

Proposal for Research on the Effect of
Disparate Sound Quality on Immersion in Video Games
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Introduction

As of the past 10 years, the study of design in video games has slowly grown from an industry-focused niche into a rich and broad field of interdisciplinary opportunities (Whalen). From neuropsychology to film studies to computer science, the analysis of both how video games are made and played is evolving into an increasingly relevant academic field. A crucial element of game design that is often understudied when compared to visuals is that of sound design. For the sake of brevity in this proposal, sound design will be used to describe not only the individual effects and ambience found within a game world, but also the music and use of dialogue/voices in an interactive experience. This proposed project is meant to examine the effects of modifying game sound and sound systems on the gameplay experience in order to further explore how the mind interprets sound coupled with a visual guide in terms of immersion.

Background

Sound design is incredibly important in video games, as it is in all audiovisual mediums, because of how our minds associate sound with causality. Sound design can tell players that they're low on health and need to find a power-up, or provide an emotional backing score to the scene where the player character's dog sacrifices itself to save its owner, or signal to players there are enemies approaching by way of footsteps quickly growing louder. Sound is used to induce different emotions in a user (Garner). Not just feelings of joy or sorrow, but the confidence that the *whoosh* of your sword brings, the uncertainty of the deep rumbles coming from further inside the dark cave. The different jingles that play when you open chests in *The*

Legend of Zelda can explain to the user the level of significance of the item they found inside with a 3-second jingle. Good sound design in a video game disambiguates and enriches the visual experience on both a mechanical and emotional level (Collins).

Karen Collins, a highly regarded scholar in the field of interactive sound, claims that sound design isn't simply important when creating an experience for a user, sound design actually completes the experience and immerses players into a world in a way that visuals alone cannot do. While the graphics of a game are limited to a screen that can usually only be viewed in one particular direction by a user, sound connects the user to the game world physically by filling the space in which they're playing and permeating throughout the user's body (Collins). Sound helps the user create cognitive associations to quickly grasp and comprehend the physicality of the game world, and further pulls them into the game world by bridging these connections (Whalen). This is demonstrated when one hears the rising octave pitch that is associated with Mario's jump in *Super Mario Brothers*, or the 'hollywood-ized' sounds of punches and kicks in *Street Fighter* (Whalen). Through sound, the world that originally existed simply within a screen surrounds the user, which is an essential element of an immersive and impactful interactive experience.

Research and scholarly articles overwhelmingly agree that good sound design greatly adds to the immersion, conveyance and emotional resonance of a video game experience (Zhang). The team behind first-person shooter *Overwatch* have even stated that they have players who are legally blind playing the game and succeeding thanks to effective sound design in the game ("The Psychology"). If sound is so important to the interactive experience in a video game's design, are those who experience a game's sound via their TV stereo output at an experiential – or worse, maybe even a competitive - disadvantage to those who play with headphones or a

surround sound system? What about those who play their own music during game time, or play with no sound at all? What about those who are hearing impaired? Is the gaming experience altered if all users are not playing the game on equal footing?

While previous studies have examined the effects of sound design on user immersion and experience, most if not all have been done assuming all players have access to the same sound systems and the same level of hearing. The plan for this research is to examine how the experience of a video game is affected by sound that is not designed for the experience in question, the removal of sound altogether, or the system through which sound is received. The goal is to gather data to craft a theory about sound design that will allow for creators and designers to craft experiences that are more effective for players who may be playing the game under different conditions, even extending to those with sensory disabilities.

Methods

This research project consists mainly of an experiment in which an extended sample of people will play under different conditions that may affect the way they experience a game's sound. For example, one subject may spend an hour playing with headphones on, while another will spend an hour playing the same game, this time with the sound through monitor speakers, while another will be playing for an hour with headphones on, but with no music and the sound effects (SFX) slider turned all the way up. Each subject will subsequently be asked to fill out a questionnaire meant to measure and score their "immersion" in their experience created by Charlene Jennet (Jennet). Falling in line with a similar experiment performed in 2015, all subjects will be asked to estimate how long they played, as time dilation is commonly cited as a

side effect of immersive gameplay (Zhang). Subjects will also be asked free response questions regarding their experience in regards to the sound design.

The game that will be played for this experiment is *The Elder Scrolls V: Skyrim*, a 2011 first-person role-playing game (RPG) which was praised for its immersive qualities in both graphic and sound design. The conditions by which players will experience the game will fall under the categories specified by this table.

<u>The Elder Scrolls</u> <u>V: Skyrim</u>	Headphones	Surround Sound	Monitor Speakers
Normal Sound	Control Group	Control Group	Control Group
No Music			
No SFX			
Muted			
Mismatched Sound*			

*Mismatched sound means the subject will be playing a modified version of the game where sounds from the game will be swapped.

Subjects will be drawn from a sample of Loyola Marymount University (LMU) students and faculty, with the intent of creating a sample that includes people of different age groups, genders, as well as experience playing video games. These demographics will be carefully recorded and reported in the final paper detailing the results of the study.

Results and Follow-Up

After the experiment has been carried out, a detailed report on the experiment will be written and submitted. Conclusions and discussion will be drawn using results of the questionnaire and free response questions. The expectations for the study are to gather data which will serve as a jumping-off point into crafting theory that will help developers create more universally accessible sound, as well as create a starting place for a more detailed study involving those with hearing disabilities. Further topics to be pursued could include creating sound design for the hearing impaired, or studying the impact of disparate sound systems in competitive gaming scenarios.

Conclusion

As previously discussed in this proposal, the sound design in video games is just as integral to the experience as the visual. Sound is used to communicate game-states and narrative emotion to the player, as well as provide a sense of physical immediacy and connect the player to the game via vibration through the play space. Studies about the effects of sound on immersive experiences have been carried out, but very few have examined what is often a stark inequality between players in their accessibility to sound systems and equipment. My experiment aims to address these questions by recording the reactions of different subjects playing a first-person RPG, testing how different sound systems affect their immersive experience.

Materials Required

To carry out this experiment, I will need a computer that will be able to run *Skyrim* at the highest level without disrupting performance, as well as the different sound systems prescribed by the experiment. A pre-built CyberpowerPC desktop computer would cost around \$1,800. For

the experiment, a set of Razer ManO' War headphones would cost \$110. A Logitech Z506 Surround Sound system would cost about \$70. A Dell 22-inch HDR monitor would cost around \$130. Ultimately this comes out to a monetary cost of about \$2,100 for equipment.

The experiment would require me to be housed in Los Angeles or on LMU's campus in the summer for access to a sample of faculty and students with which to carry it out. The simplest way to handle these costs would be on-campus housing via LMU's SURP program.

References:

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