings during the holidays.

6.3. Limitations and future research

This study has several limitations that offer opportunities for future research. First, in the future, researchers could test this model in other product categories to explore the effectiveness of AR marketing beyond the food/beverage context. Second, using a single item to measure new brand experience in the main study might be a limitation. In the future, researchers could use multiple items to test new brand experience. Doing so could help extend AR research by refining mobile app marketing strategies. Third, sample representativity may be an additional limitation. Data for Study 1 were collected from students in their 20 s who were tech-savvy and familiar with applied technology. Data for Study 2 were collected from a broader sample by a marketing research firm. Thus, participants in Study 2 might not have been as familiar with AR apps as the participants in Study 1.

An increasing number of well-known retailers and brands such as Amazon.com, IKEA, and Audi have begun incorporating AR marketing in various ways through high-quality AR apps. However, small companies may also adopt this marketing approach by using a mix of AR app ads and traditional mobile app ads, as in the current study. In previous studies in the AR marketing literature, AR apps that firms or organizations had built were used as stimuli. However, the stimulus in this study was developed for a specific purpose, indicating that AR advertisements created with simple methods and/or a low budget can positively influence purchase intentions and shared social experience.

Researchers can build on this foundation by testing the effectiveness of AR ads developed with small budgets instead of testing existing brands' ads, which may yield results applicable only to larger firms with large advertising budgets.

Given the current state of AR technology, the AR digital content (audio and visual elements) appearing on participants' screens along with a visual rendering of the real environment was used in the mobile app ad to promote consumer engagement for this study. However, technology is evolving quickly, and researchers are investigating ways to augment consumers' sensory experiences beyond the audiovisual domain (Petit, Cheok, Spence, Velasco, & Karunanayaka, 2015). As the technology becomes available, researchers should seek to incorporate advanced sensory marketing into AR mobile app adds.

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