

# Effects of Built-in Audio versus Unrelated Background Music on Performance in an Adventure Role-Playing Game

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## ABSTRACT

*This article presents an empirical study of the role of video game audio on performance. Twenty participants played The Legend of Zelda: Twilight Princess on the Wii console for a 45-minute session on five consecutive days. Employing a repeated measures design, the authors exposed players to one orientation session and four sound conditions, i.e., silence, remote control sounds, remote control and screen sounds, and unrelated music played on a boom-box, in a counterbalanced order. Performance was weakest when playing without sound, increasingly stronger with audio emitted by remote control only, and by remote-and-screen respectively. Surprisingly, the highest scores were earned when playing with music that was unrelated to players' actions or events unfolding on screen. These findings point to the challenges of processing multisensory cues during the initial stages of an elaborate role-playing game, and suggest that the most effective players swiftly develop strategies incorporating task-relevant information conveyed by both sound and images.*

*Keywords:* Audiovisual, Auditory, Cognitive Load, Interactive, Multimedia, Music, Video Game

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## INTRODUCTION

Video game audio has come a long way since the bleeps and blips of pioneering games such as *Pong* (Atari, 1972). In particular, as sound design has advanced, the player has taken on an increasingly active role with respect to video game audio. Gamers must decipher cues

in the musical score for information about the surrounding environment, and listen for sound effects such as footsteps, which situate the player within the virtual environment. Audio cues alert players to approaching danger, guide them in tracking the moment-to-moment location of enemies, and give immediate feedback on successful execution of actions. Sound can be used to communicate aspects of the narrative, enhance immersion, and convey emotion

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(Zehnder & Lipscomb, 2006). An increasing number of consoles and games also allow players to select from various musical soundtracks (e.g., *de Blob*, Blue Tongue Entertainment, 2008) or to incorporate music entirely of their own choice into the gameplay (e.g., *Project Gotham Racing 4*, Bizarre Creations, 2007). This introduces another sort of control of sound by the player, though this music is not linked to the player's actions or events occurring in the game.

Despite video game audio's growing relevance in game design and the wealth of information that it can convey, few empirical studies have examined the role of sound on players' performance and game experience (Collins, 2007; Hébert, Béland, Dionne-Fournelle, Crête, & Lupien, 2005; Tafalla, 2007). In order to address this important gap in the empirical literature, the present study explores the effects of built-in video game audio and unrelated background music on players' performance and quality of gaming experience in *Twilight Princess* for the Wii console.

## The Wii Console and 'The Legend of Zelda'

The Nintendo Wii console was first released in 2006 and gained immediate and widespread popularity. The Wii console's use of a simplified interface capitalized on a market saturated with sophisticated, but specialized, consoles. In turn, it has allowed many players to access games previously perceived as too difficult to play.

A unique feature of the Wii console's interface is that its controller relies on kinetic-gestural movements for input. Moving the controller a certain way seems to cause the avatar on the screen to enact the same motion. For instance, in *The Legend of Zelda: Twilight Princess* (Nintendo, 2006), the player moves the Wii remote as if it were a sword - compared to previous gaming consoles, which relied exclusively on button input. The Wii remote also features a small speaker, which can emit a variety of sounds that are linked to the kinetic gestures of the player - such as 'swooshes' and

'slashes' when handling the remote as a sword. This extends the interactive element of the Wii remote to include both movement and sound.

The Nintendo Wii console hosts one of the latest installments of *The Legend of Zelda*, a widely popular game series. *The Legend of Zelda* series debuted in 1986, and introduced a novel gaming experience. The series features non-linear explorative play focusing on puzzles and problem-solving, rather than a strict point-based system. The player moves about freely in the environment along any routes and can accumulate any of a wide selection of items along the way. The game series' creator, Shigeru Miyamoto, wanted to create an experience in which players try to complete an adventure rather than simply aim to earn the highest possible score (Vestal, O'Neill, & Shoemaker, 2008). The original game provided a template for other non-linear games and has been credited as one of the inspirations for the creation of the genre of Role-Playing Games or RPGs (Long, 2000).

Another defining characteristic of the series is its pervasive use of music and especially the inclusion of music into its game play, for example as audio cues for the player. In particular, one of the later games in the series - *The Legend of Zelda: Ocarina of Time* (Nintendo, 1998) - was the first non-music game to significantly incorporate music-making into its structure (McDonald, 2008). In addition to its use of sound effects and music to convey meaning to the player, the game also uses distinctive musical ideas as a tool for solving puzzles. Characters in the game are linked to specific themes, and players must recognize these characters' musical themes (*leitmotifs*) to successfully interact with the virtual environment. Specific regions of the virtual world also have their own *leitmotifs*, and musical ideas similar to them are associated with characters belonging to those regions. In one puzzle, for instance, players have to navigate a forest maze by following the melody played by a character hidden at the end of the maze. The melody serves not only as the *leitmotif* for this character, but is interwoven into the bass line of the overarching theme for the forest area. By

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