Social Signifiers of Interactive Advertising in Mobile Gaming

An Empirical Study on Gamers’ Perception towards Interactive Advertisements

Wenkai Han
Abstract

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With the rapid growth of mobile games, more and more people are involved in gaming. As a result, a growing number of advertisers seek to promote their brands and products in mobile games. However, as previous studies on product placements were mostly focused on traditional media formats like television and movies, the unique feature of interactivity was largely missing among current studies on in-game advertising. This study aimed to investigate how interactive styles of advertisements would influence gamers’ perception of the brands as well as the gaming experience. We took the perspective from interactivity and discussed how affordances and signifiers could be connected to the interactivity in gaming. Subsequently, we developed a prototype with five different interactive advertisements for our experiments. After an experiment combined with observation, semi-structured interview and survey on 25 participants, we produced our results through qualitative thematic analysis and quantitative statistical analysis on the gathered data. Through the analysis, we found an underlying connection between the social signifiers connected to the advertisements and the users’ perception of the corresponding brands. This study produced meaningful insights on how interactive advertisements would influence gaming experiences and users’ perception of the advertised brands.
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1. Introduction

With the rapid growth of mobile games, more and more people are involved in gaming. As a result, a growing number of advertisers seek to promote their brands and products in mobile games. However, as previous studies on product placements were mostly focused on traditional media formats like television and movies, the unique feature of interactivity was largely missing among current studies on in-game advertising. This study aimed to investigate how interactive styles of advertisements would influence gamers’ perception of the brands as well as the gaming experience.

1.1. Background

In this study, we collaborated with an immersive advertising platform for mobile, Virtual Reality (VR) and Augmented Reality – Adverty – to further investigate immersive advertisement in mobile gaming. We decided to focus on mobile gaming particularly because of the prevalence of it – in a recent industry report published by Newzoo (Wijman, 2018), the market share of mobile gaming in the gaming industry is 51% with a 70-billion-dollar revenue and a 25.5% of year-over-year increase in 2018. In contrast, AR gaming reached merely 2 billion dollars in revenue in the same year (Batchelor, 2018). Thus, our research specifically on immersive advertising in mobile gaming would generate more meaningful results for the current market. The intention was to study the how the players perceived the immersive advertisement in mobile gaming in terms of signifiers.

The unique nature of gaming and advertisement also makes its signifier an interesting subject to study – in a traditional setting like learning, the perceived affordances and social signifiers of interface elements were usually studied and evaluated in the context of recognizability and usability (Boy et al., 2016; Cheng & Tsai, 2013; Dunleavy, Dede, & Mitchell, 2009; Nielsen, Brandt, & Swensen, 2016). However, gaming is usually not a context for productivity, and advertisements in gaming are usually not necessary elements that users tend to interact with to achieve their goals. This is particularly true for immersive advertisements in gaming. Immersive advertisements prone to blend in with the environment of the game, but still need to stand out in some ways and show that they are interesting to interact with, so the information of the advertisement could be successfully delivered. This puts a unique dilemma between the game developers and the advertisers. On the one hand, game developers need to ensure that the gaming experience would not be hurt by putting advertisements in the games.
On the other hand, advertisers want gamers to be exposed to their brands as much as possible. Thus, this dynamic between different stakeholders proposes a special question on the perspective of signifiers and affordances\(^1\) – what styles of the immersive advertisements would give rise to the users’ understanding of the advertising elements’ social signifiers without disturbing the gaming experience?

### 1.2. Research Questions

The goal of the study is to investigate the following issues:

Q1: How do users understand the social signifiers of each interactive advertising style in mobile gaming.

Q2: What is the connection between the social signifiers of an interactive advertising style in mobile gaming with the users’ perception towards corresponding brands.

### 1.3. Delimitations

There are several processes of an interaction that might involve the concept of a signifier – visibility, mental model process, and the outcome. The study only examines perceived social signifiers, that is, the immediate understanding of the possible functions and outcomes of interacting with an object under the gaming context.

With different mental models of understanding different objects, people with different backgrounds might understand the signifier of an object differently. This study also mostly focuses on the general trend of the social signifiers, but not the differences of them among groups. Among possible factors, we will only examine how previous gaming experiences might influence their understanding of social signifiers of the advertising objects.

Also, we won’t examine the social signifiers in fields other than gaming and advertising. However, the comparison with similar studies in other fields might be made to discuss the peculiarity of social signifiers in gaming and advertising.

\(^1\) The concepts affordance and signifier will be discussed in detail in chapter 2.3.
Finally, we won’t discuss the traditional marketing side of advertisements like retention rate, brand attitude, and recognition, as we’re focusing specifically on interactive advertising in gaming and its interactive nature.
2. Theoretical Background

In this chapter, we will discuss related studies from product placements and the gamification of advertisement to the theories in affordances and social signifiers. We will start with product placement, as the in-game advertisements are one category of product placement. Then we will discuss the unique feature of interactive advertising in gaming – interactivity – and connect it with theories regarding affordances and signifiers.

2.1. Product Placement

Product placement, also known as embedded marketing, was defined by the European Audiovisual Observatory as “any form of audiovisual commercial communication consisting of the inclusion of or reference to a product, a service or the trademark thereof so that it is featured within a programme” (European Audiovisual Observatory, 2019). The early research on product placement was done by Vollmers, Mizerski and Karrh, who recognized the importance of product placements (Karrh, 1998). Growing investments and interests in this topic have led to a range of related research on product placements in not only movies and television programs, but also in the gaming industry (Baalbaki & Samih, 2012; Bardzell, Bardzell, & Pace, 2008; Hansson, 2017; La Ferle & Edwards, 2006; Lewis & Porter, 2010; Li, 2015; Nelson, 2002; Terlutter & Capella, 2013; Yang et al, 2006).

Initially seen in mostly movies and television programs, early studies on product placement usually focused on these areas and analyzed the impact of product placement on brand recall or recognition (D’Astous & Chartier, 2000; Gupta & Lord, 1998; Karrh, 1998), brand attitudes (Babin & Carder, 1996; Nelson, 2002) and brand salience (Babin & Carder, 1996).

In the first decade of the 2000s, a growing number of consumers were transforming from watching television and movies to playing computer and console games in their leisure time (Chaney et al., 2004). This transformation attracted attention from both the advertising industry and researchers. As most previous studies were based on product placement in movies and television at the time, the related research in gaming heavily referred to those studies and compared the results with those in movies and television (Bardzell et al., 2008; Chaney et al., 2004; Lewis & Porter, 2010; Nelson, 2002; Terlutter & Capella, 2013).
Previous studies on brand placements in video games claimed that the similarities between brand placements in movies and television programs offered them a starting point on brand placements in video games (Bardzell et al., 2008; Lewis & Porter, 2010; Terlutter & Capella, 2013). First, similar to product placements in movies and television programs often associated the famous actresses or actors with the brands, implying their endorsements to such product, the product placements in video games could also be associated similarly to the characters, developers or celebrity figures appeared in them (Baalbaki & Samih, 2012; La Ferle & Edwards, 2006; Lewis & Porter, 2010; Nelson, 2002; Yang et al., 2006). Second, product placements are usually seen more positively than traditional advertisements, and they can enhance the realism of both movies or television shows and video games (Gupta, Balasubramanian, & Klassen, 2000; Lewis & Porter, 2010; Nelson, 2002). For example, the famous movie series Fast & Furious has been placed with various cars such as Maserati, Porsche, and Chevrolet among others, and such placements would help to develop the characters and facilitate the audiences to relate to the movie. A similar example in gaming is racing game Gran Turismo 2. Different brands from motor oil to cars and tires were proven to add game realism as they correspond to the brands used in real life racing. However, the advantage of product placements’ realism heavily depend on the game genre and scenery, and if the advertisements did not match reality or were placed poorly, it would compromise the gaming experience (Lewis & Porter, 2010; Nelson, 2002). In addition, another similarity is that the lifetime of brands placed in movies or television programs and games are longer than a typical advertisement (Yang et al., 2006).

Despite the prominent similarities between product placements in video games and traditional media like movies and television programs, there is also a critical difference in the interactive nature of video games. Unlike passively watching the television shows or movies, players need to actively control the gameplay and make decisions accordingly. Some studies show that as the gamer’s attention is divided between the game controls and the graphics they’re watching, their attention towards the visually presented advertisement might be divided (Terlutter & Capella, 2013; Yang et al., 2006). This might subsequently lead to a lower retention rate of the brands or the products. However, other studies argue that the higher level of engagement due to the interactive nature of gaming might give rise to both explicit or implicit memory and the understanding of the brand and product (Bardzell et al., 2008; Chaney et al., 2004; Lewis & Porter, 2010). Indeed, when users interact with an advertising
element in a game, not only the users’ attention of watching the advertisement was aroused, it also activates additional attention to rationalize their decision and control regarding the advertisement. This might compensate for the “divided attention” previous studies proposed and even add to the attention that users pay to the advertisements.

2.2. **The Gamification of Advertisement**

After summarizing the previous studies in product placements, in this section, we will more closely examine advertising in gaming and its interactive nature. This would help us to understand how different factors might influence the outcome of interactive in-game advertising and connect this subject with the discussion on affordance and signifier in the next section.

A large number of studies were done on interactive in-game advertising recently (Bardzell et al., 2008; Chaney et al., 2004; Hansson, 2017; Lewis & Porter, 2010; Li, 2015). They mostly focused on the player’s memory and attitudes towards the advertising placement. Among them, the most comprehensive one is a recent study by Ralf Terlutter and Michael L. Capella (2013), in which they established a framework for the analysis of advertising in digital games. In their framework, they included various characteristics of the advertised brand and the game, as well as individual factors of the player, both contributed to the player’s psychological responses and behavior outcome towards both the brand and the game (see Figure 1). These factors are also in line with the previous studies on product placements in movies or television programs and video games. The most outstanding contribution of this particular framework is that they illustrated the dynamics between different factors and pointed out the unique features of interactive in-game advertising.
From Figure 1, we can see a number of factors that might influence the outcomes of gamification in advertising is enormous. For example, the genre of games might influence how advertising placement might be available as well as the perception of such advertisement – Multiplayer Online Battle Arena (MOBA) and First Person Shooting (FPS) games tend to be very competitive, and some more intrusive types of advertising like pop-ups or banners might negatively influence the user experience more in these genres of games (Chaney et al., 2004; Nelson, 2002). Another example is the congruity between the game and the advertisement, which has also been brought up in some other related studies (Bellman & Rossiter, 2004; Lewis & Porter, 2004). If the advertisement does not match the context of the
game, the gaming experience would be severely compromised – this is also why most current in-game advertising appeared in sports games like racing and football games where billboards and banners for advertisements are prevalent even in real-life sports events.

Despite the previous studies on a comprehensive framework and elaborate lists of factors that might influence the outcome of interactive in-game advertising, there is still a fundamental factor largely missing in current research – the games’ interactivity. It is true that the “degree of interactivity” was included in the framework proposed by Ralf Terlutter and Michael L. Capella (2013), but they focused merely on the limitation that high degree of interactivity might pose on users’ attention as previously discussed in the section for product placement, and further discussion on how interactivity of the advertisement would influence the users’ psychological responses and behavior outcome was not mentioned. This is also true for other studies we found – it was pointed out in some studies that the most prominent difference between traditional product placement and in-game advertising is its interactivity (Bardzell et al., 2008; Chaney et al., 2004; Lewis & Porter, 2010). However, further analysis of this particular feature of in-game advertising was mostly unexplored in all the studies we were able to find.

2.3. **Affordances, Social Signifiers and Interactivity**

In this section, we will first discuss the origin of affordance, then explain its importance as the first step to interactivity. We will also compare the difference between affordance and social signifier. Finally, we will discuss the possible implications of social signifiers for our study on interactive advertising in mobile gaming.

Advised by experts from Adverty, we were initially going to focus our study on the *affordance of immersive advertisement* in mobile gaming. The concept of affordance was first proposed in the field of Cognitive Psychology by James J. Gibson in 1966 – “The affordances of the environment are what it offers the animal, what it provides or furnishes, either for good or ill” (Gibson, 1966). Donald A. Norman later introduced the concept into the field of HCI as perceivable action possibilities (Norman, 1988), which most scholars define as “perceived affordances”, and it affects the interaction design in a lot of ways. For example, it would decide if users are able to recognize and relate an object in the design to their mental model and try to interact with it accordingly to finish their ideal goal, and it would also hugely
influence the learning curve and efficiency of using the system on the whole (Boy, Eveillard, Detienne, & Fekete, 2016; Gibson, 1977; Warren, 1984).

However, with the prevalence of the concept of affordances, some scholars started to extend the idea of affordances further to digital interactions and users’ understanding of certain features of a product. To avoid misunderstanding and misuse, Norman consequently distinguished real affordances (actual action possibilities a specific artifact may provide) from perceived affordances (the understanding of perceivable actions users may have on a specific artifact).

Mads Soegaard later further explained the concept of perceived affordances (Soegaard, 2002):

1. Perceived properties that may not actually exist
2. Suggestions or clues as to how to use the properties
3. Can be dependent on the experience, knowledge, or culture of the actor
4. Can make an action difficult or easy.

The actions between a human player and a computer would compose a general basis for “human-computer interaction”. Such interaction usually begins with the computer displaying an initial state, after which the human observes the initial state and perceives the possible actions they may take then executes their action. Thus, we would argue that “perceivable action possibilities”, defined by Donald A. Norman as perceived affordances, are essentially the first step on the human part to interactivity when a human is faced with an interactive system.

Indeed, proposed as “Suggested Interactivity”, a recent study in HCI for Information Visualization also interpreted “perceived affordances” as “visual cues” to interactivity for users (Boy et al., 2016). Such interpretation is essential to our study – numerous studies have suggested that the users’ understanding towards the possible interactivities with a system would greatly influence how they actions actually take place (Boy et al., 2016; Dunleavy et al., 2009; Nielsen et al., 2017). Furthermore, the understanding towards the possible interactivities would decide users’ willingness to interact with an advertising element, which would also in turn influence the conversion rate, the percentage of users that was led to the advertisers’ site, of the advertisement. In addition, the users might also connect their impression towards the interactive model of the advertising element with the actual product.
However, in a recent paper by Norman, he proposed that social signifiers should replace the concept of affordances, especially perceived affordances. He emphasized that affordances focus on the imagination of the designers, no matter if they are perceivable or even knowable by the users or not (Norman, 2008). On the contrary, signifiers give a richer and broader meaning – they allow deliberate signifiers, defined as social signifiers, as well as accidental ones. Such definition is interesting and important, as it was proposed by Norman, who introduced the idea of affordances to HCI in the first place.

As we investigated deeper into the topic of affordances, we came to realize that the definition of affordances becomes limited in the context of mobile gaming. Norman explained this further in his paper in ACM Interactions (2008):

“Affordances did not have to be perceivable or even knowable - they simply existed”

As a conclusion he finally stated:

“Forget affordances: what people need, and what design must provide, are signifiers. Because most actions we do are social, the most important class of these are social signifiers.” (ibid.)

Indeed, objects in games are not as organic as what we define as “affordance” – they don’t have meanings that “simply exist”, but rather understandings that people assign to them in a social context. For instance, a billboard in a game might be seen as an advertising element because most people might have seen advertising billboard in real life. They understood the meaning and purpose of such element not through instincts, but observations, experiences, and contexts, which coincides with the definition of “signifier” rather than “affordance”. Following such logic, we will address issues related to users’ perception of the interactivity with advertising objects in games as “signifier” instead of “affordance”.

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3. Method

After investigating related studies on how different factors would influence users’ impression of interface elements in gaming and the possible implications for commonly used objects in immersive advertisement, a structure of observation and interview-based experiment was formulated.

We would use both qualitative and quantitative methods in this study through observations and interviews throughout a gameplay with a representative group of gaming participants on the commonly used objects in immersive advertisement. The setting of gameplay was set to a 5.15-inch Android 8.0 device with Snapdragon 835 and 6GB random access memory in a well-lit living room. The participants would be asked to go through a simple gameplay built in Unity with immersive advertisement objects of different styles. The styles of the objects will be randomized for each participant. We would observe how they interact with these objects, interview how they think of the possible interactivity of the objects and analyze the influence of the advertisements. Observation was chosen as one of the main research methods because they would help us to observe users’ reaction first-hand. Also, a controlled environment would ensure the testing process for each participant is consistent and comparable. The interview right after the observation would help us to directly understand and analyze the participants’ reactions and opinions. The final survey would help us to quantify participants’ reactions to different styles of advertisements and understand the influence of the styles on the participants’ impressions of the brand. The relationships between different methods in this study is shown in Figure 2.

![Figure 2. Methods Used in This Study and Connections between Them](image-url)
The game genre we chose was RPG, as a large majority modern games are different derivatives if it (Bostan, 2009; Ghuman & Griffiths, 2012). Using RPG, we will be able to include most common gaming scenarios of advertising.

A pilot study was done first to validate the design of the study, and a protocol for the study was adopted accordingly to ensure the instructions for the participants were consistent.

The objective of the study was not informed to the participants until the second question in the interview to ensure the participants would not pay additional attention to the advertisement during the gameplay. This was done to make sure the gaming experience in our study replicates the real-life experience as much as possible.

Before the experiment, when we asked the participants to sign the consent form, we also asked the age of each participant and their experience with gaming and mobile gaming. This would help us to see if these factors might have any influence on our results.

### 3.1. In-game Observation

To observe how users might react to different types of immersive advertisement in games, we designed a prototype based on an Action-RPG Starter Kit in Unity for our experiment and asked users to explore the game. The goal of in-game observation is to gain understanding on the process of how users would interact with different types of immersive advertisement, which would help to capture the users’ first natural reaction to the advertisement and subsequently facilitate us to explain the social signifiers of each of the interactive advertising style.

The game for exploration was designed and developed based on Action-RPG Starter Kit in Unity. The game was developed on Windows 10 (2018 October update) in Unity (2019.1.3) and was running on Android 8.0 environment. The game was able to run successfully on the device with 60 frames per second without noticeable frame drops. The game contains only one playable character in the game.

The observation not only provided a real-life context for the following interview and survey, but also contributed both qualitative data like users’ reactions for the following interview to help us deeply analyze the users’ logics and decision-making process.
3.1.1. Game Scenes

There were three different scenes with clues that guided participants through the gameplay experiment.

The first scene was an environment with only a portal to the second scene. No other characters or elements were included in the scene. The participants would be asked to familiarize with the controls and functions in the scene.

After finishing familiarizing with the environment, the participants would be asked to access the portal to the second scene. In the second scene, there were ally non-playable characters that would provide gamers with resources they can purchase or conversations they can carry on.

Then participants would be guided by the conversations to the third and final scene with several enemy non-playable characters where they would engage in fighting.

3.1.2. Immersive Advertisement Placement

Immersive advertisements were placed through the second and third scenes in the game. To ensure participants were not influenced by the brand of the advertisement in the game and avoid any copyrights issue, the placement of advertisement in this game was five fictional brands we designed. We didn’t just use one universal brand for all the advertisement, because the different advertising styles might influence the users’ understanding to the brands differently and it would be hard to analyze how each advertising style would influence the users’ perception if they were advertising about the same brand. The brand for each style of advertisement was randomized for each participant, so each brand was not tied to the advertisement style. This was done to avoid a systematic influence of the image and name for each brand on the perception towards each advertising style.

Through researching current popular placement style for immersive advertisement in games, as well as discussion with research experts in immersive advertisement, we selected five different advertisement placement styles for this experiment:

i. Non-character Object in Game Scenes
Non-character objects are usually environmental elements fundamental to an immersive gaming experience. Many of them can be non-interactive – a tree or a house can be seen in a game scene, and users might not be able to interact with them in any way. Other interactive ones usually provide some signifiers indicating its interactivity. For example, a button usually informs users that it can be clicked or touch on.

However, these signifiers can be hard to understand or even confusing at times. Take popular RPG games like Final Fantasy and Fallout series as an example, there are a lot of objects like boxes or posters might seem interactive, but in fact not. Thus, it is meaningful to investigate how users would perceive the signifiers of such objects in the game scenes.

a. Interactive Billboard in Game Scenes
   Different derivatives of billboard advertisement have been used in numerous sports games where billboards also appear in the corresponding real-life scenario. They could be videos playing repeatedly or still picture shown on the billboard.

   In our game, one such billboard was set up in the second scene, as shown in Figure 3. Gamers could interact with the billboard by touching on it, and it would lead to the fictional advertising website we set up for the corresponding brand.

Figure 3. An Example of Interactive Billboard
b. Interactive Button in Game Scenes

Buttons are widely used for guiding users to the advertised site. It has been traditionally seen as interactive and provides a relatively clear signifier for users to click or touch on (Phiriyapokanon, 2011; Tiab & Hornbæk, 2016).

In our game, one such button was set up in the third scene, as shown in Figure 4, and its color has been styled according to each brand. Gamers could touch on it, and it would lead to the fictional advertising website we set up for the corresponding brand.

![Figure 4. An Example of Interactive Button](image)

ii. Functional Item

Functional item refers to an object that can be collected and used in the items storage or backpack system. For example, it can be used to recover the playable character’s health or finish some tasks in the game. In our game, a fictional branded energy drink was included as an item to recover the playable character’s health.

One such item was included in the storage from the start of the game, and gamers can also purchase more in the game through ally non-playable character or obtain it by defeating enemy non-playable characters. An example is illustrated in Figure 5.
iii. Ally Non-Playable Character in Game Scenes

Non-playable characters are important in RPG games, as they help to carry on the plot of the game and guide gamers throughout the game. Ally non-playable characters are characters that could directly provide the playable character with resources or tasks in the game, or even fight alongside with the playable character. They usually won’t be able to deal damage to the playable character and would influence the playable character positively. Consequently, it would be interesting to investigate if advertising on ally characters would grow comparably more positive impressions on the connected brands.

One advertising placement on one ally non-playable character was included in the second scene in our game, which is shown in Figure 6. The appearance of the character was changed to represent the product of the advertised brand. The name and conversation with the character would also include an advertising element.
iv. Enemy Non-Playable Character in Game Scenes

Enemy non-playable characters are usually referred to as “monsters” or “boss”. They are characters that gamers try to defeat to obtain resources or finish tasks in the game. They usually would be able to deal damage to the playable characters, and gamers would try to survive through the damage and win the fight. There were several studies reporting that people might develop aversive emotion towards enemy characters (Goldstein, 1999; Klein, 1929; Russell, 2001; Zillmann, 1998). However, sometimes gamers might grow positive sentiment to them, and even create lovable fan-fictions about them (Goldstein, 1999; Russell, 2001; Zillmann, 1998). Thus, it would be meaningful to study if gamers would also grow such emotion and sentiment towards the brand if the enemy characters were linked to the brand.

One enemy non-playable character in the third scene was transformed into an advertising character, as shown in Figure 7. The appearance of the enemy character was changed to represent the product of the advertised brand.
In addition, we will consider the factor that advertisement usually would be seen negatively in gaming (Lewis & Porter, 2010; Nelson, 2002). For example, users might be less willing to interact with an advertisement element in the game, unless meaningful rewards were included. Users might also see some styles of advertising as non-interactable, as most of the traditional advertisements in their daily lives usually contain limited interactivity. Thus, we will also investigate how each style advertising would influence gamers’ experience in the game and try to understand how they would change the social signifiers of the advertisements and possible interactions with each object and item in the game.

3.1.3. Experiment Setup
We set up a camera to record users’ reaction as well as a screen recorder for analysis. Both video and audio recording were enabled. We used an Android 8.0 device a 5.15-inch LCD screen with the resolution of 1080 by 1920 on a landscape display orientation. The game was able to run 60 frames per second without noticeable lagging on the device.

The room for conducting this research was a 13-square-meter with only the experiment setting. The room was naturally lit about 250 lux, and artificial lighting was used when natural lighting was not sufficient. The users were asked to adjust the brightness of the screen according to their preferences to simulate an experience closer to the real-life use case.
3.1.4. Instructions

Users were instructed first to familiarize with the controls and interface of the game and asked to explore the game after they finished familiarizing with the game. They were also asked to speak out freely about their experiences throughout the game. As we were not evaluating users’ performance or time-sensitive factors, the possible impact of adopting speaking aloud on the results of our study would be minimal.

During the game, users were instructed by the plot of the game and conversations with non-playable characters in the game, as most RPG games have a specific plot that the user can follow through. However, they were not explicitly asked to only follow the plot in the game and were able to explore freely as they wish. This was done to ensure we can replicate the real-life gaming experience as much as possible.

Participants would be asked to stop playing when they reach the end of the plot. If the participant was not able to finish the game within 15 minutes, they would be asked to stop if they’ve seen all the advertising placement.

After the game, would be asked to proceed to the following interview and finish the user experience scale.

3.1.5. Observation Focus and Coding

The focus of our observation was on the users’ reactions to each style of the advertising placement. During the observation, we would focus on users’ facial and verbal reactions when they see the advertisement as well as the process of their interaction with the advertising elements. We would then ask the reasoning behind the reaction during the interview with the participants. This would facilitate us to investigate the users’ emotional reactions and logical understanding of the social signifiers of each advertising style.

3.2. Semi-Structured Interview

After finishing the gameplay, the participant would be asked to proceed to a semi-structured interview. The interview was audio recorded for the following thematic analysis. The goal of a semi-structured interview is to analyze the explicit perceptive process on the possible interaction the user might perceive and understand the motives and reasoning of users’ actions. For example, some users might interact with an advertising object only because it was
necessary to do so, and they might not actually enjoy the interactions. On other occasions, the users might have perceived the advertising objects and intended to interact with them but were focused on other tasks in the game and were not able to follow through their intentions. A follow-up interview would give us a meaningful opportunity to delve into such topic and understand the reasoning behind their actions.

3.2.1. Interview Design

To design our interview, we first referred to related studies on in-game advertising and social signifiers (Bardzell et al., 2008; Chaney et al., 2004; Lewis & Porter, 2010; Nelson, 2002; Norman, 2008; Terlutter & Capella, 2013). Combined the previous studies with the goal of our research, we decided that the interview questions should cover the following topics:

- Did the participants notice anything unusual or uncomfortable due to the existence of the advertisement?
- How did the participants perceive the different styles of immersive advertising differently?
- How did the participants understand the possible interactivity of the advertising objects?
- How did different styles of immersive advertisement influence the experience in gaming?
- How did different styles of immersive advertisement influence the participant’s understanding and perception of the corresponding advertised brand?

However, due to the lack of studies specifically on social signifiers in gaming advertisement, we also consulted with professionals in gaming and advertising to finalize our interview questions.

In addition to the formalized interview questions, we would also propose follow-up questions according to their interactions and reactions we observed. We will focus on their logic and reasoning of their interactions to understand the unique influence of interactivity on in-game advertising.

1. How do you think of the overall experience of the game?
2. Did you notice anything unusual in this game?
   a. If so,
      i. Which styles of advertisement did you notice?
ii. Did the advertisement make you unconformable? How?

b. If not, inform the participant about the existence of immersive advertisement.

i. Knowing there were advertisements in the game, can you recall any of them?

ii. What did you think they were?

3. Did you think you can interact with each of the advertisement when you saw it? Why?
(Present the participants with the screenshots of each of the advertisement while asking)

4. How did(would) you interact with each of the advertising objects? Why?

5. Did each of the advertising object influence your actions in the gameplay? If so, how?

6. Did each of the advertising object influence the experience of the gameplay? If so, how?

7. How did each of the advertising style influence your impression of the corresponding brand?

8. I noticed that you were … (description of their interactions or reactions in the gameplay), why did you do that?

9. Overall, how do you think each of the advertising styles?

### 3.2.2. Thematic Analysis

After the interviews were conducted, we transcribed the interviews for the following thematic analysis (Aronson, 1995). To carry out the analysis, we used a user-centered qualitative coding approach (Braun & Clarke, 2006). After first transcribing the interviews into texts, we asked the participants who were available to come back and coded the transcripts into different themes. Three participants were able to participate in the process. This was done to make sure we were interpreting the interviews from the participants without misunderstanding and bias from the researchers. We also used a bottom-up coding approach, as we didn’t have specific proposed themes for this study. More precisely, the topics were summarized from the transcripts as we read through them, instead of having proposed themes before we began coding. This would also help us to explore different themes from the interviews and discover new themes from the transcripts accordingly.
During the coding process, all transcripts were summarized then transferred onto sticky notes with our participants. In an iterative process, we sorted the codes and grouped them into different categories. The categories were subsequently summarized to several overarching themes.

Moreover, we also used different colors of post-it notes on different advertising styles. Through observing the trends of the colors in each category and theme, we could also conclude corresponding traits for each advertising style.

### 3.3. User Perception and Experience Scale

In a gaming experience for advertisement, there are two important stakeholders – game developers and the commercial brands seeking to post advertisements. On the one hand, game developers need to ensure the gaming experiences and engagement are not damaged by the advertisement. On the other hand, the commercial brands want to see a positive influence on the user’s perception of the brand and product. However, if we take a look at current studies in advertising (Chaney et al., 2004; Lewis & Porter, 2010), researchers have established a meaningful connection between the “experience” and “brand perception” – no matter what the style of advertisement is, be it a static picture or an interactive website, the experience that the advertisement provides is highly influential on the end-users’ perception of the brand. Thus, for the purpose of our study on social signifiers, it would be meaningful to investigate more on the possible connection between the social signifiers that one style of advertising might provide and the perception of the brand.

Consequently, in the last part of the study with the participants, we included a short 2-part User Perception and Experience Scale on each brand and each style of advertising after the observation and interview to understand the potential influence of the advertisement on the brand, and how such influence could be connected to the social signifiers of each advertising style.

The User Perception and Experience Scale is also an important complement to the observation and interview, as it provided meaningful quantitative data on how users might perceive
different types of immersive in-game advertisement, and how the social signifiers might influence the experiences of the interaction and the perception of the brands.

3.3.1. User Perception of the Brands
We first asked the participant to answer a 2-question survey on each of the brand they’ve seen. As the participants only interacted with the brands shown for a limited amount of time, it was hard for them to form detailed opinions towards the brands, we only asked the participants their relatively broad perception on each brand. The participants were shown the name of each brand, and they were asked to answer the following questions:

1. How likely are you to recommend … (brand name)? (Scale of 1 to 7: 1 as not likely and 7 as very likely)
2. Among all the brands shown, which brand do you prefer?

For the first question, the participants would be asked to rate the corresponding brand on a 1 to 7 Likert-scale, which is identical to the following User Experience Scale. For the second question, the participant would be asked to choose one of the shown brands, which would also help us to analyze if the advertising style would have any significant influence on the favorability to the advertised brands.

For this survey, even though the questions we asked are on the advertised brands, the goal of them remains to be helping us to find the possible underlying influence of the social signifiers in each style of advertising on the brands. Thus, the results were analyzed according to the style of advertising instead of the brand.

We also considered the possible influence of the brand image on our results. To minimize the users’ possible emotional attachment towards each brand, we randomized the brand assigned to each style of advertising. In addition, as the brands we chose were fictional, the possible prejudice of participants’ preconception towards the brands could also be excluded.

3.3.2. User Experience Scale on Advertising Styles
User Experience Questionnaire has been one of the most widely used evaluations for a comprehensive impression of user experience (Rauschenberger, Olschner, Cota, Schrepp, & Thomaschewski, 2012; Schrepp, Hinderks, & Thomaschewski, 2014, 2017b, 2017a). Both
classical usability aspects (efficiency, perspicuity, dependability) and user experience aspects (originality, stimulation) are measured (Cota et al., 2014). The following is an example of a commonly used short version of User Experience Questionnaire, which contains several couples of antonyms related to user experiences. Users would be asked to rate their user experience on a specific product with a 7-point Likert Scale, as shown in Table 1.

<table>
<thead>
<tr>
<th>obstrusive</th>
<th>o o o o o o o</th>
<th>supportive</th>
</tr>
</thead>
<tbody>
<tr>
<td>complicated</td>
<td>o o o o o o o</td>
<td>easy</td>
</tr>
<tr>
<td>inefficient</td>
<td>o o o o o o o</td>
<td>efficient</td>
</tr>
<tr>
<td>confusing</td>
<td>o o o o o o o</td>
<td>clear</td>
</tr>
<tr>
<td>boring</td>
<td>o o o o o o o</td>
<td>exciting</td>
</tr>
<tr>
<td>not interesting</td>
<td>o o o o o o o</td>
<td>interesting</td>
</tr>
<tr>
<td>conventional</td>
<td>o o o o o o o</td>
<td>inventive</td>
</tr>
<tr>
<td>usual</td>
<td>o o o o o o o</td>
<td>leading edge</td>
</tr>
</tbody>
</table>

As we previously discussed, the focus of this part in our study lies more on the connection between the users’ perception on the interactivity of the advertising styles and their perception of the brand, we decided to adapt the content of User Experience Questionnaire more closely connected to the goal of our study. After considering previous research on user experience questionnaire (Cota et al., 2014) and consulting with game developers and advertising experts. Through an initial discussion, we came up with these following questions to for User Experience Evaluation under the context of Immersive Advertising in Gaming:

- Do you think the advertisement style was intrusive to you gaming experience?
- Do you think the advertisement style was intriguing and attracted your attention to engage in interactions with it?
- Do you think the advertisement style greatly helped to deliver the message from the corresponding brand and product?
- Do you think the advertisement style positively or negatively influenced your impression on the corresponding brand and product?
- Overall, how do you think of the advertisement style?

To come up with a list of related couples of antonyms, we went through all the elements in the full version of User Experience Questionnaire (Cota et al., 2014), and evaluated their relevance to the interactivity in advertising and gaming according to our proposed list of questions. We then adapted the related couples of antonyms under the context of our study.
We also consulted with the Merriam-Webster Thesaurus for the accuracy for our coupled antonyms and tested them in our pilot experiment. Combined the proposed questions with the style of User Experience Questionnaire, we came up with the following User Experience Scale for Immersive Advertising in Gaming in Table 2:

<table>
<thead>
<tr>
<th>How do you describe your perception on the influence of each style of the advertisement on the corresponding brand?</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intrusive</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
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<tr>
<td>Distracting</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Meaningless</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Uninfluential</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Negative</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

We would ask the participants to rate the advertising style regarding the questions above from a scale of 1 to 7.

4. Results and Analysis

In this chapter, we will present the results for our experiment. We will first describe the demographics of our participants, and then present the results from the interview and following User Perception and Experience Scale. Thematic analysis was made on the qualitative data we gathered from the interview, and statistical analysis on the mean and correlation was made on the User Perception and Experience Scale. The results were also interpreted comprehensively for different sections of the study.

4.1. **Demographics**

A pilot test was done with 2 participants to verify the experiment structure and content.
There were 25 participants in this study excluding the pilot test. Among them, 13 were female and 12 were male. We offered a non-binary gender option for participants, but it was not chosen by any participant in our experiment. Their age ranged from 18 to 35. All participants speak English at an advanced level. The distributions of participants’ age and their self-report experience with gaming were summarized in Figure 8 and 9.

4.2. **Observation**

During the observation, we focused on users’ facial and verbal reactions towards the in-game advertisements. The users’ reactions were used as follow-up questions to help us understand users’ logical reasoning behind their actions.
The gameplay was 11 minutes and 35 seconds on average for all participants, with the shortest one as 8 minutes and the longest two as 15 minutes. All participants interacted with all the advertising elements during the gameplay.

4.3. **Thematic Analysis of the Semi-Structured Interview**

The recorded interviews were transcribed, then coded with invited participants to ensure the accuracy of our interpretation. The keywords of the transcribed interview answers were transformed onto post-it notes and then grouped based on their categories to recognize the patterns. Fifteen categories were summarized and subsequently grouped into 4 themes – Interactivity, Appearance, Context, and Experience according to their vicinity of meaning.

The following is the categories and themes we concluded:

1. Advertisement Interactivity
   a. Previous Experience
   b. Possible Actions
   c. Movement of the Element
2. Advertisement Appearance
   a. Size
   b. Color
   c. Shape
   d. Likability
3. Gaming Experience
   a. Obtrusiveness
   b. Privacy
   c. Integration
4. Context
   a. Game type
   b. Brand type
   c. Environment of the Game
   d. Plot
   e. Personal Preference for the brand

**4.3.1. Interactivity**

As the focus of our study, the users’ perception of the possible interactivities was the most mentioned theme in our interviews. The participants were all engaged and curious about the possible actions with different advertising elements in the game.
Between the two Non-character Objects in Game Scenes, Billboards and Buttons, most participants indicated that the billboards were not significantly clear on its implication of possible interactive feature, while buttons provided a clear indication that it could be clicked on. They mostly cited their personal experiences with such elements in games and real life - as one participant put it:

“I didn’t think the billboard is something you can interact with because you can’t do that in real life.”

For the usable item that the user can interact with, most participants found the possible interactivity with them and understood that it could be used. However, it also depends on the previous users’ experience with such items. Three users did not use the item in the gameplay because they thought it was an item to complete a task in the game. One participant explained:

“I thought it’s just another task in the game where you need to give the item to another NPC or something. I didn’t take the time to read through the description of the item, so I didn’t know that you can actually use it to recover your health.”

However, most users who interacted with the item reported a positive feeling because the positive outcome the actions might bring:

“I can use it to recover my health, so of course I’m happy with that.”

“I wish I had more of the items because it gave me a sense of security facing the monsters in the last scene.”

“I know it sounds a kind of ironic that an energy drink can recover your health, but I do think it might actually work – you know a lot of energy drink actually brand themselves as a healthy drink.”

From the ally and enemy character, we found that different users have vastly different understanding of “interactivity”. For example, two participants mentioned that they didn’t think their conversation with the ally character counted as “interaction”, because they did not have any “choice” in the conversation. They also contributed their understanding of interactivity to the fact that the ally character was “fixed” and not “movable”, so the outcome
of their interaction process would be “always the same” and “not as valuable” compared to the enemy character. One participant also mentioned the example of the billboard in this comparison:

“It’s like the billboard. In this game, it was a static picture, so I didn’t think it was very interactive. But if it’s playing a video, I might actually think it’s interactive. Same with the monsters. The monsters were always jumping around, and I can be hurt by it, so I thought it’s obviously interactive.”

Here we see an interesting dynamic between the possible actions and movement of the element – the movement of an element might give rise to the users’ understanding to the possible actions they might take with the element. One of our participants further commented on this dynamic:

“I don’t think the enemies are necessarily bad here just because I’m fighting with them. I felt that I’m more attracted by it because I have to think about how to fight it. Also, I felt more sense of freedom because I might have different outcomes - I might kill it, but I might be killed by it.”

Contrary to most might assume, the enemy character actually provided more “sense of freedom” and led to more user attention and interaction because of its dynamic nature and possible different actions and outcomes the users might take with it.

From the results above, we summarized that a good in-game advertising element should match users’ previous experience with such element, provide possible actions that require users’ attention and utilize a dynamic style when it is necessary.

### 4.3.2. Gaming Experience

The gaming experience is important for both advertisers and game developers, as users might stop playing a game if the gaming experiences were significantly impeded by the placements of advertisements. Several participants pointed out that some types of advertising might be too obtrusive to the gaming experience, particularly the billboards and buttons:
“The billboards and buttons felt... a bit strange. They’re not really a part of the game.”

“I accidentally clicked on it (the billboard) and I didn’t want to visit their website. It’s really annoying.”

One way to counteract the “obtrusiveness” is to integrate the advertising placements into the game in a more meaningful way. Ten of our participants showed a clear preference towards more integrated styles of advertisements (item and non-playable characters) during the interview:

“I really like how you put the drink as an element that I can use to recover my health! It’s really useful and I would definitely use it again.”

“The conversation I had with the person who’s advertising about the drink was really funny. It felt like I was having a real conversation.”

“When I killed the final boss, I almost feel bad about that bottle (of energy drink).”

Here we can observe a pattern that the participants were having an emotional connection with the advertising element. This is very interesting, as this connection would transfer to the corresponding brand, which might build a personal preference for the brand:

“It felt like watching a televised ad, but you’re actually talking with the advertiser, so the message is more personal.”

“I might actually feel the brand of the drink is healthier if they actually advertise themselves that way.”

Two participants said they prefer the billboards and buttons, while others did not voice particular preference.

“I prefer more normal ways of advertising, so it (the advertisement) is not creeping up on every part of my gameplay.”

“The button is attractive as if it’s telling me to push it.”
Privacy was only mentioned by two participants, but we still included it in our final result, as it is a prevalent concern for people regarding technologies, and losing people’s trust on privacy might greatly influence how people view a product. The concerns our participants had were mostly on the invasion in personal space and gathering personal data:

“I hate ads very much, and I try to avoid them as much as possible. I felt like they are invading in our lives all the time – you see them from TVs, movies, and YouTube all the time, and now even games?”

“They probably can gather a lot of information about me through how I play the game and target me using different ads. I think gaming is very personal, and I don’t like seeing in moments like this.”

From the results of gaming experience, we concluded that the advertising element should be more integrated into the gameplay to avoid obtrusiveness to the gaming experience. However, developers should avoid integrating too many advertisements in the game and respect the gamers’ privacy.

### 4.3.3. Appearance

As was pointed out in several previous studies, the appearance of the advertising element might have different influences on users’ perception of the advertisement. In this study, several participants also mentioned appearance as an influencing factor regarding interactivity.

The color of the advertising elements was the most mentioned factor under this theme. Some participants cited their preference of colors as an important influencing factor:

“The color combination on the billboard was quite interesting.”

“I personally like red very much, so I thought the red button was pretty intriguing.”

However, they also further explained some dynamics between the style of advertisements and color:
“The button should be red or green because it’s usually like that.”

“I didn’t want to touch the red button, because it looks dangerous.”

From these comments, we can see that the users’ preconception about a certain style of the advertising element might influence what social signifiers they perceive. The traditional usage for buttons was mostly red or green, and a red button might suggest a dangerous or emergent outcome. This would influence how users understand the possible social signifiers the elements would provide, and in turn might change users’ reaction and interaction with these elements.

The size was also a concern for some participants, especially for the billboard and button.

“The thing (billboard) was really big, and I almost felt like it’s in my face. I was trying to remove it.”

“I thought I could jump on the button since it’s so huge.”

Indeed, the size of an item might change its social signifiers implied to users. In the first case, the participant was trying to remove the billboard element and thought it was movable. In the second case, as the button was relatively flat and bigger than the character, the participant thought they could jump on the element.

From the second case above, we see the shape of the element can be important, too. As the participant further explained:

“It’s pretty flat, and almost look like a carpet, so I thought I can activate something by jumping on it.”

Another participant also commented similarly:

“Oh, that was a button? I thought I could jump high on it or something like that if I get on it.”

For the non-play characters, most participants stressed the likability of them instead of color, size or shape:
“I thought the monster in the end looks pretty cute. You know – a little can jump around. I was low-key attracted by it.”

“The NPC (ally character) looks cool, but almost comes off as a bit cold. I didn’t know if he’s friendly or not.”

From the comments above, we can observe how the likability of the character can influence how users might perceive and interact with them. Having a “cute” feature might connect the element with positive feelings and encourage users to interact with them. Conversely, a “cold” or unattractive appearance might be negative and discouraging towards interaction. However, we must be careful with such classification, as we see some other participants voiced different opinions - users might have different preference and definition on what is attractive.

From this chapter, we concluded that the color, size, and shape are important for the non-character objects in the game scenes. Their corresponding features should align with traditional preconceptions users might have towards such elements to ensure the social signifiers are consistent with the developers’ intentions. For non-playable characters, their likability is important in attracting users’ attention and eliciting interaction. However, the definition of “likability” differs among different users. There was no specific comment regarding the appearance on the usable item in our game.

4.3.4. Context

The context of the game and advertisement were also mentioned by most of our participants as an important factor. The type of game and advertisement were the most mentioned concerns for the participants. They said that the congruity of the game and brand is one of the most important factors in such advertisement:

“In your game, I felt like it makes sense for me because the names for the drink are not very out of place, and there are a lot of places to advertise for role-playing games.”

“I play a lot of driving games, and they usually put a lot of billboard ads in it, and I think they really go with each other.”
“I think some of the ads were really smart (in your game) – I didn’t really think they were advertisements, and thought this game was designed as a parody-ish thing. It feels really natural.”

The plot also played an important character in our game to instruct participants’ interaction with some of the advertising element:

“I knew I need to fight with the final boss because the storyline was leading me there.”

“I used the thing to recover my health because I was told by a person (NPC) in the game.”

Although such design was not intended, we can see that a clear instruction in the plot provided a context for the participants to understand the social signifiers we wanted for them, which in turn helped to increase the possibility of them interacting with the corresponding advertising elements.

However, the participants also criticized some of the placements of advertisements as they think these placements did not fit in the environment very much:

“The billboard was really annoying to me because the game was in a forest and felt a bit historic, but billboards are pretty modern stuff.”

“It’s super weird that the game was filled with energy drinks, because the scenes don’t look like a time when there are a lot of energy drinks.”

Such inconsistency would hinder users’ understanding of the social signifiers and might discourage some users from interacting with the advertising elements:

“I didn’t know why you put those drinks in the game – I thought they had nothing to do with the game.”

“I wasn’t sure what the button would do. I guess the button was not really in the right place.”

In this chapter, we summarized that the consistency of the advertisement with the game type and the environment is essential to their understanding of social signifiers from the
advertising element. Furthermore, a clear context, such as the plot and instruction, would further give rise to the users’ understanding of social signifiers.

4.4. **User Perception and Experience Scale**

In this section, we present the results of users’ perception of the brands corresponding to the advertising styles and the users’ experience scale on each advertising style individually. Further analysis would be done in the following analysis chapter.

4.4.1. **User Perception towards the Brands**

We will present the results on the two question we proposed on user perception towards the brands respectively:

- How likely are you to recommend … (brand name)?
- Among all the brands shown, which brand do you prefer?

Note that the results are presented according to the advertising styles, as we’re studying the advertising styles’ influence on users’ perception. The brand names used for each advertising style were randomized for each participant to eliminate the potential influence of branding.

**Influence of Interactive Advertising Styles on the Recommendation of the Brands**

Here we present the results on how the different interactive styles of advertisements might influence how likely the participants would recommend corresponding brands.

| Table 3. Descriptive Statistics of the Recommendation Scale for Each Advertising Style |
|---------------------------------|--------|--------|-------|--------|--------|
|                                | N     | Minimum | Maximum | Mean   | Std. Deviation |
| Billboard                      | 25    | 1       | 6       | 3.48   | 1.005   |
| Button                         | 25    | 2       | 6       | 3.28   | 1.208   |
| Item                           | 25    | 2       | 7       | 4.68   | 1.492   |
| Ally                           | 25    | 1       | 6       | 3.64   | 1.150   |
| Enemy                          | 25    | 1       | 7       | 4.32   | 1.930   |

Consistent with the results from our study, the interactive item that could recover the playable characters’ health was the most highly rated interactive style. To our surprise, the mean value for the enemy style of interactive advertisement was also rated relatively high. We also saw a
trend in our data that more experienced games tend to rate this style particularly higher (Pearson Correlation r of gaming experience with recommendation ratings on enemy style = 0.450). This might explain why the standard deviation of the ratings for the enemy style was significantly higher than other styles – the participants’ opinions are more divided on such style based on gaming experiences. Furthermore, the ally, button, billboard, and button styles received relatively lower ratings, and the differences among the three styles are not significant. The descriptive statistics for each advertising style are listed in Table 3 above.

Note that when we ask the participants to rate the brands, they were presented with only the brand names without the visual connection to the styles of the brands. We also randomized the brand names to eliminate the possible influence of branding. Thus, such a huge statistical difference was quite surprising.

From Figure 10 above, we can more closely observe the distribution of recommendation scale results for each advertising style. The thick black line in the middle of each box was the median of the corresponding style, and the boxes represent the middle 50% of the results. The lines at the two ends of the box cover another 150% value interval of the middle 50%. Due to the relatively small number of participants, the existence of some outliers (dots outside of the boxes and lines) was not excluded from our results.
We can see that the recommendation ratings on the billboard, item, and ally are more consistent, while the ratings on buttons and enemies are distributed more widely. This suggests that the influences of button and enemy styles of advertisements on users’ recommendations are less stable among our participants.

Influence of Interactive Advertising Styles on the Preference of the Brands
Here we discuss how the styles of interactive advertisements might influence the participants’ preference of the presented brands.

Table 4. Frequency and Percentage of the Corresponding Advertising Style of Favorite Brand

<table>
<thead>
<tr>
<th>Style</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Billboard</td>
<td>4</td>
<td>16%</td>
</tr>
<tr>
<td>Button</td>
<td>2</td>
<td>8%</td>
</tr>
<tr>
<td>Item</td>
<td>10</td>
<td>40%</td>
</tr>
<tr>
<td>Ally</td>
<td>2</td>
<td>8%</td>
</tr>
<tr>
<td>Enemy</td>
<td>7</td>
<td>28%</td>
</tr>
<tr>
<td>Total</td>
<td>25</td>
<td>100%</td>
</tr>
</tbody>
</table>

From Table 4 above, we can see that the results are generally consistent with the recommendations – item style is the most popular one, with the enemy in the second, and the other three styles’ preference rates are relatively lower. However, we see one significant data point is that the preference for billboard styled brands is higher compared to the results in the recommendation scale. We will further discuss the possible reasons in the following chapters.

4.4.2. Experience Scale of the Interactive Advertising Styles
In this chapter, we will discuss the results from the experience scale for the interactive advertising styles and analyze its implications on and connections with the results from previous chapters. We will first analyze the results for each style individually and then conclude the overall trend. The average values from our surveys are listed in Table 5.

Table 5. The Average Values of Brand Recommendation, Preference, and Experience Scale

<table>
<thead>
<tr>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Billboard</td>
<td>3.48</td>
<td>16%</td>
<td><strong>3.56</strong></td>
<td>*3.00</td>
<td>*4.52</td>
<td><strong>3.92</strong></td>
<td><strong>3.84</strong></td>
</tr>
<tr>
<td></td>
<td>Rating</td>
<td>%</td>
<td><strong>Rating</strong></td>
<td><strong>Rating</strong></td>
<td>Rating</td>
<td>Rating</td>
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<td>--------</td>
<td></td>
</tr>
<tr>
<td>Button</td>
<td>3.28</td>
<td>8%</td>
<td><strong>3.96</strong></td>
<td><em>3.40</em>*</td>
<td>2.84</td>
<td>2.40</td>
<td></td>
</tr>
<tr>
<td>Item</td>
<td>4.68</td>
<td>40%</td>
<td><strong>4.88</strong></td>
<td><em>4.92</em>*</td>
<td>4.04</td>
<td>4.36</td>
<td></td>
</tr>
<tr>
<td>Ally</td>
<td>3.64</td>
<td>8%</td>
<td><strong>4.04</strong></td>
<td><em>4.12</em>*</td>
<td>3.76</td>
<td><strong>4.28</strong></td>
<td></td>
</tr>
<tr>
<td>Enemy</td>
<td>4.32</td>
<td>28%</td>
<td><strong>4.88</strong></td>
<td><em>4.92</em>*</td>
<td>4.12</td>
<td><strong>4.24</strong></td>
<td></td>
</tr>
</tbody>
</table>

* Correlation is significant at the 0.05 level (2-tailed) with the corresponding brand recommendation.
** Correlation is significant at the 0.01 level (2-tailed) with the corresponding brand recommendation.

**Billboard**

For the billboard style of interactive advertisements, we see the lowest rating for intrusive – immersive pair, meaning overall the participants rate it as the most intrusive type of advertisement. However, the billboard-style also has the highest rating for informativeness and the second-highest rating for being influential. This could partially explain why a relatively higher percentage of participants preferred the corresponding brands for this type of advertisements – a billboard can be more informative than other styles of advertisements, as it directly delivers the messages from the brand, which could make it more influential and effective.

Furthermore, as we mentioned in the chapters for thematic analysis on our interviews, most participants saw billboards as a common and traditional way of delivering advertisements – this could activate the contextual awareness of users to receive advertising information. This also helped us to explain the relatively lower immersive rating, as most participants were aware that it is an advertising element, which would be intrusive to their gaming experience.

**Button**

For the button advertising style, it is relatively lower in intrusiveness in our results. However, most participants tend to regard it as “meaningless” and “uninfluential” in the experience scale, as it doesn’t provide any descriptive information on the product. Several participants said during the interview that they were confused by the function of the button and could not understand the potential information it might provide before interacting with it. This result was confirmed in our statistical analysis of the experience scale.

**Item**

The ratings for the interactive item that could recover playable characters’ health received the highest ratings among three of the five scales and second highest ratings in the other two scales. As the item would pose a positive effect on the characters (recovering health), there is
no surprise to us that it received the highest rating in the negative-positive pair. Furthermore, as the usable items are an essential part of games, the participants would naturally regard it as an immersive and engaging element of the game. Indeed, some of our participants also described the interactive item as a “smart” way to advertise and “feels natural”.

To our surprise, participants also rated it as more influential and informative than most other styles of interactive advertisements – the item itself didn’t contain any specific description of the product. However, if we look back to the results from our interviews, this could be easily explained. Several participants pointed out that the function of the item could be connected to the corresponding brands. For example, we mentioned that some participants thought the brand advertised themselves as “healthy” and could recover them from “low health”. This signifier of the item in the game was therefore transferred to its corresponding brands. We also anonymously identified five participants who explicitly mentioned such phenomena during their interviews and confirmed with their rating results – the ratings for the interactive item were all relatively high (>=5) especially for its being informative (>=6).

**Ally Character**

For the ally nonplayable character, we found that most of the ratings are in the mid-tier among the five styles of interactive advertisements. This is consistent with the brand recommendation ratings. The relatively lower percentage of brand preference might be explained by the trend that there was no feature of the advertisement that stood out among the advertisements. Furthermore, most participants were not aware of the specific signifier the ally character might provide. During the interview, most participants did not know what function the ally character actually could provide before they interact with it. They mostly acknowledged that they understood that they could talk to the ally character, but such signifier was not prominently interactive and functional in the gaming scene compared with the enemy character and the interactive item. Thus, we propose that a more interactive implementation might improve such advertising style. For example, the character could be more deeply connected to the plot and provide more functions like trading or delivering tasks.

**Enemy Character**

The negative-positive ratings are relatively lower for the enemy character because some participants regarded the enemy as an adversative character, and this might have triggered
some negative emotions towards the corresponding brands. Indeed, some participants mentioned that this during the interview – they thought the enemy might threaten the life of their controllable character. This signifier of attack might be subsequently transferred to the corresponding brands. However, the enemy character style of interactive advertising has the highest ratings in immersive, engaging and influential. This coincided with the results in the previous chapters – several participants mentioned the interactive nature in the enemy character is the most pronounced, and they could engage in the fight with the enemy in different ways. Such interactive nature would attract users’ attention and might positively influence users’ impression despite the “adversative” nature of it.

One trend we noticed for the uninfluential – influential pair of rating is that some participants who rated negatively against the enemy characters’ corresponding brands still rated it as “influential”. This was not seen in other styles of advertisements. We found this particularly interesting because this suggests that some participants might find the enemy style of advertising still negatively influential on the brand, thus rated it accordingly. However, we also found that such phenomena were more pronounced among less experienced gamers. This could be partially explained by the fact that they might feel more threatened by the enemies as they felt less skilled in dealing with them – less experienced gamers did voice such concerns more during the interviews. It could also be attributed to the gamers’ different understanding of gaming culture. More experienced gamers tend to describe the enemy characters positively during the interview such as “cute”, “lovely” and “interesting”. This factor should be considered when developers are implementing such interactive advertisements.

**Overall Trends**

Overall, we saw most of the ratings coincided with the results in brand recommendation and preference. There were some abnormalities in different pairs of ratings, but the reasons were explained through the results in our interviews.

Moreover, we saw a general trend that most of the results for the experience scale are correlated with brand recommendation. Specifically, the intrusive-immersive pair is highly correlated with the corresponding brand recommendation rating. This suggests that how intrusive the advertisement style has the highest correlation with how participants might perceive the corresponding brand.
5. Concluding Discussions

In this chapter, we conclude the results and analysis from the previous chapters and analyze their strengths and weakness. We will also address the possible ethical concerns with in-game interactive advertising.

5.1. Conclusions from Results and Analysis

Through a comprehensive literature review in product placement and in-game advertising, we identified the unique characteristic of interactivity for in-game advertising placement. Connecting it with theories in social signifiers, we proposed two research questions on social signifiers and their influence in interactive advertising.

The proposed experiment with interview and survey helped us to address our research questions in a meaningful way. First, through a thematical analysis, we were able to break down the social signifiers of in-game interactive advertising to fifteen categories under four themes - Advertisement Interactivity, Advertisement Appearance, Gaming Experience, and Context.

We then analyzed the influence of the interactive advertisements’ social signifiers on the users’ perception towards the brands. We were able to recognize the social signifiers’ underlying influence on brand perception from the perspective of immersive-ness, engagement, information, and emotions. We also recognized that people with different gaming experiences and backgrounds might understand the signifiers that the advertising elements might provide differently and proposed corresponding advice to game developers.

5.2. Strengths and Weaknesses

This study provided a meaningful empirical probe into the concept of social signifiers, especially under the gaming and advertising context, and guidance for immersive advertising in gaming and beyond.

Furthermore, in this study, we proposed an innovative approach to the quantitative analysis for a qualitative concept. We combined qualitative and quantitative approaches in our study in an organic and meaningful way to help to interpret qualitative results in a more universal
background. A user-participated interpretation process also allowed us to investigate the results more accurately.

However, due to the limited amount of time and resources, we were not able to conduct the experiment on a larger number of participants. This poses a limitation on the validity of the results from our statistical analysis – the number of participants of related studies was usually 30 to 200 with several researchers working up to around one year. However, twenty-five is still relatively a sufficient number of participants for such scale of work, and we did conclude statistically significant results from the analysis.

Furthermore, there could be more innovative yet more adventurous methods used in this study. For example, some subconscious factors like eye tracking or subliminal advertising could be utilized and investigated in our study to avoid the conscious influence of users’ preconceptions. During the interview, the participants might have developed certain opinions towards the brands and the styles of advertisements. Thus, the results from the following survey might have been influenced by such opinions. Using more unconventional subconscious experiment methods might help us to generate a more accurate result.

5.3. Ethical Concerns

Advertisement is always a socially concerned subject, as it usually benefits the capitalists promotes an environment of consumerism. What is more concerning is that recently advertisers tend to probe into users’ privacy. Many websites’ tracking could be avoided by enabling “do not track” tab or incognito mode, but such options are usually not provided in games. Some participants in our study also voiced similar opinions – we’re surrounded with all kinds of advertisements around us, and sometimes it almost felt like “nowhere else to hide”. We strongly advise that game developers should actively comply with relevant regulations like the EU General Data Protection Regulation and inform what information they collect to the gamers. Also, an extensive amount of advertisement would hurt the experience of gaming, so we suggest game developers to wisely choose the interactive models of advertisements and integrate them in the game in an interesting and enjoyable way.
References


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doi:10.13140/2.1.1783.9045


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## Appendices

### Appendix 1. Interview Protocol

<table>
<thead>
<tr>
<th>Action</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Welcoming the participant</td>
<td>Hi, ___, thank you for participating in our experiment today!</td>
</tr>
<tr>
<td>Introduce them to our topic</td>
<td>During this interview, we will ask you some questions about the gaming experience. The whole interview will take approximately 30 minutes.</td>
</tr>
<tr>
<td>Inform the person that we are going to record him/her</td>
<td>We will take notes about the conversation, and we will audio record it. We will store the information confidentially and securely and not use them outside of this research project, so you should feel free and comfortable talking about your idea.</td>
</tr>
<tr>
<td>Make the person feel comfortable</td>
<td>Please be aware that you can end the experiment at any time without specifying a reason. You can also skip one or more questions if you don’t feel comfortable answering them.</td>
</tr>
<tr>
<td>Ask the participant if he/she has any questions</td>
<td>Do you have any questions?</td>
</tr>
<tr>
<td>Ask the participant to sign the consent form</td>
<td>We have prepared a consent form. Please read through it, tick the boxes if you agree with the statements and sign the form at the bottom. If you have any questions, don’t hesitate to ask.</td>
</tr>
<tr>
<td>Start the recording</td>
<td>We will start the experiment and the recording now.</td>
</tr>
<tr>
<td><strong>Experiment</strong></td>
<td></td>
</tr>
<tr>
<td>Move on to the interview</td>
<td>Now I will ask you some questions regarding the gaming experience you just had.</td>
</tr>
<tr>
<td><strong>Interview</strong></td>
<td></td>
</tr>
<tr>
<td>Move on to the survey</td>
<td>Now please fill out the survey accordingly. Please read the instructions carefully and let me know if you have any questions.</td>
</tr>
<tr>
<td><strong>Survey</strong></td>
<td></td>
</tr>
<tr>
<td>Thank the participant</td>
<td>The experiment is over now. Thank you very much for your participation!</td>
</tr>
</tbody>
</table>
Appendix 2. Consent Form

CONSENT FORM

Experience in Mobile Gaming
Researcher: Wenkai Han (wenkaihan@outlook.com)

If you are willing to take part in this experiment including observation, interview, and the following survey, please complete the consent form below by ticking the boxes and signing your name and date:

1. I am willing to take part in this experiment. ☐

2. I give permission for my gameplay and conversation to be recorded noted down during the interview session. ☐

3. I understand that all the data recorded will be coded and stored confidentially and securely. ☐

4. I understand that any information which I give will be used solely for the purposes of research, which may include a written report. ☐

5. I give permission for the data recorded during this session to be used by members of the research team in future projects. ☐

.........................................................  ....................................................
(Signature of participant)                  (Date)