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Papers

Demographic differences in recall and recognition rates of in-game advertisements

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Abstract

In recent years, there has been growing interest from advertisers in product placements in video games. While studies have been conducted on the effectiveness of such in-game advertisements, they have generally been limited owing to the profile of respondents, who were younger and of male gender. With the growing number of gamers from other demographic groups, this study aims to establish whether there is any difference in the effectiveness of in-game advertisements across demographic segments. For this study, 58 participants were selected. Participants were instructed to play a racing game on a computer tablet. This was followed by a test of the respondents' rate of recall and recognition of the in-game advertisements. Results showed that there is no difference in the recall and recognition rates between the genders. However, respondents from the younger demographic group are more likely to have higher rates of recall and recognition as compared with respondents from the older demographic group. This suggests that, in targeting older consumers using in-game advertisements, marketers need to develop different strategies to increase the recall and recognition rates. *Journal of Direct, Data and Digital Marketing Practice* (2014) **15**, 187–196. doi:10.1057/dddmp.2013.76

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recognition

**Sports themes popular
in video games**

Introduction

The computer and video game business is a major, growing industry. In the United States, 49 per cent of households own a dedicated game console. In 2011, the industry recorded sales of US\$16.6 bn in the United States alone. Including consumer spending on related hardware and accessories for the same year, the sales figure reached \$24.75 bn.¹

Sports and video games enjoy a complex relationship with each other. Sports-themed games are popular with video games developers as they sell well in the market. Some of the best-selling video game titles are sports related, including the Madden NFL series.² In 2011, the combined sports and racing game genres sold more video games than any other genres.¹ In turn, the video games industry provides significant promotion and income for sports and individual athletes. Software and hardware manufacturers are advertising in sports venues and sponsoring individual athletes, sports teams and competitions.²

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Advertisers interested in product placement

In recent years, there has also been growing interest from advertisers in product placements in video games. Spending on product placements in video games, also known as in-game advertisements, has been growing steadily over the years. In particular, this has been driven by the belief that the use of in-game advertisements is effective in reaching the teenage market as sports video games are gaining in popularity in this market segment.^{3–5}

Specific to sports video games, the use of in-game advertisements is acceptable to gamers as sponsored brands are commonly found within real sports competitions and venues. As such, the use of in-game advertisements in sports video games can boost the level of game realism by being similar to actual sports events. This allows sport marketers to deliver their promotional messages effectively.^{4–7} However, a number of studies conducted on in-game advertisements suggest that they may not be effective, given the low number of advertisements recalled and recognized in these studies.^{6,8,9}

Demographic profile of gamers changing

Many of the studies on in-game advertisements used respondents who were male and aged between 18 and 35 years of age. In part, this was justified by the majority of sport video gamers belonging to this demographic group.^{10,11} However, as video games become more popular and mainstream, there has been an increase in gamers from other demographic groups. In 2011, the average game player was 37 years of age, while gamers who were 50 years old and above formed 29 per cent of total gamers.¹² In 2012, 47 per cent of gamers were female and women 18 years and older represent a greater portion of the game-playing population than boys aged 17 or younger.¹

Given the changing demographics of video game players, it becomes necessary to examine the effectiveness of in-game advertisements among other demographic groups.^{4,5,8} The aim of this study is therefore to compare the effectiveness of in-game advertisements across demographic groups and provide information for sport marketers in using in-game advertising to reach out to other demographic groups.

Literature review

Product placement started in the 1920s

Balasubramanian¹³ defined product placement as a paid product message aimed at influencing audiences via the planned and unobtrusive entry of a branded product into a movie or television programme. Originally used in films and television programmes as early as the 1920s, product placement as a marketing tool had grown in popularity both in terms of frequency of use and monetary value by the 1980s. This was driven mainly by two main reasons. Sponsors believed that product placement allowed them to reach their target consumers and portray their brands favourably. In turn, the media was motivated by the economic incentives provided by the sponsoring firm in encouraging the growth of the use of product placements.¹³

Brands made their first appearances in games owing to developers' desire for realism. Gamers expected to see soccer players from Manchester United sporting shirts with 'Vodafone' logos and drivers in a car racing

Gamers are also consumers

game driving well-known marques. However, it soon became apparent that brand owners would be willing to pay to have their brands featured in games, especially when the brands are relevant to the game and appeal to the same target market as the game. Electronic Arts, for example, earned \$10 m in 2004 for product placement deals.¹⁴

Today, with the popularity of video games, there is growing interest from brand owners in using product placement in video games. The majority of sports video gamers are also consumers of a wide range of sports activities and products. As such, sports video games allow sports brand owners access to a common target market.^{5,10,11} More importantly, sports video gamers find in-game advertising acceptable and appropriate as the brands add realism to the game.^{7,15} This has led to an increase in the use of product placement within sports video games, with one study finding that the average number of brands in sports video games doubled from 2004 to 2006.^{4,5}

Studies on the effectiveness of in-game advertisements have concluded that there are several factors affecting the recall and recognition rates of in-game advertisements. These include the prominence of the brand within the game, the role of the brand in the game and the congruence of the brand with the game. The prominence of the brand within the game environment has a positive effect on recall and recognition rates. A large and colourful banner or logo that is highly visible within the game is more likely to be recalled and recognized by gamers. Similarly, an advertisement that is placed strategically at a prominent location is more likely to be recalled and recognized by gamers. For example, a banner that is placed at a sharp bend in a racing game is likely to have higher recall and recognition rates because of the repeated exposure from crashing into the banner.^{16–18}

Higher recall of car brand being driven

Not surprisingly, studies have also shown that when the brand is part of the game, the rate of recall and recognition of the brand is higher when compared with brands that are part of the background.^{9,19} Using a racing game as an example, the brand of the vehicle that the gamer selects is more likely to be recalled compared with the brand displayed at the billboard. This is because there is an interaction between the gamer and the brand of the vehicle during the vehicle selection process.

Other studies have found that brands that are irrelevant to the game can lead to a higher rate of recall and recognition. This is because gamers do not expect such brands to appear in the game and therefore are attracted to them. Conversely, relevant brands or those that are expected to be in the game are not given sufficient attention. For example, in a racing game, brands of cars, oil companies or tyres are expected and will be remembered to a lesser extent than pet food.^{13,17,20} However, extremely incongruent in-game advertising can reduce the realism of the game and annoy gamers.²¹

Familiarity with brands aids recall

Besides, the factors involving the brand within the game, other studies have examined the relationship between the gamer's characteristics and the rate of recall and recognition of in-game advertisements. A few studies have shown that there is a positive relationship between the gamer's familiarity with the brands advertised and the rates of recall and recognition of in-game advertisements.^{3,16} Owing to perceptual fluency,

gamers are able to process familiar brands more easily because these brands are already in their minds.²²

The relationship between the level of involvement in the game and the rate of recall and recognition of in-game advertisements, however, are more complex. Lang²³ suggested that people are information processors. However, a person's ability to process information is limited. Gamers have to allocate cognitive resources between playing a game and processing other peripheral information. As a gamer becomes more involved in a game, more cognitive resources are dedicated to the game and, subsequently, the gamer has fewer cognitive resources left to process other information, such as the background advertisements in the game.

Inverse relationship between attention and recall

Gamers who are highly involved in the games are therefore likely to have lower rates of recall and recognition of in-game advertisements.^{24–26} On the other hand, gamers who are not interested or less involved in the game may pay little attention to the game and the in-game advertisements. This suggests that the relationship between gamers' involvement and the extent of recall and recognition is an inverted U-shaped curve with gamers at the extreme ends of high and low involvement producing lower recall and recognition rates of in-game advertisements than gamers who are moderately involved in the game.¹⁷

As video gamers are predominantly young males, many studies have used gamers from this demographic group in their studies. However, with growing numbers of gamers from other demographic groups, it is necessary to conduct studies on samples from other demographic groups.^{1, 12} A small number of studies have shown that there is no significant difference between the genders in the rates of recall and recognition of in-game advertisements.^{3, 18} However, other studies show that differences between the genders exist in terms of attitudes towards in-game advertisements and brands.^{21, 26}

Demographic differences in recall to be expected

There has been little research on the effectiveness of in-game advertisements among the older demographic segment. Studies on the older demographic segment on the effectiveness of advertisements in other media found that the older segment had lower rates of recall of advertisements compared with the younger segment.^{27–29} From these studies, it seems plausible that there will be differences in the recall and recognition rates of in-game advertisements between gamers of different age groups.

Given the small number of studies on other demographic groups in the examination of the effectiveness of in-game advertisements, the changing demographic profile of gamers suggests that a study in this area is timely. The aim of this research is to examine whether there is any difference in the recall and recognition rates of in-game advertisements between players of different genders and in different age groups. It is partly a response to calls for more research on other demographic groups in this area.^{4, 5, 8}

Tablet-based commercially available game in test

Methodology

Specially developed games with fictitious brands are commonly used in research involving advertisement recall and recognition to control for prior

exposure to the games and advertisements.¹⁷ However, if a new video game is used, the gamer may not find the controls intuitive. As such, there might be a steep learning curve and this can affect the attention paid to advertisements.⁵ This study therefore used a commercially available sports racing game, Race of Champions.

In recent years, the tablet has been growing in popularity as a gaming machine. Hence, it was decided that an Android tablet would be used as the game medium for this study instead of the traditional computer or gaming console. To ensure reliability of the data collected, the same tablet device, an ASUS Transformer Pad TF300T, firmware version 4.1.1, was used for all participants. In addition, all participants played the game with the same game settings. These game settings included manual acceleration, manual brake and virtual steering wheel control. The game mode selected was time challenge and the game track selected was London. The same vehicle, the RX150, was also used by all participants. In order to create a natural and comfortable gaming environment, the study was conducted at the participants' school or home.

Using convenience sampling, respondents were sought from the principal investigator's friends and relatives. As the aim of the study was to establish whether there were differences in advertisement recall and recognition rates between different demographic groups, respondents were selected from different genders and age groups.

Before playing the game, all participants were informed that they were required to play a short racing game followed by answering a simple questionnaire. However, they were not told the purpose of the study beforehand. Deception was necessary so that the participants would not be primed to pay attention to the in-game advertisements while they are playing the game.^{16,18}

All participants were briefed on the game controls and were not given any objectives for the game. The game ended once the participant had completed four laps or when the time limit of 3 minutes was up. For all respondents, there was no extra time given for practice and no assistance was provided during game play. Upon the completion of the game, respondents were given a questionnaire on the recall and recognition of advertisements for the game and several demographic questions.

Following earlier studies, effectiveness of in-game advertising was determined by the participants' unaided recall and recognition rates. Although there are criticisms to the use of recall and recognition as a method for measuring the effectiveness of in-game advertisements and more generally product placements, they are still the most common measure used in studies.^{6,8} Unaided recall required participants to list down as many brands as they could remember from the game. Participants were also allowed to describe the logo that they saw if they could not remember the brand. Responses were coded as correct when the brands were identified correctly even if there is a mis-spelling.

Brand recognition was tested by presenting the participants with a list of 21 brands where only 11 brands appeared in the game. From the list, participants were required to identify the brands that they saw in the game

**Time- and lap-
restricted length of
play**

**Listing ads recalled
from game**

Testing explicit short-term memory

High recall and recognition — where provided

and the number of correctly identified answers was used as the measure of the recognition rate.

The question on advertisement recall was placed before the recognition question because exposing participants to the recognition question first could result in contamination of the recall data.³⁰ Like most studies, this research is focused on explicit, short-term memory.³¹ Explicit memory refers to the intentional and conscious effort to recollect a specific past event. In contrast, implicit memory involves memory effects that occur without intentional or conscious recollection of an event.⁸

Descriptive statistics was used to analyse the advertisements recall and recognition rate of the participants. To test the statistical significance of the findings, independent sample *t*-tests were conducted. Cohen's³² *d* was also calculated to estimate the magnitude of the differences between variables. When respondents had completed the questionnaire, they were informed of the objectives of the study. At this stage, participants were given the opportunity to opt out of the study if they felt uncomfortable with their participation.

Results

Advertisement recall and recognition

A total of 58 respondents participated in the study. Of these respondents, 31 (53 per cent) were between 18 and 33 years of age, while the remaining 27 (47 per cent) were between 49 and 67 years of age. The younger group comprised 18 male (58 per cent) and 13 female (42 per cent) participants, while the older group had 14 male (52 per cent) and 13 female (48 per cent) participants.

Table 1 below shows the advertisement recall and recognition rates for this study. The advertisement recall rate is lower than the recognition rate. The mean advertisement recall and recognition rates were 0.31 (SD = 0.71) and 1.52 (SD = 1.38), respectively. The minimum number of advertisements recalled and recognized by respondents was 0, and the maximum number of advertisements recalled and recognized by respondents was 3 and 5, respectively.

The advertisement recall and recognition rates were low and concurred with previous studies^{17,18} that have found recall rates to be between 0.45 and 0.86 and recognition rates at 0.37.¹⁸

The percentage of correct responses for advertisement recall and recognition was high at 82 and 72 per cent, respectively. The high percentage of correct responses was because of the large number

Table 1: Advertisement recall and recognition rates

	Mean	SD	Minimum	Maximum
Mean advertisements recalled	0.31	0.71	0	3
Mean advertisements recognised	1.52	1.38	0	5

Note. *n* = 58.

of participants who did not answer the questions on advertisement recall and recognition — 44 participants (76 per cent) and 17 participants (29 per cent) did not provide any response on recall and recognition, respectively. This suggested that respondents only answered the questions when they were confident of their answers and did not simply put in guesses for their responses.

No difference in recall rate between genders

Analysis by gender

Table 2 below shows the advertisement recall and recognition rates between the genders. An independent *t*-test was conducted to compare the advertisement recall rate between male and female participants. There was no significant difference in the recall rate for male ($M = 0.25$, $SD = 0.67$) and female ($M = 0.38$, $SD = 0.75$; $t(51) = -0.71$, $p = 0.48$) participants. In addition, an independent *t*-test conducted to compare the advertisement recognition rate between male ($M = 1.44$, $SD = 1.22$) and female ($M = 1.62$, $SD = 1.58$) participants found no significant difference ($t(46) = -0.47$, $p = 0.64$). This result concurred with earlier studies that found no significant difference in in-game advertisement recall and recognition rates between the genders.^{3,18}

Younger gamers had higher recall

Analysis by age group

Table 3 below shows the advertisement recall and recognition rates by age group. An independent *t*-test was conducted to compare the advertisement recall rate between younger and older games. Younger games recalled a higher number of advertisements ($M = 0.45$, $SD = 0.85$) as compared with older gamers ($M = 0.15$, $SD = 0.46$; $t(47) = 1.72$, $p = 0.09$). The magnitude of the difference in the means was medium ($d = 0.44$). In addition, an independent *t*-test found that younger gamers recognized a higher number of advertisements ($M = 2.03$, $SD = 1.35$) when compared with older gamers ($M = 0.93$, $SD = 1.17$; $t(56) = 3.33$, $p = 0.00$).

Table 2: Advertisement recall and recognition rates by gender

	Male ^a	Female ^b	<i>t</i> -value
Mean advertisements recalled	0.25 (SD = 0.67)	0.38 (SD = 0.75)	-0.71
Mean advertisements recognised	1.44 (SD = 1.22)	1.62 (SD = 1.58)	-0.47

^a $n = 32$.

^b $n = 26$.

Table 3: Advertisement recall and recognition rates by age group

	Younger gamers ^a	Older gamers ^b	<i>t</i> -value	Cohen's <i>d</i>
Mean advertisements recalled	0.45 (SD = 0.85)	0.15 (SD = 0.46)	1.72*	0.44
Mean advertisements recognised	2.03 (SD = 1.35)	0.93 (SD = 1.17)	3.33**	0.87

^a $n = 31$.

^b $n = 27$.

* $p < 0.10$, ** $p < 0.01$.

The magnitude of the difference in the means was large ($d = 0.87$). The results show that younger gamers are able to recall and recognize advertisements to a larger extent than older gamers.

Discussion and conclusion

Frequency of exposure is high in gaming

The findings in this study concurred with earlier studies that the recall and recognition rates of in-game advertisements are low. However, this does not necessarily mean that in-game advertising in sports video games is not effective. Unlike movies and television programmes, video games are usually played more than once. Gamers are thus exposed to the advertisements repeatedly for a prolonged period of time.^{6,16,30} Owing to the limitations in the research design, the findings for this study, like other similar studies, do not measure the recall and recognition rates of in-game advertisements beyond the participants' initial exposure to the game. As such, the actual recall and recognition rates could be potentially higher. With mobile gaming, the frequency of exposure is even higher as gamers play casual games for short periods of time repeatedly.¹⁴

Recognition in games similar to other media

The findings also established that there is no difference between the gender in terms of the rate of recall and recognition of in-game advertisements. In this case, this study concurred with the small number of earlier studies that found no difference between the genders.^{3, 18}

Older gamers may have fewer cognitive resources

More importantly, it was found that younger gamers are more likely to recall and recognize in-game advertisements than older gamers. Specifically, the difference because of age is more apparent in the rate of recognition as compared with the rate of recall. These findings are comparable to similar studies conducted on different media.^{27–29}

Emphasize brand interaction with gameplay

With advertisements common at real-life race tracks, racing games are often considered one of the best formats for in-game advertising.¹⁶ However, such fast-paced games mean that gamers require more attention to control the car, thus leaving less attention capacity to notice the in-game advertisements.¹⁸ The majority of the older gamers in this study were not IT-savvy and many had never handled a tablet before the study. As such, this may have affected them as they would have needed to devote more cognitive effort to learning how to control the game on a unfamiliar medium and, as such, may have had fewer cognitive resources to process the peripheral cues.⁹ In contrast, the younger participants did not have any trouble in handling the tablet during game play as they were familiar with the device. This may partially explain the difference in the recall and recognition rates between the age groups.

However, this does not mean that brand owners should neglect the older demographic as there is an increasing number of gamers from this group. Rather, the study suggests that brand owners need to review their in-game advertisements strategies for this demographic segment. The literature has already established that there are several factors that can positively have an impact on the effectiveness of in-game advertisements. These include improving the prominence of the brand within the game, placing the brands at strategic locations and emphasizing interaction of the brands with the gameplay. In particular, by allowing personalization of the

Older gamers have more time to play

character or vehicle used in the game, it can also lead to an increase in gamers' enjoyment and retention.^{9,33} This is especially so when the older demographic segment is more likely to remember advertisements that are relevant to them.^{27,29}

While the older demographic segment may have lower recall and recognition rates, it must also be recognized that this segment of consumers is also more likely to have more leisure time. As such, they may be able to spend more time on playing games and to be exposed for longer durations to in-game advertisements.²⁷

This study is limited by the use of only one genre of sports video game in establishing the rate of recall and recognition of in-game advertisements. With different sports video games genres having a different pace and set of interactions, the ability of the findings to be generalized across other sports video games genres may be limited.^{10,17} Future studies should examine recall and recognition rates of in-game advertisements across different types of sports video games so that the genre that is most suitable in reaching out to older gamers can be identified.

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