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A Study of Music, Embodiment, and Meaning in the World of *Portal*

by
Helen Rowe

Appleton, Wisconsin
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Introduction

The field of video game studies has been rapidly expanding since its birth. The first recognized video game was created in 1962,[1] and the few that followed it in the 1960s and early 70s were still extremely primitive, as was the technology they used. The limited storage space on the game cartridges meant that the first video games had little sound and no music.[2] The 1980s saw a surge in the popularity of video games, and a corresponding uptick in writing about video games. Before the 1980s, all books on video games were either instructions or strategy guides; in 1983, the first history of video games was published, which, although groundbreaking at the time, was a very short book meant for children. 1984 marked the first book seriously devoted to video game theory, in which Chris Crawford says that "computer games constitute a new and as yet poorly developed art form that holds great promise for both designers and players."[3] Since then, both video games and video game studies have spread and branched out tremendously.

Today, there is a large amount of general video game scholarship, and it has emerged as an essentially interdisciplinary field. Video games are viewed, and analyzed, from the perspectives of many different disciplines: psychology, computer science, sociology, gender studies, and semiotics are only a few.

Mark J. P. Wolf and Bernard Perron have edited two books on general video game theory, *The Video Game Theory Reader 1* and *2*, the contents of which sometimes engage with game sound. In *The Video Game Theory Reader*, which was published in 2003, the essays are an

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[1] Mark J. P. Wolf and Bernard Perron, introduction to *The Video Game Theory Reader* (New York: Routledge, 2003), 2.

[2] Karen Collins, *Game Sound: An Introduction to the History, Theory, and Practice of Video Game Music and Sound Design* (Cambridge, MA: MIT Press, 2008), 8.

[3] Mark J. P. Wolf and Bernard Perron, introduction to *The Video Game Theory Reader* (New York: Routledge, 2003), 4.

attempt to create a generally accepted set of definitions about video game theory, off of which to base the next wave of research. Both of these books were very useful in order to gain general knowledge about video games, and some of the essays can be interpreted in a musical light. Helpful topics in *The Video Game Theory Reader* include semiotics, debates between narratology and ludology as functional theories for game analysis, and essays on immersion and identity, particularly focusing on creating a new theory, and terminology, about how to relate the player to the avatar. *The Video Game Theory Reader 2* is an update, published in 2009, which addresses some of the changes that have taken place since the first volume was published in 2003. The most important of these changes for game sound theory was the introduction of musical performance games, such as *Rock Band* and *Guitar Hero*, which is addressed in the chapter on embodiment and interface in reference to the unusual controllers of both games.[4] In addition to musical changes, the book addresses further theories of gameplay, such as the interactivity of emotions[5] and the Magic Cycle.[6]

There is a small--but growing--collection of work on video game music and sound. Karen Collins, in her 2008 book "Game Sound," gives a history of the development of game sound, emphasizing its connections with the development of sound technology and computers. Collins also explores the similarities and differences between interactive games and linear visual media such as film, focusing on the degrees of interactivity in game audio and its functions in creating immersion. Finally, she examines present approaches to nonlinear composition, such as the use of variables to create dynamic music and procedural music.

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[4] Andres Gregerson and Torben Grodal, "Embodiment and Interface," in *The Video Game Theory Reader 2*, ed. Mark J. P. Wolf and Bernard Perron (New York: Routledge, 2009), 65.
[5] Aki Järvinen, "Understanding Video Games as Emotional Experiences," in *The Video Game Theory Reader 2*, ed. Mark J. P. Wolf and Bernard Perron (New York: Routledge, 2009), 85.
[6] Dominic Arsenault and Bernard Perron, "In the Frame of the Magic Cycle," in *The Video Game Theory Reader 2*, ed. Mark J. P. Wolf and Bernard Perron (New York: Routledge, 2009), 109.

Karen Collins has also edited a book on interactive sound in new media and games, focusing on the use of music as an advertising technique as well as an in-game element. Some of the collected essays branch out to explore further composition techniques for interactive music, and their creation and function in games. Rob Bridgett examines the role of silence and dynamic variability in games, and Kristine Jørgensen questions "the impression that the use of audio is purely ornamental" by games without their sound.[7] These two articles in particular emphasize the importance of music as a gameplay element.

Most recently, Collins has written another book about interacting with game sound, this time focusing on the perspective of the player. This most recent book mentions the Turret Opera[8] as a context for fan remixes of game music, and the creation of "performative and social activity that extends well beyond the game."[9] The rest of the book focuses specifically on the effects of game music on the player in terms of immersion, interaction, and how the music escapes from the game to become embodied in real-life performance and culture.

Although video game music isn't traditional music history and theory, it still may have something to offer them. Art has to have a history to be seen and studied in any sort of historical context; music already has a history, and it's bringing that history to video games. This process has already begun: in a discussion of open form music and how it creates variability, Karen Collins mentions the *Third Piano Sonata* of Pierre Boulez, which ventured into open form well before it was a possibility for video games.[10] In the context of such a new genre as video games, traditional music history is prosthetic, borrowed. However, the games and the music share

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[7] Kristine Jørgensen, "Left In The Dark: Playing Computer Games With the Sound Turned Off," in *From Pac-Man to Pop Music: Interactive Audio in Games and New Media*, ed. Karen Collins (Burlington, VT: Ashgate, 2008), 163.
[8] Karen Collins, *Playing With Sound: A Theory of Interacting with Sound and Music in Video Games* (Cambridge, MA: MIT Press, 2013), 101.
[9] Ibid., 89.
[10] Ibid., 157.

common roots, and studying each could ultimately benefit the other. Wolf and Perron mention video games giving back to other disciplines; video game music can certainly give back to its ailing historical relatives, the operas and the symphonies. Already, performances of video game music are resuscitating symphony orchestras across the world with sold-out concerts.[11] A recent campaign to add themes from *Final Fantasy 7* and *Skyrim* to the Classic FM Hall Of Fame has been completely successful. According to the man who spearheaded the campaign, Mark Robins, "If Mozart or Beethoven were alive today, who's to say this isn't the stuff they'd be composing. It absolutely sits alongside movie and traditional classical music."[12] New music based on centuries of music history hasn't evaporated--it's simply jumped, while nobody was looking, to a new genre that is in the process of being legitimized.

In light of all the reasons above, this is an attempt to examine some of the music of the *Portal* series, and how it functions within the greater context of a video game. *Portal* and *Portal 2* are perfect games to study in terms of music: the world of the games is dripping with sound of every kind. Its use in the gameplay invites a study of how these sounds function dynamically in an interactive environment, and how the experience of interactive gaming is, in turn, changed by the sounds. *Portal* examines musical identity, and the creation of a musical embodiment of space. *Portal 2*'s soundtrack, which is combined from many tiny and interrelating motives, creating soundscapes which relive memory and weaving the plot progression into a musical drama. The finale of *Portal 2*, in particular, provides a perfect opportunity to look at the game music in terms of opera and explore how it fits in with this tradition.

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[11] Tom Bramwell, "The PR Man Who Spams Games Journalists About Classical Music," EuroGamer, http://www.eurogamer.net/articles/2013-02-12-the-pr-man-who-spams-games-journalists-about-classical-music (accessed April 23rd, 2013).
[12] Ibid.

Portal and *Portal 2* are games about music, and about art. However, both are endlessly self-conscious and self-referential: study of music in the *Portal* world will, invariably, become a study of the games themselves. Through the lens of music, both games address some of the dilemmas inherent in the field of game studies, such as immersion, semiotics, and gameplay.

The games even address some of the issues of their own self-reference: recursion, reflection, and paradox. Once a player is on the lookout, paradoxes are everywhere. Physical paradoxes appear with the use of portals--one favorite is to place a portal on the ceiling of a chamber and one on the floor directly beneath it. Then, by jumping through the floor portal and instantly emerging out of the ceiling portal, the player can enter an infinite loop, eventually reaching terminal velocity just by falling continually through the floor/ceiling.

Spoken paradoxes and gameplay paradoxes also abound. Musical paradox, in the shape of the Turret Opera, appears in the last chapter. All the underlying themes in both games tend to present themselves on all levels of the game: a theme of the physical space will also be manifested in music, as well as in the narrative. *Portal* and *Portal 2* are, at their core, obsession: a looping theme and variations in video game form, on their own nature.

Taken as analytical works, *Portal* and *Portal 2* make a bold statement of the worth of video games: in a feat of dizzying self-reference, they have elevated the status of video games from the subjects of research to the conductors of research. In terms of gaining respect for the genre in terms of its scholarly value, no greater coup could be pulled. From the video game research perspective, it's fascinating to see a video game that explores the problems of its own existence. *Portal* could easily be regarded, in this way, as yet another analytical work among the many about video games. The difference, of course, is that both games are immersive and are under no pressure to answer all the questions they pose. It is an almost impossible endeavor to

accurately convey, on paper, a sense of the complexities of an entire colorful, musical, interactive world. The best way to study *Portal* is to play it.

A Synopsis of *Portal* and *Portal 2*

Since this thesis falls into the category of music history, I suspect few readers will have played *Portal*. The plot is about as simple and plausible as that of any self-respecting opera, so a synopsis is going to be important. Bear with me.

Both games take place, in their entirety, inside an underground scientific research facility called Aperture Laboratories. Aperture Laboratories is located in a fictional Michigan.[13] Founded in the late 1940s in a former salt mine, Aperture rode on the back of the scientific exploration boom of the 50s and 60s, before sinking deeply into debt in the 1980s. Sometime in the early 2000s, Aperture attempted to earn government grants by engineering and activating GLaDOS,[14] a massive AI computer. This attempt backfired--GLaDOS had locked down the entire facility and killed almost everyone inside with neurotoxin. It is into this recently-emptied facility that the unknowing gamer is precipitated at the start of *Portal*.

In *Portal* (released in 2007), the player inhabits the body of Chell, a test subject in Aperture Laboratories. Chell wakes up from a stasis of undetermined length, and is instructed by GLaDOS (who is only known at this point as an anonymous voice-over) as she moves through a series of 19 sleek, sterile test chambers. The tests are puzzles, all of which revolve around the use of portals. A portal is a sort of quantum wormhole that connects two flat surfaces, forming a doorway through which a person can walk (or jump or fall). Chell can use her "Aperture Science Handheld Portal Device" (hereafter referred to as a portal gun) to place portals on the walls,

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[13] It forms a small part of an alternate universe imagined by Valve Corporation as the setting for another of their game franchises, *Half-Life*.
[14] Short for "Genetic Lifeform and Disc Operating System."

ceiling, and floor of test chambers, then travelling through them herself in order to reach previously inaccessible places needed to solve the puzzles.

No other human is ever seen or heard as Chell/the player continues testing, and observation rooms built into the walls of each test chamber are clearly deserted. At the end of the final test chamber (19), Chell is thanked for her participation by the voice-over, and slowly lowered into a pit of fire intended to kill her. She escapes by using her portal gun to jump to safety, at which point GLaDOS becomes angry, accidentally revealing her sentience. Chell moves through the back rooms of Aperture, using her portal gun to evade the traps set for her by GLaDOS, until she reaches a large room at the center of the facility, which houses the GLaDOS mainframe. Chell destroys the mainframe, defeating GLaDOS, and is blown out of the facility by the ensuing explosion. However, she is dragged back inside Aperture by a robot guard, and put back in a suspended state. This was all the reward gamers were to expect for their testing until April of 2011, when *Portal 2* was released.

Portal 2's single-player campaign continues the story of Chell: she wakes up, again inside Aperture Laboratories, an undetermined (but very long) time after the end of the events in *Portal*. She is awoken by Wheatley, a tiny and annoying robot, who runs along a rail and tells her to escape the facility. In a sequence strange because of its odd reminiscences, Chell moves through several of the same test chambers that formed the beginning of *Portal*. Eventually, still guided by Wheatley, Chell finds herself once again in the room housing the destroyed GLaDOS mainframe. At this point, Wheatley accidentally wakes up GLaDOS, who recognizes Chell and decides to put her through more tests, rebuilding the destroyed Aperture around her. Chell escapes once again with the help of Wheatley, and manages to find the mainframe (again) and depose GLaDOS, attaching Wheatley to the mainframe instead.

Upon being attached to the mainframe and gaining control of the facility, Wheatley becomes drunk with power and turns evil, putting GLaDOS' mind into a potato battery and dropping them both down an elevator shaft. They fall to the very bottom of the salt mine in which Aperture is built. Chell and GLaDOS have no choice but to work their way back up, through abandoned test chambers dating from the 1940s through the 1980s, to the present-day facility, where Wheatley is now in charge. Chell and GLaDOS are captured and made to run a series of hilariously inept tests invented by Wheatley. Unfortunately, Wheatley has failed to safely maintain any of Aperture's nuclear power sources. An explosion is imminent. Fortunately, Chell and GLaDOS find Wheatley's lair, depose him from the mainframe, and reinstate GLaDOS. In the process, Chell opens a portal to the moon, whose surface is conducive to portals. Wheatley is sucked through the portal into space, but Chell is saved at the last minute by GLaDOS, who has retaken control of the facility. In the final minutes of the game, GLaDOS grants Chell her freedom from Aperture, sending her on a final upwards elevator ride through a sea of sentry turrets, which sing an opera aria, before she is deposited outside of Aperture in a deserted field. *Portal 2* ends here, and the analysis begins.

What Are the Rules?

According to Dominic Arsenault and Bernard Perron, "we cannot play unless we are conscious of playing."[15] Play, by definition, does not involve an assumption of reality or any true suspension of disbelief, but rather a working acknowledgment of the falsehood of its most basic elements. Objects in play are defined by what they are *not*: for example, a rocking-horse is *not* a horse. A stick is *not* a sword. The necessary definition of an object as something it is not gives that object a form that it is not, or an *anti-form*.[16]

Any game can be defined as a mathematical system of rules. However, these rules are only half the game itself: like written music, these rules can only be made present, whole, through play. Eric Zimmerman and Katie Salen define play as "free movement within a more rigid structure."[17] Somewhere between the rigid structure of rules and the free movement of gameplay lie the liminal elements of the game that link the two. These include the game interface, physical controls, aesthetic design, and sound effects of all kinds. Together, the interaction between the rules and play, through the intermediary elements, is defined as gameplay.

In order to play a game involving anti-ness, the player must mentally transform physical sensations into conceptual objects--things into anti-things. This process is defined as semiosis.[18] Through semiosis, the player must act on different levels, essentially splitting themselves into two: on one level, the player is a member of the game world; on another, they are actively working to sustain the illusion of the game's reality, like a puppeteer controlling the strings on

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[15] Dominic Arsenault and Bernard Perron, "In The Frame of the Magic Cycle," in *The Video Game Theory Reader 2*, ed. Bernard Perron and Mark J.P. Wolf (New York: Routledge, 2009), 111.

[16] David Myers, "The Video Game Aesthetic," in *The Video Game Theory Reader 2*, ed. Bernard Perron and Mark J.P. Wolf (New York: Routledge, 2009), 47.

[17] Katie Salen and Eric Zimmerman, *Rules of Play* (Cambridge: MIT Press, 2004), 304.

[18] Ibid., 46.

their puppet. For example, a child who plays on a rocking horse is, on the level of the game,

riding a horse. To ride a horse is the ideal, the entire point of that game. However, on a more

detached level, the child is consciously controlling the motions of the rocking horse as a toy, in

order to preserve the illusion of horse-ness on the level of the game. Rocking too hard, for

example, will tip over the wooden "anti-horse," thus ruining the illusion and breaking the game.

In most gaming scholarship, the half of the child who controls the rocking horse is the *player*.

The half who gets to ride the flesh-and-blood horse is the *avatar*, the embodiment of the player

in the game.[19] It would be easy to try to define the player as the anti-avatar, just as the rocking

horse is an anti-horse, but this would be a mistake. The player is not an approximation of the

avatar as the rocking horse is of the horse, but is instead the avatar's chaperone: the player

consciously creates (or connects to) the avatar and curates its existence in the game world, along

with all of the conceptual objects that exist in the game world as anti-things. In terms of video

games, semiosis is the link that turns the button on a controller into the trigger on a gun, or the

player's slight thumb movement into the avatar's running forward. The world of a video game

can be inhabited only through semiosis--the player is the person sitting on a couch and pressing

buttons, and their avatar is their embodiment in the video game.

   Players need not always create avatars. For instance, in a game which does not require

much semiosis, such as poker, no avatar makes an appearance--cards are cards, and are never

required to become anti-cards, to approximate themselves. Games requiring little or no semiosis,

no matter how dissimilar, share a few common characteristics: all must take place entirely in the

world of the player (without creating a make-believe one for the character), all must deal only

with pre-existing physical objects that remain themselves throughout the game, and (most

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[19] David Myers, "The Video Game Aesthetic," in *The Video Game Theory Reader 2*, ed. Bernard Perron and Mark J.P. Wolf (New York: Routledge, 2009), 47.

importantly!) the rules must be very clear. Such nonsemiotic games invoke neither a doubling/halving of the player nor of reality, but instead a conscious engagement with the clearly-defined rules of the game.

Here's an example of just such a nonsemiotic game: a series of rooms, containing tasks for the player to complete in order to exit that room--for example, the player might have to find a large, weighted cube and place it on top of a button in order for the door to open. The rules of the game are clearly communicated to the player through pictorial symbols on the walls (i.e., exit signs) and spoken directions via a speaker. In such a game, there is no semiosis required: a cube is a cube and a button is a button. The player of such a game, physically standing in the room, never needs to imagine that the room is anything else than itself, or that she is anything else than herself. The rules of the game are clear to her and she can choose to follow them as she wishes. The entire game takes place in her, the player's, real world.

The player of the cube-and-button game can understand the rules of the nonsemiotic game she plays, but what about the rules of the world in which she and the game are both situated? According to Myers, "all games… consist of rules that [they] cannot themselves unravel."[20] A semiotically conceived avatar inside a semiotic game world will never be able to perceive the rules that dictate her own existence. In this case, the player, the cube, the button, and the series of rooms are all elements of the *Portal* world. The player who stands in the room and places cubes on buttons is Chell, *Portal*'s protagonist. The rooms themselves are the test chambers, from which Chell eventually escapes. Chell's actions are controlled by the player of *Portal*--so she is both the player of a nonsemiotic game and the avatar of the player of a larger semiotic game.

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[20] Ibid., 58.

Multiple, nesting layers of game within game create interesting possibilities for the interaction of rules and play. Play must be always in reference to the rules, but could contradict them or play *with* them. It is not only objects that attain an anti-form in gameplay; self-referentially, anti-ness can even extend to the rules themselves, since play can be in reference to those rules. In this case, rules become anti-rules, and approximate themselves--they are self-defeating. If the rules are anti-rules, there must also be anti-play--in other words, play that imitates play, but ultimately fails to satisfactorily fulfill its own role.

As an example of self-defeating rules and play, here is a mind game, first invented in some form by the Cambridge Science Fiction Society in 1976.[21] Called simply "The Game," there are only three rules:

> 1. Anyone who knows about The Game is playing The Game.
>
> 2. To win, do not think about The Game.
>
> 3. If a player thinks about The Game, they lose and must announce their loss.

To play The Game *is* to lose The Game. The only way to win is not to play, but of course someone who is not playing the game cannot win. Anti-play, because of its self-reference, invites paradox into the gameplay, leaving players with a game that can never be legitimately won. An unwinnable game, by eliminating success through ordinary play, inherently involves and inspires subversive behavior.[22] In *Portal*, some of this same self-reference, paradoxical rules, and subversive behavior can be seen in the liminal interactions between the different layers of gameplay: the test chambers, much like a Shakespeare play-within-a-play, are a simplified

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[21]"FAQ," Lose The Game, http://www.losethegame.net/faq (accessed March 20th, 2013).

[22] According to Jonty Haywood (who founded a site devoted to The Game), The Game was banned in an Ohio high school due to class disruptions.# The administration threatened students with suspension for continuing to play. Unfortunately, the announcements backfired, reminding students of the existence of The Game and inspiring them to further loss. In a final subversive twist, students littered the hallways of the school with "loss-inducing notes." "FAQ," Lose The Game, http://www.losethegame.net/faq (accessed March 20th, 2013).

reflection (and, perhaps, intensification) of the greater Aperture world. This is important both in terms of physical structure and music. Ultimately, the player's escape from the test chambers and their rules exposes the tests as games even as the player is still inside Aperture. The construction of the tests, both physical and aural, is laid bare for the player to see and understand. In this way, *Portal* and *Portal 2* subvert (but also self-consciously examine) the elements of gameplay.

As mentioned in the introduction, paradox is a huge theme in Portal. Perhaps its presence in meta- and anti-play is the root of all this. The liminal is the thread that ties all of the aforementioned things together. Through semiosis, what appears to be becomes what is.[23] Anti-forms become forms, the roles of player and avatar are confused, and a world crystallizes into distillations of itself.

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[23] David Myers, "The Video Game Aesthetic," in *The Video Game Theory Reader 2*, ed. Bernard Perron and Mark J.P. Wolf (New York: Routledge, 2009), 59.

1. The Emergence of Musical Identity and Embodiment in *Portal*

> *After recording a blank mouth slack hands straight back   all will*
>
> *conclude that what one witnesses is made: string smoke mirrors it is   not*
>
> *-Caryl Pagel, "Levitation"[24]*

In multimedia, there is a rift inherent in the production of a unified sound and image. The projection of a character speaking in a movie is, however, actually a recombination of two very disjunct things: the image of the character on the screen, and the sound of their voice emanating from speakers at the back of the cinema. Mary Ann Doane calls the audience's perception of the oneness of film characters or entities, reconstituted from image and sound, the "fantasmatic body."[25]

The film industry is very careful to make sure that that these two halves, the body and the voice, are perceived as whole and unbroken by the film audience. The natural relationship between body and voice is organic: cause and effect; the voice reflects the actions of the body. It is only through the connection of a voice and a body that identity is formed. To expose the rift between recombined sound and image is to expose the diegesis of the film, and its characters, as a collective nonentity, a fabrication. To unify the disjunct voice and body of a character, film presents the image as dominant, and sound as secondary. According to Doane, "one of the basic goals of the motion picture industry is to make the screen look alive in the eyes of the

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[24] Caryl Pagel, *Experiments I Should Like Tried at My Own Death* (Hadley, MA: Factory Hollow Press, 2012), 13.
[25]   Mary Ann Doane, "The Voice in the Cinema: The Articulation of Body and Space," *Yale French Studies* 60, Cinema/Sound (1980), http://www.jstor.org/stable/2930003 (accessed April 23rd, 2013): 33.

audience."[26] The wording of this phrase reveals some of the dismissive attitudes of the film industry towards sound, and similar preconceptions of viewers about its importance (or lack thereof). Even the name "viewers," as a general term for audience members, suggests that in a typical perception (or presentation) of the fantasmatic body in multimedia, sound is subordinate to image.

A similar emphasis on the importance of a physical body applies to recorded music. This philosophy of visual dominance affects both the choices of recording subject and the use of recording technology. According to Doane, "technical advances in sound recording are aimed at diminishing the noise of the system, concealing the work of the apparatus, and thus reducing the distance perceived between the object and its representation."[27] The more faithful the recorded sound is to the sound of the original, the more of a "presence"[28] the sound has. The recorded voice, then, exists as a musical afterimage, a remembrance of the body from which it came. Its goal is to to evoke the life of its original subject, to make the imagined screen come alive, to have presence.

In attempting to sustain a fantasmatic body, recorded music is intrinsically trapped, tied to the memory of the body that once created it. This makes realistic music recording an inherently connected entity: it is joined to visual space, time, and the re-membered identity of the original body.

Against the traditional multimedia world of connections, memories, and references, consider the introduction of *Portal*. The world begins simply for Chell, who awakes in a small,

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[26] Mary Ann Doane, "The Voice in the Cinema: The Articulation of Body and Space," *Yale French Studies* 60, Cinema/Sound (1980), http://www.jstor.org/stable/2930003 (accessed April 23rd, 2013): 35.
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[27] Mary Ann Doane, "The Voice in the Cinema: The Articulation of Body and Space," *Yale French Studies* 60, Cinema/Sound (1980), http://www.jstor.org/stable/2930003 (accessed April 23rd, 2013): 35.
[28] Mary Ann Doane, "The Voice in the Cinema: The Articulation of Body and Space," *Yale French Studies* 60, Cinema/Sound (1980), http://www.jstor.org/stable/2930003 (accessed April 23rd, 2013): 35.

clean room panelled in glass. Inside this new space, there is no history, memory, or knowledge of the outside world. It is a ludic vacuum; it has no identity but that it is the beginning of a game.

Chell has little time to examine her surroundings before she is addressed by a robotic voice.[29] Such a voice is disembodied in every sense: here, the multimedia rules of fantasmatic bodily unity have been reversed to their logical extreme. Most obviously, this voice has no clear diegetic source, let alone a mouth or a face. It is also distanced (in terms of recording fidelity) from any possible image of an original body: the sound is decidedly inhuman, and occasionally completely overcome by static, beeps, or other aural glitches. In fact, this voice is perceived less as a voice than as an aural set of instructions, since there is no presence, no sense of humanity or identity. This lack of presence is compounded by word choice. A voice connected to an identity would naturally also have a musical line, a direction, phrasing, some indication of the mind and body behind its creation; although its sentences are perfectly grammatical, the phrasing of this voice is halting and incomplete, and reveals no such identity.

In this voice, which has no link to a greater body or context, the environment of the test chambers is echoed. Chell travels through most of the game in a contextual vacuum, without any hint of what sort of world lies outside the tests, where she is ultimately going, or even who she is herself or why she is a test subject. The only music consists of small radios placed in corners (which will be discussed in the next chapter), and occasional ambient music. Never is another human seen or heard; there are only the panelled rooms, the puzzles, and the empty robotic voice. The effect is of perfect, disconnected solitude.

This calm sense of nonentity lasts, for the most part, until the end of the final official test. Having survived Test Chamber 19, Chell is being transported down a long hallway by a moving platform. There is a sense of release; the test sequence is over, and so is the video game. The

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[29] *Portal* (Seattle: Valve Software, 2007), Test Chamber 00.

player has won. Then the platform turns a corner, revealing a pit of fire into which it begins to descend; as Chell is transported towards her own death, the robotic voice thanks her for her participation in testing and says goodbye.

Here, several things happen at once, fundamentally changing--but not ending--the game. Chell sees that there is a small balcony edging the fire pit, and uses her portal gun to jump to safety. She has escaped from both the fire and the test chambers; she should also have escaped the robotic voice, which had only existed as a function of the test chambers. However, no sooner does she land on safe ground than she hears the voice once more: "What are you doing? Stop it. I-"[30]

Chell is now faced with an enemy rather than an echo, who, after an awkward pause, tries to cover up her mistaken pronoun by backpedaling furiously: "...*WE* are pleased that you made it through the final challenge, in which we pretended we were going to murder you." The fact that this betrayal of identity is a mistake to be covered up further reveals that the mind behind the voice. GLaDOS has only been pretending to be nonexistent for the entirety of the game. Until now, GLaDOS had revealed no hint of sentience in her diction; any "self" she referred to was always "the Enrichment Center" or "we."

In 1927, Theodor Adorno warned that "only when gramophonic reproduction breaks down are its subjects transformed."[31] Now, in this futuristic and inhuman world, that warning is brought to bear. Here, musical reproduction has been so broken down that the voice is infinitely separated from any kind of original source. And it is certainly transformed by this separation, although perhaps not in the way Adorno anticipated: instead of simply becoming unintelligible and dying away, the recording has come to life. It is no longer doomed to recall and repeat the

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[30] *Portal* (Seattle: Valve Corporation, 2007): Test Chamber 19.

[31] Theodor Adorno, "The Curves of the Needle," ed. Thomas Y. Levin, *October* 55 (Winter 1990), http://www.jstor.org/stable/778935: 55.

words of a long-lost physical body, but free and under its own power. What the listener thought was an infinite distance between sound and meaning is now no distance at all. The robotic voice has as much of a "presence" now as if it were standing in the room with the player--which, in a way, it is. The reconstitutions and flaws of recording, in light of the new sense of identity, are revealed as natural inflections of the voice.

When we hear a voice, we will mentally create a body to go with it, for "who can conceive of a voice without a body?"[32] Physical bodies are recalled in faces, looks, and hand gestures. However, this new body is not a physical body, as the remembered objects of recordings are, and, while it is certainly imagined, cannot be imagined visually: it exists purely in terms of sound. Donna Haraway writes, "our best machines are made of sunshine; they are all light and clean because they are nothing but signals, electromagnetic waves, a section of a spectrum... ether, quintessence."[33] This body is the aural equivalent of light: the small mechanical flaws that create its inflections have no physical source, but instead are physically intangible, disembodied themselves.

The body painted by sound must be defined by more than just noise: it is music, the artistic sculpting of sound, that creates a form and an identity. Alex Ross says that "[music] has become a radically virtual medium, an art without a face."[34] In this case, music creates its own face, and its own identity, with no reference to the visual. It is centered on the play of words, motives, themselves reconstituted from pre-existing notes and inflections. We could say that this new musical body, made purely from sound and inflection, is indeed a kind of fantasmatic body;

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[32] Mary Ann Doane, "The Voice in the Cinema: The Articulation of Body and Space," *Yale French Studies* 60, Cinema/Sound (1980), http://www.jstor.org/stable/2930003 (accessed April 23rd, 2013): 33.

[33] Donna Haraway, "A Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late Twentieth Century," in *Simians, Cyborgs and Women: The Reinvention of Nature* (New York; Routledge, 1991).

[34] Alex Ross, *Listen To This*" (New York: Farrar, Straus and Giroux, 2010), 55.

it does fulfill Doane's qualifications, which are "unity and presence-to-itself."[35] Nowhere here is there a qualification that the body must be visible.

There is ample precedent for a theory of musical embodiment. Arnold Schoenberg "described the musical idea in fundamentally human terms."[36] He related the recombination of musical phrases to "functioning limbs, [which] are found only in organisms and that, unlike parts--which are actually dead--sustain their power as a result of their organic membership in a living organism."[37] The musical body of *Portal* is formed from phrases, sentences, arpeggiations, and many interrelated themes, which combine to give the sound world of the game a sense of simplicity, wholeness and purpose, even of obsession. The small selection of themes is offset by a wide variety of instrumentations, styles, and musical settings, through which the themes evolve over the course of the game. The motives fall together to create a reconstituted, and living, whole, just as the sentences of GLaDOS are assembled from disjunct recorded words.

The interplay of musical motives flows over, metaphorically, into other aspects of the game, reflecting a similar collective wholeness, but individual fracturing, of characters. In the entirety of both games, there is not a single traditionally, consistently whole fantasmatic body. The protagonist is a body without a voice; the villain is usually a voice without a body.[38] Characters are constantly killed, resurrected, and body-switched. Musically, they are all part of a larger ensemble--a musical ensemble--that defines them all in terms of sound.

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[35] Mary Ann Doane, "The Voice in the Cinema: The Articulation of Body and Space," *Yale French Studies* 60, Cinema/Sound (1980), http://www.jstor.org/stable/2930003 (accessed April 23rd, 2013): 34.

[36] Amy Lynn Wlodarski, "'An Idea Can Never Perish': Memory, the Musical Idea, and Schoenberg's *A Survivor From Warsaw* (1947)," *The Journal Of Musicology* 24, no. 4 (2007): 584.

[37] Amy Lynn Wlodarski, "'An Idea Can Never Perish': Memory, the Musical Idea, and Schoenberg's *A Survivor From Warsaw* (1947)," *The Journal Of Musicology* 24, no. 4 (2007): 584.

[38] GLaDOS does not always maintain simply an aural presence; for the purposes of gameplay, she is occasionally physically represented as a mass of wires and mechanical spheres hanging from the ceiling of a large room. This "body" is a sort of placeholder, more of a symbolic throne of power than any sort of functioning organism.

The musical body has a face, limbs, a mind. It has a memory. It tells stories. When we engage with different aspects of the physical *Portal* world, we engage with the musical body. The following writing will illustrate some of the ways in which the musical body functions and creates deeper meaning within the diegesis of *Portal* and *Portal 2*: it is the source for the player's sense of space, time, and meaning.

Musical Mapping

Even from the beginning of *Portal*, within the nonidentity that is the test chambers, music articulates and embodies the space through which the player moves. This music, like the empty and austere space in which it resides, is presented as fractured, not phrased, and totally lacking in identity or emotion. However, even such unmusical music helps create an identity: in this case, the music identifies, and personifies, the empty test chambers of *Portal* by existing as a navigational tool, creating a sort of musical echolocation, a forerunner of the greater musical embodiment in *Portal 2*.

Both *Portal* and *Portal 2* are both first-person puzzler games, which makes them extremely dependent on spatial definition and navigation. The very walls and floor are moving gameplay elements, and their configuration is part of each puzzle; In order to solve any test, the player must internalize an extremely detailed mental map of each test chamber. According to Kim Swift, a *Portal* developer, preview players for *Portal* had a hard time navigating levels that were cluttered with objects and decorations. In response, the developers of *Portal* wiped the test chambers of all embellishment in order to make the aesthetics of the test chambers as clean and uncomplicated as possible.[39] The developers also did something else, perhaps not on purpose, that almost certainly helped players navigate the game: they placed a small portable radio in every *Portal* test chamber.

Much like the disembodied voice of GLaDOS, these testing radios are carefully distanced from the original music that they reproduce. Each radio loops, incessantly, a 20-second pop

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[39] Shawn Elliot, "Beyond the Orange Box: Orange Box Afterthoughts and the Future of Valve," *1up.com*, http://www.1up.com/do/feature?pager.offset=3&cId=3165930 (accessed April 25th, 2013).
[39]

tune.[40] The sound quality overall is tinny, and the high notes of the tune take on a piercing

quality which carries throughout even the largest test chamber. In short, the radios certainly do

not exist for the test subject's enjoyment. According to composer Scott Morton, "by looping [the

music] over and over, you've completely detached the player from even registering it altogether...

let's be honest. Why even hire a composer in the first place if the music isn't going to play a

functional part in the gaming experience?"[41]

Morton is right that looping background music ceases to register in any purely musical

sense after a short time, and these radios are no exception. However, their detachment from

musical significance means that they are perceived, instead of mere vessels conveying musical

meaning, as physical objects themselves--directional signifiers. Originally, arcade games relied

upon looped tunes as both advertisement and a sort of echolocation, enabling gamers to

recognize their favorite games by sound in a crowded arcade.[42] A tinny or piercing sound,

besides being a necessary characteristic of primitive sound technology, was a positive trait in

such a setting. Besides creating musical space, the tune helped identity, and personify, the game

itself.

Although *Portal* is not an arcade game and has no need to advertise itself within its own

diegesis, the same effects used in original original arcade tunes--the repetition, as well as the

piercing timbre--make the radios serve as a potent navigational tool. In general, every piece of

information about what happens outside of our limited field of vision is acquired aurally, and that

information helps us inhabit the space. In film, voice-off (hearing a character who is inside the

diegesis but not currently pictured on the screen) "constitutes a denial of the frame as a limit and

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[40] Zacman2kalt, "Portal Radio for Two Hours," *Youtube.com*, http://www.youtube.com/watch?v=s-UFPhz2nZ0 (accessed April 24th, 2013).
[41] Karen Collins, *Game Sound*, Cambridge, MA: MIT Press, 2008, 140.
[42] Karen Collins, introduction to *From Pac-Man to Pop Music*, Burlington, VT: Ashgate, 2008, 2.

[is] an affirmation of the unity and homogeneity of the depicted space."[43] In this way, music is used as an extremely effecting mapping tool, creating (through repetition and physical anchoring) a musical space, as well as a physical one, through which the player can move.

Standing in a test chamber with one of these radios is like having radar: it is impossible to lose one's sense of direction. In each test chamber, the radio's sound carries above all other noises, such as the player's feet, the voices of turrets, or the noise of the portal gun. The player herself changes the volume and direction of the radio music by moving around the test chamber and looking in different directions. The player can also pick up the radio, and carry it around with her. Upon playing *Portal* for long enough, the looping whine of the radios erases any idea of musical significance, becoming part of the environment of the test chamber. Take the music away, and something about the space is palpably missing.

The radios are a perfect reflection of the space they inhabit and define: it is clinical, impersonal, and presented without artifice or placement within a past or future. The looping, repetitive effect of the radios separates them from the ability to musically interpret the game action or imbue any events with emotional meaning. The radios are presented as merely a navigational tool--but an extremely effective one. It is a testament to the power of sound and music that such an aural presence, so completely deprived of traditional musical meaning, can nevertheless be so useful in defining space.

We are listening, even when we don't think we are. The radios are necessary for a complete understanding of the space they inhabit; they are a precursor to the more sweeping musical embodiment of *Portal 2*, in which every aspect of the space is enveloped in a cloud of

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[43] Mary Ann Doane, "The Voice in the Cinema: The Articulation of Body and Space," *Yale French Studies*, no. 60 (1980): 37-8, http://www.jstor.org/stable/2930003.

sound. In *Portal 2*, such clinical directional pointers as the radios are replaced with an interacting web of musical motives, which join together to create another kind of musical map.

This music is dynamic music, used in video games to connect music with interactivity. The most common techniques used to make music dynamic are used on continuous soundtracks--perhaps adding an echo to the ambient sound when the player enters a tunnel, for example. In *Portal 2*, dynamic music is most visibly connected to objects, and presented as an intrinsic aspect of their form.

The player's musical map is maintained through the dynamic music, which joins the background music in test chambers. Objects emit musical lines. As each test is solved, the interplay of the musical motives indicates the action and physical placement of the testing elements, ultimately creating a counterpoint that is both physical and musical. In one test, three lasers must be directed into three adjacent wall receivers. When all three are activated, the exit door will open and release the test subject. As each laser is activated, its receiver begins to hum, creating a sort of luminous muttering. After the first laser is activated, adding a second adds a second voice to the humming. Together, the three activated lasers create a whole-tone babble of notes, which (if the player stands next to them and listens for long enough) will resolve itself into a mechanically rhythmic chanting. The three musical lines of the laser phase are inextricably linked to the three lasers and their respective statuses (active or inactive; silent or playing). Solving the test and activating all three lasers creates a phase, a full and cohesive musical piece reminiscent of Steve Reich. Here, spatial completion confers musical completion.

Portal 2's test music also reflects the function and narrative character of each testing element, within the context of each test: the music played depends on the testing situation as well as on the testing object. For example, one chamber is inundated with Baroque-sounding

harpsichord music. As the player flies through the air, the line continues in Baroque chord sequences, but the sound of the harpsichord is transformed into a driving, electronic line. Once the player lands, the harpsichord reappears. Through the dynamic music, the situation of the player at any moment (for example, in midair) is musically integrated with the processes of solving the tests--the physical becomes musical. This transition creates a curious, and extended, unity of the space (physical and musical) with the avatar's body.

The nature of *Portal 2*'s interactive music is that of pure musical embodiment: the objects in the tests are aspects of a greater musical whole, and they show that by being surrounded by the musical clouds. These clouds are not exactly diegetic, because they have no clear physical source within the game, but they are also not exactly non-diegetic: they are clearly attached to objects within the game space, and their sound is directional, as the radios' sound was. This musical extra dimension creates a sort of augmented reality, in which the music is, instead of an extension of an object, part of the object's basic definition: a companion cube is pink and grey, and hums atonally. A laser beam is red, burns, and emits buzzy arpeggios. These object sounds, defying the standard boundaries and clarity between nondiegetic and diegetic, are a reflection of the pure musical body as it relates to objects in space.

Music and space, in any Aperture test chamber, become synonymous, drawing the game world around the player and the player into the game world. *Portal 2*'s music comes closer than *Portal*'s to conforming to modern standards of video game music; it is dynamic, changing according to the position of objects and the player's actions within the level. However, both games' methods of creating music also extend the game world out from the screen and make it surround and immerse the player--both by creating the illusion of offscreen space through voice-off, and by enhancing the player's perception of on-screen objects. They embody space.

Ultimately, although video games commonly use dynamic music to enhance the player's immersion, the almost exclusive connection of musical changes to physical objects creates a deeper sense of musical embodiment. These testing elements are embodied by music; instead of the music enhancing the visuals, the physical objects in *Portal 2* act as enhancers of the sound world.

Soundscapes: Musical Painting

In *Portal 2*, the musical body is incarnated in landscape. Going further than mere mapping, the musical body here creates nuanced, sensitive paintings, musically composed by its many tiny motives and then embodied in space. Like any art, these soundscapes are meant to have a meaning and an interpretation. Musical techniques and ideals frequently seen in the work of established composers are embodied in these soundscapes, sometimes resulting in a game space that embodies a single musical work or composer that is unconnected to *Portal*.

The musical body remembers by reliving. To it, a memory is a recording, a re-animation of the past, that is recalled through repetition. In the most extreme instance, the player travels through a series of tests that are nothing but a reincarnation of memory. A large portion of the game takes place in blocked-off, "vitrified" test chambers from the 1950s. In addition, these earlier Aperture spaces are all labeled as reflections of the past. There are large signs painted on the walls bearing year dates as labels. Each different era's waiting room contains a collection of similar items: telephones from different eras, for example. In addition, each level of tests contains a different portrait of Cave Johnson, the founder and first owner of aperture Laboratories, progressing from young to old. The images capture, and label, the essence of each time's Cave Johnson, just as the painted dates label the year of each version of Aperture. Together, the progression through this set of abandoned spaces resembles a walk through a history museum, or a collection of snapshots of the company at various times in its history.

The music for these levels is presented in much the same way as Charles Ives sometimes presents his gathered musical tunes: the memories to be viewed or heard are splashed against a background that "shifts in and out of attention like the flicker of a silent film."[44] In this case, the

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[44] Lawrence Kramer, "Music and the Politics of Memory: Charles Ives' 'A Symphony: New England Holidays'", *Journal for the Society for American Music* 2, No. 4 (November 2008): 464.

backdrop for the section begins as a muttering landscape of extremely low, organ-like tones.[45] Slowly, low brass motives begin to play above this dark horizon, but always fade back into it again. The juxtaposition of the partial fanfares above the dark background is best explained by Lawrence Kramer as the "zoetrope" effect: "The mosaic of melodies corresponds with the projected images in which the past lives on as an apparition."[46] In this case, the projected images are resting on a backdrop of sound, which imprisons them in a sense of the past, and (again) of inevitability.

It is by presenting the player's surroundings as somehow unreal that the music forces the projections of the past to engage with the present, making memory replay itself. While the player is, again, navigating through places and times whose narrative structure is definitively closed, there is a certain sense of detachment and of escape from the inevitability of the events. Oddly, some of the elements of the past test chambers interact with the player, such as "pre-recorded" messages from Cave Johnson.

These messages sometimes address the player's current situation as she moves through the old levels, although the voice is supposed to be from the past. This slight interaction between past and present suggests that the musical memory is subjective, affected by the act of remembering. Ultimately, though, the voice fades back into the musical horizon like the trumpet fanfares, signaling the end of the musical memory.

The player's movement through these levels represents a kind of re-doing of past events-- as before, an engagement with occurrences that only truly exist in the past. These spaces are remembered by music.

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[45] Mike Morasky, "Vitrification Order," *Portal 2: Songs to Test By (Collector's Edition)*, Aperture Science Psychoacoustics Laboratory (2011), CD.

[46] Lawrence Kramer, "Music and the Politics of Memory: Charles Ives' 'A Symphony: New England Holidays'", *Journal for the Society for American Music* 2, No. 4 (November 2008): 464.

A particularly beautiful, and evocative, soundscape comprises the opening sequence of test chambers in *Portal 2*, and paints a soundscape that closely resembles Olivier Messiaen's *Quartet For The End Of Time*. After being woken from a long cryogenic sleep (of undetermined length), the player happens once more upon the beginning test chambers of *Portal*. Since the events of the first game, these rooms have been extensively damaged by time. In many places, the ceiling has fallen in and glimpses of the sky can be seen. The walls are overgrown with vines, and pile of dirt and rubble litter the floor. The effect is made all the more striking for players who remember these test chambers from *Portal* as being clean and sleek. In addition, these spaces as they appear in *Portal* are entirely insulated from the external; there is no sign of the existence of an outside world, let alone a profusion of vines or the sight of the sky. To be suddenly precipitated into this familiar space, so much changed from its original perfection, is uncanny to say the least. To have what once was an isolated, complete world put into the context of a larger whole (although mostly unseen) is even more disconcerting. The ruined state of the test chambers, in combination with the revelation of sky, begins to put the events of the game into a greater temporal context as well as a spatial one.

The sounds and music that go along with this level heighten this sense of vague alarm, as well as the contrast between the two experiences of these rooms. They also help define the space in the player's mind. As soon as the player drops into the first familiar test chamber, the sounds of birds, dripping water, and broken mechanics percolate into the background. The radio that used to inhabit the chamber is gone. Together, the new sounds create a soundscape that suggests vast, echoing vertical spaces. The background music is comprised of continual, harp-like augmented arpeggios contrasted with a hushed melody. This is a totally different musical environment from the one created by *Portal*'s radios; while the busily looping tune gave an

impression of life and energy, the new sounds only invoke the emptiness and space left by the absent radio.

This musical environment--the combination of the soundscape and the background music--very closely resembles the middle section of the second movement of Olivier Messiaen's Quartet For the End of Time. This movement, entitled "Vocalise, Pour L'ange qui annonce la fin du temps" is made up of 16th-note piano chords beneath a slow melodic line in the violin and cello.[47] The top and bottom lines of both pieces match in timbre almost exactly, and the overall feel of the two pieces is startlingly similar.

Many themes associated with Messiaen's quartet are explored and represented in this sequence of test chambers, both visually and musically. For example, both birds and abysses are common traits of the test chambers, and are represented both as images and in sound. Messiaen defines the abyss as "time, with its weariness and gloom"[48] and birds as "the opposite of Time; they represent our longing for light, for stars, for rainbows, and for jubilant song!"[49]

Some of Messiaen's other musical descriptions match even more uncannily closely with the visual aspects of the test chambers. For example, Messiaen describes the piano part that underlies the melody as "a gentle cascade of blue-orange chords."[50] Blue and orange are, perhaps, the two colors most represented in the mechanics of *Portal* and *Portal 2*. Most significantly, portals themselves are either blue or orange. They shimmer slightly, and give off soft, high tones whenever the player goes near them--in short, they physically personify Messiaen's description of a musical feel. In addition, Messiaen's description (in French) mentions the "impalpable

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[47] Olivier Messiaen, *Quatour Pour la Fin du Temps* (Paris: Editions Durand & Cie, 1957), 7.
[48] Rebecca Rischin, *For the End Of Time: The Story of the Messiaen Quartet* (Ithaca: Cornell University Press, 2003), 130.
[49] Ibid., 130.
[50] Ibid., 130.

harmonies of Heaven"[51] The French word for Heaven is *ciel*--an oddly close match to "Chell." This similarity is further underlined by the use of a pun in the ending Turret Opera between Chell's name and "sky" in Italian. The player gets occasional glimpses of themselves (as Chell) through portals as they pass between them. These test chambers have built a physical representation of Messiaen's second movement: there are the blue-orange entities, there is Chell (or ciel?) and there are the birds and the abyss that signify time and the escape from time. The idea of time being suspended is all the more significant because of the strong memories that go along with these spaces: as the player sees the ruined test chambers, they remember them as undamaged and clean; they remember which way to walk, and how to interact with the space in order to solve the tests, because they have already done so. The music adds to the overwhelming sense of deja-vu that is forced onto the player--another way in which time is suspended or even repeated. In this way, the space of the "repeated" test chambers has personified the musical presentation (Messiaen's quartet) of this suspension of time, through a combination of memory (particularly of the previous musical world, involving radios) and music.

The role of music here is especially important in its effects on the player and the player's ability to navigate through and engage in the game space: music joins with space to create a unified game world for the player to inhabit. Music's use and worth as a gameplay element is demonstrated especially in light of multiple experiences of the same test chambers, the second of which recalls the first. Furthermore, the similarities between these opening test chambers and Messiaen's music suggest a kind of convergent evolution of the composer's musical techniques and the game's musical embodiment. These soundscapes are, themselves, art; that we as players get to wander through them and look around is a miraculous testament to the power of musical embodiment.

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[51] Ibid., 130.

Musical Narrative in *Portal 2*

In terms of video game theory, a tight narrative line is sometimes seen as a betrayal of the possibilities of the genre. Simulation, rather than narrative representation, is valued by some scholars as the method of realization that uses the capabilities of video games in the most productive way. Gonzalo Frasca describes simulation as richer in information and experience than representation, in the same way that flying an airplane is different than watching a video of a plane landing.[52] The plane simulation responds to the actions of the player, introducing a level of rules and cognition that would not be visible to someone just watching a video of the plane. In this way, the process of creating the actions that are seen on screen, and eliciting direct feedback from them, is at the heart of simulation.

Although some deny the need for narrative, there is a collective search for an effective way to combine stories and interactivity. According to Brenda Laurel, interactive narrativity is "a hypothetical beast in the mythology of computing, an elusive unicorn we can imagine but have yet to capture."[53] The idea is that simulation and narrative each express things that the other cannot.[54] What about the interactive narrative makes it so impossible to realize, so highly elusive? Is it, in its very nature, an impossible contradiction? Narrativity implies fate and inevitability, and interactivity (for devout ludologists, anyway) requires a good amount of free will on the part of the player. Any attempt to create or address interactive narrativity will be fraught with tension between the two extremes.

The music of *Portal 2* addresses this tension, as well as the impossibility of creating something truly interactively narrative. In the world of a game, whose form is based on interactivity, there is an overwhelming presence of fate and inevitability. The end result of the

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[52] Ibid., 224.
[53] Ibid., 229.
[54] Ibid., 225.

tension is a cast of characters who simultaneously have motion and are paralyzed by the momentum of the narrative. The music plays a crucial role in binding the interactive game setting into the rigid narrative line of the story, but its basic interactivity between different motives also initiates a search for agency, and a desperation to escape the line of narrative. Although the game has not reached the mythical status of "interactive narrative," the self-conscious struggle between the two enables *Portal 2* to examine the differences between a purely ludic or purely narrative setting.

As before, the musical body is the root of this struggle. It does more than create soundscapes and illustrate the interaction of gameplay elements; it tells the story of the game, dictating plot changes by initiating changes in the musical landscape. As a result, the single player campaign of *Portal 2* follows an extremely rigid narrative. Unlike games that incorporate multiple plot possibilities, the player can only choose between successfully advancing the plot and dying (although, to be fair, she is given ample opportunity to do the latter).[55] It is clear from the very beginning of the game that every character, including the player, is essentially helpless against the inevitability of the plot--and the narrative is driven by the soundtrack. The result is an ever-shifting, eerily real climate for gameplay, resonating with illusions both of free will and fate.

One excellent example of a musical shift jump-starting narrative change comes near the end of the first chapter, throughout which the player has been navigating through the soundscape reminiscent of Messiaen: both the musical and physical worlds are deeply asleep, and the music shows this by creating a soundscape that is minimally functional tonally. Imagine the player's apprehension when, entering another broken-down room just like all the ones before it, she hears

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[55] *Portal 2*, Valve Corporation, 2011: "The part Where He Kills You," TC 3.

a driven, focused line of minor arpeggios.[56] In contrast to the unfocused, cloudy sound of earlier

tracks, this instrumentation (if it can be called that) is much more akin to a guitar, making it more

precise and less echoing. Clearly, some important shift in situation is about to happen, because

the sound world has changed to reflect a state that the visual world (and actual narrative stream)

has not yet achieved. As Wheatley announces to the player, shortly after the arpeggios begin, that

she is about to walk through the room containing the destroyed GLaDOS, the event of GLaDOS

being woken up begins to seem inevitable. This musical/narrative foreboding is in direct contrast

with both the visual surroundings, which give no indication that GLaDOS is anything but totally

destroyed, and the player's intentions, which are to tiptoe through the chamber and escape

without mishap.

Because of the way the player's experience of game space and the interactive

environment is musically embodied, such shifts in the aural landscape are reliable harbingers of

important plot events. Players, used to being finely attuned to the musical atmosphere, will

notice any sudden shift. More importantly, a shift in musical structure creates a sudden discord

between the musical environment and the visual one. This contradiction creates a sense both of

unease and foreboding--the sounds the player hears tell her that her spatial situation is about to

change to resemble it. Out of this arises a sense of narrative, musical, clairvoyance.

In this case, the purposeful tonality of the new music brings with it an extra sense of

inevitability, because the scene in which GLaDOS is reawakened is the most inevitable plot

event in the entire game. It's even featured in the very first trailer for *Portal 2*,[57] which is so well

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[56] Mike Morasky, "There She Is," *Portal 2: Songs to Test By (Collector's Edition)*, Aperture Science Psychoacoustics Laboratory (2011), CD.

[57] Valve, "Portal 2 Teaser Trailer," *Youtube*, last modified June 15th, 2010, http://www.youtube.com/watch?v=tax4e4hBBZc.

known by fans that they were quoting it before *Portal 2* was even released.[58] By hinting that this

scene is about to take place, the music blurs the player's perception of real-time events with the

fast-approaching sequence detailed in the trailer, creating an obvious narrative trap of which the

player is extremely aware and about which she is able to do exactly nothing. The importance of

this sequence, and its musical initiation, is that it makes the player conscious of her narrative

imprisonment, which in turn makes escape from that narrative an important theme in the game.

Sometimes, musical motives become handy weapons to be deployed by various

characters against one another, in attempts to influence their ties to narrative and fate by

changing their own musical settings. This musical warfare is effective because the many small

motives that make up the sound world are all pre-packaged with meaning: the way they stack and

recombine forms the shifting musical body of the game, and to manipulate them is to manipulate

the rest of the game. An example early in *Portal 2* uses one of the *Portal* radios, which is

precipitated into a *Portal 2* test chamber by falling through a vent in the ceiling. GLaDOS

explains the appearance of the radio by saying that is is trash left over from *Portal*, "standing

around, smelling, and being useless."[59] Since the sound of the radio so strongly recalls both the

space and the narrative line of *Portal*, a dismissal of the radio as trash is also a dismissal of the

narrative of *Portal*, specifically Chell's defeat of GLaDOS. Through the nasty quote, Chell is

also equated with garbage, which also further equates her and her history with the radio and its

musical meaning. This is a good example of characters attacking one another by a re-situating of

their own narrative ties. The fact that they self-consciously mess with their own soundtrack to do

this is both hilariously self-referential, but also emblematic of the power of the musical body to

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[58]Source: *Every single member* of the Lawrence University Gaming Club.
[59] *Portal 2*, Valve Corporation, 2011: "The Cold Boot," TC 15.
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affect and change the game space: the best way to change a situation in *Portal 2* is to change its

musical setting.

The ludologist Gonzalo Frasca says, "Unlike narrative, simulations are not just sequences

of events; they also incorporate behavioral rules."[60] By making musical narrative so essential a

trait of the musical surroundings, and by having players play in reference to it as well as simply

with it, *Portal 2* makes its own narrative into a behavioral rule. It might be said that the music

makes this game into an exploration of the power, and composition, of plotlines--a simulation of

a narrative. The momentum and force of the story does manage to contain every character, but

barely. The music, used both to forward the plot and to subvert it, echoes the game's self-

conscious engagement with narrative rules by blurring the line between interactive game music

and narrative motives.

The musical body animates the entire *Portal* world, but also crafts and interprets it. If

music is a modified, sculpted voice, then the *Portal* series is a sculpted reality which in turn

embodies sound. To solve a test chamber is to walk through a living and breathing piece of

music or to relive a reconstructed memory; to pick up an old radio is to engage in a voiceless

argument and a struggle for free will. This sort of world might be called a musically augmented

reality, but in fact the reality comes from the augmentation itself. Here, physical space,

characters, and narrative are all a reflection of a greater musical idea, like Schoenberg's, only

this time expanded into an imagined physical world. Music, since it creates the artistic space, is

the "real" reality of the game; like all art, its physical incarnations approximate it and mirror it

but do not, ultimately, convey all of its complexities. While a test chamber might not make

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[60] Gonzalo Frasca, "Simulation Vs. Narrative," in *The Video Game Theory Reader*, ed. Mark J. P. Wolf and Bernard Perron (New York: Routledge, 2003), 229.

physical sense, such as in the artificially labeled 1950s test chambers, the music defines and reveals the whole scene as memory.

The voice is the real thing. The rest of the body is imagined.

3. Opera, Transcendence, and Paradox in *Portal 2*

That which holds the form of an angel becomes itself an angel.

-Melody Pond[61]

In the final scene of *Portal 2*, Chell has been promised her freedom by GLaDOS. An elevator is carrying her upwards towards the exit from Aperture. Suddenly the elevator comes to a halt, a door flies open, and Chell is faced with four sentry turrets pointing their lasers at her. They stand in a little semicircle, like a firing squad; Chell's death, not her release, is imminent.

Then, one by one, the laser beams turn off. There is a moment of silence, and then the turrets begin to sing...

The performance that follows was named the "Turret Opera" shortly after the release of *Portal 2* by general fan consensus. It has become, in the two years since its release, one of the most universally beloved video game scenes. After the turret quartet begins to sing, the elevator starts to rise again, through a huge room in which hundreds of turrets are arranged like an orchestra. A soloist turret, in a spotlight and set above the crowd on a pedestal, sings to Chell as she rises. The lyrics are in Italian, and the delivery includes all the vibrato and inflection of an operatic aria. Everything about this scene is operatic, and everything about it intentionally summons operatic tropes and conventions. The solo turret is even rounder than the rest, evoking the adage "it's not over until the fat [turret] sings." The scene's invocation of operatic stereotypes was clearly a success; if video gamers can identify opera, a genre so removed from

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[61] *Dr. Who*, "The Time Of Angels," series 5 episode 4, April 24th, 2010.

their collective interests, anyone should be able to. But what are these stereotypes, and how do they function within the setting of a video game?

Opera is a powerful genre, tied to issues of cliche, realism, and emotional power. Aaron Copland says that "opera is bound from head to foot by convention... nothing sensible ever seems to take place on an operatic stage."[62] This symbolism speaks to a general acknowledgement of the vast amounts of cliche surrounding the existence of opera--in fact, there is so much cliche and it is of such importance to the opera that it is given a more important role than realism in opera productions. The fact that opera is generally a staged performance means that audiences and performers are traditionally, almost ceremoniously, separated. Asked to imagine "opera," the idealized hall in which it lives comes to mind as much as the events on the stage; the role of the audience is glorified by the image of plush seats, red velvet, and fancy curtains. Opera is also defined by contradictions: it is seen as a dusty, elitist and outdated musical form, but also "presented as a sign of the universal--"[63] a universal accessibility as well as a universal sign of emotion. The idealized operatic emotion is the absolute force that, with some help from cliché, is seen as transcending the web of inconsistencies that surround the operatic production and presentation.

The power of these operatic stereotypes makes *Portal 2* reshape itself into an operatic experience, dividing the game into two halves: performer and audience. The strength of the cliché, tradition, and emotional excess inherent in opera proves enough to subjugate, and eventually end, the entire game. The power of opera as a genre is clearly demonstrated in its invasion of *Portal 2*, as it reshapes the entire game into an image of itself.

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[62] Aaron Copland, *What To Listen For in Music* (New York: New American Library, 2009), 184-5.

[63] Marc A. Weiner, "Why Does Hollywood Like Opera?," in *Between Opera and Cinema*, ed. Jeongwon Joe and Rose Theresa (New York: Routledge, 2002), 89.

The turret opera recreates the operatic tradition of live performance within the diegesis of the game. In opera, live performance is traditionally regarded as somehow more special, more engaging, and more real than a recording or reproduction. To enhance the impression of live-ness, the singing turrets are clearly producing and shaping sound by moving their "wings," and they are assumed to be thinking together and working as an ensemble as well. There is no screen between Chell's eyes and the turrets, although she is trapped in an elevator; therefore the performance is "live."

The perception of the Turret Opera as live performance prompts a change in the physical layout of the game environment: a divide arises between the player and the singing turrets, simulating a stage and audience space. The player, trapped in a rising elevator, can only spectate from her position. The space where the turrets are arranged becomes a stage for performance. This new division is emphasized by the fact that it arises from a video game: the player's full engagement and participation with physical space is one of the defining characteristics of the *Portal* world, until it is overtaken by opera and half of that space is made inaccessible.

The inaccessibility of performance space for the player-turned audience member soon becomes even more restrictive. Another of opera's many conventions is that of a motionless audience--and the presence of opera in the game essentially captures the player and ties her to an auditorium chair, forcing her to embody the motionless audience. David Levin says that opera in modern film "embodies (in all senses of the word) a zone of immersion and transcendence that is inflected as antithetical to action."[64] This enforced immobility is precipitated by the only unexplained cutscene[65] in the entire game, intensifying the sense that the player is an audience

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[64] David Levin, "Is There a Text in This Libido?," in *Between Opera and Cinema*, ed. Jeongwon Joe and Rose Theresa (New York: Routledge, 2002), 125.

[65] A scene in a video game during which the player has no control over their avatar (rendering the game temporarily a film by also removing the player's control over the screen view).

member and no longer a participant in the action. All other instances of player loss of control are explained by some in-game entity. One example would be the giant claw the picks up the player at the start of "The Cold Boot," rendering her unable to move. This cutscene robs the player of agency without giving any physical explanation for why she has lost control. However, it is no coincidence that the advent of opera in the game coincides with an unexplained loss of player control; the state of the game has changed enough so that the player is now forced to embody (again, in all senses of the word) a space that has become antithetical to action--and because the beginning of the cutscene is connected to the beginning of the opera scene, immobility of the player is put into the context of opera and reinforces her role as audience. Throughout the course of the game, the player has found immersion through being an agent; with agency, her connection to the game wanes and the events of the cutscene begin to seem less real. Levin's "antithetical to action" zone echoes, in the world of the game, a simultaneously bodiless and trapped-in-a-body state for the player. This state is not natural, especially to a player who has just worked her way through this world by being an agent; however, the cutscene (and through it, the opera) strictly reinforces it.

The player's loss of control, through both the cutscene and the division of space, coincides with the departure of game events from any sort of coherent reality--an odd version of phantasmagoria, or musical transport. Marc Weiner defines phantasmagoria as the obscuring of reality by a "magical delusion"[66] of sound. Although audience members are usually musically transported within their heads and not purely through the actions on stage, here the phantasmagoria takes hold at a level the player cannot control or escape: within the physical setting and actions of the cutscene, making the game space into a literalized phantasmagoria. The

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[66] Marc Weiner, "Why Does Hollywood Like Opera?," in *Between Opera and Cinema*, ed. Jeongwon Joe and Rose Theresa (New York: Routledge, 2002), 78.

most obvious literalization is that Chell's final elevator ascension and viewing of the Turret Opera is, physically a "musical transport." This literalism means that, although the player herself may remain unmoved, the reality with which she is engaging is itself transported, and drags her along as it merges into a physicalized departure from reality. The oddity of this literalized phantasmagoria is made more visible by the blending of genres: players of video games, who are used to being able to participate in their entertainment, will find phantasmagoria, as well as the attitude that it's something to be sought through stillness, both unfamiliar and a little alarming.

Other aspects of the translation of *Portal 2* into opera reveal issues with authenticity inherent in both opera and video games. For example, the use of the operatic voice, besides labeling the aria as and aria and not simply a song, labels it as authentic--accredits it. Ellen McLain, the voice actor for GLaDOS (and opera singer) who sang the Turret Opera, explains that "one of the reasons it sounded like an aria is because Mike [Morasky] wanted me to use my...we say, legit sound, or operatic sound, in the recording session." This style of singing has its own set of issues with authenticity. The fact that operatic sound is described by singers as "legit" suggests that it is somehow more authentic than other vocal styles, or deserving of greater regard. Certainly this relates to the impression of opera as accessing a higher or ultimate truth in relation to other styles. True legitimacy seems to be an ideal state towards which the aria reaches--and as it project its image onto the game through operatic singing, the game takes on the image of opera.

The impression of realism and authenticity grows with the cutscene's transformation into opera. Although the scene is clearly marked as opera, other essentials still anchor the performance within the stereotypically unreal world of video games. Because the entire performance takes place inside a diegesis, any realism is limited to the confines of the game.

Outside the diegesis, seeing from the player's eyes instead of Chell's, this is anything but an authentic, live performance: everything about it is reconstituted, or borrowed, or completely fabricated. The singers themselves are made from chopped-up people and robots. The song itself is a bunch of overlapped samples of a single voice. For example, the voices of the turrets sound intentionally mechanical. Even in the voice of the solo turret, small mechanical glitches are obvious. They are not quite capable of fully achieving the human, "legit" voice idealized in opera. At the same time, the mechanical sound quality adds a sense of authenticity to the scene, because the singers are robotic, and that sound quality is inherent to them. Also the purity of electronic sampled sound belies some of the ideals of live performance: unlike with a normal voice, there is no possibility of being out of tune, or making mistakes. On the other hand, electronic sound is disconnected from any body producing it, thus totally wrecking any sense of fantasmatic unity. However, this not-quite-properly-anchored voice is a defining characteristic of the turrets that has been firmly attached to their bodies in terms of the functional game: turret voices are usually warnings that warrant a lot of attention in gameplay.

The turrets, in addition, are already seen to provide an important symbolic connection between body and voice, humanity and robotics, agency and immobility. They also, in the Turret opera, become a mouthpiece for GLaDOS--and, by extension, the facility and the rules of the game, since GLaDOS is in control of Aperture and often acts as a stand-in for the game rules. Since the turrets are so broadly representative, the changes in their behavior are a good indicator of the changes opera creates in the game. This emotional reversal is most clearly demonstrated in the pivotal moment, directly before the beginning of the aria, when the four turrets target the player, change their minds, and then begin to sing. Particularly in reference to the ending of *Portal*, during which GLaDOS attempts to murder Chell at the conclusion of the last test

chamber, an execution instead of a release would be extremely unsurprising. The total reversal of the turrets' behavior creates an operatic excess of emotion, a sort of apologetic catharsis out of which the aria begins.

What sort of operatic changes are going on behind the face of the performance? Like the turrets, GLaDOS is changing logic for emotion, and taking the rules of the game with her. It would seem impossible for the very rules of a game to descend into emotional excess, but this would only be an extension of what has already happened in academia: in the words of David Levin, "a growing number of academics have been writing about opera in explicitly lyrical, intensely personal ways--ways that are not traditionally 'academic.'"[67] One scholar so affected writes," I found myself listening... without a libretto; nor did I consult a synopsis of the opera. I simply indulged myself in the thing itself."[68] Any academic engagement with the specifics or the logic of the opera he listened to is abandoned in favor of total immersion. What is his goal? A phantasmagoric communion with "the thing itself," the perceived ideal essence of opera, achieved through a desertion of logic. Levin calls this wave of critics "Neo-Lyricists,"[69] and their changing of logic into emotion is reflected in the Turret Opera.

The lyrics of the aria (named "Cara Mia Addio" in the soundtrack)[70] reveal an operatic excess of emotion that mirrors the literalized musical transport of the player. In reference to "the thing itself," the idealized absolute of emotion so sought after by neo-lyricists, operatic performance is a sort of front, an approximation. The lyrics, then, are the attempt to embody this absolute emotion, and they employ every operatic trope in their power to invoke the emotion.

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[67] David Levin, "Is There a Text in This Libido?," in *Between Opera and Cinema*, ed. Jeongwon Joe and Rose Theresa (New York: Routledge, 2002), 122.

[68] Ibid., 123.

[69] Ibid., 122.

[70] Mike Morasky, "Cara Mia Addio," *Portal 2: Songs To Test By (Collector's Edition)* (Seattle: Aperture Science Psychoacoustics Laboratory, 2011).

Sung in the operatic "legit" voice, they are mashed together from various Italian operatic expressions.

>Dear beautiful, my beautiful darling!
>
>My child, oh Chell! [pun: "oh heavens!"]
>
>For I hold her in esteem...
>
>For I hold her in esteem.
>
>Farewell to my dear!
>
>My dear girl,
>
>why do you not walk away?
>
>Yes, away from Science,
>
>My dear, my dear girl?
>
>Ah, my beautiful!
>
>Ah, my dear!
>
>Ah, my dear!
>
>Ah, my child!
>
>Oh dear, my dear...[71]

In the lyrics, operatic form overwhelms the singer, who has been made subject to phantasmagoria by her own words and her own voice. This language is markedly different from any other spoken line in either *Portal* or *Portal 2*. It is ungrammatical and imprecise. Sentences are begun and then abandoned, reading more like sighs than articulate phrases. The repetition of

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[71] Maxi Lyrics, "Cara Mia Addio! Lyrics," Maxi Lyrics, http://www.maxilyrics.com/aperture-science-psychoacoustics-laboratory-cara-mia-addio!-lyrics-3e1c.html (accessed April 24th, 2013).

the lyrics is also striking. Almost every line, even if it is not an exact repetition, is a restatement of the same sentiment of loss. The lyrics, seen as a whole, evoke an overwhelming emotional force, in the grip of which the singer can only repeat herself. Most of all, the simple emotions in these lyrics, expressed so strongly, are an astonishing, total reversal of the usual thinly-veiled hostility GLaDOS displays for Chell. Considering the language, the repetition, and the sentiment, something more out of character than these lyrics could hardly be imagined. This change of heart is a more articulate version of the turrets deciding to sing rather than kill; both are revealed only in the presence, and context, of opera. This is, yet again, a literalization of an abstract concept: the sentiments of neo-lyricist opera critics who let their emotions run away with them in writing has now been transferred into singing, literal lyricism--and what more fitting way to express operatic longing than through opera itself?

The Neo-Lyricist tradition of self-indulgence is also clear in the aria lyrics: the fact that they are in Italian suggests that they were not created explicitly for the player to hear and understand. Indeed, the exact lyrics of the Turret Opera were never released by Valve, although the words to the following end song (which is in English, and perfectly clear) were; the only translations from Italian are approximations created by fans of the game. If not for the player's immediate benefit, the lyrics can only be for the singer's own personal catharsis. The fact that they are in Italian, a stereotypically operatic language, and sung in operatic phrases in an operatic voice--all meant to invoke the operatic style--suggests a similar attempt to summon the ideal of opera, the elusive "thing itself."

Lyricism, when applied to one's own music, begins to reverse the traditional roles of performer and audience. The performer, whether she is simply the Fat Turret or represents GLaDOS or Aperture itself, displays a phantasmagoric stillness that directly mirrors the

immobility of Chell (or the player) as audience. Seen from the other side of the performance, Chell is the performer, the one in motion as she rises to freedom; the turrets and GLaDOS are the ones who are trapped, both in their mechanical bodies and in a storyline that has reached its conclusion. The stage, with its rows of turrets arranged in a semicircle, becomes a ring of Neo-Lyricist spectators, come to witness the ascension of Chell and, through song, immerse themselves in her freedom. Chell, the ultimate listener, is now elevated (also literally) as a performer of opera would be by her audience, although Chell's performance is only ever a silent one. The lyrics of the opera support the the pedestalization of Chell: the pun between her name and "heaven" in line 2 equates her with the ideals of transcendence and freedom, at least in the eyes of the singer.

The flipping of roles, as well as the musical transport of the performer, are enacted reluctantly. There is a lurking sense of embarrassment and denial inherent in the performance of the aria. The veiling of the lyrics indicates, as well as an aspiration to commune with operatic ideals, a reluctance on the part of the singer to reveal the emotional excess. This reluctance begins to question, again, the authenticity of operatic emotion: although opera wishes to present itself as symbolic of a sort of higher truth, can it really be trusted to convey that truth authentically? Its traditions and tropes are what give the genre the power to overcome rationality, not (as we would so clearly like to believe) the higher truth itself. The Turret Opera scene is not free of this internal conflict. It is introduced by a sort of introductory recitative, in which the sentiment of the aria is completely contradicted. In the recitative,[72] GLaDOS informs Chell (in English, and in no uncertain terms) that she is being kicked out of Aperture for being difficult to handle. The delivery is absolutely devoid of emotion: "I had a pretty good life. And then you

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[72]This might be simply a cutscene dialogue, were it not immediately followed by an aria and matched phrase for phrase by running arpeggios. In the context of the aria, this scene also takes on the shape of opera.

showed up--you dangerous, mute lunatic. So you know what? You win. Just go."[73] The absolute

contrast between this deadpan recitative, delivered clearly, and the emotional excess of the aria,

concealed by language, only emphasizes the power of opera to subjugate its surroundings: it

takes only a few seconds for the entire setup of the game to change, submerging its own

performers in phantasmagoria. Its presence can be excused, but not eradicated. Which farewell is

the more authentic one, the spoken word or the song?

The Turret Opera makes its performers into audience members, and its audience

members into performers. It also calls into question its own authenticity, suggesting that perhaps

the higher truth advertised as the heart of opera is, in fact, an empty shell of tradition and

convention waiting to envelop unsuspecting hosts. This constant self-approximation turns the

Turret Opera, appropriately enough into a musical paradox, a strange loop of lyric meaning.

Neo-Lyricism is all about the futile search for the essence of opera, a longing to commune with

"the thing itself." But this particular instance, the performer's way of expressing her entrapment

within stillness, itself takes the form of an opera. "The thing itself" now embodies a longing for

"the thing itself," which means that "it" is not, in fact, real. This is a self-perpetuating

contradiction, a musical version of the liar paradox: "this sentence is false." Earlier in *Portal 2*,

the liar paradox destroyed a whole roomful of AI characters.[74] Now, it has assumed the form and

power of operatic phantasmagoria and undone the entire game: it robs the player of the ability to

play and turns the rational character embodying the rules into an emotional wreck, entirely

removing any sort of ludic balance. A game is not a game without a player, and a player is not a

player without a game. Thus, *Portal 2* ends.

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[73] *Portal 2* (Seattle: Valve Corporation, 2011), ch. 9: final scene.
[74] *Ibid.,*, ch. 8: Test Chamber 1.

Although ultimately paradoxical, opera's appropriation of the video game form still reveals as much about the combination of genres as it does about either games or opera by themselves. Gamers' love of the Turret Opera, with its interrogation of audience and performer roles, suggests that something in the mixing of opera and video game was successful in creating a connection. The yearning of the characters and the player for movement and agency in the face of phantasmagoric stillness might echo a growing desire for participatory listening in live performance. This new ideal, instead of creating an audience without agency, would reinforce it, creating an emphasized attachment between the body and voice of the performer and that of the audience members. Participatory actions like gaming create a sort of higher bodily consciousness, a collective musical fantasmatic body made up of many people, their voices, and their physical presence. Music performance could accentuate the unity of such a body, itself helping to connect audience with agency instead of dividing the two.

This idealist vision is, admittedly, a vague projection formed from only one experience. However, the current disconnect between traditional music performances and prospective audience members is clear, far-reaching, and troubling. Musical genres and groups that are known for discouraging audience participation--orchestras, opera companies, and other classical ensembles--are facing declining audiences and a general lessening of interest.

Opera, in a parasitic quest for survival, relevance, and reality, has reshaped an entire video game in its own image, widening its traditional scope. The next time opera appears, the remembrance of the video game setting will be part of its history. In the long term, opera may be migrating from an environment of audience stillness to one of motion. This is hardly surprising if the new emotional ideal of the audience is participation rather than stillness. Neo-lyricists, and audience members, are becoming obsolete; players, as agents, are the future.

Conclusion: Instress

No sé cuál de los dos escribe esta página.

-Jorge Luis Borges[75]

In the words of Denise Levertov, "form is merely a *revelation* of content."[76] Chell never entirely escapes becoming part of the paradoxical loops of Aperture. Similarly, there was little chance that a linear thesis about *Portal* could be created without being pulling its author, at least a little, into the mad entanglements of her subject matter.

I will take the fourth wall with me on my way out. The *Portal* world ends with an opera; the least I can do here is to end with a story, which begins here: last summer, I cut my hair.

This would not be such a big deal had I not so assiduously avoided salons for the previous four years or so. By the time I cut it short, I was regularly being compared to the likes of Cinderella and Rapunzel. This meant it was time for a change--but what I didn't anticipate was that cutting my hair would drag me further into the loops of my own honors project.

I went for a short, angled bob. Shortly after I cut my hair and posted the obligatory "before-and-after" pictures on Facebook, I engaged in the following phone conversation with a friend.

"Hi Helen! Any chance you would want to be GLaDOS for Halloween?"

"Hi Chelsea. It's July. Why are you asking me this?"

"I'm being Chell and I need a GLaDOS-- and your new haircut is perfect!"

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[75] Jorge Luis Borges, *El Hacedor* (New York: Random House, 2012), 65.

[76] Denise Levertov, "Some Notes on Organic Form," in *Postmodern American Poetry: A Norton Anthology*, ed. Paul Hoover (New York: Norton, 1994).

"Haha, you're Chell-sea! But about the hair... are you or are you not aware that computers are bald?"

"Yes, you idiot, I'm talking about cosplay. Google it."

So I googled cosplay, and saw the extents to which some people go to recreate fictional worlds in real life. Cosplay is the practice of fans dressing up as various characters from video games, a sort of real-life embodiment of the people and other entities that can normally only exist on the other side of a computer screen. For human characters such as Chell, cosplay simply involves copying that character's appearance as directly as possible, sometimes down to obsessive, minute details. For non-human (and essentially non-embodied) characters such as GLaDOS, a more abstract approach is necessary. However, enough different people have created personifications of these characters that certain accepted conventions of their depiction begin to emerge. One such convention (or is it a rule?) is that any successful anthropomorphized depiction of GLaDOS will almost invariably include blonde or white bobbed hair. Similarly, any good anthropomorphization of Wheatley will consist of some variation on brown hair, glasses, and a business suit.

Where do these conventions come from? Logically, they make no sense; there are no business suits in the *Portal* world, and if there were Wheatley could never wear one. However, these standardized human depictions of non-human characters are indeed universally recognizable; something about the image of a young, bespectacled man in a business suit evokes the essence of Wheatley the irritating robot, who is nothing but a talking sphere. And when I took my blonde bob to a costume party with my face painted white and wires trailing from my

back, I suddenly, somehow, embodied an image that was universally recognizable to any *Portal* fan.[77]

I never had to speak a word; the cosplay embodiment is a purely visual replication, even of a character as aurally defined as GLaDOS. With this in mind, perhaps part of the appeal of cosplay is to reunite, or re-create, the fantasmatic bodies of characters whose voices and bodies are perceived as separate, or only partially depicted. What is so musically interesting is that the physical anthropomorphizations of aural characters are, out of necessity, almost entirely based on their voices. By reimagining a human form from a voice, cosplayers unconsciously undo, or unwind, the deep connection and tension between voice and body that is so essential to the *Portal* world. At the same time, cosplayers are simply putting a more defined form on an idea that is already circulating; the aural or musical body. In any case, *Portal* cosplay is the replicated body of a replicated voice of a fake, nonexistent original body. It is easy to see this pattern continuing forever: body and voice, alternating, each competing for the chance to represent the other. We are a culture obsessed with obsession; we cannot resist a paradox.

Such knowingly pointless attempts to embody impossible realities have continued well past cosplay. By December 2012, a year and a half after the release of *Portal 2*, the National Entertainment Collectibles Association (NECA) had released several iterations of their "limited-edition Aperture Science Handheld Portal Device"--life-size replicas of portal guns, complete with light and sound effects at the pull of a trigger. ASPHDs based on those carried by Chell, Atlas, and Peabody in Portal 2 were released in three separate installments, each edition limited

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[77] I even won the LU Gaming Club's 2012 costume contest--not that I would brag. But that's right, I beat Chell.

to 5,000 pieces. The price to own such a thing? $150. The reaction by fans? In the words of

ThinkGeek, "sales were limited to one per customer, and they were gone in five minutes."[78]

However, we have yet to come to the one glaringly obvious drawback of these APSHDs.

They are all, no matter how faithfully copied from the game, fake. Portal guns have entered the

realm of reality, but at the cost of their essential purpose: creating portals. Yet NECA has made a

killing selling these broken goods. Why? Surely all these eager customers know that, when they

finally open the box and point their new ASPHD at a wall, they will not be able to subsequently

step through it? The gun is a prop, its plastic and electronics suffused with the collective

imagination of thousands of fans. The fact of its existence is both a promise and a betrayal; it is

and is not real.

NECA calls the ASPHD replica "one of the most requested video game replicas of all

time."[79] I did not understand this, until I had the opportunity to hold one. Just laying eyes on a

portal gun caused me to question reality a little, and holding it in my real hands--without the

usual semiotics of a video game--felt uncannily familiar. Suddenly, my own vision merged with

the view of the *Portal* computer screen: the peripheral, comforting bob of the portal gun in the

lower-right hand corner of my vision made every detail of my surroundings seem like elements

of a puzzle I knew how to solve. I pointed the gun at a clock on the wall and pulled the trigger,

and for half a second absolutely, solidly, and without conscious thought expected to see an

expanding orange circle of light knock it off the wall.

In the real-life absolution of an imagined paradox, one outcome or the other will

eventually come to pass; both possibilities cannot continue to exist side-by-side forever. In this

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[78] Think Geek, "Customizable Aperture Science Handheld Portal Device," ThinkGeek,
http://www.thinkgeek.com/product/f220/?srp=3 (accessed April 30th, 2013).

[79] NECA, "Yes, We Are Making A Life-Sized Portal gun Replica. Here Are The Details,"
http://necaonline.com/33243/blog/news-and-announcements/yes-we-are-making-a-life-size-portal-gun-replica-here-are-the-details/ (accessed February 3rd, 2013).

case, predictably, physical reality was reaffirmed. The ASHPD flashed and made a tinny noise from its cheap speakers,[80] and the clock remained obstinately in place. But in my mind, the part of me that has been trained to think with portals, a different reality was playing itself out: that wall clearly wasn't smooth enough to sustain a portal--or maybe I aimed too near the corner and the portal just didn't take! That must be it. Before I could think twice, I was raising the device to try again.

There is a willed, longing confusion inherent in today's culture. We create brilliant, immersive, and ultimately inaccessible worlds for our minds to inhabit. We want to be tricked; we want to experience the paradoxical feeling of being pulled in two directions at once by two absolutely irreconcilable realities. This self-trickery, our own confusion between player and character, is, perhaps, why NECA's portal guns sold out so astonishingly quickly: they create a bridge between Aperture Laboratories and reality, and the gaps in that bridge will be jumped by any fan's imagination with unsettling ease.

We are all prey to our own imaginations, perceptions and perspectives. I am realizing as I write this conclusion that GLaDOS makes a perhaps uncanny number of appearances in this thesis. This was unintentional--but then again, so was copying her "hairstyle." As an instrumentalist, many of the themes that surround the existence of GLaDOS--a struggle to balance the human and the mechanical, the technical and the emotional--resonate strongly, and probably informed my reading of the games. I once read that "the whole point of the violin is fighting against iron."[81] Performers are all made of opposing halves, which struggle to reconcile with one another in endless loops; we embody, alternately, every side of the music we create.

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[80] I have chosen to imagine that this cheap sound is intentional, an effort by NECA to aurally ground their real-life test subjects in physical space.

[81] Theodore Levin, *Where Rivers and Mountains Sing: Sound, Music and Nomadism in Tuva and Beyond* (Bloomington: Indiana University Press, 2011), 223.

The sublimation of a unified musical voice out of such disparate entities as body, space, and mechanics is the ultimate goal to which performers aspire. If the physical space of the game is a reflection of a more essential musical body, then the musical body is itself a reflection of real life. In this way, the musical embodiment of *Portal* represents the ultimate joining of voice and body, the ideal, perfect performance art.

Musicians clearly have something to learn from *Portal*. So do composers, conductors, film scholars, and musicologists, and everyone else. Such musically evocative and insightful games as these deserve our scholarly attention and engagement, and in order to engage we must enter the game world. The best way to study *Portal*, reader, is by playing it yourself.

Digital Appendix

Videos of gameplay:
   I have put together video clips of all game scenes and events that I discuss in my thesis, so that readers who haven't played the games can get a sense of what exactly I am discussing. Feel free to focus on the parts of the videos containing my timestamps, since the videos were not made by me and some of them are much longer than they would need to be to illustrate my points.

Chapter 2:

Portal, Test Chamber 00 (introduction of the reconstituted voiceover):
http://www.youtube.com/watch?v=oIgHVsImbCo&list=SP29D2795AD125D6DB&index=1
   -The voice begins to speak at 0:34.

Portal, escape from Test Chamber 19: http://www.youtube.com/watch?v=Vby-QK4Jip0&list=SP29D2795AD125D6DB&index=21
   -Chell escapes the fire and GLaDOS reveals her own sentience at 0:56.

Chapter 3:

Portal (a montage of the player engaging with the radios):
http://www.youtube.com/watch?v=WSqG-SmXriU
http://www.youtube.com/watch?v=WSqG-SmXriU
Portal 2, Chapter 4, Test Chamber 20 (Triple Laser Phase):
http://www.youtube.com/watch?v=bNA4C3q-7SE&list=PL4F7761F2171105B5&index=3
   -"Triple Laser Phase" begins at 0:42.

Portal 2, Chapter 8, Test Chamber 05 (harpsichord augmentation):
http://www.youtube.com/watch?v=VMmdC1M9uag&list=PL33B3E599A67FA716&index=6
   -"Machiavellian Bach:" the harpsichord is augmented by electronics at 0:42.

Chapter 4:

Portal 2, Chapter 1, Introduction (*Portal* Test Chamber 00 revisited):
http://www.youtube.com/watch?v=vikaCt9eJ80&list=PL5734019CA6E46B12
   -Chell reenters *Portal* Test Chamber 00 at 5:30.
   -"Technical Difficulties" also begins at 5:30.

Portal 2, Chapter 1, Test Chamber 01 (further examples of Messaien embodiment):

http://www.youtube.com/watch?v=vFV1q-M3hjs&list=PL5734019CA6E46B12
-Birds, abysses, and the sounds of dripping water are all demonstrated here.
-The "shimmering" of portals can be heard faintly at 0:52 and 0:57.

Portal 2, Chapter 1, "Her Chamber" (introduction of tonality):
http://www.youtube.com/watch?v=UpevCoyFiYg&list=PL5734019CA6E46B12&index=8
-"There She Is" begins at 0:13.

Portal 2, Chapter 5, "Beyond The Seal" ("Zoetrope" effect):
http://www.youtube.com/watch?v=EKeGue5y0o4&list=PLFE0701910E53D03A&index=2
-The scene shows the parallel emergence of visual and aural memories (brass, strings)
-"Music of the Spheres" begins at 0:00.
-The label "1952" can be seen on the wall at 1:01.
-Cave Johnson (and brass) are introduced at 1:22.

Portal 2, Chapter 2, Test Chamber 06 (reappearance of *Portal* radio):
http://www.youtube.com/watch?v=dvQy2ely2eA
-"Trash" quote begins at 0:48.
-The *Portal* radio appears at 1:10.

Chapter 5:

Portal 2, finale and Turret Opera:
http://www.youtube.com/watch?v=DS7sTnddw5g&list=PLEC6AD2EDCBD944AE&index=61
-Recitative quote is at 9:17.
-Chell encounters the turret quartet, and the opera begins, at 9:48.

Here is the link to a complete walkthrough of *Portal* on Youtube:
http://www.youtube.com/playlist?list=PL29D2795AD125D6DB
http://www.youtube.com/playlist?list=PL29D2795AD125D6DB
And to *Portal 2*:
http://www.youtube.com/playlist?list=PLEC6AD2EDCBD944AE

If you have a computer, you can download and play *Portal* and *Portal 2*. You don't already have to be good at computer games; they're designed to teach you as you go. The games can be purchased together at http://store.steampowered.com/app/620/

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