

Can You Judge a Video Game by Its Cover?

An Exploration of Subjective Impressions and Viewing Patterns

Mikki H. Phan^(✉), Jibo He, and Barbara S. Chaparro

Wichita State University, Wichita, KS, USA
{mhphan, jibo.he, barbara.chaparro}@wichita.edu

Abstract. Studies have shown that first impressions of websites can lead to lasting opinions regarding usability and trustworthiness. However, little research has been conducted concerning first impressions of video games. In this study, 20 college-age students were asked to view and rate images of 48 game box covers after a brief exposure while their eye movement patterns were recorded. Results revealed that participants can reliably form different impressions (e.g., fun vs. boring) about certain video games based on a brief viewing of the game box cover. Analysis of eye tracking data revealed that participants viewed the front image, side title strip, and front game title the most. Relationships among the different subjective attributes (e.g., design quality, entertainment value) are reported.

Keywords: Video games · Box cover · Game quality · Subjective ratings · Eye tracking · Eye movement pattern · First impressions

1 Introduction

Conventional wisdom tells us that first impressions matter, especially when we are meeting someone new or deciding whether we should try or buy an unfamiliar product. A substantial body of academic literature exists about the topic of first impressions. Specifically, many studies have focused on first impressions in relation to person perception and social cognition [1]. For instance, Willis and Todorov [2] showed that in as little as 100-ms exposure participants were able to make specific trait judgments about a person (e.g., likeability, trustworthiness, and competence) just by viewing his/her face.

In the Human-Computer Interaction (HCI) domain, there are a growing number of studies examining first impressions in relation to user interface and product design. In particular, researchers found strong relationships between user's initial impressions of interface aesthetics and their a priori and post facto evaluations of system usability [3–5]. Additionally, researchers have found that users may form an impression of a website in as little as 50 ms [6, 7]. Lindgaard and colleagues [6] also found that first impressions not only influenced the visual appeal of a website, but also its perceived trustworthiness and usability.

2 Purpose

While there has been a large focus on first impressions in the context of websites, there has been very little research about first impressions of video games. First impressions of video games may occur at a gaming store in which game boxes are displayed or online where images of the boxes may appear. The main goal of this study was to explore people's first impressions about game quality and content based on images of video game covers. Specifically, this study aimed to answer the following questions:

- Q1. Are people able to form first impressions about a video game from a brief exposure to the game box cover?
- Q2. What portions of the game box cover do people view to form first impressions?
- Q3. How do the perceived attributes of game box covers relate to one another?

3 Method

3.1 Participants

Twenty native English-speaking undergraduate students (Age: $M = 21.45$ years, $SD = 4.24$ years) participated in the study in exchange for course credit. All participants reported to have 20/20 or corrected-to-normal vision, and normal color vision. Eleven of the participants were females, and all but one reported that they were video game players. Of the 19 game players, 2 self-identified as "Newbie/Novice", 11 as "Casual", 5 as "Core/Midcore", and 1 as "Hardcore/Expert" gamer. In addition, 13 gamers reported going to video game stores (e.g., GameStop) at least once a year to purchase video games. None of the participants had previous experience with playing any of the video games that they viewed in the study.

3.2 Materials and Apparatus

Fifty-two Xbox 360 game covers were presented in the study (four covers were used in practice trials). Forty-eight of the covers were from less popular game titles. Prior to the selection of the game covers, two video game experts heavily involved in the business of selling games were asked to evaluate a list of 139 less popular video games on a 7-point Likert scale (1 = Not Popular; 7 = Very Popular). The 48 game covers selected were rated 3.5 or less on the popularity scale. Four covers were selected for each of the 11 major game genres (see Table 1).

A computer with Intel Core 2 Duo 2.53 GHz processor running Mac OS X (Version 10.6.8) and a ThinkVision C220p 22.0-inch CRT monitor were used to present the game cover images at a resolution of 1920×1080 . The EyeLink 1000 was used to track participants' eye movements, and a chin rest was used to keep participants' head stable throughout the experiment. Fixations were automatically defined in the system as the periods between saccades (velocities $> 30^\circ/\text{sec}$ and accelerations $> 8000^\circ/\text{sec}^2$) that

Table 1. List of 48 less popular game titles per genre

Genre	Game Titles
Action	<i>Blades of Time, Fairytale Fights, Kung Fu High Impact, Splatterhouse</i>
Adventure	<i>Deadly Premonition, Rise of Nightmares, Vampire Rain, Knights Contract</i>
Driving	<i>Autobahn Polizei, Ben 10: Galactic Racing, Nail'd, PocketBike Racer</i>
Fighting	<i>Battle Fantasia, Lucha Libre AAA: Heroes Del Ring, TNA Impact!, WarTech: Senko no Ronde</i>
Fitness	<i>Jillian Michael's Fitness Adventure, The Biggest Loser: Ultimate Workout, UFC Personal Trainer: The Ultimate Fitness System, Your Shape Fitness Evolved</i>
Music/Dance	<i>Dance Masters, Disney Sing It, Rock of the Dead, Rocksmith</i>
Other	<i>Culdcept Saga (Card Battle), Kinectimals (Virtual Life), Motion Explosion! (Party), Rabbids: Alive & Kicking (Party)</i>
Role-Playing	<i>Enchanted Arms, Infinite Undiscovery, Kingdom Under Fire: Circle of Doom, Venetica</i>
Shooter	<i>Bullet Witch, Hour of Victory, Velvet Assassin, Wanted: Weapons of Fate</i>
Simulation	<i>Air Conflicts: Secret Wars, DarkStar One, Heroes Over Europe, Naval Assault: The Killing Tide</i>
Sports	<i>Adrenalin Misfits, Blood Bowl, Motion Sports, Stoked</i>
Strategy	<i>Record of Agarest War, Stormrise, Thrillville, Warhammer: Battle March</i>

are not blinks [8]. All images presented were 3000 × 2000 in pixels. A keyboard and mouse were used to record participants' responses.

3.3 Procedure

Participants were seated approximately 70 cm in front of the computer. After a consent form was signed and general instructions were given, participants' eyes were calibrated on the EyeLink 1000. Each trial began with a fixation screen, followed by a screen, which displayed a cover image for 20 s, and ended with the response screens.

All 52 game covers were presented in a random order to every participant. After each cover was viewed, participants were asked to complete seven subjective ratings about the game on a 9-point Likert scale similar to what Lindgaard and colleagues [6, 7] used. Only one attribute rating targeted the game covers (i.e., visual complexity), the remaining five attributes (excluding game familiarity) asked participants to evaluate the games themselves based on what they saw from the covers (see Table 2).

The first four game covers that participants saw were presented as practice trials to allow participants to be familiarized with the general procedure of the study. Excluding the practice trials, participants were offered a 5-minute resting period for every 16 trials they completed. Participants took about 60 min to complete the study.

Table 2. List of subjective ratings according to the order in which they were asked (top = asked first; bottom = asked last).

Attribute	Scale Anchors
Design Quality of the Game	1 = Poorly Designed; 9 = Well Designed
Challenge Level of the Game	1 = Easy; 9 = Difficult
Visual Complexity of the Cover	1 = Simple; 9 = Complex
Entertainment Value of the Game	1 = Boring; 9 = Fun
Violence Level of the Game	1 = Not Violent; 9 = Very Violent
Purchase Likelihood: Imagine that you're in a game store, what is the likelihood that you would buy this game?	1 = Very Unlikely; 9 = Very Likely
Familiarity: How familiar are you with this game (i.e., seen it, heard of it, or play it before)?	1 = Not Familiar; 9 = Very Familiar

4 Results

Data from the four practice trials were excluded from final analyses. The mean game familiarity ratings across the 48 game titles were very low ($M = 1.78$, $SD = 1.78$ out of 9), which confirmed that participants were not familiar with the game titles.

4.1 Q1. Subjective Rating Differences Among Game Box Covers

Six dependent samples *t* tests were conducted comparing the highest- and lowest-rated game covers in order to assess whether first impressions about a game can be formed based on a brief exposure of the cover. Bonferroni correction method was implemented to control for family-wise type I error. Results revealed that there was a significant difference between the highest- and lowest-rated game covers per subjective attribute rating (see Table 3). This indicated that participants reliably perceived certain video games as better designed or more fun based on a 20-second viewing of the game covers.

4.2 Q2. Viewing Patterns Across Game Box Covers

Eye tracking data were analyzed in order to examine how people viewed the video game covers. Each game cover was divided into nine natural segments (front image, side title, front title, back image, front Entertainment Software Rating Board (ESRB) label, back ESRB label, back other info, Xbox 360 header; company logo), which are commonly referred as areas of interest (AOI).

The first three AOIs that participants typically fixated on were the: front image, side title strip; front game title. The three AOIs that tended to be visited last were the: the other info area on the back, Xbox 360 header; game publisher's logo. After accounting

Table 3. Comparison of the highest- and lowest-rate game covers ($N = 20$; $df = 19$)

Attribute	Game Cover Pair (Mean; SD)	<i>t</i> Statistics & Effect Size
Cover Visual Complexity (9 = Complex)	<i>Kingdom Under Fire</i> (7.40; 1.23) vs. <i>PocketBike Racer</i> (3.60; 1.93)	<i>t</i> value = 6.90, $p < .001$ <i>Cohen's d</i> = 2.35
Game Design Quality (9 = Well Designed)	<i>Kingdom Under Fire</i> (6.65; 1.42) vs. <i>PocketBike Racer</i> (3.65, 2.08)	<i>t</i> value = 5.58, $p < .001$ <i>Cohen's d</i> = 1.68
Game Challenge Level (9 = Difficult)	<i>Stormrise</i> (7.20; 1.64) vs. <i>Kinectimals</i> (2.90, 2.10)	<i>t</i> value = 9.36, $p < .001$ <i>Cohen's d</i> = 2.10
Game Entertainment Value (9 = Fun)	<i>Motion Sports</i> (6.70; 2.52) vs. <i>Splatterhouse</i> (3.90; 1.86)	<i>t</i> value = 3.70, $p = .002$ <i>Cohen's d</i> = 1.26
Game Violence Level (9 = Very Violent)	<i>Splatterhouse</i> (8.60, 0.82) vs. <i>Sing It</i> (1.00; 0.00)	<i>t</i> value = 41.40, $p < .001$ <i>Cohen's d</i> = 13.11
Game Purchase Likelihood (9 = Very Likely)	<i>The Biggest Loser</i> (4.65; 2.44) vs. <i>Lucha Libre</i> (1.85; 2.08)	<i>t</i> value = 4.80, $p < .001$ <i>Cohen's d</i> = 1.14

for the different sizes of AOIs, results revealed that participants are more likely to look at the main images on the front and back covers, and were less likely to look at the game publisher’s logo, Xbox 360 header, and front ESRB label (see Table 4).

Table 4. Areas of interest (AOI) data across 48 game covers

Mean Fixation Order	Areas of Interest	Mean (SD) Dwell Time in seconds	Adjusted Mean (SD) Dwell Time in seconds
1	Front Image	3.95 (2.52)	2.88 (1.84)
2	Side Title	0.80 (0.76)	2.47 (2.32)
3	Front Title	1.22 (1.43)	2.40 (2.82)
4	Back Image	4.58 (2.77)	2.49 (1.51)
5	Front ESRB Label	0.01 (0.09)	0.12 (1.16)
6	Back ESRB Label	0.27 (0.78)	2.14 (6.27)
7	Back Other Info	0.83 (1.35)	1.27 (2.06)
8	Xbox 360 Header	0.01 (0.05)	0.01 (0.14)
9	Company Logo	0.00 (0.01)	0.00 (0.13)

Note: Adjusted Dwell Time = (AOI’s Dwell Time /AOI’s Area)*1000

Table 5. Spearman's correlations between attributes ($df = 958$)

	Visual complexity	Design quality	Challenge level	Entertainment value	Violence Llevel	Purchase likelihood
VC	1.00					
DQ	0.57	1.00				
CL	0.52	0.66	1.00			
EV	0.45	0.70	0.52	1.00		
VL	0.31	0.13	0.38	$p > .05$	1.00	
PL	0.28	0.59	0.46	0.78	-0.07*	1.00

*The only case where $p = .03$, the rest had $p < .001$.

4.3 Q3. Relationship Between Subjective Attribute Ratings

A series of two-tailed Spearman's rank-order correlations were conducted in order to examine whether the subjective attributes were related to one another. The strongest relationships were found to be between game purchase likelihood and game entertainment value; game entertainment value and game design quality (see Table 5).

5 Discussion

To the best of the authors' knowledge, this is the first study that investigated first impressions of video game box covers. Overall, findings in this study support the notion that first impressions of a video game can be formed by simply viewing the game cover for a short duration. Specifically, participants were able to develop general impressions about the quality and content of the games (e.g., design quality, violence level).

Interestingly, visual complexity of the covers had strong positive relationships with design quality and challenge level of the games. This suggests that a game cover with a complex rather than simple appearance can lead people to perceive that the game itself is challenging and well designed, which in turn can influence their purchasing decision.

Eye tracking data suggests that the front image area of the cover was viewed first and the longest, and may possibly be the most influential to first impressions. Overall, these results suggest that careful thought and care should be given to the overall design of game covers as there are strong positive correlations among game design quality, entertainment value, and purchase likelihood. A limitation of this study is that we only assessed people's subjective impressions of video games based on the game box cover, and did not assess the validity of these impressions. Future studies should examine how these perceptions might change after participants played the games, as well as uncover specific design elements on game covers (e.g., contrast, color scheme, text density) that contribute to both positive and negative first impressions of video games.

References

1. Ambady, N., Skowronski, J.J. (eds.): *First impressions*. Guilford Press, New York (2008)
2. Willis, J., Todorov, A.: First impressions making up your mind after a 100-ms exposure to a face. *Psychol. Sci.* **17**(7), 592–598 (2006)
3. Kurosu, M., Kashimura, K.: Apparent usability vs. inherent usability: experimental analysis on the determinants of the apparent usability. In: *Conference Companion on Human Factors in Computing Systems*, pp. 292–293. ACM, May 1995
4. Tractinsky, N.: Aesthetics and apparent usability: empirically assessing cultural and methodological issues. In: *Proceedings of the ACM SIGCHI Conference on Human Factors in Computing Systems*, pp.115–122. ACM, March 1997
5. Tractinsky, N., Katz, A.S., Ikar, D.: What is beautiful is usable. *Interact. Comput.* **13**(2), 127–145 (2000)
6. Lindgaard, G., Dudek, C., Sen, D., Sumegi, L., Noonan, P.: An exploration of relations between visual appeal, trustworthiness and perceived usability of homepages. *ACM Trans. Comput. Hum. Interact. (TOCHI)* **18**(1), 1–30 (2011)
7. Lindgaard, G., Fernandes, G., Dudek, C., Brown, J.: Attention web designers: you have 50 milliseconds to make a good first impression! *Behav. Inf. Technol.* **25**(2), 115–126 (2006)
8. Nguyen, D., Owens, J., Chaparro, A., Chaparro, B., Palmer, E.: Gaze pattern differences between subjective and objective search of e-commerce Web pages. In: *Proceedings of the 56th Annual Human Factors and Ergonomic Society Meeting*, pp. 1619–1623, October 2012