

Effects of Brand Congruity and Game Difficulty on Gamers' Response to Advertising in Sport Video Games

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The purpose of this research was to examine the effect of sport video game difficulty and brand congruity on gamers' brand recall, brand recognition, and attitudes toward the brand using a controlled experimental design. A total of 116 participants were recruited to play an interactive sport video game and randomly assigned to one of two game difficulty conditions (easy vs. hard). They were then asked to respond to questions concerning the brands featured in the in-game advertisements. The procedure entailed a pretest survey, main experiment, and posttest survey. Data analysis was conducted through use of McNemar's test, repeated measures analysis of covariance, and binary logistic regression. Findings revealed significant effects for game difficulty and brand congruity on brand recognition (but not brand recall) and attitudes toward the brand. This study contributes to the growing body of literature that suggests video game settings and brand placement are key considerations for achieving desired advertising results.

Keywords: advertising, branding, experimental design, gaming, sport video games

Advertisers and agencies increasingly recognize that in-game marketing can play a key role in modern communication objectives and is an effective means to enhance the delivery of brand messages to consumers (Lewis & Porter, 2010). Recent industry reports estimate that the total revenue generated globally from in-game advertising (IGA) is expected to reach nearly \$7 billion by 2019, an increase of more than \$5 billion since 2009 (Statista, 2016). Current research on IGA has been encouraging yet not exhaustive. Scholars have explored effects of IGA on memory (recall and recognition), attitude (toward the gaming experience and brand), and purchase intention (Chaney, Lin, & Chaney, 2004; Cianfrone & Zhang, 2013; Kim & Ross, 2015; Lewis & Porter, 2010; Nelson, Yaros, & Keum, 2006; Terlutter & Capella, 2013; Walsh, Zimmerman, Clavio, & Williams, 2013). Although there are many types of video games (Newman, 2013), a sport video game (SVG) is especially meaningful as it is considered the most realistic and appropriate type of video game for in-game advertisements (Nelson, 2002). In addition, the SVG market represents the third highest selling type of video game in the industry (Entertainment Software Association, 2015). As such, SVGs provide advertisers and agencies a unique and sizable medium through

which to reach consumers and influence their attitudes and perceptions (Clavio, Kraft, & Pedersen, 2009).

Advertising in a SVG can be a seamless way to introduce brands to consumers, whether through static advertisements, product placement, or auditory mentions (Walsh et al., 2013). The least intrusive and most frequently used form of IGA is the static advertisement, particularly the virtual billboard (King, Delfabbro, & Griffiths, 2010). There are growing numbers of brands that are investing in virtual billboards in SVGs, and there is some practical evidence of their positive effects on the brand. According to Guzman (2010), virtual billboard advertising in EA Sports, a branch of Electronic Arts that creates and designs SVGs, boosted sales of Gatorade by 24%. Furthermore, the extent to which a brand can be recalled from virtual billboards has been shown to be significantly greater than that from real-life billboards (Chaney et al., 2004). Other researchers have investigated the effects of virtual billboards on various outcomes variables. For example, Lee and Faber (2007, p. 79) stated "brand congruity in the video gaming context is the extent to which the product category of the embedded brand is related to the content of the game." These authors found that congruity between a game context and the product category of in-game brands influenced gamers' capacity to recall brands, such that gamers were more likely to recall incongruent brands at a greater rate than congruent brands. Dardis et al. (2015) found that game difficulty (how easy or hard it is to play a video game) affected brand recall and attitudes toward the

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brand. Nelson (2002) found that brand recall rates correlated negatively with gamers' familiarity with the in-game brands; however, Tina and Buckner (2006) found that gamers recalled in-game brands better when they demonstrated having greater brand familiarity.

Although advertising in SVGs is emerging in practice and has been shown to be an effective means of marketing, there are some inconclusive results regarding the effectiveness of IGA in SVGs, and there is little knowledge about how game difficulty contributes to the effectiveness of IGA in SVGs. Extant studies have been focused primarily on how the different types of IGA (e.g., banner ads, product placement, virtual billboards) affect gamers and the various ways in which gamers are influenced by IGA (e.g., recall and recognition, attitudes and perceptions, purchase intentions; e.g., Clavio et al., 2009; Kim & Ross, 2015; Walsh et al., 2013). Yet there is a lack of studies examining the effectiveness of IGA in regards to brand congruity and game difficulty; the findings and data from studies that have been conducted have not sufficiently examined the different types of IGA. For example, Dardis et al. (2015) employed the manipulation of vehicle performance features in an experiment designed to examine the effects of game difficulty on brand recall and attitudes in a virtual racing game. Though the results showed game difficulty significantly affected gamers' recall and attitudes toward the brand, IGA used in the experiment was brand placement, and the product was a primary source of the gaming experience. Hence, it is unclear if the difficulty of the game would have the same impact for other types of IGA (e.g., virtual billboards), where the brand is involved in the video game not as a primary source of the gamers' experience but rather as a peripheral component.

With regard to brand congruity of in-game brands, Lee and Faber (2007) found brands that were highly incongruent with the primary task of the gaming experience led to participants' having higher recall rate compared with brands that were perceived as being more congruent. The authors, however, employed only fictitious brands as a means to avoid any confounding effects on participants' responses from prior knowledge and brand experience. Further, the video game was a non-SVG, and because some video game genres require the use of established brands for IGA to have any real impact (Nelson et al., 2006), the use of such brands in a SVG may play an important role in how brand congruity affects gamers' recall, if at all. Moreover, given that scholars have advanced distinct theoretical views to describe the relation between recall and recognition (Tulving, 1976), it is surprising more scholars have not studied game effects on both recall and recognition among gamers. There is also some debate among researchers as to whether brand congruity positively or negatively impacts attitudes toward in-game brands. For example, Kim and Eastin (2015) found gamers had more positive attitudes toward congruent brands. However,

Gross (2010) showed congruent in-game brands resulted in less favorable attitudes than brands that were perceived as being incongruent.

Although the aforementioned studies support the conceptual relevance of game difficulty and brand congruity to the success of IGA, scholarly research in these areas is still in its relative infancy. Building on prior literature, this study seeks to expand the current understanding of the effectiveness of IGA in a SVG in efforts to fill this void in the literature, particularly where the effectiveness of virtual billboards was concerned. We specifically examine the effects of two main factors, game difficulty and brand congruity, on gamers' recall and recognition of and attitudes toward brands in virtual billboards in a popular SVG. The current research will contribute to practice in that gaming is still in its relative infancy, and how gamers respond to advertising in video games is a field of study that has yet to be fully developed. Moreover, this research has the potential to contribute to the extant literature related to information processing and limited capacity model (LCM), which represent the theoretical basis of the study.

Literature Review

Brand Placement in SVGs

Because of the limited attention span of consumers (Kahneman, 1973), marketers are continually seeking out ways in which to effectively position brands both in our minds and in our physical realities (Keller, 2003; Lehu, 2007). A unique advantage of virtual billboard advertising in a SVG is that gamers generally have no control over advertisements. Unlike scenes in other types of video games, a sport video gaming scene is confined to virtual stadiums, courts, or arenas, and therefore gamers are more likely to be continuously exposed to virtual billboards regardless of whether they voluntarily skip a replay or a highlight while playing. According to Cianfrone, Zhang, Trail, and Lutz (2008), many sports-related and nonsports-related organizations focus their money on advertising in SVGs to increase brand awareness and product sales, and thus the central question of how to enhance the success of such marketing efforts warrants attention from sport marketers.

One of the most important factors that must be considered for effective IGA in SVGs is the location of a brand logo or a brand product. Prior researchers have found that when a logo or a product is placed in a prominent location within a form of entertainment, such as at the center of a movie screen, the desired effect is better than when it is located in the background (e.g., Gupta & Lord, 1998; Lee & Faber, 2007; Terlutter & Capella, 2013). The same rule might be applied to the context of SVGs—a gamer's attention and focus tends to be at the center of the gaming scene, where most of the action appears. When a brand is placed at the focal point, it might be easier for the gamer to integrate his or her gaming experience (i.e., primary task) with the

processing of the brand (i.e., secondary task). The location of logos or products in video games has been examined by Dardis et al. (2015) and Nelson (2002), who found that brands positioned in the foreground of video games (e.g., product placement) had higher rates of recall than those that were situated in the background of video games (e.g., visual billboards).

Despite the aforementioned results, background IGA can still be an effective means of marketing. Chaney et al. (2004) found virtual billboards in the background of video games were recalled at better rates than popularly used outdoor billboards. According to Kim and McClung (2010), gamers recalled and recognized brands in SVGs at higher rates than other forms of sport marketing (e.g., sponsorship). In a SVG, virtual billboards are mostly located just outside of the sport field or court, just as in real-life sporting events. Thus, if IGA in SVGs generates positive outcomes irrespective of the type (e.g., product placement or virtual billboard) or location (i.e., foreground or background), then it is important to also understand the theoretical foundations of cognitive processing and how game difficulty might play a significant role in one's brand recall.

LCM and Processing of IGA

When gamers play video games, they are exposed to various amounts and types of IGA. In addition, there are many other sensory components of video games that collectively, although not equally, make up the game environment or atmosphere (e.g., background music and scenery; Nelson, 2002; Tafalla, 2007). As such, the focus of the individual is divided between the primary gaming task and the sensory stimuli included in the background of the video game. Therefore, it is important to understand the extent to which gamers allocate their cognitive resources to focus on the primary gaming task, as well as all other game elements (Lee & Faber, 2007). Kahneman (1973) contended that an individual's collective attention is determined by a cognitive process of allocating available processing resources for a task or an object. Lang (2000) proposed an LCM for information processing, which suggests the total attentional capacity of an individual at a given time is limited. LCM holds that our ability to process information is limited, and our capacity to retrieve information from particular stimuli decreases as we become exposed to excessive stimuli (Lang, 2000). Conventional wisdom in branding literature suggests that two major measures of memory retrieval are recall and recognition (Aaker, 1992). Recall is defined by Aaker (1992) as how well an individual can retrieve a bit of information without any cue or mention of the information. Conversely, recognition refers to the ability of individuals to retrieve information using an aided technique in which information (e.g., brand names) is listed and people select which ones they recognize. Because cognitive resources allocated to a primary task cannot be duplicated for secondary tasks (Kahneman, 1973; Lang, 2000), a greater amount of

cognitive resources utilized for the primary task leads to lesser ability to focus on and carry out secondary tasks, resulting in reduced rates of recall and recognition for the secondary tasks (e.g., processing IGA).

A gamer's ability to focus on primary and secondary tasks is an important concept in understanding the effects of advertising in video games. Various aspects of a video game make up the gamer's primary task, such as action play, storyline, and character development, whereas processing IGA in the game can be either a primary or a secondary task depending on the type of IGA employed (Grigorovici & Constantin, 2004). For instance, if a brand product is featured as part of the game, especially a product that is under the gamer's main control (e.g., vehicle, gear, equipment), then processing this particular IGA (i.e., brand placement) is considered a primary task. On the other hand, if a brand is featured in the background of the gaming experience (e.g., visual billboard or audio feature) or during lulls between action play (e.g., intro or outro video), then gamers will process these brands as a secondary task (Dardis et al., 2015). Hang and Auty (2011) argued that processing and recalling brand information is more effective when the brand is associated with the primary gaming task. According to Haiming (2014), however, when IGA is a secondary task within a video game, findings become less clear and inconclusive relative to recall or recognition of brands. That is, some secondary tasks related to IGA are achieved with more success than others for reasons that remain unclear.

One factor that has received little attention from researchers is game difficulty. Dardis et al. (2015) argued that game difficulty is appropriate to incorporate the rationale of LCM because greater task difficulty commonly reduces the capacity of memory. The degree of difficulty of a game can influence an individual's awareness of IGA and brand communication. According to Ahissar and Hochstein (2000), as a task becomes increasingly challenging, the window of attention becomes narrower and, in turn, our focus becomes more localized on the objective task. This explains why drivers turn down their music or radio while parking or driving in a crowded parking lot (Dibben & Williamson, 2007). To this end, an easy setting does not require gamers to spend a significant amount of cognitive resources thinking about the primary tasks in the video game, allowing other cognitive resources to be made available to process IGA. On the other hand, if gamers experience a more difficult game setting, more cognitive resources are employed to deal with greater amounts of in-game challenges. Consequently, gamers would not have the cognitive resources necessary to process secondary tasks, such as IGA and brand information.

To date, researches on the effects of game difficulty have been few. The research that has been conducted showed that easier gaming levels led to higher brand recall and recognition for brands in IGA (Dardis et al., 2015). However, the researchers utilized a video game whereby the IGA type was brand placement, which

means the brand was presumably processed together with the primary task. To extend this line of scholarly research, this study seeks to examine whether game difficulty is still a significant factor in recall and recognition when processing of IGA is a secondary task. Therefore, we propose the following hypotheses:

Hypothesis 1: Gamers who play in easy mode will have higher rates of recall for brands placed on the virtual billboards than gamers who play in hard mode.

Hypothesis 2: Gamers who play in easy mode will have higher rates of recognition for brands placed on the virtual billboards than gamers who play in hard mode.

Recall and recognition are the two measures most commonly used in brand placement studies to test the effectiveness of IGA (Kim & Eastin, 2015). To our knowledge, however, no studies on IGA effectiveness have compared recall and recognition rates. It may be meaningful to compare recall and recognition rates because recall is considered by researchers to be a less sensitive measure of memory relative to recognition (Aaker, 1992). If we consider how gamers in SVGs will experience different stadium or arena characteristics over time spent playing (just like a gamer in a driving video game will experience different racecourses), gamers' recall may not capture as much saved memory as aided recognition. This naturally has implications for the effectiveness of IGA in the SVG context. Given this research was based on the perspectives of LCM, it lends itself to making comparisons between brand recall and brand recognition rates. That is, according to LCM, when mental resources allocated to encoding increase (as is the case when the difficulty of a task increases), resource allocation for storage and retrieval suffers (Kim & Eastin, 2015). Therefore, we propose the following hypothesis:

Hypothesis 3: Gamers' recall rates of in-game brands will be lower than recognition rates of in-game brands.

Though brand recall and brand recognition are important factors determining the success of many marketing efforts, positively influencing attitudes consumers express toward the brand is a particularly significant variable in video game advertising (Nelson, 2002). Ample evidence in recent studies shows recall and recognition do not always transfer into attitude (see Chan, 2012; Yoo, Kim, & Stout, 2004). Regardless of whether gamers have high recall or recognition of a certain brand in an SVG, it does not guarantee that they will exhibit positive feelings toward the brand, or that they been convinced to buy products from the brand in the future. Nonetheless, several researchers have asserted that IGA might influence not only recall and recognition but also gamers' attitude toward in-game

brands (Mackay, Ewing, Newton, & Windisch, 2009; van Reijmersdal, Smit, & Neijens, 2010). The unique context and environment of media in which brands are embedded can lead to different levels of attitudes toward brands depending on the viewers' media experiences (Jeong, Bohil, & Biocca, 2011). This implies that gamers may respond differently to IGA based on the extent to which they enjoy their gaming experience. Based on prior studies that demonstrate the notion of affect transfer (see Huang, Su, Zhou, & Liu, 2013; Waiguny, Nelson, & Marko, 2013), we posit that, when gamers are exposed to game conditions whereby the video game becomes easy to play, they are more likely to enjoy the game and have positive experiences, which likely transferred to IGA. Conversely, if gamers struggle with their gameplay due to the high difficulty level, then they may have less favorable attitudes toward the game, thus resulting in less positive attitudes toward the IGA. For example, Dardis et al. (2015) claimed that virtual experience with a brand in a video game could produce real-life changes in attitudes toward the brand. The results of their study showed that gamers formed more positive attitudes toward the in-game brand in the easy game condition than in the hard game condition. These researchers also argued that this effect would be even more apparent when IGA was directly integrated into the game play as part of the primary task.

Although Dardis et al. (2015) provided some practical evidence of the effects of game difficulty on gamers' attitudes toward IGA, it is still unclear if virtual billboards can effectively influence attitude toward the brand in the same manner. To this end, King et al. (2010) reasoned that virtual billboards are the least intrusive and most frequently used form of IGA, and there are increasing numbers of brands that are investing in virtual billboards in SVGs. Hence, it might be worth examining whether game difficulty plays a significant role in affecting gamers' attitudes toward brands in SVGs, which may serve as an important point for marketers to consider when placing their brand messages in such platforms. We posit that an easier game setting will result in a more positive gaming experience for gamers and that the favorable feelings will be transferred to the brands featured in IGA in the game. As such, the following hypothesis is forwarded:

Hypothesis 4: Gamers who play in easy mode will have more positive attitudes toward the brands placed on the virtual billboards than gamers who play in hard mode.

Brand Congruity in SVGs

When people are exposed to new information, they are inclined to incorporate it into their previous knowledge structures. Conceptual fluency refers to the ease with which a person processes information (Whittlesea, 1993) and how certain concepts enhance processing more than others when they are consistent with expectations in a particular context setting (Tversky & Kahneman, 1974).

In addition, Lee and Labroo (2004) found that positive valence of concepts in advertising (e.g., a recovery drink featured at the end of a Nike athletic training commercial) had positive effects on viewers' recall and attitudes toward the brand, whereas negative valence (e.g., an animal rights logo featured in a commercial for the Kentucky Derby) had unfavorable effects on these variables (e.g., Ballouli & Bennett, 2014; Moorman, Neijens, & Smit, 2002). Therefore, IGA in SVGs that is conceptually fluent should also lead to more efficient processing by gamers during a gaming experience, thereby enhancing brand recall and attitudes toward the brands.

Another term commonly used in the marketing literature to reflect the fluency of concepts in consumer behavior is congruity. Based on the theoretical perspectives of conceptual fluency, IGA that features more congruent brands (i.e., brands that fit into the genre of the video game or its storyline) is thought to be more conceptually fluent in a gaming experience where gamers expect to experience brand-related marketing activity, thus leading to relatively efficient processing of IGA among gamers. To this end, if IGA in a SVG featured a sport-related brand or product, one might expect gamers to have an easier time processing IGA, which could lead to an overall greater set of outcomes for advertisers (Lewis & Porter, 2010).

Wise, Bolls, Kim, Venkataraman, and Meyer (2008) examined the relationship between attitude toward a video game and attitude toward an in-game brand. They found that there was a positive relationship between these variables, but only when the in-game brand was congruent to the context of the gaming experience. However, results from previous studies are inconclusive as to whether brand congruity or brand incongruity has a greater impact on recall and attitudes. For example, many researchers have shown how brand recall is higher with incongruent brands than with congruent brands based on the belief that incongruent brands interrupt the flow of cognitive processing, such that more attention is given to these brands (Kim & Eastin, 2015; Lee & Faber, 2007; Nelson, 2002). More interestingly, Gross (2010) found that congruent in-game brands received less favorable attitudes than did incongruent brands. Gross (2010) argued that congruent brands were mundane for gamers, whereas the incongruent brands induced more interest and attention, which resulted in more favorable attitudes.

Although brand incongruity has been shown to have positive effects on brand recall and attitudes toward the brand, it nevertheless requires more attention on the part of the receiver due to the larger workload it enacts on the encoding process (Lee & Mason, 1999). A receiver must, therefore, mitigate the cognitive dissonance caused by the unanticipated information and decode the information at a slower rate in order to achieve a more balanced cognitive status. In addition, strongly incongruent brand messages can diminish a gamer's perceived sense of realism and can reduce the overall advertising

effect (Nelson, 2002). Therefore, although extant studies have shown incongruence to have some positive effects, it could be argued that it is more crucial that brands in IGA maintain a high level of real-world consistency in order to enrich the gaming experience. Given the inconclusiveness of previous gaming studies, we aligned our predictions with popular advertising studies in which greater congruence has traditionally meant more positive outcomes for advertised brands (e.g., Lewis & Porter, 2010; Moorman et al., 2002; Wise et al., 2008). As such, we advance the following hypotheses:

Hypothesis 5: Gamers will exhibit lower rates of brand recall for incongruent (nonsports-related) brands than congruent (sports-related) brands.

Hypothesis 6: Gamers will exhibit lower rates of brand recognition for incongruent (nonsports-related) brands than congruent (sports-related) brands.

Hypothesis 7: Gamers will exhibit less favorable attitudes toward incongruent (nonsports-related) brands than congruent (sports-related) brands.

In addition to the aforementioned variables, previous gaming experience is also an important factor to consider for one's allocation of cognitive resources to primary and secondary tasks. Inexperienced gamers are more likely to assign more cognitive resources to the playing of the game and, as a result, fewer resources will be available for processing peripheral components of the game, including IGA (Pham, 1992). Another notable factor to consider is game enjoyment, which concerns the level of involvement a gamer has with the gaming experience (Kim & Eastin, 2015; Lee & Faber, 2007). Gamers tend to have higher recall rates when they are moderately, but not excessively, involved in the gaming experience (see Lee & Faber, 2007; Terlutter, & Capella, 2013). As previous gaming experience and game enjoyment might have an effect on cognitive processing related to IGA, controlling for these factors was important during hypothesis testing. Further, given the aforementioned inconclusive findings in previous studies on brand familiarity, we also controlled for this factor in hopes of adding some new insights to the extant literature.

Method

Participants

Participants comprised 116 students from a research university in the southeastern part of the United States. A student sample was considered appropriate for this study given that 80% of young adults whose ages range between 18 and 29 have reported playing video games (Lenhart, Jones, & Macgill, 2008). Moreover, the majority of IGAs are targeted toward consumers aged 18–24 (Entertainment Software Association, 2015). The majority of the respondents were between 18 and

21 years of age (93.1%). Sixty-three percent of the sample was males, and the racial breakdown of study participants was 80% White, 8% African American, 3% Hispanic, 3% Asian, and 6% self-identified as "Others." Students were recruited using an e-mail solicitation sent out to sport management classes in the spring semester of 2016. Students who agreed to participate in the experiment replied by e-mail and were given a time to meet researchers in a controlled laboratory on campus. Extra course credit was given to students who volunteered their time and completed the experimental task.

Procedure

The authors examined how game difficulty and brand congruity affected gamers' recall, recognition, and attitudes toward the brand using a popular SVG entitled *Virtua Tennis 4*, which prominently features virtual billboards for Dunlop, Prince, Ricoh, and Honda at courtside during gameplay. The procedure entailed a pretest survey, main experiment, and posttest survey. Study participants were required to complete the pretest survey 1 week prior to their participation in the main experiment as a means to measure participants' familiarity with the aforementioned in-game brands, preexisting attitudes toward the brands, and gaming experience. A 1-week hiatus between the pretest survey and the primary study was employed to mitigate the impact of any pretest opinions or judgments on the main experiment (see Smith & Terry, 2003). After the main

experiment, study participants completed a posttest survey consisting of the same items so that their responses could be compared. Data were organized in IBM SPSS Version 24 (Armonk, NY) for analysis.

Pretest survey. For the pretest survey, participants were asked to report their level of familiarity with Prince, Dunlop, Ricoh, and Honda as a means to control for its effects on recall and attitude toward the brand in the main experiment (Laroche, Kim, & Zhou, 1996; Nelson et al., 2006). In addition to the target brands, four dummy brands whose product categories were the same as the target brands were included in order to divert attention away from the primary purpose of the study. Brand familiarity was measured for each brand utilizing Laroche et al.'s (1996) three-item, 7-point semantic differential scale with the endpoints *very unfamiliar* to *very familiar*, *no information* to *a lot of information*, and *no previous experience* to *a lot of previous experience* (α 's ranged from .80 to .89 for the four target brands; see Table 1). Honda was the most familiar brand ($M = 5.02$, $SD = 1.47$), followed by Dunlop ($M = 2.39$, $SD = 1.51$), Prince ($M = 2.23$, $SD = 1.57$), and Ricoh ($M = 1.67$, $SD = 1.01$).

The pretest survey also assessed participants' preexisting attitudes toward the brands in order to determine whether there was a change in attitudes after playing the video game. A four-item, 7-point semantic differential scale designed by Mitchell and Olson (2000) was used. Endpoints for the items were *worthless* to *very valuable*, *very unpleasant* to *very pleasant*, *very likable*

Table 1 List of Constructs, Scale Items, and Cronbach's Alpha Coefficients for Pretest and Posttest Surveys

Scale	Items	Cronbach's α
Brand familiarity ^a	How familiar are you with each of the brands listed below?	.87 (Dunlop)
	How much experience do you have with each of the brands listed below?	.89 (Prince)
	How much information do you have with each of the brand listed below? (based on Laroche et al., 1996)	.84 (Ricoh)
		.80 (Honda)
Attitude toward the brand (pre) ^a	How appealing is the brand to you?	.83 (Dunlop)
	How likable is the brand to you?	.86 (Prince)
	How valuable is the brand to you?	.79 (Ricoh)
	How pleasant is the brand to you? (based on Mitchell & Olson, 2000)	.84 (Honda)
Attitude toward the brand (post) ^a	How appealing is the brand to you?	.93 (Dunlop)
	How likable is the brand to you?	.94 (Prince)
	How valuable is the brand to you?	.90 (Ricoh)
	How pleasant is the brand to you? (based on Mitchell & Olson, 2000)	.90 (Honda)
Game experience	Have you played the video game <i>Virtua Tennis 4</i> ?	
Game enjoyment ^b	I found playing <i>Virtua Tennis 4</i> to be enjoyable (based on Klimmt et al., 2009)	
Tennis involvement ^b	I consider myself to be a fan of tennis (based on Kowert et al., 2014)	
Brand recall	What brands do you recall from the in-game billboards?	
Brand recognition	Which of the following brands do you recognize from the in-game billboards?	

Note.^aItems were measured using a 7-point semantic differential scale. ^bItems were measured using a 7-point Likert-type (1 = *strongly disagree*; 7 = *strongly agree*).

to *very unlikely*, and *very unappealing* to *very appealing* (α 's ranged from .79 to .85 for the four target brands; see Table 1). Study participants' prior attitudes toward each brand were Dunlop ($M = 3.73$, $SD = 1.02$), Prince ($M = 3.72$, $SD = 1.05$), Ricoh ($M = 3.45$, $SD = .87$), and Honda ($M = 4.92$, $SD = 1.12$).

Another purpose of the pretest was to screen participants and exclude those who had previously played *Virtua Tennis 4*. Participants were given a list of video games and were asked to note the video games with which they had prior playing experience. No participant had a prior gaming experience with *Virtua Tennis 4*, allowing the authors to make full use of the sample of 116 students. To this end, Albaumb and Peterson (1984) and Ott and Longnecker (2010) argue a sample size larger than 100 subjects is a moderate and acceptable size for experimental studies.

Main experiment. Participants were divided evenly between and randomly assigned to one of the two game experimental conditions (i.e., easy mode and hard mode). In order to test the effect of brand congruity, we included all four brands in each of the conditions and subsequently assessed respondents' responses to each of the brands. All other settings for the game remained the same between the conditions. For both groups, the majority of the participants were between 18 and 21 years in age (94.9% in the easy mode group, 91.4% in the hard mode group). Sixty percent of the sample in the easy mode group was males, while 65% of the sample in the hard mode group was males. The racial breakdown of participants was 74% White, 10% African American, 5% Hispanic, 2% Asian, and 9% self-identified as "Other" in the easy mode group, while the racial breakdown for the hard mode group was 86% White, 5% African American, 3% Asian, 2% Hispanic, and 4% self-identified as "Other." A Pearson chi-square test showed there were no statistically significant demographic differences between the two groups ($p > .10$). Hence, the two groups were demographically homogeneous.

Participants were asked to schedule a date and time to visit the researcher-controlled gaming laboratory located on the university's campus. The gaming laboratory featured multiple gaming stations separated from each other by sound and visual barriers (e.g., headsets, cubicle walls). As mentioned previously, the SVG used in this research was *Virtua Tennis 4*, created by Sega (Tokyo, Japan), and the game console used was the Sony PlayStation 3 (PS3, Tokyo, Japan). Participants were first briefly instructed how to use the PS3 controller and how to play the game, and they were then given a chance to play the game in practice mode for approximately 10–15 min. The allotted time given to practice was determined by reviewing extant gaming studies across various disciplines, in which there is agreement among researchers that 10–15 min is an adequate amount of time for participants to get accustomed to the game controller (Barlett, Harris, & Baldassaro, 2007; Lee & Faber, 2007). Questions from participants concerning the controller and video game were answered by the lead

author during the practice session. The lead author spent months designing this experiment, and during this time became very knowledgeable about *Virtua Tennis 4*. He also brought years of video gaming experience (both academic and leisure) on this console (PS3) to the study. He was present for each iteration of the experiment, and thus he was able to respond knowledgeably and consistently to questions from participants. The purpose of this study was not revealed to the participants until after the main experiment and posttest survey were finished in order to prevent the participants from deliberately focusing on virtual billboards. Before starting the actual game, Group I participants were assigned to a gaming station where *Virtua Tennis 4* was set to the easy mode, and Group II participants were assigned to a gaming station where the video game was set to hard mode. On the game screen, participants in both groups were exposed to IGA in the form of virtual billboards for the brands Prince, Dunlop, Ricoh, and Honda. All billboards had equal distribution around the monitor screen (e.g., Ricoh logos were placed at the bottom-left corner, Dunlop logos were at the bottom-right corner, and Prince and Honda logos were at the top-left and top-right corners, respectively). In order to control the exposure time of the four brands, the fixed camera angle mode was applied in the option menu.

Each participant played a full-length match that consisted of three game sets against a computer player. All participants played their match with the same virtual player and opponent, and both the participants' virtual player and the computer opponent were customized imaginary players whose uniforms and tennis racquets did not show any visual logos. Because other game options were preset, all participants began playing the game immediately following the practice session, and each participant spent approximately 10–15 min completing their match.

Virtua Tennis 4 provided several advantages with regard to the purposes of this study. First, *Virtua Tennis 4* features two game difficulty options (i.e., easy mode and hard mode) that are easily controlled by adjusting the game settings. Second, the game contains recognizable in-game billboards centered around the main court just as they would be in a real-life tennis event. Third, of the four brands featured in the billboards, two of them, Prince and Dunlop, are sports-related (i.e., congruent) brands, whereas the other two brands, Ricoh and Honda, are nonsports-related (i.e., incongruent) brands. As such, *Virtua Tennis 4* provided researchers a near-exact in-game setting in which to assess whether game difficulty and brand congruity affect brand recall, brand recognition, and attitude toward the brand. In addition, the virtual billboards for the two brands featured sport-related visuals (e.g., tennis ball), which only enhanced their congruency (virtual billboards for nonsports-related brands did not feature such visuals).

The structure of the experimental design was a two-factor nested design, which included game difficulty and brand congruity as the two independent variables. Brand

recall, brand recognition, and attitude toward the brand were the three dependent variables. Game difficulty was used as a between-subjects factor (i.e., easy mode in Group I and hard mode in Group II), while brand congruity was treated as a within-subjects factor, manipulated by testing each participant at each level of the variable. With regard to the latter, each participant was asked to evaluate four brands (i.e., Dunlop and Prince as congruent brands; Ricoh and Honda as incongruent brands), and thus each participant score was used for congruent and incongruent comparisons.

Posttest survey. After each participant finished playing the game, a paper-based survey was conducted in the same laboratory to gather data. Participants were asked to answer questions regarding their recall and recognition of the brands, attitudes toward the brands, and other items that were not included in our hypotheses but offered context to the research as well as flexibility during data analysis and results reporting (game enjoyment and tennis involvement). To this end, brand recall, brand recognition, and attitude toward the brand were the three dependent variables for testing the main hypotheses tests, and game enjoyment and tennis involvement were used as covariates. Game enjoyment and tennis involvement were measured by asking participants to assign ratings to two single-item scales (“I found playing the game enjoyable” and “I consider myself a fan of tennis”) from Klimmt, Rizzo, Vorderer, Koch, and Fischer (2009) and Kowert, Domahidi, Festl, and Quandt (2014), respectively.

Measures

Game difficulty. As previously mentioned, game difficulty was adjusted in the game settings prior to the participants sitting down at the gaming station. Participants were randomly assigned to either easy mode (Group I) or hard mode (Group II), and they did not know to which group they were assigned. It should be noted that the level of difficulty of a video game does not always match with the gamer’s perceived level of difficulty, which is relative and subjective. For instance, participants in the easy mode might have felt the game was challenging, just as other participants in the hard mode might have felt the game was relatively easy to play. Nevertheless, a manipulation check was performed to assess whether participants in their respective condition perceived the two conditions of game difficulty (easy mode and hard mode) as intended.

Brand congruity. There were four brands featured in virtual billboards in *Virtua Tennis 4*. A congruent brand was operationalized in this research as being sport related. The two brands deemed congruent and sport related were Prince and Dunlop—both companies are tennis racket and equipment manufacturers. The other two brands were deemed incongruent, as Ricoh is an electronics company and Honda is a motor vehicle manufacturer. As mentioned, *Virtua Tennis 4* provided

researchers a real-life gaming scenario in which both congruent and incongruent brands were featured equally and prominently at courtside during gameplay.

Brand recall. Brand recall was measured in the posttest questionnaire by asking the gamers to name all of the brands they saw advertised while they played the video game. Each of the brands were assessed separately, and each recall was coded as “1” if the brand was recalled or “2” if the brand was not recalled. Brand recall was, therefore, inputted as a dichotomous variable for the purpose of data analysis.

Brand recognition. Recall is determined by unaided awareness, whereas recognition is determined by aided awareness (Laroche et al., 1996). After completing the recall portion of the posttest survey, participants were provided a list of 10 brand names and asked to check whether each of the brands appeared while they played the video game. Of the 10 presented brands, four brands were featured in the game and represented the target brands, whereas the other brands were included in the list as dummy brands. Each recognition rating was coded as “1” if the brand was recognized or “2” if the brand was not recognized. Brand recognition was, therefore, inputted as a dichotomous variable as well.

Attitude toward the brand. Attitude toward the brand was measured before and after the main experiment in both the pretest and posttest surveys. Mitchell and Olson’s (2000) attitude toward the brand scale was employed as a four-item, 7-point semantic differential items with anchors *very unappealing* to *very appealing*, *worthless* to *very valuable*, *very unpleasant* to *very pleasant*, and *very unlikable* to *very likable* (Mitchell & Olson, 2000). The reliability of the scale used for the posttest was high (α ’s ranged from .90 to .94 for the four target brands; see Table 1).

Statistical Analysis

A binary logistic regression was conducted to analyze the effects of game difficulty on recall and recognition of the four brands (Hypotheses 1 and 2). This analysis method was selected based on the use of a categorical independent variable (game difficulty) and binary dependent variables (recall and recognition). Based on the recommendations of Menard (2002), a binary logistic regression also allowed researchers to control for covariates, which a chi-squared test would not have allowed. In order to compare participants’ recall and recognition rates of the four brands (Hypothesis 3), a paired samples *t* test was conducted. Because participants reported recall and recognition rates of the four brands, the two datasets (recall and recognition) were not independent, resulting in a pair of measurements for recall and recognition (Zimmerman, 1997). Therefore, a paired samples *t* test seems to be an appropriate means to test Hypothesis 3.

McNemar’s test was used to assess whether brand congruity affected participants’ brand recall and brand recognition (Hypotheses 5 and 6). Given that

brand congruity was a nested factor and the dependent variables (brand recall and brand recognition) were dichotomous variables, McNemar's test was considered to be an appropriate form of analysis (Krummenauer, Kalden, & Kreitner, 1999). Moreover, it was not possible to combine recall and recognition rates of the two congruent or incongruent brands due to the dichotomous nature of the variables (yes or no). Therefore, four congruent–incongruent brand pairs were measured (Prince–Ricoh, Prince–Honda, Dunlop–Ricoh, and Dunlop–Honda) to determine whether recall and recognition rates were significantly different based on brand congruity.

A repeated measures analysis of covariance (ANCOVA) was conducted to test the remaining hypotheses (Hypotheses 4 and 7). As such, game difficulty was included as a crossed factor (i.e., between-subjects factor), and brand congruity was included as a nested factor (i.e., within-subjects factor). This statistical method was employed due to the ability of an ANCOVA to test multiple associations at the same time (Delaney & Maxwell, 1981). Brand recall and brand recognition were dichotomous dependent variables, whereas attitude toward the brand was a continuous dependent measure. Thus, it was appropriate to combine the congruent brands (Dunlop and Prince) and incongruent brands (Ricoh and Honda) to form a categorical independent variable of brand congruity for the ANCOVA. Finally, (preexisting) attitude toward the brand, brand familiarity, game enjoyment, and tennis involvement were added as covariates.

Results

Manipulation Check

A manipulation check was performed to assess whether participants perceived the two different conditions of game difficulty (easy mode and hard mode) as intended. On the posttest survey, perceived game difficulty was measured by asking study participants to assign ratings to a 7-point Likert-type scale item ("I feel the video game was easy to play"; 1 = *strongly disagree* to 7 = *strongly agree*) developed by Lewis, Savenye, and Haas (2013). Results of independent samples *t* tests revealed Group I participants found *Virtua Tennis 4* to be easier ($M = 5.40$, $SD = 1.12$) than Group II participants ($M = 3.26$, $SD = 1.37$), $t(114) = 9.188$, $p < .001$. As such, the manipulation of difficulty using preset options in *Virtua Tennis 4* was effective and successful.

Hypothesis Testing

Hypothesis 1 postulated that gamers who played in easy mode would have higher rates of recall for brands in virtual billboards than gamers who played in hard mode. A binary logistic regression was performed four times to measure recall for each of the four target brands. Each regression predicted the probability an observation would fall into one of the two groupings for the

dichotomous dependent variable (recalled or not recalled) based on the categorical independent variable (game difficulty) and continuous covariates (brand familiarity, gaming enjoyment, and tennis involvement; Field, 2009).

The logistic regression model for Dunlop was statistically significant, indicating that game difficulty and covariates as a group reliably classified those who recalled Dunlop and did not ($\chi^2 = 18.475$, $df = 5$, $p < .05$). Nagelkerke's R^2 was .205, and prediction success was 72.4%. A Wald test was used to evaluate whether the independent variable and covariates were statistically significant and contributed to the full model. The Wald test for Dunlop demonstrated that only brand familiarity made a significant contribution to the prediction ($p < .05$). This means that increasing familiarity was associated with an increased likelihood of recall for Dunlop. Game difficulty did not predict recall for Dunlop when the covariates were controlled. The logistic regression model for Prince was statistically significant, showing that the predictors as a set reliably distinguished between participants who recalled the Prince brand and those who did not ($\chi^2 = 15.365$, $df = 5$, $p < .01$). Nagelkerke's R^2 was .293, and prediction success was 78.4%. The Wald test showed only brand familiarity made a significant contribution to the prediction ($p < .01$). Game difficulty did not have a significant effect on recall prediction for Prince when covariates were controlled. The model for Ricoh was not statistically significant ($\chi^2 = 10.719$, $df = 5$, $p > .05$), which implies that game difficulty and covariates as a group did not reliably distinguish between those who recalled Ricoh and those who did not recall the brand. The model for Honda was also not significant ($\chi^2 = 5.754$, $df = 5$, $p > .1$). Overall, there was no statistical evidence to support Hypothesis 1 that game difficulty would have significant effects on recall (see Table 2).

Hypothesis 2 posited that gamers who played in easy mode would have higher rates of recognition for the brands in virtual billboards than gamers who played in hard mode. As discussed previously, a binary logistic regression was performed four times to measure recognition rates of each brand. The logistic regression model for Dunlop ($\chi^2 = 22.390$, $df = 5$, $p < .01$), Prince ($\chi^2 = 12.328$, $df = 5$, $p < .05$), and Ricoh ($\chi^2 = 14.849$, $df = 5$, $p < .05$) were each statistically significant. The model for Honda was not statistically significant ($\chi^2 = 7.958$, $df = 5$, $p > .05$). Wald tests from the model for Dunlop and Prince each revealed familiarity made a significant contribution to predictions ($p < .05$). However, familiarity was not a significant covariate for the Ricoh and Honda models ($p > .10$). The models for Dunlop, Ricoh, and Honda showed that game difficulty strongly influenced the predictions as a main predictor ($p < .05$). However, game difficulty was shown to have had a marginally significant effect on the prediction model for recognition of Prince ($p = .75$). Based on these findings, there is evidence to partially support Hypothesis 2 (see Table 2).

Table 2 Results of Logistic Regression Analyses for Effects of Game Difficulty on Brand Recall and Brand Recognition

Variable	Dunlop			Prince			Ricoh			Honda		
	Wald	Sig.	Exp(B)	Wald	Sig.	Exp(B)	Wald	Sig.	Exp(B)	Wald	Sig.	Exp(B)
Brand recall												
Game difficulty	.001	.978	.987	.043	.836	1.12	2.22	.137	.376	2.50	.114	.506
Brand familiarity	8.78	.003	1.58	8.45	.004	1.61	.170	.680	1.13	.000	.996	1.00
Game enjoyment	.391	.532	1.17	3.19	.074	1.72	3.29	.070	1.94	.623	.430	.835
Tennis involvement	1.82	.178	1.20	.012	.913	.982	.178	.673	.923	.957	.328	1.13
Brand recognition												
Game difficulty	11.73	.001	.207	3.17	.075	.467	8.72	.003	.241	4.88	.027	.379
Brand familiarity	4.47	.034	1.43	5.64	.018	1.42	1.82	.177	1.34	.070	.792	.964
Game enjoyment	.012	.913	1.03	.001	.971	.992	.036	.850	1.05	.216	.642	.899
Tennis involvement	.831	.362	1.13	.331	.565	1.08	.031	.861	1.02	.492	.483	1.09

Note. A logistic regression was performed eight times to analyze recall for each brand. Game difficulty was the independent variable; other variables were included as covariates. Wald = the Wald chi-square values; Sig. = two-tailed *p* values; Exp(B) = the odds ratios for the predictors.

Hypothesis 3 posited gamers' recall rates of the four brands would be lower than their recognition rates of the four brands. The findings of a paired samples *t* test showed that overall gamers' recall rates ($M = 1.09$, $SD = 1.23$) were statistically significantly lower than recognition rates ($M = 2.04$, $SD = 1.25$), $t(115) = -9.012$, $p < .001$. Two additional analyses were conducted to examine whether the statistical difference between recall and recognition rates was also separately detected in the two groups of the study. In the easy mode group, gamers' recall rates ($M = 1.3$, $SD = 1.4$) were statistically significantly lower than recognition rates ($M = 2.6$, $SD = 1.1$), $t(57) = -7.420$, $p < .001$. In the hard mode group, gamers' recall rates ($M = .90$, $SD = 1.04$) were also statistically significantly lower than recognition rates ($M = 1.53$, $SD = 1.16$), $t(57) = -5.701$, $p < .001$. Thus, Hypothesis 3 was supported.

Hypothesis 5 posited that gamers would exhibit lower rates of recall for incongruent (nonsports-related) brands than congruent (sports-related) brands. Results of McNemar's test did not reveal consistent significant associations between brand congruity and brand recall. The recall rates for Dunlop (32.8%) were significantly higher than the recall rates for Ricoh (14.7%, $p < .001$), which did offer support for Hypothesis 5. There was also no significant disparity between recall rates for Dunlop (14.7%) and Honda (39.7%, $p > .10$), as well as Prince (21.6%) and Ricoh (14.7%, $p > .10$). However, there was a significant proportional difference in recall rates between Prince and Honda ($p < .01$), as gamers recalled Honda (39.7%) at a significantly higher rate than that for Prince (21.6%). Based on the results, Hypothesis 5 was not supported.

With regard to whether gamers would have lower rates of recognition for incongruent brands than congruent brands (Hypothesis 6), there were no consistent significant differences to support these hypothesized relationships. Results of the McNemar's test revealed the proportion of recognition for Dunlop (58.6%) was

significantly higher than that for Ricoh (33.6%, $p < .01$). There were no significant differences between recognition rates for Dunlop (58.6%) and Honda (63.8%, $p > .10$). Findings further showed that the proportion of recognition for Prince (48.3%) was significantly higher than recognition of Ricoh (33.6%, $p < .05$). However, the proportional difference between the recognition rates for Prince and Honda was significant, such that Honda (63.8%) was recognized at a greater rate among gamers than Prince (48.3%). Hypothesis 6 was, therefore, significant in the opposite direction than hypothesized (see Table 3 for the results of McNemar's tests on recall and recognition).

Hypothesis 4 and Hypothesis 7 posited gamers' attitudes toward the brand would be significantly affected by game difficulty and brand congruity, respectively. More specifically, Hypothesis 4 proposed gamers assigned to the easy mode would have more favorable attitudes toward the brands than gamers assigned to play in hard mode. This hypothesis was supported. Results revealed significant main effects for game difficulty, $F(1, 109) = 28.247$, $p < .001$, as gamers in easy mode ($M = 5.08$, $SD = .76$) had more positive attitudes toward the brands than gamers in hard mode ($M = 3.96$, $SD = 1.00$). We conducted additional multiple comparison analysis (i.e., Dunlop vs. Ricoh, Dunlop vs. Honda, Prince vs. Ricoh, and Prince vs. Honda) to check if the effects of game difficulty on the outcome variable of brand attitude are consistent across different combinations of a congruent brand versus an incongruent brand. The results show that the between-subjects factor of game difficulty has a significant effect on brand attitude in all four possible combinations, $p < .01$, providing further evidence in support of Hypothesis 4.

With regard to Hypothesis 7, it was proposed that gamers might exhibit less favorable attitudes for incongruent brands than congruent brands based on the notion that congruent brands in IGA are more likely to maintain a

Table 3 Results of the McNemar Test for Effects of Brand Congruity on Brand Recall and Brand Recognition

Variable	Dunlop/Ricoh	Dunlop/Honda	Prince/Ricoh	Prince/Honda
Brand recall				
<i>N</i>	116	116	116	116
Chi square	13.79	1.63	1.89	11.43
<i>p</i> value	.000 ^b	.201	.170	.001 ^b
Brand recognition				
<i>N</i>	116	116	116	116
Chi square	17.42	0.595	5.69	5.56
<i>p</i> value	.000 ^b	.440	.017 ^a	.018 ^a

Note. A McNemar test was performed eight times to compare recall and recognition of four congruent/incongruent combinations.

^aSignificant differences ($p < .05$) for congruent/incongruent combinations: Recognition of Prince (48.3%) was greater than Ricoh (33.6%), and recognition of Honda (63.8%) was greater than Prince (48.3%). ^bSignificant differences ($p \leq .001$) for congruent/incongruent combinations: Recall of Dunlop (32.8%) was greater than Ricoh (14.7%), recall of Honda (39.7%) was greater than Prince (21.6%), and recognition of Dunlop (58.6%) was greater than Ricoh (33.6%).

Table 4 Results of ANCOVAs for Effects of Game Difficulty and Brand Congruity on Attitude Toward the Brand

Variables	Effects of Game Difficulty on Attitude Toward the Brand ^a			
	<i>df</i>	Mean Square	<i>F</i>	Sig.
Game difficulty	1	34.06	28.15	.000
Brand familiarity	1	.324	.269	.605
Game enjoyment	1	9.26	7.68	.007
Tennis involvement	1	.674	.559	.456
Attitude toward the brand (pre)	1	23.39	19.69	.000
	Effects of Game Congruity on Attitude Toward the Brand ^b			
	<i>df</i>	Mean Square	<i>F</i>	Sig.
Brand congruity	1	1.82	4.96	.028
Brand familiarity	1	.006	.016	.899
Game enjoyment	1	.218	.593	.443
Tennis involvement	1	.001	.004	.950
Attitude toward the brand (post)	1	1.38	3.74	.056
	Results for Main Effects on Attitude Toward the Brand ^c			
	Condition	<i>M</i> (<i>SD</i>)	<i>F</i>	Sig.
Game difficulty	Easy	5.08 (.76)	29.12	.000
	Hard	3.96 (1.00)		
Brand congruity	Congruent	4.10 (1.21)	4.56	.035
	Incongruent	4.63 (1.05)		

Note. ANCOVA = analysis of covariance.

^aANCOVA results for game difficulty (independent variable) and covariates on attitude toward the brand. ^bANCOVA results for brand congruity (independent variable) and covariates on attitude toward the brand. ^cANCOVA results for main effects (game difficulty and brand congruity) on attitude toward the brand.

high level of real-world consistency and thus might enrich the gaming experience. Although the analysis findings for this hypothesis were significant, $F(1, 109) = 4.958$, $p < .05$, the association between brand congruity and attitude toward the brand was not as expected. That is, participants demonstrated more positive responses toward brands that were incongruent ($M = 4.63$, $SD = 1.05$) than they did toward congruent brands ($M = 4.10$, $SD = 1.21$). Moreover, we checked if results for Hypothesis 7 are affected by the combination of a congruent brand versus an incongruent brand. Results showed that of the four possible combinations, the Dunlop versus Honda combination demonstrated a significant effect on attitude toward the brand, $p < .05$, while Prince versus Honda approached the .05 significance level, $p = .06$. The remaining two congruent versus incongruent pairs, Dunlop versus Ricoh and Prince versus Ricoh, did not reveal significance. Therefore, the additional analyses provide partial support for Hypothesis 7. On the basis of the analysis, the results for Hypotheses 4 and 7 are relatively robust.

An additional analysis was conducted to check if there were any interaction effects for game difficulty and brand congruity on attitude toward the brand. Results showed there were no interaction effects, $F(1, 109) = .684$, $p > .1$. Table 4 details the findings for the ANCOVA, and Figure 1 shows an illustration of main effects and the noninteraction effect for game difficulty and brand congruity on attitude toward the brand.

Discussion

Based on LCM and extant literature on gamers' processing of IGA, particularly where SVGs are concerned, the authors sought to investigate the effects of game difficulty and brand congruity on brand recall, brand recognition, and attitudes toward the brand using a controlled experimental design. The following sections provide an overview of the significant findings of the study as well as some meaningful implications for sport consumer

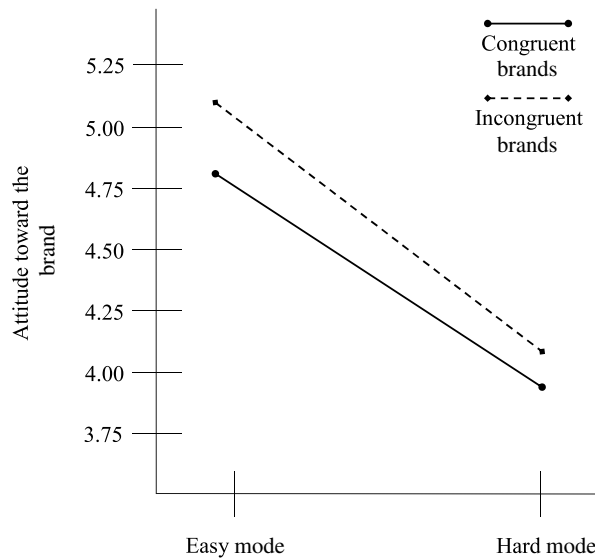


Figure 1 — Main effects of game difficulty and brand congruity on attitude toward the brand.

research. To this end, the authors demonstrate how different modes of game difficulty and differences in brand congruity among in-game advertisers significantly impact gamers' memory and attitudes after gameplay.

Overview of Significant Findings

Findings of the study show that game difficulty did not have an impact on brand recall. With regard to brands included in the SVG setting (Dunlop, Prince, Ricoh, and Honda), playing the video game in easy mode did not enhance gamers' recall of the in-game brands. However, results did show differences for gamers' recognition of the four in-game brands, as recognition rates for the three brands (Dunlop, Ricoh, and Honda) were significantly higher among gamers assigned to the easy mode condition, and for one brand (Prince), gamers' recognition rates were marginally higher with the easy condition. The lack of significant effect of game difficulty on brand recall was likely due to the challenging nature of recall itself. Baddeley, Eysenck, and Anderson (2009) contend that recall for specific concepts or objects is more challenging than recognition because no informative cue is provided. In addition, the average length of gameplay for gamers in this study was approximately 10–15 min. Hence, it is possible that there was not enough time for gamers to assign sufficient cognitive resources to recall in-game brands without any aid. To this end, if gamers were continuously exposed to in-game brands for extended amounts of time, then it might be possible for game difficulty to have the same effects on brand recall as on brand recognition.

This research is not the first to validate the effects game difficulty can have on gamers' recognition of brands advertised in a video game. Dardis et al.

(2015) forwarded similar findings after manipulating modes of difficulty in the game settings. However, these authors were mainly focused on brands that were part of the primary task and IGA in the form of brand placement. In this research, the focus was on brands that were part of a secondary task and IGA in the form of virtual billboards. This distinction is important because many prior scholars have noted the positive effects of including brands in a primary task (e.g., Cauberghe & De Pelsmacker, 2010; Dardis et al., 2015; Gupta & Lord, 1998; Lee & Faber, 2007; Terlutter & Capella, 2013); however, there is a lack of research on the effects of peripheral IGA. Furthermore, because IGA is most frequently featured as virtual billboards (King et al., 2010), studies about how peripheral IGA affects consumer behavior and advertising effectiveness are warranted.

We also examined whether brand congruity had a significant impact on brand recall and brand recognition. Results were mixed from this analysis. That is, gamers were able to recall and recognize Honda (incongruent) at a higher rate than Prince (congruent), yet gamers also recalled and recognized Dunlop (congruent) more than Ricoh (incongruent) and recognized Prince more so than Ricoh. One possible explanation for the mixed findings could be brand familiarity, as Honda scored a full point higher on brand familiarity than the other three brands. Analyses of a logistic regression demonstrated that, among the three covariates controlled in the data analysis, brand familiarity was the only significant covariate. Thus, patterns of recall and recognition rates were consistent with brand familiarity—the stronger the gamer's preexisting familiarity was with the brand, the more likely the gamer was to recall and recognize the same brand. These findings support current research on the influence of familiarity on brand awareness (Laroche et al., 1996; Mau, Silberer, & Constien, 2008; Nelson et al., 2006).

In regards to attitude toward the brand, results showed that gamers assigned to the easy mode condition exhibited more favorable responses toward the in-game brands. One explanation for these results may be related to previously mentioned theoretical perspectives of LCM. When gamers spend a lesser amount of cognitive resources concentrating on primary tasks in the video game, they become more aware of the brands, which in and of itself could lead to a positive attitude toward the brands. According to scholars, less demanding game conditions typically lead to more positive experiences, which in turn can transfer into positive feelings to brands placed in the video game (Redondo, 2012; Waiguny et al., 2013). Based on theoretical perspectives of LCM, the mental resources required to encode information while playing a hard video game increase, diminishing the available resources that would otherwise be allocated for storage and retrieval when playing an easy game (Kim & Eastin, 2015). Results from this research demonstrate how participants who played the game in easy mode did in fact report a higher game enjoyment

($M = 6.12$, $SD = .84$) than the study participants who played in hard mode ($M = 5.34$, $SD = .95$), which perhaps explains how gamers in the easy mode formed more positive attitudes toward the brands.

These results further contribute to the literature as previous research on IGA has centered primarily on in-game brands that were incorporated into the gaming experience as brand placement. Previous scholars have found that transferring positive attitudes toward the game to the in-game brand mostly happens when the brand is part of the gaming experience (Cauberghe & De Pelsmacker, 2010; Dardis et al., 2015; Gupta & Lord, 1998; Lee & Faber, 2007; Terlutter & Capella, 2013). Results from this research indicate that virtual billboards are also effective in the same regard. Thus, regardless of the form of IGA (e.g., brand placement, virtual billboards), in-game brands are likely to gain positive attitudes from gamers, but particularly when levels of game enjoyment are high.

Attitude toward the brand was also highly associated with brand congruity. Previous researchers have studied the effects of brand congruity on attitude toward the brand but have advanced some opposing conclusions based on their findings. The findings from this research revealed gamers had more positive attitudes toward brands in *Virtua Tennis 4* that were nonsports related, which suggests incongruent brands perhaps provided gamers with a novel gaming experience to the extent that it provoked intellectual stimulation to process the information (Gross, 2010), which would align with the rationale of LCM. Perhaps by interrupting conceptual fluency, incongruent brands were allocated more cognitive resources among gamers, which according to research conducted by Kim and Eastin (2015) on LCM explains why more consideration might have been paid to these brands. It is also likely gamers recognized each of these brands not only as advertisers in the actual game but also as sponsors in the fictional tennis match. Sponsorship research has shown consumers often exhibit the same if not more positive attitudes toward nonsports-related brands comparative to sports-related brands based on what researchers consider to be a sense of gratitude toward the sponsors for contributing to the operations and success of the sport event (Lacey & Close, 2013). Although numerous other scholars have shown the negative effects of incongruity (Gwinner & Bennett, 2008; Gwinner & Eaton, 1999; Koo, Quarterman, & Flynn, 2006), there is a lack of research examining the effect of brand congruity in SVGs. SVGs are some relatively new phenomena, but with the rapid growth and popularity of eSports, more research is required to understand how this form of entertainment might affect sport marketing research and practice.

Implications of the Study

There are several practical implications for sport marketers and sport managers, as well as the sport gaming industry in particular. First, it is requisite to understand

that gaming is still in its relative infancy, and how gamers respond to advertising in video games is a field of study that has yet to be fully developed. As such, one implication of this research is not surprising—profiling the gaming community is necessary, and marketing to this consumer segment may vary substantially given what we know about how millennials respond to advertising in ways different from older generations (Jin & Phua, 2015). To this end, it is noteworthy that while differences in brand congruity affected gamers' attitudes toward the brands, the ratings that were reported for the brands in this study were low relative to previous gaming studies that have used the same measure (Kim & Eastin, 2015; Lee & Faber, 2007). These results point to the primacy of learning more about how gamers perceive brand placement in video games compared with more traditional sport consumers.

Second, in regards to the influence of game difficulty on gamers' recall and recognition of IGA brands, the results indicated that game difficulty significantly influenced recognition, but not recall. Although it was not assessed in this study, it is believed that the secondary task of IGA in *Virtua Tennis 4* might have played a role in limiting the rate of recall of brands among gamers. There are many video games that put brands at the forefront of the gaming experience in primary tasks, such as gamers driving a Nissan concept car in *Gran Turismo*, which makes recalling the brand an easier task. Thus, advertisers should focus on ways in which the brand can become part of a primary task in a gaming experience.

Third, because gamers had more positive attitudes toward brands in *Virtua Tennis 4* that were nonsports-related (i.e., noncongruent) brands, the findings of our study contribute to the growing body of literature that suggests novelty and incongruity relative to brand placement may be an effective means to achieving desired advertising results. This further indicates one of two things. Perhaps this was a representative sample of gamers and they were not tennis fans, and therefore noncongruent brands were regarded more positively by comparison. Or maybe our sample was a representative group of gamers who not only like tennis but also consider virtual billboards to be a form of peripheral marketing activity (i.e., secondary task), to which end congruency might be less of a factor. We doubt the former is the case as we measured tennis involvement and did not find that factor played a significant role in this study. Thus, advertisers might be surprised to consider that congruency is less of a factor in marketing strategy depending on consumption conditions.

Fourth, brand familiarity was revealed to be a significant predictor of recall and recognition rates among the congruent brands in this study. Therefore, if preexisting familiarity is important to increase recall and recognition, brands involved in SVG advertising should look to potentiate their levels of awareness among gamers in complementary ways. Previous studies show gamers spend a considerable amount of time in

online social forums and message boards, where brands might look to create associations with the gaming community through marketing and promotion.

Fifth, partial support for the hypotheses and variables therein should indicate to sport marketers and sport managers the need to investigate various forms of marketing in video games that are relevant to a specific gaming experience. As video games and systems become more and more realistic, be it through novel customization features or virtual reality technology, and more competitive (e.g., consider the booming industry of online gaming and eSports), practitioners too will embark into new territories where traditional marketing principles and applications may or more not apply the same way they have before. To this end, the results of this study highlight quite simply the need to learn more before assuming what marketing and management practices have worked in the past will work now in the digital space.

Limitations and Conclusion

This study was not without its limitations. A primary advantage of using an established video game was that the experiment could mirror real-world scenarios as well as any experiment could for this particular study. However, using an established video game meant we were unable to modify the game settings to control the degrees to which the game modes were difficult and the in-game brands were congruent. A more advanced experimental setup might control for even more levels of game difficulty and degrees of brand congruity. A second limitation of this study was the temporal component of gamers' playing experience. Time spent playing the video game might have had an influence on gamers' responses to survey items, as gamers averaged only 10–15 min playing the video game. Longer playing times would presumably have had an effect on recall and recognition in both game difficulty conditions (i.e., playing the video game should become easier with more time spent playing) as less cognitive resources would need to be given to the video game's primary task. Third, it is unclear whether the tennis video game used in this research affects gamers' reactions regarding brands the same way a baseball or a basketball video game does. As we discussed in the literature review, the virtual environment and atmosphere in video games is important for gamers' information processing. Fourth, the ratio of ethnicity and gender in the sample was not equally distributed. A majority of participants were White males, who comprise the largest proportion of gamers in the United States; however, future researchers should use a more diverse sample to gain a better understanding of the growing gaming industry. Finally, although this research provides meaningful insights into how advertising affects gamers, future researchers are encouraged to focus on IGA effects on purchase intentions and behaviors.

This research examined advertising effectiveness of virtual billboards in a SVG. By testing the effects of game difficulty and brand congruity, the research provides some insights into how these factors might affect gamers' recall and recognition of the advertised brands, as well as how their attitudes toward the brands might be affected. To this end, the study makes several theoretical contributions. First, the findings of this study point to the primacy of game difficulty on brand recognition. There is a gap in the sport marketing literature on video game advertising, in particular where the effects of game difficulty are concerned. This study offers some meaningful discussion in this regard. Second, our research contributes to a vast body of literature on LCM by indicating how game difficulty might affect the capacity gamers have to process secondary tasks during gameplay. This naturally has practical implications as well, as sport marketers should recognize the different factors that affect advertising effectiveness in a SVG. Further, our findings provide some added discussion to the already conflicted literature where the effects of brand congruity are concerned. Although many researchers, though not all, have found that brand incongruity can have adverse effects on marketing outcomes, our results illustrate a circumstance in which brand incongruity had positive outcomes for attitude toward the brand.

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