Effect of User Interface on the Experience of Horror in Games

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Abstract

For this research project, we are looking at how different types of user interfaces affect player experience in the horror video games Resident Evil 7: Biohazard (Capcom 2017) and Dead Space (Electronic Arts 2008). Specifically, how the presence of a heads-up display (HUD) or lack there of impacts how engaged a player is with the games. Horror games depend on a high level of player engagement to achieve the desired effect of "scaring" them, which makes them a strong genre to use for the purposes of this study. Our solution to solving this problem is to create two surveys for these games, the first of which participants will be asked to express their level of satisfaction with the games' user interface based on the Likert Scale, and the second will ask questions about their overall player experience with the game. It is our perspective that the presence of a HUD increases the overall enjoyment and quality of the player's gameplay experience, and that the lack of a HUD UI is actually detrimental.

Introduction

The dictionary defines "heads up display" as "a display of instrument readings in an aircraft or vehicle that can be seen without lowering the eyes, typically through being projected onto the windshield or visor." Real world application of these displays made them a natural choice for early game designers to apply as well. Looking at Space Invaders, we can see how giving players information greatly added to the fun of a game, as well as giving them a way to balance the mechanics the game without having to take their eyes off the action. As games have evolved, so too has their use of these heads up displays. It is the purpose of this study to examine the usability of these HUD's, specifically in the horror games Dead Space and Resident Evil 7: Biohazard. Horror games are a particularly interesting genre because as opposed to being defined by their individual mechanics, their success or failure is judged by the emotional response of the players. This makes every element of their aesthetics very important, including the types of HUDs game designers use. Removing the HUD all together would lead to a great

immersion for players, but it could frustrate them if they need to search for information vital to their survival. Alternatively, one elegant technique to create a better immersion for the players while giving them information within the game world is called a "diegetic" interface. The two games we have selected for use in our survey were curated because they are perfect examples of these contrasting choices; Resident Evil has little to no information on the screen at any given time, while Dead Space has a diegetic interface built into the characters avatar. The goal of our survey is A.) to collect data concerning user's feedback on the user interfaces of the two games and B.) collect data on their user experience with the games themselves. Plotting that data into a mean table will illuminate for us if there is in fact a correlation between user interface and the players experience with both horror games. It is our perspective that a well-designed diegetic UI gives players all the information they need and adds to the immersion of a game, creating a better gaming experience. If the data found in our survey supports this, we hope it contributes to better designed games in the future.

Related Work

We explore player satisfaction and player experience by conducting two surveys for horror games' heads-up display (HUD). Hence, we briefly review previous work in game user experience, usability in video games, transparency in video game user interface, player's immersion, and game interface design and the HUD.

Game User Experience

Practical approach to define game user experience (UX) is to "consider the whole experience players have with the game itself, from interacting with menus to the emotion and motivation felt during and after gameplay" (**Hodent, 2018**). Video games' UX should be the primary focus of game designers since the goal of video games is to entertain players (**Drachen et al., 2010**).

Usability in Video Game

Usability in video games is about considering the ability of a game's system image to clearly convey information about what the system means and how it can be used. Game developers must pay attention to human capabilities and limitations to ensure their game is usable. They also must anticipate likely errors that can be made, and work with the expectations and abilities of players

(**Isbister & Schaffer, 2008; Hodent, 2018**). Game designers should focus their attention primarily on user experience and creating fun in their games, as opposed to merely concentrating on usability (**Renshaw et al., 2009**).

Transparency in Video Game User Interface

A usable user interface (UI) in video games is one that feels transparent. Transparency of UI in video games means giving the proper amount of information to the players at the right time to avoid more friction, more cognitive load, and less immersion for players. Therefore, with an UI that does not distract players' attention for the main action, players do not struggle finding information they need to accomplish their goals (**Hodent, 2018**).

Game Interface Design and the Heads-Up Display

Game designers use HUD to convey crucial information to the players. These information are in form of signs and feedbacks that display the player's status such as stamina level, their ammunition level, their weapon currently equipped, the current score, where they are on the map, what abilities they can use, and so on (**Pagulayan et al., 2003; Wilson, 2006; Hodent, 2018**).

HUD for a video game can be designed by various methods. UI elements may consist of spatial and/or fictional qualities. Spatial elements exist within the game design space, while fictional elements are representations of artifacts that exist within the game's literature (**Fagerholt & Lorentzon, 2009; Babu, 2012**).

Non-Diegetic Interface

UI that its elements are outside of the game space and is not acknowledged by any of the game characters is called a non-diegetic interface. These elements are seen to overlay the game world, such as health bars, ammunition bars, maps, or even background music (**Fagerholt & Lorentzon, 2009; Babu, 2012**).

Diegetic Interface

Game developers sometimes remove the HUD from the UI entirely and incorporate the necessary information into the game world, which is called a diegetic interface. This can lead to a great

immersion for players if well-designed (**Wilson, 2006; Andrews, 2010; Fagerholt & Lorentzon, 2009; Hodent, 2018**). A HUD-less game would make players feel as if they are in "real-life", but can cause frustration if players cannot find necessary information easily in the game. Therefore, players will be less immersed in the game and have fewer deep experiences (**Thompson, 2006; Hodent,2018**).

Most of the video game user experience studies, especially those related to HUD are limited in scope to first-person shooter games, while our work aims to analyze the effects of diegetic and non-diegetic user interfaces of two horror games in players' sense of immersion.

Method

We produced a survey gathering participants' thoughts on horror interfaces by comparing two very different HUDs (Dead Space and Resident Evil 7). The survey involved user satisfaction and player experience questions on said interfaces. This allowed us to understand how the HUD impacts, enhances, or hinders the player's overall enjoyment of the game as well as how well the HUD itself functions within the game. Our questionnaire will consist of two different types of five-option Likert Scales, one on a scale of 1-5 and another using a range between disagreement and agreement on the basis of several statements. The survey was distributed to players of said games through communities on Discord, Facebook, and other sources where players of these games may enjoy them.

Two identical surveys were distributed, one about Dead Space and one about Resident Evil 7 and their corresponding interfaces. The questions in the survey were broken into two sections: player satisfaction and player experience. In the player satisfaction section, respondents were asked to state their level of agreement on the following statements on a scale of strongly disagree, disagree, neutral, agree, and strongly agree:

- I think I would like to play games with this interface frequently.
- I found the HUD unnecessarily complex.
- I think the HUD was easy to understand.
- I think I would need a guide to use the HUD.

- I found the information in the HUD was well integrated.
- I think the HUD was distracting and inconsistent with the game.
- I would imagine that most players would learn how to navigate the HUD very quickly.
- I found the HUD took away from my enjoyment of the game.
- I felt very confident using the HUD.
- I needed to learn a lot of things about the HUD before I could play the game.

These questions tackle a few different topics within the sphere of player satisfaction. The effectiveness of the HUD can be broken down into a few different topics within this survey: ease of use, understandability, integration into the game world, and enjoyment. By measuring ease of use, we can determine how well players were actually able to use the interface to further their progress in the game, and whether it detracted from that or not. By measuring how well the interface could be understood, we can determine which sort of interfaces are ideal for the player to use and which interfaces are a chore to navigate, ultimately taking away from the game's aim. By measuring the HUD's integration into the world, we can see how they function as diegetic interfaces and how that influences player enjoyment and immersion. Finally, by measuring their enjoyment and confidence in the interface in general, we can see if the interface was actually effective in creating a positive influence on the player.

As for the player experience section, we asked the following questions using a standard one to five Likert Scale with 1 being "not at all" and 5 being "a lot":

- To what extent did the game hold your attention?
- To what extent did you feel you were focused on the game?
- How much effort did you put into playing the game?
- To what extent were you aware of your surroundings?
- To what extent did you feel that you were interacting with the game environment?
- To what extent did you feel that the game was something you were experiencing, rather than just something you were doing?
- At any point did you find yourself becoming so afraid that you were unaware you were even using controls?

- To what extent did you find the game horrifying?
- At any point did you find yourself becoming so involved that you wanted to speak to the game directly?
- When interrupted, were you disappointed that the game was over?

These questions serve to identify if the HUD and interface used was effective in creating positive player experiences and immersion. It starts by asking simple questions revolving around the interface's success. If it is able to make the player aware of what's going on, as well as provide good feedback from the game environment, these are key details that point toward a good interface. Following this up we used questions regarding the immersiveness of the game. We asked about their experience, as well as the "scare factor" of the game to determine how much players felt that the experience truly frightened them. The last question relates to the satisfaction of the game and interface system as a whole, asking if players were disappointed that the experience had ended.

Results

All statistical analyses were performed using qualtrics.com and RStudio. Overall, eleven participants filled out the survey for Dead Space and seven people took part in the Resident Evil 7 survey. The usability of HUD for two games were calculated based on three factors of agree, neutral, and disagree to compare and correlate the mean of data collected. This was also adjusted appropriately for the positive or negative versions of the questions. By looking into the means of player satisfaction, we realized that players find the HUD of two games easy to work with, understandable, and well-integrated. Overall, players are more satisfied with the Resident Evil 7's HUD compared to Dead Space's HUD.

	#	RE7	Dead-Space	Likert scale
1	1	3.57	4.00	Agree
2	2	2.14	2.27	Disagree
3	3	4.29	3.82	Agree
4	4	2.86	1.73	Disagree
5	5	4.43	4.00	Agree
6	6	2.57	1.64	Disagree
7	7	4.00	4.00	Agree
8	8	1.86	1.73	Disagree
9	9	3.86	4.45	Agree
10	10	2.43	1.73	Disagree

Figure 1. The Mean of Player Satisfaction

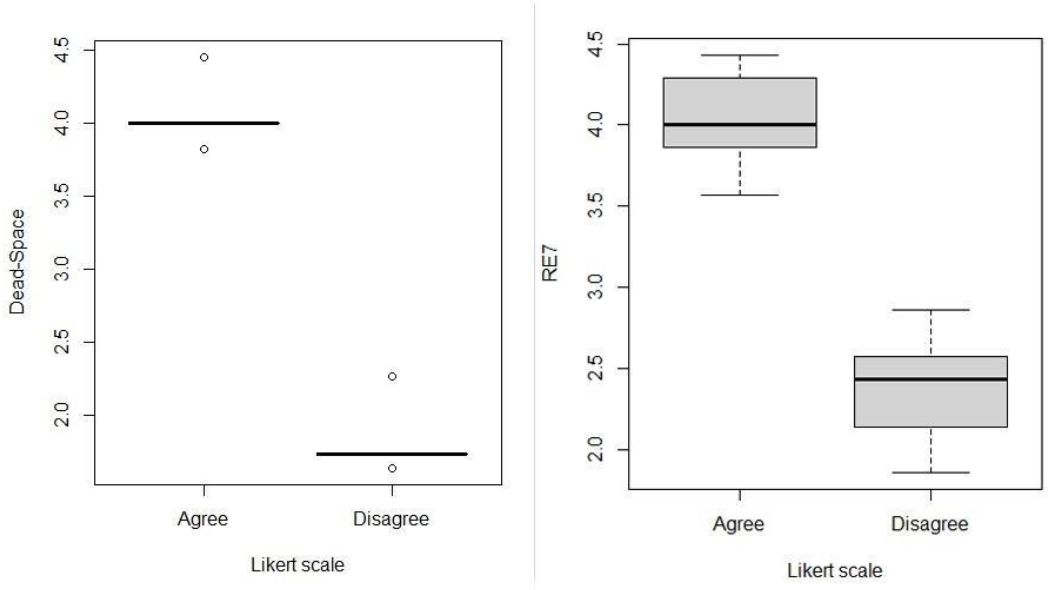

Figure 2. Player Satisfaction Box Plots

Based on the results of the player experience section, the first three questions indicate that players engaged better with Dead Space than Resident Evil 7 because they were more focused, devoted more attention, and invested less effort to play. Also, the level of player's awareness of surroundings and their interaction with the game world shows that Dead Space with a slight

difference creates a better game experience and adds more to player's immersion than Resident Evil 7. Moreover, by looking into questions 7 and 8 which examine the level of horror in games, Dead Space was found to offer players a significantly more horror experience than Resident Evil 7.

#	RE7	Likert Scale	Dead-Space	Likert Scale
1	4.14	Agree	4.27	Agree
2	4.14	Agree	4.27	Agree
3	4	Agree	3.82	Agree
4	3.86	Agree	3.64	Agree
5	4.14	Agree	4.09	Agree
6	3.86	Agree	3	Neutral
7	2.57	Disagree	4	Agree
8	2.57	Disagree	3.64	Agree
9	2.57	Disagree	3.36	Agree
10	3.57	Agree	3.45	Agree

Figure 3. The Mean of Player Experience

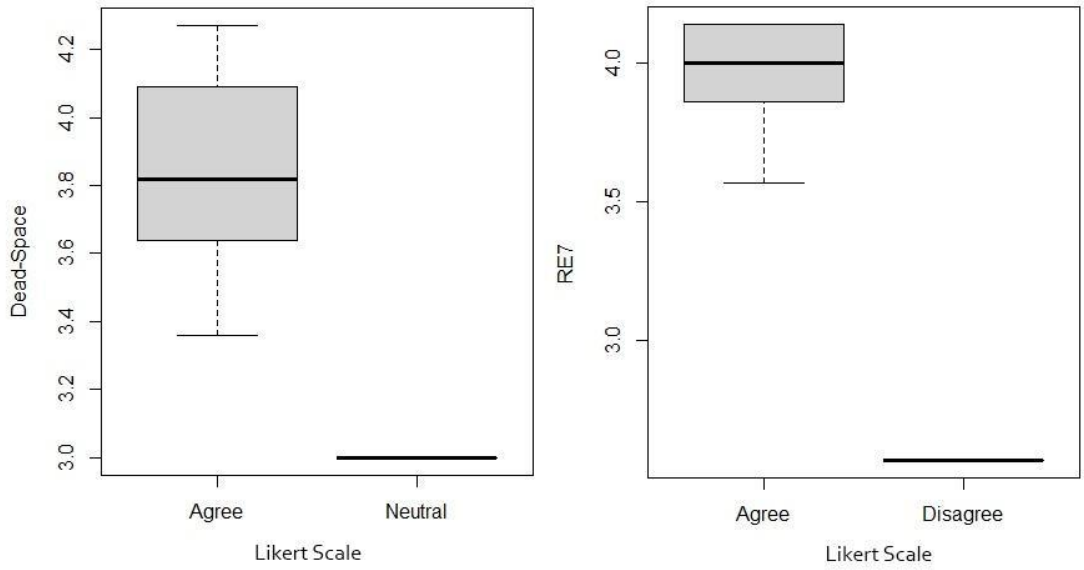

Figure 4. Player Experience Box Plots

Discussion

Our intention in this study was to find a relationship between players' satisfaction with the user interface and their overall player experience, so the first interesting data comparison we looked at was participants' answers involving the HUDS of the games. Again, for purposes of

clarity, the Resident Evil HUD is very minimalist, giving players almost no information as they play the game, while Dead Spaces is diegetically built into the player's avatar. Both games scored very well amongst study participants but looking closer at the mean differences in some of the responses did illuminate some patterns. For instance, question 3 asked if "The HUD was easy to understand", and Resident Evil scored higher per average on the Likert scale. This seems to be very consistent with the stated fact of it having little to no HUD, meaning players really had next to nothing to have to understand. Again with question 5, "I found the information in the HUD were well integrated", Resident Evil scored higher on average, which makes logical sense again because "no information", is as well integrated as anything could possibly be. We highlight these examples for one very important reason; those were the only user responses where positive satisfaction favored Resident Evil, the game that had less information on screen. This is significant for the purposes of discussion because in this study, both games scored very high on our Likert scale for overall player satisfaction, yet statistically based on our data Dead Space's diegetic interface was preferred by participants. Making deductions strictly from this data set, we can conclude that participants preferred the interface of Dead Space, which is important to understand before looking into the results of the player experience portions of each survey.

In this set of data, again both game surveys showed very similar results except for questions 7, "At any point did you find yourself becoming so afraid that you were unaware you were using controls?", question 8, "To what extent did you find the game horrifying?" and 9, "At any point did you become so involved you found yourself speaking to the game directly?". In all three of those, which were questions that all dealt directly with the emotion of fear in the player experience, the mean average of response was higher for Dead Space. What does this tell us? Is Dead Space just a scarier game? Since all we can do is use the information gathered, it seems clear that there is indeed a connection between the interface and the experience of the game. In Marcus Andrews article, "*Game UI Discoveries: What players Want*" (Gamasutra), the concept of transparency in gaming interfaces is discussed in depth. In essence, he argues that transparency in a UI is achieved when a player is no longer thinking, they are just doing. The data from our survey indicates that participants did find more satisfaction in an interface that seamlessly provided them with in-game information from a diegetic display, as opposed to the

minimalist system in Resident Evil. We would argue that this is due to the fact that in both cases, players are aware they are playing a game. As such, having on screen access to information that plays a direct role in their success is more satisfying for them. Also based on our data, in the player experience section of our surveys, results showed participants felt Dead Space was the more "horrifying" experience. This suggests that there is INDEED a connection between user interface and player satisfaction in both of these games.

Limitations and Future Work

This paper shows the use of HUD(Head's Up Display) in the horror game genre. We check for HUD's role in game concentration by comparing the HUD's used in both the Dead Space and Resident Evil 7 games. We reach a conclusion using the data collected from user's feedback through the two surveys which will be represented from the likert scale. The limitations of this paper are that the survey data is obtained from a limited sample of users who are less than one percent of total users who have played both the games. The selection of the sample is also limited as we have only chosen two contrasting games in the horror genre, whereas there are other new titles in the market which are not yet taken into consideration.
Also, the timing of study puts a limitation as we have chosen the HUD of Dead Space, which was released in the year 2008 compared to the Resident Evil 7 game which was released in early 2017. However, we failed to obtain opinions from the larger community of users who have played these titles, we consider the responses from the smaller percentage of users who share their opinion in surveys.

The future work of this paper will be how we can expand our current study while introducing different game genres and game titles in the market. In future, we will broaden our scope of research by taking surveys on player immersion along with the current surveys on both player satisfaction and player experience. For closure, we want this data to contribute in building games with better diegetic UI.

Conclusion

Our research sought out to evaluate the usability of HUDs within the scope of the horror genre by using Resident Evil 7 and Dead Space as a focal point. These games, as well as the genre, place a lot of the game's focus in making the player experience and emotional response, making the HUD important in keeping the feel of the game intact. In addition, both of these games use their HUDs in very different ways, creating potentially different atmospheres and experiences for players. While Resident Evil 7 had nearly no HUD, Dead Space utilized a diegetic HUD to display information to the players.

These different HUDs showed different results in our data, showing that while players found Resident Evil 7's HUD easier to understand due to the minimal information, the player's satisfaction with it was ultimately higher in Dead Space. As for player experience, players of Dead Space claimed to have more of an emotional response to the game's horrifying aspects than those of Resident Evil 7, leading us to believe that there is some link between a game's user interface and the player satisfaction and experience of it.

Moving forward, as HUDs and interfaces become more and more advanced, research like this will be constantly iterated on to determine the most effective uses of HUDs in horror games to enhance the experience. We believe that the interfaces of today will surely be overtaken by those of tomorrow as more and more ways are found to create unique experiences for the player, creating games that shake us to our core more than we could ever imagine.

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