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Advergame speed influence and brand recall: The moderating effects of brand placement strength and gamers' persuasion knowledge

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ABSTRACT

This study explores the effect of advergame speed, brand placement strength and consumers' persuasion knowledge on brand recall from the perspectives of attention and elaboration. Results show that low-speed advergames result in high brand recall as compared to high-speed advergames. A two-way interaction effect between advergame speed and brand placement strength reveals that for a low-speed advergame, a prominent brand placement results in higher brand recall than a subtle brand placement; for a high-speed advergame, there is no difference in brand recall between a prominent brand placement and a subtle brand placement. Further, for a low-speed advergame with prominent brand placement, subjects with high persuasion knowledge report higher brand recall than subjects with low persuasion knowledge. However, for a high-speed advergame with prominent brand placement, there is no difference in brand recall between subjects with high persuasion knowledge and subjects with low persuasion knowledge. Implications are provided.

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1. Introduction

Advertising is continually changing. A number of new and highly effective advertising tools have emerged that have made advertising extremely effective, but also challenging. Advertising on the internet via online games, by viral marketing, or on social networks are but a few of the still new non-traditional advertising tools on which big corporations are expending significant dollars for their brand promotions (Goh & Ping, 2014; Gross, 2010). For example, the large US companies spent around 16.6 billion US dollars on advertising from 2012 to 2014 (Statista, 2014). One report projects the gaming market to double and reach nearly 23.9 billion US dollars by this next year (Newzoo, 2013). Despite this augmented status and the significance of advergames as an advertising opportunity, limited scholarly insights exist about the effectiveness of brand placements in online games. While considerable academic work has used brand recall as an advertising effectiveness measure, less is known about the potential factors that affect brand recall in advergames. Further, the elements of

advergames such as game speed, location of brand placements in games and gamers' persuasion knowledge could be important factors in understanding consumer brand outcomes in the context of advergames.

Hence, the purpose of this research is to explore the conditions under which gamers' mental resources impact their processing of in-game brand placements. Specifically, this study explores the interaction effect of game speed, brand placement strength and persuasion knowledge on gamers' brand recall by utilizing insights from the Limited Capacity Model of Attention (Kahneman, 1973) and the Persuasion Knowledge Model (PKM) (Friestad & Wright, 1994) because these theories 1) explain how cognitive resources are allocated when individuals discern both the game and brand content while playing an online game embedded with brand messages, and 2) explain how individuals process in-game advertising when they demonstrate their persuasion knowledge about advergames.

2. Background

2.1. Advergames

Advergames are the interactive online games embedded with

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brand messages to promote a company's products (Bellman, Kamp, Haddad, & Varan, 2014; Cauberghe & De Pelsmacker, 2010). These digital games are specifically designed to advertise a brand, service or product through entertainment (Kretchmer, 2004; Vashisht & Sreejesh, 2015a), and are a form of branded entertainment that features advertising messages, logos and trade characters in a game format (Moore, 2006). Advergames are the latest tools in online advertising used to lure and attract customers to play in branded environments (Edwards, 2003; Vashisht, 2015). Businesses refer to advergames as a form of "embedded advertising" (Wade, 2004). Various companies use advergames to communicate to their prospective customers (Vashisht & Sreejesh, 2015b). For instance, leading cereal company Kellogg's launched various advergames promoting its brand Froot Loops, while Jeep Wrangler Rubicon launched its advergame "EVO" in 2001, resulting in a significant increase in revenue; the company reported sales of more than 1000 Jeeps. Additionally, the US Army used an advergame for its promotion, "America's Army" which was considered a success (CGW, 2004).

Advergames are highly influential on customers as compared to traditional advertising media (Wade, 2004) because advergames have several advantages over traditional advertising such as arresting customers' attention for long time spans (Edwards, 2003), easy adjustability, cost-effectiveness and viral marketing ability (Ipe, 2008). Further, customers get more involved with the game as compared to their involvement when watching television ads as simply passive viewers of the TV program content (Nicovich, 2005). Prior research on different forms of advertising suggests differences between the customers' information processing mechanism used in the traditional ad context and that used in online games (Bellman, Kamp, Haddad, & Varan, 2014; Grigorovici & Constantin, 2004; Obermiller, Spangenberg, & MacLachlan, 2005). The basic difference is that in traditional advertising formats (e.g., commercial spots during and between TV programs), a viewer generally recognizes the motive behind the ad which triggers consumer suspicion and persuasion knowledge that works to attenuate the desired persuasive effects (Friestad & Wright, 1994; Obermiller et al., 2005). In online advergames, such defense mechanisms (Grigorovici & Constantin, 2004) are less likely to be triggered.

Second, the advergame task becomes the focal point of the consumer's attention, but in television ads, watching the program is the primary focus (Grigorovici & Constantin, 2004; Lang & Basil, 1998; Lang, 2000). Finally, unlike traditional forms of advertising media, advergames are very hypnotic and enthralling in nature because focusing on the location of brands in the game becomes secondary and a less important task for the players (Nicovich, 2005). Hence, game speed, the brand placement strength and players' persuasion knowledge may be important characteristics that cannot be ignored in understanding consumer response to advergames.

2.2. Advergame speed

Game speed of an advergame is the overall pace of the game that includes the steering speed, the pace with which the objects placed in the game move, and the type and the difficulty level of game task in the advergame (Vashisht & Sreejesh, 2015b). To understand and study the impact of game speed on players' brand recall, we apply the limited capacity model (LCM) of attention (Kahneman, 1973; Lynch & Srull, 1982). According to the LCM, an individual has a limited amount of attentional capacity at any given point of time and when multitasking, division of total attentional capacity occurs in two parts: one is for the primary task and the rest (the spare capacity) is necessary for the secondary task. The less capacity used for the primary task, the more spare capacity is

available for the secondary task. For an advergame player, game playing is the primary task where processing of in-game brand placements is the secondary task (Grigorovici & Constantin, 2004). The more attentional capacity used for game playing, the less remaining for processing in-game brand placements.

As digital games have become more challenging both graphically and attentionally, game-playing influences visual processing (Blumberg, 1998; Green & Bavelier, 2006) and in particular, visual processing of objects either by increasing the attentional resource or affecting the pre-attentive processing (Reisenhuber, 2004). Studies show that higher attentional capacity is required for steering and the gaming task in fast video games than slow games (Kureshi & Sood, 2009). This stress to perform quickly on numerous game controls leads to a needed increase in perceptual load to play a fast game as opposed to a slow game. Further, the attentional load becomes greater in fast games because of the high speed as compared to slow games (Vashisht & Sreejesh, 2015b; Vashisht, 2015). Based on the LCM, in fast games, with the increasing strain of the primary task (game-playing), mental capacity needed to process the secondary task (here in-game brand placements) gets washed-out (Lavie, 1995; Lavie & Cox, 1997). In contrast, because of less difficulty in the slow game less mental capacity is used for game-playing and more spare capacity remains which is high enough to process in-game placements. Thus, based on such rationale, it is expected that brand recall of a low-speed advergame player will be greater than that of a high-speed advergame player. Hence, the following hypothesis is offered:

H1. A low-speed advergame will result in higher brand recall than a high-speed advergame.

2.3. Brand placement strength

The advertising literature defines brand placement strength (or brand prominence) as "the extent to which the appearance of the brand possesses characteristics designed to make it the central focus of audience attention" (Gupta & Lord, 1998, p. 48). The brand placement is considered a prominent placement in an advergame when "the product or other brand identifier is made highly visible by virtue of size and/or position on the screen or its centrality to the action in the scene" (Gupta & Lord, 1998, p. 49). In contrast, a brand placement is defined as a subtle brand placement in the game "when it is peripherally placed on the game screen or in the background or when the brand size is very small" (Gupta & Lord, 1998, p. 49). Thus, the location or size of the embedded brand defines its prominence or placement strength which may control its effect.

Existing research has found that prominent brand placements (focal brand placements) produce higher recall than subtle brand placements (peripheral brand placements) (e.g., Cauberghe & De Pelsmacker, 2010; Gupta & Lord, 1998; Herrewijn & Poels, 2014; Homer, 2006; Nelson, 2002; Russell, 2002; Van Reijmersdal, Jansz, Peters, & Van Noort, 2010). Vividness effects explain the dominance of prominent product placements in advergames. Steuer (1992) conceptualizes vividness as "the representational richness of a mediated environment as defined by its formal features: that is the way in which an environment presents information to the senses." When a message is emotionally appealing, tangible and imagery provoking and contiguous in a sensory, chronological or spatial way, then it is said to be a vivid message (Nisbett & Ross, 1980). Thus, a prominent brand placement would be perceived as more thrilling, which ultimately results in higher brand recall than a subtle brand placement.

Based on the limited capacity model (Kahneman, 1973), it is expected that in low-speed advergames, less attentional capacity

would be required for the game-playing task (primary task) and gamers would retain more spare-capacity that is high enough to process in-game placements. Further, when a brand is prominently embedded in a slow game where the brand noticeability is very high and gamers have high spare-capacity, the recall rate will be higher as compared to the subtle brand placement in the low-speed advergaming condition. In a high-speed advergaming, more attentional resources are used in the game playing task (primary task), leaving less spare-capacity for processing in-game advertising. Therefore, brand recall differences between prominent brand placements and subtle brand placements will be low and insignificant for high-speed advergaming. Hence, the following hypotheses are proposed:

H2a. For a low-speed advergaming, a prominent brand placement results in higher brand recall as compared to a subtle brand placement.

H2b. For a high-speed advergaming, there is no difference in brand recall between a prominent brand placement and a subtle brand placement.

2.4. Persuasion knowledge

Consumer persuasion knowledge is defined as the knowledge that “enables them [consumers] to recognize, analyze, interpret, evaluate and remember persuasion attempts and to select and execute coping tactics believed to be effective and appropriate” (Friestad & Wright, 1994, p. 3). When a consumer recognizes the persuasion attempt in the advergaming, persuasion knowledge is likely activated (here referred to as subject with persuasion knowledge), and we believe that recall will vary depending on whether or not persuasion knowledge is activated. According to the PKM, persuasion knowledge provides an understanding to the consumers that the source of the advertising format is marketable, money-making and includes persuasive intent (Friestad & Wright, 1994). If a high-speed advergaming player needs more mental capacity for the game playing task, the game becomes the center of attention and thus, more involving in nature. In this case, identifying the persuasion agent or source and persuasive intent of brands embedded in advergaming would become more difficult for the players than when compared to traditional advertising such as TV ads or ads in movies etc. (Livingstone, 2009), despite the fact that the brands are prominently placed in the game. Hence, it can be argued that in high-speed advergaming with prominent brand placements, brand recall differences between the gamers with high and low persuasion knowledge will be small and immaterial.

Conversely, the spare capacity of a low-speed advergaming player required to process in-game advertising will be higher than that of a high-speed advergaming player. As a result, when brand prominence appears in a low-speed advergaming, the player notices the brand which should translate into high brand recall. However, when a gamer playing a low-speed advergaming with prominent brand placement activates persuasion knowledge, he/she is likely to connect the reasons for the very noticeable brand in the game with the ad-persuasion source (Friestad & Wright, 1994). This increases a player's cognitive elaboration (Petty & Cacioppo, 1986), resulting in higher brand recall as compared to the players who have not acquired such persuasion knowledge or have very low persuasion knowledge in the low-speed prominent brand placed advergaming condition. Thus, it is likely that for a low-speed advergaming with prominent brand placement, the player's recall rate would be higher than when he/she activates persuasion knowledge than when he/she does not. Thus, the following hypotheses are proposed.

H3. There will be a game speed $\times$ brand placement strength $\times$ persuasion knowledge interaction effect on brand recall. More specifically,

H3a. For a high-speed advergaming with prominent brand placement, there is no difference in brand recall between players with high persuasion knowledge and players with low persuasion knowledge.

H3b. For a low-speed advergaming with prominent brand placement, players with high activated persuasion knowledge will report higher brand recall than players with low persuasion knowledge activation.

3. Method

3.1. Design and development of stimulus materials

To test the hypotheses, a 2 (game speed: high or low) $\times$ 2 (brand placement strength: prominent or subtle) $\times$ 2 (persuasion knowledge: high or low) between-subjects experimental design was conducted. Game speed and brand placement strength were manipulated variables and persuasion knowledge was measured. Hence, four conditions were developed.

To develop the stimuli for high speed versus low speed advergaming, and prominent versus subtle placements, we conducted a focus group with 10 student gamers to select the product category to use in the advergaming as well as the advergaming theme. This was to ensure that both the product category and the game theme would be relevant and familiar to the students. Based on focus group feedback, the energy/diet drink product category and a racing theme game were selected. In addition, potential fictional brand names that were consistent with the product category and the game theme were examined. Fictional brands were used to eliminate bias from preexisting attitudes toward brands. Four brand names were selected to use in the study: Amola Sports Energy Drink, 20-20 Sports Energy Drink, Nutri-Protein Shake, and BalDiet Soft Drink.

Two pretests were then conducted to select the stimulus for the manipulated variables of game speed (high versus low) and brand placement strength (prominent versus subtle). Pretest 1 was conducted in two stages. In stage one, a group of 10 student gamers were asked to choose four games from a list of 25 that they believed were very fast, very slow, prominent placed and subtly placed games. An example was provided to ensure the students understood the task. In stage two, randomly selected participants ($n=40$) who regularly play online-games came to a computer laboratory. After playing the game, participants rated the speed of the selected advergaming on a five point semantic differential scale that was developed with the input of advertising professionals. Specifically, 1 = very slow, 2 = slow, 3 = little bit fast, 4 = fast and 5 = very fast. Because the professionals felt that 3 might represent a fast game, the empirical mean of 2.5 was used as the midpoint to divide high speed and low speed games. Hence, high speed advergaming (above 2.5) and low speed advergaming (below 2.5) were selected for the study.

Pretest 2 was then conducted to select the stimuli for brand placement strength from the selected low and high speed advergaming. Pretest 2 was conducted in two stages. In stage one, the same focus group gamers were asked to indicate the extent to which they felt the brands were prominently placed in each game. Similar to the first pretest, a five point semantic differential scale (1 = highly subtly placed, 2 = subtly placed, 3 = less prominently placed, 4 = prominently placed, 5 = highly prominently placed). Accordingly, prominent and subtle brand placement advergaming

were then identified. In stage two, to confirm the process carried out in stage one of pretest 2, another set of randomly selected gamers ($n=40$) were called to a computer laboratory to play one of the advergames. They then rated the extent of brand placement strength on a five point semantic differential scale (1 = highly subtly placed to 5 = highly prominently placed). Results revealed that the players were able to differentiate between prominent and subtle placed games. Based on the mean scores, prominent brand placement advergames (above 2.5) and subtle brand placement advergames (below 2.5) from high and low speed games were selected. This process resulted in four advergames (high-speed with prominent-placement, high-speed with subtle placement, low-speed with prominent-placement and low-speed with subtle placement). All four brands were embedded in each advergame, consistent with the specific condition. All stimuli were developed by agency professionals.

3.2. Participants and procedure

Participants were selected from a large urban university in India. Studies report that 90% of teens are gamers (Mediaedge:cia, 2005; Reisinger, 2011), supporting the use of a student sample for this study. The gamers selected were undergraduate management students between the age group of 16–19 years. A random group of 349 students was selected from a list of all the university students, and were asked to rate their game playing interests on a five point Likert scale which was developed with the input of marketing professionals (1 = “not at all interested,” 2 = “very less interested,” 3 = “a little bit interested,” 4 = “interested” to 5 = “very much interested”). Since the advertising professionals felt that 3 might represent some interest in the game, the empirical mean of 2.5 was used as the midpoint to divide the subjects into high game playing interest and low game playing interest categories. Only students that showed a game playing interest score above the average (2.5) were chosen for the study. Hence, a total of 300 (males = 223 and females = 177) students were selected.

Subjects were then called to a computer lab where they were randomly assigned to one of the four conditions. They were told they would be playing a computer game for about 10 min (one gamer playing one game on the assigned PC). The subjects were not told about the purpose of the study (advergame research). They then played the respective advergame on individual consoles for the 10 min. After playing the game, participants completed the questionnaire which included questions eliciting their responses to brand recall as well as manipulation check items. At the end of the questionnaire, subjects were asked about their prior familiarity of the brands in the advergame with the following yes or no question: Were you aware of the brands (brand name) used in the advergame earlier? If participants answered positively, responses were considered invalid and omitted from the analysis to ensure that this perceived familiarity would not bias the results. The question was asked at the end of the study to avoid any potential priming effects. This reduced the sample to 224 (males = 115 and females = 109) because 76 participants responded positively to this question.

3.3. Measures

Three independent variables were examined in the study; game speed and brand placement strength were manipulated variables, while persuasion knowledge was a measured variable. Persuasion knowledge was measured using a seven-item five-point persuasion knowledge scale (1 = definitely disagree to 5 = definitely agree) adapted from Wu (2009): (1) the way this ad tries to persuade people seems acceptable to me (reverse coded), (2) the advertiser tries to manipulate the audience in ways that I don't like, (3) I am

annoyed by this ad because the advertiser seemed to be trying to inappropriately manage or control the consumer audience, (4) The ad was fair in what was said and shown (reverse coded), (5) when I read the ad, I think it's pretty obvious the ad is trying to persuade me to buy the product (6) I noticed tricks in this ad to promote the product, and (7) this ad is meant to sell the product. Mean ratings of the seven items divided the sample into three groups (high persuasion knowledge = Mean ≥ 4 ; neither high persuasion knowledge nor low persuasion knowledge = Mean 3; and low persuasion knowledge = Mean ≤ 2).

Because the study's prime objective was to examine the role of persuasion knowledge under high and low conditions, we omitted those respondents with neither high nor low persuasion knowledge. Moreover, there is a possibility that a student population might be more homogeneous in their persuasion knowledge levels than the general population; hence tripartite partitioning was used in the study. That is, we selected the top and bottom thirds for the study. This also reduces classification errors and variance. This practice has been used in other studies examining individual's factors (e.g., Cacioppo, Petty, & Morris, 1983). This further reduced the sample into 200 usable responses. Post hoc analysis confirmed that this split was orthogonal to the other manipulated variables ($p > 0.10$). Reliability ($\alpha = 0.732$) and construct validity (0.751) were checked and found to be satisfactory.

The dependent variable, brand recall, was measured by asking participants to list the brand names that appeared in the advergames. Two coders who were blind to the experiment counted the number of brand names recalled. If a subject listed an advertised brand correctly, it was coded as a correct response. An answer was coded as an incorrect response if the participant did not list an advertised brand or listed a non-advertised brand name. The numbers of correct responses ranged from 0 to 4 as there were four different brands embedded in the advergames. Inter-coder reliability was checked and found to be satisfactory ($\alpha = 0.85$).

4. Results

4.1. Manipulation checks

To test the manipulation of game speed, participants were asked to rate the perceived speed of the advergame by using a five point semantic differential scale ranging from 1 to 5 (1 = very slow to 5 = very fast). Results of a one-way ANOVA revealed a significant difference ($F(1,196) = 70.562, p = 0.000$) between high-speed advergames ($M = 3.991, SD = 0.082$) and low-speed advergames ($M = 2.015, SD = 0.07$). Similarly, the manipulation of brand placement strength was confirmed by asking the respondents to specify the extent to which they felt the brands were prominently placed in each game by using a five point semantic differential scale (1 = “highly subtly placed” to 5 = “highly prominently placed”). Results of a one-way ANOVA showed a significant difference ($F(1,196) = 35.163, p = 0.000$) between prominent brand placement ($M = 3.907, SD = 0.081$) and subtle brand placement ($M = 2.482, SD = 0.065$), indicating that both manipulations were successful.

4.2. Hypotheses testing

The hypotheses were tested via a $2 \times 2 \times 2$ ANOVA with brand recall as the dependent measure and game speed (game speed: high or low), brand placement strength (brand placement: prominent or subtle), and persuasion knowledge (persuasion knowledge: high or low) as the predictor variables. Results indicate that variation in game speed significantly influenced brand recall ($F(1, 196) = 430.58, p = 0.000, M_{\text{high-speed}} = 2.53, SD = 0.21, M_{\text{low-speed}} = 3.98, SD = 0.19$), supporting H1. Although not hypothesized,

results also show that brand placement strength significantly influenced brand recall ($F(1, 196) = 523.67, p = 0.000$, $M_{\text{prominent}} = 3.90, SD = 0.32$, $M_{\text{subtle}} = 2.35, SD = 0.87$), and persuasion knowledge significantly affects brand recall ($F(1, 196) = 422.54, p = 0.000$, $M_{\text{high-persuasion knowledge}} = 3.51, SD = 0.22$, $M_{\text{low-persuasion knowledge}} = 1.90, SD = 0.79$).

As predicted, the game speed $\times$ brand placement strength interaction has a significant effect on brand recall ($F(1, 196) = 331.64, p = 0.000$). Preplanned contrasts revealed that prominent brand placement (versus subtle brand placement) results in higher brand recall for low-speed advergames ($F(1, 196) = 564.84, p = 0.000$, $M_{\text{low-speed/prominent brand placement}} = 3.82, SD = 0.43$, $M_{\text{low-speed/subtle brand placement}} = 2.01, SD = 0.26$). For high-speed games, prominent brand placement (versus subtle brand placement) did not have any significant influence on brand recall ($F(1, 196) = 1.31, p = 0.07$, $M_{\text{high-speed/prominent brand placement}} = 2.74, SD = 0.21$, $M_{\text{high-speed/subtle brand placement}} = 2.70, SD = 0.13$). These findings are illustrated in Table 1 and Fig. 1, and support H2a and H2b. Although not hypothesized, the brand placement strength $\times$ persuasion knowledge interaction had a significant effect on brand recall ($F(1, 196) = 320.73, p = 0.028$). The two-way interaction result for prominent brand placement in the high-persuasion knowledge condition (versus low-persuasion knowledge condition) showed a significant difference in brand recall ($F(1, 196) = 591.22, p = 0.04$, $M_{\text{prominent brand placement/high-persuasion knowledge}} = 3.55, SD = 0.39$, $M_{\text{prominent brand placement/low-persuasion knowledge}} = 2.20, SD = 0.45$). However, gamers exposed to subtle-placement games in the high-persuasion knowledge condition (versus low-persuasion knowledge condition) did not demonstrate a significant difference in brand recall ($F(1, 196) = 1.72, p = 0.62$, $M_{\text{subtle brand placement/high-persuasion knowledge}} = 2.02, SD = 0.21$, $M_{\text{subtle brand placement/low-persuasion knowledge}} = 1.81, SD = 0.24$). Similarly, we also examined a two-way interaction between speed $\times$ persuasion knowledge interaction effect on brand recall ($F(1, 196) = 313.45, p = 0.031$). Results for low-speed games in the high-persuasion knowledge condition (versus low-persuasion knowledge condition) showed a significant difference in brand recall ($F(1, 196) = 432.19, p = 0.029$, $M_{\text{low-speed/high-persuasion knowledge}} = 3.64$,

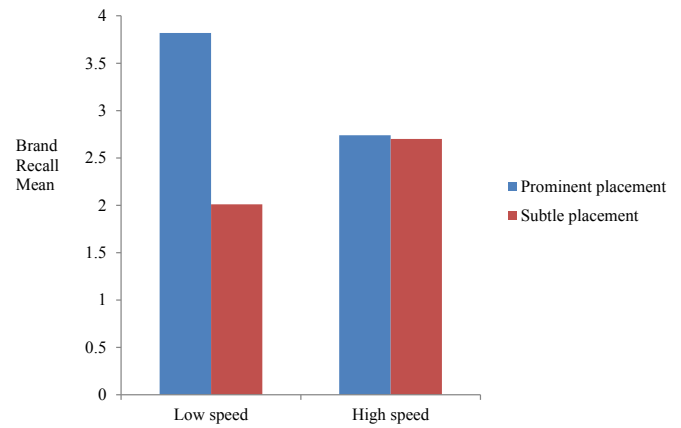


Fig. 1. Advergame speed $\times$ brand placement on brand recall.

$SD = 0.37$, $M_{\text{low-speed/low-persuasion knowledge}} = 2.85, SD = 0.02$). On the other hand, players exposed to high-speed games in the high-persuasion knowledge condition (versus low-persuasion knowledge condition) did not reveal a significant difference in brand recall ($F(1, 196) = 1.89, p = 0.071$, $M_{\text{high-speed/high-persuasion knowledge}} = 2.03, SD = 0.25$, $M_{\text{high-speed/low-persuasion knowledge}} = 1.22, SD = 0.11$).

The ANOVA also indicated a significant three-way interaction between game speed $\times$ brand placement strength $\times$ persuasion knowledge on brand recall ($F(1, 196) = 72.84, p = 0.000$). Preplanned contrasts revealed that gamers who had played a high-speed game in the prominent brand placement condition indicated lower levels of brand recall, and their persuasion knowledge about the embedded brand did not influence their brand recall ($F(1, 196) = 1.27, p = 0.07$, $M_{\text{high-speed/prominent brand placement/high persuasion knowledge}} = 2.20, SD = 0.03$, $M_{\text{high-speed/prominent brand placement/low persuasion knowledge}} = 2.00, SD = 0.02$). Additionally, gamers who had played a low-speed game in the prominent brand placement condition had higher levels of brand recall, and this recall was

Table 1
ANOVA results.

Effects		Mean	SD	F-value	Significance
Speed $F(1, 196) = 430.58, p < 0.05$	Low-speed	3.98	0.19	430.58	0.000
	High-speed	2.53	0.21		
Brand placement strength $F(1, 196) = 523.67, p < 0.05$	Subtle placement	2.35	0.87	523.67	0.000
	Prominent placement	3.90	0.32		
Persuasion knowledge (PK) $F(1, 196) = 422.54, p < 0.05$	Low PK	1.90	0.79	422.54	0.000
	High PK	3.51	0.22		
Speed $\times$ brand placement strength $F(1, 196) = 331.64, p < 0.05$	Low-speed $\times$ prominent placement	3.82	0.43	564.84	0.000
	Low-speed $\times$ subtle placement	2.01	0.26		
	High-speed $\times$ prominent placement	2.74	0.21	1.31	Not significant
	High-speed $\times$ subtle placement	2.70	0.13		
Brand placement strength $\times$ persuasion knowledge $F(1, 196) = 320.73, p < 0.05$	Prominent placement $\times$ high PK	3.55	0.39	591.22	0.040
	Prominent placement $\times$ low PK	2.20	0.45		
	Subtle placement $\times$ high PK	2.02	0.21	1.72	Not significant
	Subtle placement $\times$ low PK	1.81	0.24		
Speed $\times$ persuasion knowledge $F(1, 196) = 313.45, p < 0.05$	Low-speed $\times$ high PK	3.64	0.37	432.19	0.029
	Low-speed $\times$ low PK	2.85	0.02		
	High-speed $\times$ high PK	2.03	0.25	1.89	Not significant
	High-speed $\times$ low PK	1.22	0.11		
Speed $\times$ brand placement strength $\times$ persuasion knowledge (PK) $F(1, 196) = 72.84, p < 0.05$	Low-speed $\times$ prominent $\times$ high PK	3.91	0.04	21.34	0.000
	Low-speed $\times$ prominent $\times$ low PK	2.19	0.06		
	High-speed $\times$ prominent $\times$ high PK	2.20	0.03	1.27	Not significant
	High-speed $\times$ prominent $\times$ low PK	2.00	0.02		
	Low-speed $\times$ subtle $\times$ high PK	2.09	0.12	1.44	Not significant
	Low-speed $\times$ subtle $\times$ low PK	1.91	0.02		
	High-speed $\times$ subtle $\times$ high PK	2.75	0.04	1.16	Not significant
	High-speed $\times$ subtle $\times$ low PK	2.66	0.03		

influenced by persuasion knowledge ($F(1, 196) = 21.34, p = 0.000$, $M_{\text{low-speed/prominent brand placement/high persuasion knowledge}} = 3.91$, $SD = 0.04$, $M_{\text{low-speed/prominent brand placement/low persuasion knowledge}} = 2.19$, $SD = 0.06$), supporting hypotheses H3a and H3b. Results are shown in Table 1 and Fig. 2.

Although not hypothesized, we also examined the three-way interaction between a low-speed game with subtle-placement in the high-persuasion knowledge condition (versus low-persuasion knowledge condition); no significant difference in brand recall was found ($F(1, 196) = 1.44, p = 0.08$, $M_{\text{low-speed game/subtle brand placement/high-persuasion knowledge}} = 2.09$, $SD = 0.12$, $M_{\text{low-speed game/subtle brand placement/low-persuasion knowledge}} = 1.91$, $SD = 0.02$). Similarly, gamers exposed to high-speed games with subtle-placement in the high-persuasion knowledge condition (versus low-persuasion knowledge condition) did not reveal a significant difference in brand recall ($F(1, 196) = 1.16, p = 0.07$, $M_{\text{high-speed game/subtle brand placement/high-persuasion knowledge}} = 2.75$, $SD = 0.04$, $M_{\text{high-speed game/subtle brand placement/low-persuasion knowledge}} = 2.66$, $SD = 0.03$).

5. Discussion and implications

Results of this study show the effect of the two-way interaction (game speed $\times$ brand placement strength) on gamers' brand recall is conditional upon their persuasion knowledge about the advergames, although persuasion knowledge does not affect recall rates in the high-speed game with prominent brand placement condition. In contrast, for low-speed with prominent brand placement advergames, gamers with high persuasion knowledge reported higher brand recall than gamers with low persuasion knowledge about advergames. Such findings support the notion that a low-speed game can help the gamer process the advertisement when it is more prominently placed in the game.

However, this processing is likely conditional upon gamers' persuasion knowledge about the advergames. When the gamer understands the persuasive intent of the ad placed in the game, it develops less favorable attitudes toward in-game advertised brand. Conversely, absence of persuasion knowledge would likely lead to high assessment toward the in-game advertised brand. Such findings are very important for marketers and advertisers because selection of media is highly noticed by the consumers, leaving a long lasting effect. Hence, it is an important consideration for media planners.

Thus, if high brand awareness and recall are prime goals for advertisers, then low-speed advergames with prominent brand placements should be considered a better media strategy for in-

game brand placements. Moreover, it is usually presumed that increasing persuasion knowledge leads to more serious processing of advertising; hence, game developers and advertising practitioners can design highly effective advergames by considering persuasion knowledge activation to ensure the execution has the strongest effect on consumer brand recall.

The two-way interaction between advergame speed and brand placement strength shows for a low-speed advergame, a prominent brand placement results in higher brand recall than a subtle brand placement; for a high-speed advergame, there is no difference in brand recall between a prominent brand placement and a subtle brand placement. These findings support the limited capacity model of attention (Kahneman, 1973). For a gamer playing a low-speed advergame, the spare capacity required to process in-game advertising is more than for a gamer playing a high-speed advergame. As more attentional capacity is used by the player of a high speed game, the capacity remaining to process in-game brand placements is reduced; hence, low-speed games result in higher brand recall than high-speed games.

Moreover, when the brand placement is prominent, the gamer's noticeability of the brand increases as compared to when the brand placement is subtle (Steuer, 1992). In prominent brand placements, the brands are centrally placed in the game screen and are very large; in subtle brand placements, the brands are peripherally placed and are very small, and hence, unnoticed by the gamers (Gupta & Lord, 1998). As a result, in low-speed games, a prominent brand placement results in higher brand recall as compared to subtle brand placements. This finding supports the theory of vividness effects which asserts that vividness is "the representational richness of a mediated environment as defined by its formal features: that is the way in which an environment presents information to the senses (Steuer, 1992)." Hence, when a message is emotionally appealing, tangible and imagery provoking and contiguous in a sensory, chronological or spatial way, then it is said to be a vivid message (Nisbett & Ross, 1980). Thus, prominent brand placement might not be perceived as more thrilling, ultimately resulting in higher brand recall than a subtle brand placement.

Overall, this research contributes to the relevant literature with findings that are consistent with the persuasion knowledge model (Friestad & Wright, 1994) and the elaboration likelihood model (Petty & Cacioppo, 1986). Such results demonstrate that when a gamer has enough knowledge about the persuasive intent of advergames, s/he cognitively elaborates on the reasons behind brand placement, which in turn results in high brand recall. Hence, in designing effective advergames, potential for the activation of gamers' persuasion knowledge must be considered.

Our results offer several theoretical and practical implications. First, much of the previous brand placement research examined the individual influence of brand prominence and persuasion knowledge in audio-visual content, such as television, film, and video games. In the current study, the simultaneous effect of advergame speed, brand prominence and persuasion knowledge on consumers' brand memory was investigated from attention and elaboration perspectives in the emerging market of India. Second, because of the many variations in the demographic composition of Internet users (Internet Live Stats, 2016), this research adds to the limited body of research examining consumers' brand recall in an emerging market context. Third, by drawing the insights from LCM and PKM, this research illustrates the conditions under which brand placements in online games create attention, elaboration and subsequent brand recall.

Fourth, this study demonstrates the cognitive mechanisms involved in processing in-game embedded brand messages. Fifth, the findings of the paper suggest that if increasing gamers' recall is the advertiser's objective, it is best to place a brand prominently in

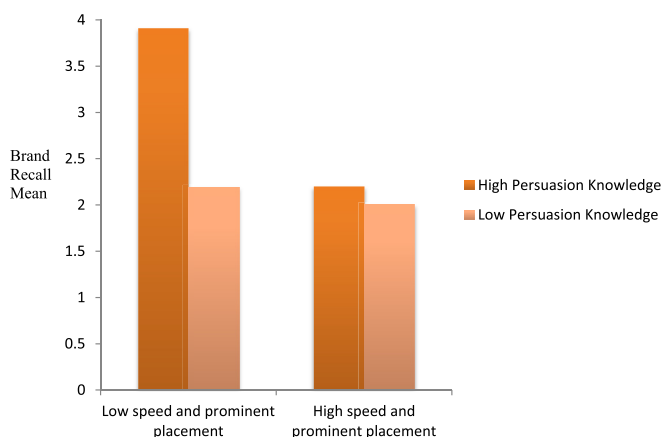


Fig. 2. Advergame speed $\times$ brand placement $\times$ persuasion knowledge on brand recall.

a slow-speed advergame. Sixth, this study shows that to design highly effective advergames, rather than considering only attention-factors or only cognitive-elaboration factors, both factors together must be taken into consideration. Finally, this paper reveals that when using game-factors such as speed and brand placement strength, managers must also keep in mind the types of products that can be placed in a low/high speed game with prominent/subtle brand placement.

Specifically, this paper reveals that in addition to game-specific factors, such as advergame-speed and brand prominence, some gamer-specific factors (e.g., persuasion knowledge) can moderate the effect of game-factors on gamers' brand memory. Hence, findings indicate key promotional strategies that marketers can implement for in-game brand placements, particularly for advertising practitioners who wish to promote a brand by using a non-conventional communication channel such as digital games.

6. Limitations and future research

While our findings offer significant findings for the development of effective advergames, we acknowledge the limitations of our study. First, we only used two levels of game speed and two levels of brand placement strength. Hence, the effect of moderate level of game speed as well as variation in brand placement strength on gamers' brand recall should also be examined, particularly given the diversity in games on the market.

Second, while we examined the moderating role of persuasion knowledge on brand recall, other potential moderating effects, such as game-product congruence should be explored in future research. Further, we only examined high and low levels of persuasion knowledge. Future inquiry should investigate a range of persuasion knowledge levels.

Although the sample for the study was highly appropriate, a broader based sample would enhance generalizability. While teenagers are significant game players, the different age groups that play online games have increased. Hence, future research should use a wide range of participants.

Additionally, in the pretests to develop the stimuli, as well as the selection of participants, we used an empirical mean of 2.5 based on input from advertising practitioners. Future research should utilize a different approach in the development of the stimuli and selection of the participant. Finally, this study did not examine any individual difference variables such as product involvement, game-involvement, need for cognition, gender or affinity with the computer. Hence, future research should consider investigating such variables.

7. Conclusion

Embedding promotional messages within the game has received considerable interest from academicians and practitioners. Despite this interest and the increased use of this medium as a promotional strategy, current understanding in this area is still limited, which may lead to a lack of effective advergame design and execution. One major issue pertinent to the current understanding in this area is relatively less availability of scientific evidence about game and gamer specific factors that influence brand memory, specifically, how and to what extent these factors create attention, elaboration and subsequent persuasion and memory of the embedded brands in the games. The current study begins the process of resolving this issue.

In sum, this research provides an understanding of advergaming effects from three perspectives, i.e., attention, elaboration and persuasion. Specifically, it describes how game-specific factors (advergame speed and brand placement strength), and a gamer-

specific factor (persuasion knowledge) as attention and elaboration components shape consumers' brand recall. Findings suggest that advertisers should consider low-speed advergames with embedded prominent placements because they result in higher brand recall than high-speed advergames and subtle brand placements. Further, persuasion knowledge should be considered in advergame design because study results show gamers with high persuasion knowledge have higher brand recall than those with low persuasion knowledge. Therefore, findings have considerable interest to both academicians and marketing professionals seeking to understand what produces higher recall in advergames and how such games really work.

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