Taking Play Seriously

a thesis submitted by

Jordan Good

in partial fulfillment of the requirements for the degree of

Master of Arts

in

Music

Tufts University

May 2024

Advisers: Alessandra Campana and Joseph Auner

Abstract:

The aim of this thesis is to critique a concept shared by the spheres of music performance and gaming; that certain objects or practices are inherently unserious and unimportant, due to various factors such as perceived or actual simplicity, association with children, incorporation of mobile or mechanical technology, allowance of casual play, or even inherently because of their ludomusicality. These chapters will show that there is much to be taken seriously about these sites of play, whether in terms of pedagogical value, meaningful affective associations, or what the ludomusical interactions might reveal about our perceptions and behaviors in the outside world. The three chapters of this thesis, though they each have a distinct subject matter, illuminate different facets of our (not-so) casual interactions with play, games, and music-making. Chapter 1 discusses the way that ludic and musical design elements of various instruments and interfaces create accessible, ludomusical experiences of piano play and performance. Chapter 2 examines the deeper implications of human listening and mobile game play through the breeding and curating of virtual, musical monsters in the 2012 game *My Singing Monsters*. Chapter 3 explores parallels between mechanical music boxes and chiptune video game music, specifically their strong connections to ideas of childhood, simplicity, nostalgia, and creating within technological/musical limitations.

Acknowledgments:

First of course a thank you to my family and friends, who have supported my academic journey even when you are unsure what it is I actually do. To my childhood music teachers and undergraduate educators, who encouraged interdisciplinary study and facilitated attempts to be a jack-of-all-trades, even when I felt like a master-of-none. To Andrew for telling me I'm the smart one, which only shows that you are.

To all of the amazing professors at Tufts who have helped me find my intellectual footing, thank you for not only personal guidance but for fostering an intellectually and creatively stimulating, supportive environment. Thank you so much to the Dean of the GSAS for the Future Leaders Fellowship and to the music faculty for my nomination, which made these last two years possible. To my thesis committee, Alessandra Campana, Joe Auner, and Frank Lehman, for giving such thoughtful feedback and encouraging me to expand these ideas further in the future.

This thesis would not have been able to take its final shape without the wonderful conversations I have had with other students and scholars during my travels this year, who each offered insight and expanded my thinking in some way or another, whether or not they knew it. A thank you as well to the ludomusicology community for being so friendly and academically open-minded, and showing that a playful spirit and scholarship can coexist! See you on Twitch.

Finally, the two years of the pandemic before I began this degree were extremely dark and difficult, so I would like to congratulate myself for coming out on the other side intact and improved, and continuously curious.

Dedicated to Poppa.

Table of Contents:

Taking Play Seriously

Preface

This thesis asserts that music-ing and game-ing are inherently similar, and that it is no coincidence that the word "play" refers to both acts. The work presented here stems from the field of ludomusicology not just in terms of video game music studies but in exploring the intersections between music making and game play, through musical and ludic instruments, toys, and games. This work also pulls from fields such as game studies, sound studies, and organology. The aim is to critique a concept shared by the spheres of music performance and gaming, that certain objects or practices are inherently unserious and unimportant, due to various factors such as perceived or actual simplicity, association with children, incorporation of mobile or mechanical technology, allowance of casual play, or even inherently because of their ludomusicality. These chapters will show that there is much to be taken seriously about these sites of play, whether in terms of pedagogical value, meaningful affective associations, or what the ludomusical interactions might reveal about our perceptions and behaviors in the outside world.[1]

It is common within the world of video games to hear a game described as "casual" or "hardcore," and for players of these games to be referred to as "casual gamers" or "hardcore gamers." The title of "hardcore gamer" standardly is given to players who devote a large amount of time and energy to gaming, and perhaps also invest a lot of money into gaming equipment. "Casual gamers" on the other hand are seen as not devoting much time, effort, or money to gaming, hence only participating casually. Generally the stereotype of hardcore games is that they are fast-paced, difficult, competitive, violent, and/or high-budget (i.e. *Call of Duty*, *Dark Souls*, *Destiny 2*, *Final Fantasy XIV*). Casual games as a category are considered to be

[1] For a compelling recent example of scholarship on the crossover between music and play, see: William Cheng, *Sound Play: Video Games and the Musical Imagination* (Oxford University Press, 2014), https://doi.org/10.1093/acprof:oso/9780199969968.001.0001.

calm, pleasant, non-stressful gaming experiences based more on sensory enjoyment, puzzle-solving, sociability, or collectables than violent competition (i.e. the *Animal Crossing* series, *Candy Crush*, *Words With Friends*–or more recently *Wordle*). Though it is not exclusive, by and large the types of games that people play on their phones or other mobile devices would be considered casual games. It is generally assumed that hardcore games require a high amount of skill and dedication, while casual games allow for anyone to participate.

In his book, *A Casual Revolution*, Jesper Juul confronts the stereotypes of hardcore and casual gamers and the very concept of casual gaming, as he finds that people who would be considered casual gamers or not gamers at all were often actually putting a significant amount of time into playing video games. It is just that these people were not playing stereotypical hardcore games like first-person shooters; instead they were playing things like Wii games with their children or mobile games on the go. The cultural phenomenon around *Candy Crush* (2012) or *Pokémon Go* (2016) for example has made it easier to conceptualize today how much a game which seemingly asks quite little of you can bring out extreme dedication from those who might not normally consider themselves to be video gamers. Juul points out that casual games "allow us to have a meaningful play experience within a short time frame, but do not prevent us from spending more time on a game. More traditional hardcore design, on the other hand, requires a large time commitment in order to have a meaningful experience, but does *not* allow a meaningful experience with a shorter commitment."[2] This idea will be extremely relevant throughout this thesis, as I explore ludic and musical devices and processes which are typically seen as casual, or simple, or childish, because they have a low barrier of entry for participation. However the three different chapters here will show that piano-inspired instruments, toys, and

[2] Jesper Juul, *A Casual Revolution: Reinventing Video Games and Their Players* (Cambridge, MA: MIT Press, 2010), 8-9.

games, a mobile game about breeding musical monsters, and mechanical music boxes and chiptune all carry weighty meaning and ludomusical potential. Juul also discusses the two most salient trends in industry-described "casual games," those being games with *mimetic interfaces* (where the player's actions mimic some activity on the screen, with sports games and music games being prime examples) and *downloadable casual games* which do not require a large amount of time or game knowledge to begin play. A mimetic musical game on a mobile device would thus be a perfect example of a "casual" game, the implications of which will be discussed further in Chapter 1. Musical games and toys—or on the other side of the coin, ludic musical instruments and practices—are seen as casual playthings in comparison to traditional musical instruments, or to "hardcore" games for that matter.

With the title of this thesis being what it is, the term "serious games" may come to mind. This term has come to have its own meaning, though it has been used by multiple people in slightly different ways, as is discussed thoroughly in Djaouti et al.'s "Origins of Serious Games."[3] The main usage of it nowadays is akin to the term "gamification," in that it refers to games specifically meant for a purpose other than entertainment, such as military and professional training such as flight simulators, corporate advertising, education, or even to demonstrate scientific findings such as in the study of artificial intelligence.[4] I do not intend the term "serious" in this thesis to carry the exact connotation of the term "serious games"; I am simply using it to point out things which I argue should be 'taken seriously' about ludomusical

[3] Damien Djaouti et al., "Origins of Serious Games," in *Serious Games and Edutainment Applications*, ed. Minhua Ma, Andreas Oikonomou, and Lakhmi C. Jain (London: Springer, 2011), 25–43, https://doi.org/10.1007/978-1-4471-2161-9_3.

[4] Of course the idea that games under the category of "serious games" cannot *also* be entertaining, or that other types of games are *solely* entertaining, or that the term "serious games" is an oxymoron, are short-sighted, as is also discussed by Djaouti et al.

interfaces and activities, where value, skill, meaning, and larger conceptual implications are often ignored.

The three chapters of this thesis, though they each have a distinct subject matter, illuminate different facets of our (not-so) casual interactions with play, games, and music-making. Chapter 1 discusses the way that ludic and musical design elements of various instruments and interfaces create accessible, *ludomusical* experiences of piano play and performance. This chapter involves interpretation of advertising materials and intentional interface design of the chosen devices, and for theoretical approach draws strongly from Roger Moseley's book *Keys to Play: Music as a Ludic Medium from Apollo to Nintendo*. Chapter 2 takes on a bit of a tonal shift in examining the deeper implications of human listening and mobile game play through the breeding and curating of virtual, musical monsters in the 2012 game *My Singing Monsters*. This chapter takes great influence from the field of sound studies on the act of listening and the interpretation of voice, particularly Nina Eidsheim's works like *The Race of Sound* and *Sensing Sound*. Chapter 3 explores parallels between mechanical music boxes and chiptune video game music, specifically their strong connections to ideas of childhood, simplicity, nostalgia, and creating within technological/musical limitations. The approach in this chapter features specific accounts of how music boxes and chiptune music operate, as well as theoretical influence from Svetlana Boym's *The Future of Nostalgia*, and analytical recounting of my personal experience with the intersection of video game music and music boxes.[5]

[5] Will Gibbons writes in a review of the recent book *Nostalgia and Video Game Music: A Primer of Case Studies, Theories, and Analyses for the Player-Academic* in favor of its intended "player-academic" readership, stating that the book "is at its most successful when it strips away the veneer of academic objectivity to reflect on how the act of scholarship engages with, and is in turn complicated by, nostalgia for the object(s) of study."
In this thesis, I aim to strike a similar balance between academic objectivity and individual nostalgia.

William Gibbons, "Nostalgia and Videogame Music: A Primer of Case Studies, Theories, and Analyses for the Player-Academic, Edited by Can Aksoy, Sarah Pozderac-Chenevey, and Vincent E. Rone," *Journal of the American Musicological Society* 77, no. 1 (April 1, 2024): 226–28, https://doi.org/10.1525/jams.2024.77.1.226.

Chapter 1

"The Piano(s) That Anyone Can Play":

Ludomusical Attainability and Enjoyment

What is it about pianos that technologically and socially lend themselves to continuous reinvention? While most people do not have the confidence or training to perform a full musical work on a piano, there is something about the instrument that welcomes participation at any level. Most musical instruments tend to be exclusively tied to a single performer, but the same does not go for pianos. Whether in salons and bourgeois living rooms, train stations or parks, pianos are a public object. Of course this is due to many factors, from size and portability of the instrument to the facts that it comes all in one piece, isn't played via the mouth, and emits sound of acceptable timbral quality even to first-time users. It has come to be that the piano is seen as a public-facing instrument or usable furniture: in any case an apparatus welcoming any user's musical play.

The piano's identity is paradoxical, though, as it is available for casual play while also being a traditional site for diligent practice and discipline. Take for instance Dr. Seuss' 1953 feature film *The 5,000 Fingers of Dr. T*, in which a young boy named Bart has nightmares about being held captive by his piano teacher and forced to practice piano for 24 hours a day, 365 days a year. Amidst the sounds of Bart's begrudging piano practice at the beginning of the film, the local plumber tells Bart's mother "Maybe you're right. Maybe even if he never learns to play the piano, maybe the discipline's good for him anyway. Maybe." To which she responds "There are no maybes about it! I assure you I know what's good for him. He's gonna learn to play piano if I

have to keep him at that keyboard forever."[6] This concept that piano practice is a vehicle to discipline, refined musical taste, and societal order in the early 20th century also appears in writings like John Philip Sousa's 1906 invective against "The Menace of Mechanical Music" in Appleton's Magazine, where he claims that "The child becomes indifferent to practice (…) when music can be heard in the homes without the labor and study of close application, and without the slow process of acquiring a technic."[7] He is "quite willing to be reckoned an alarmist," appalled as he is "by the impending harm to American musical art. I foresee a marked deterioration in American music and musical taste, an interruption in the musical development of the country, and a host of other injuries to music in its artistic manifestations, by virtue—or rather by vice—of the multiplication of the various music reproducing machines."[8] Even in the famous floor-piano scene from the movie *Big* (1988), a prime media example of the piano representing playfulness and public interactivity, the performances of "Heart and Soul" and "Chopsticks" are accompanied by Tom Hanks and Robert Loggia's characters commiserating about being forced to take piano lessons every day after school. While the "Big Piano" itself will not be a main item of focus in this chapter, its ability to take someone with only a disciplinary history with the instrument and get them making music in a playful way leads nicely into the topic at hand. Its innovative design simultaneously brings familiarity and subversion of keyboard-playing expectations, and is a testament to the impact that ludomusical design can have on the ways users interact with music-instrumental interfaces.

Between fearmongering and elitism like Sousa's and a more general inclination in Western music studies towards traditional, high-brow musical practices, the inherent ludic

---

[6] *The 5,000 Fingers of Dr. T* directed by Rowland, Roy (Columbia Pictures, 1953).

[7] John Philip Sousa, "The Menace of Mechanical Music," (*Appleton's Magazine*, 1906), 280.

[8] Sousa, "The Menace of Mechanical Music," 278.

potential of music making has been largely ignored until recently. Amongst recent studies in organology and cultural music history, Roger Moseley's book *Keys to Play: Music as a Ludic Medium from Apollo to Nintendo* takes this phenomena to task and focuses on the keyboard as "a threshold at which music becomes playable and play becomes musical."[9] As Moseley explains, keys can render notes, letters, or any signified piece of information as distinct and activatable, and sequences of interaction with keyboards can bring about infinite creativity with finite resources. Keyboards have the potential to be extremely simple or extremely complex, simultaneously limiting sonic potentialities and allowing for vast creative freedom within the ordered structure provided. Moseley crucially provides the term ludomusicality to refer to the concept which underlies and connects music, play, and games, writing that "Through its affordance of modes of engagement that are at once playful and musical, the keyboard is implicated in diverse forms of what might be called *ludomusical* praxis," and "ludomusical play fluctuates between the preordained and the unforeseeable, emerging in relation both to the performance of familiar cultural scripts and to the imperative to improvise."[10] Play rejects any insistence on the primacy of player identity or of the system being played; instead it is about the *interaction* and creative feedback between human and machine, player and game, instrumentalist and instrument. Neither music nor games could exist without the existence of rules and structures, and play is the way in which we follow or flout them. This play is ludomusical, and musical interfaces can encourage it in various ways, as will be seen in the rest of this chapter.

Moseley traces keyboard-games from the quasi-mythical fourteenth-century chekker board–a combination between a musical instrument and a game of checkers–to the more familiar

[9] Roger Moseley, *Keys to Play: Music as a Ludic Medium from Apollo to Nintendo* (University of California Press, 2016), https://www.jstor.org/stable/10.1525/j.ctt1kc6k47, 1.
[10] Moseley, *Keys to Play*, 1, 16.

idea of performance contests, and to rhythm video games such as *Beatmania* (1997). He also points out that there is of course inherent playfulness in musical improvisation as well as in the interaction between coterminous players, such as with Mozart's competitive and collaborative Sonata for Two Pianos in D major, K. 488/375a (1781). Similarly, the practice of piano four-hands is discussed in Kiri Miller's book chapter "How Musical is *Guitar Hero*?" (2012), as it compares to modern musical rhythm games.[11] Both four-hands arrangements and the notation systems of rhythm games have at times been critiqued for being mere facsimiles of some "real" versions of musical pieces, and the activity of playing these musical arrangements has been negatively judged based on popularity with amateur or untrained musicians. Miller also links rhythm games with piano four-hands as methods of bringing music into the home, which provide players with the opportunity to explore a musical piece they would otherwise have no opportunity to perform. They both are playful and (at least perceived to be) casual musical practices, which teach players musical syntax and listening strategies while remaining primarily enjoyable experiences.

The enjoyability of musical play is an important element of ludomusical experiences, and for terminology to discuss this enjoyability I will be drawing from work done within the field of game studies. Marc LeBlanc and colleagues have presented a taxonomy of gaming pleasures as part of a larger framework called MDA, to understand what makes games fun through Mechanics, Dynamics, and Aesthetics with the goal that this understanding will be helpful to future game developers and scholars.[12] This taxonomy of game pleasures includes eight elements (Sensation, Fantasy, Narrative, Challenge, Fellowship, Discovery, Expression,

[11] Kiri Miller, "How Musical Is Guitar Hero?," in *Playing Along: Digital Games, YouTube, and Virtual Performance*, The Oxford Music/Media Series (Oxford: Oxford University Press, 2012), 105.
[12] Robin Hunicke, Marc LeBlanc, and Robert Zubek, "MDA: A Formal Approach to Game Design and Game Research," in *Proceedings of the AAAI Workshop on Challenges in Game AI*, vol. 4, 2004, 1722.

Submission), though enjoyment is not limited to these eight elements. I will now give a brief description of each, considering how they make sense both ludically and musically. Throughout the rest of this chapter I will make reference to these elements and how they aptly portray both the overlap between what makes music making and playing games enjoyable, and the ways in which the three case studies herein make use of these shared elements.

The first is "Sensation" or "game as sense-pleasure."[13] "Sensation" refers to the pleasure gained from sensory or haptic experiences: the enjoyment and satisfaction felt when you get great contact between baseball and bat or soccer ball and foot, or the little jolt of excitement upon pressing the die-rolling dome in the middle of a Trouble board. In music making this relates to the haptics of playing an instrument, the receiving of sound as vibrations in the body, or the sensations such as chills that one might experience through emotional responses to music. "Fantasy" refers to the enjoyment that comes from suspension of disbelief ("game as make-believe"), and "narrative" to the satisfaction gained from dramatic progression ("game as drama"). In music sometimes specific narrative meanings are ascribed to pieces, but whether or not these are successfully interpreted the piece would still have its own perceived "narrative" progression–if only in terms of rising and falling tension– which draw listeners/performers into the musical experience.

"Challenge" ("game as obstacle course") is an element that is ever-present in both game and music playing; think of the satisfaction when overcoming a barrier or solving a puzzle, but also the importance of calibrating an experience to be difficult enough to allow for that satisfaction while remaining achievable. "Fellowship" ("game as social framework") refers to the community that can form around people with related game playing experiences, and music of

[13] Hunicke, LeBlanc, and Zubek, "MDA: A Formal Approach to Game Design and Game Research," 2.

course has great capacity to create fandoms and communities of common interests as well. "Discovery" ("game as uncharted territory") refers to the pleasure of being dropped in an unfamiliar world where you must discover what challenges you will face and what new capabilities you have to face them. Similarly, I would contend that a strong motivation to engage with music making is a sense of discovery; to learn new pieces, techniques, or entirely new musical systems. "Expression" ("game as self-discovery") refers to *self*-expression in games, whether as a certain type of strategic player or as a visual avatar, and expression of identity is of course important in music whether you are trying to express yourself as an individual artist or meld with a group in a more communal style of music performance. Finally, "submission" ("game as pastime"), at other times called "masochism," refers to the pleasure found in fully accepting the rules and structure of the game, mainly in opposition to the displeasure felt when another participant is operating by unfair or different rules.[14] While music as a practice is vast and highly variable, rules and categories such as genres, techniques, and notation systems provide a great deal of enjoyment and commonality to musicians and music fans alike.

This chapter will look at three different piano-inspired technologies for how they emphasize and expand upon the ludic possibilities of piano play, resulting in wider accessibility and enjoyment of piano performance. They range over a century in their inception from the machine age to the digital age and the relatively recent obsession with mobile devices, but they all exist to some extent in opposition to the standard form of piano practice, instead keeping the focus on play. Of these three ludomusical technologies one is identified more as an instrument, one as a toy, and one as a game. The first is the mechanically innovative Pianola of the turn-of-

[14] Greg Costikyan, "I Have No Words & I Must Design: Toward a Critical Vocabulary for Games," ed. Frans Mäyrä (Proceedings of Computer Games and Digital Cultures Conference, Tampere: Tampere University Press, 2002), 9–33.

the-20th-century, which entirely changes the physical playing technique needed to bring music forth from a piano, but still intends for the user to have an interactive and expressive (ludo)musical experience. The second is a digital toy piano from 1996 called the "Little Smart Super Sound Works," which sparked my very own childhood interest in music as a child through its wide array of sonic manipulation capabilities as well as explicitly ludomusical pedagogical features. The third is a 2011 mobile game called *Magic Piano*, which as a game makes explicit and quantifiable many of the ludomusical aspects of piano performance. While they have very different designs and immediate goals, these technologies all take inspiration from the same instrument and bring ludomusical play and enjoyment to a wider range of players.

Player Pianos

The mechanization of music and keyboard instruments has a long history, from ancient hydraulic organs and medieval carillons, to 18th-century musical automata and beyond.[15] The immediate predecessors to player pianos, though, were external devices called "piano players". These were created towards the end of the 19th century, in the form of cabinets to be pushed up directly in front of a traditional piano, so that each of its felted wooden "fingers" aligned with the piano keys. A set of foot-pedaled bellows served to keep the mechanism inside of the cabinet in a state of vacuum: as holes in the music roll passed over a "tracker bar" they would allow air to pass through specific channels and the resultant pressure difference would trigger a valve to open, and a pneumatic motor to press one of the wooden "fingers". These "piano players" then turned into the more familiar "player pianos" around the turn of the century when piano manufacturers began to create instruments with built-in pneumatic player mechanisms instead.

[15] Charles B. Fowler, "The Museum of Music: A History of Mechanical Instruments," *Music Educators Journal* 54, no. 2 (1967): 45–49, https://doi.org/10.2307/3391092; Moseley, *Keys to Play*, 23.

Both types of instruments are often referred to as "Pianolas," which began as a brand name for Aeolian and Orchestrelle Company instruments but has come to be used as a general term for mechanical piano-playing devices.[16]

Another predecessor to the player piano is the barrel piano, usually powered through hand-cranking. As the name implies, the music was stored as pins protruding from a cylinder (barrel) which triggered the piano keys as the barrel turned. The cylinder method was very limiting particularly in terms of how long pieces could be, as one cylinder only has so much circumference to turn before it reaches the beginning again, and larger cylinders meant less portability. Pianolas instead adopted the method of storing music as holes punched in rolls of paper, with the advantage of lightweight support for extended lengths of music.

The image of a player piano which may come to mind today is of a piano in the lobby of a quaint hotel, lowering its keys and emitting music seemingly of its own accord. In this case, a discussion of ludomusicality and user interaction with the device may seem confusing. These more fully automated piano-playing machines first came about with the Welte Company's Welte-Mignon reproducing piano in 1904.[17] This device was powered electrically rather than by manual bellows, and it could control the amount of suction involved in the pneumatic activation of the keys, allowing for a more expressively nuanced musical performance. In order to "reproduce" music, this technology also needed a way to record a performance. The keys of the Welte-Mignon could be electrically connected to an external recording machine, which would take input from the piano keys and foot pedals and make corresponding ink markings on a paper roll turning at a consistent speed. These ink markings would afterwards be punched out of the

[16] G. C. Ashton Jonson, "Mechanical Piano - Players," *Proceedings of the Musical Association* 42 (1915): 15–32.
[17] Patteson, "'The Joy of Precision.'" 26.

paper, and playback at a similarly constant speed would reproduce the fluctuations in rhythm and tempo of the original performance, as well as its range of dynamics.[18] The reproducing piano was intended to be fully automated, and to reproduce performances of famous pianists and composers as if they were happening live right in the drawing room. The manually-operated Pianola from earlier however remained most common in middle-class homes, and the following section will review the intended goals of that instrument, drawing from advertising language.

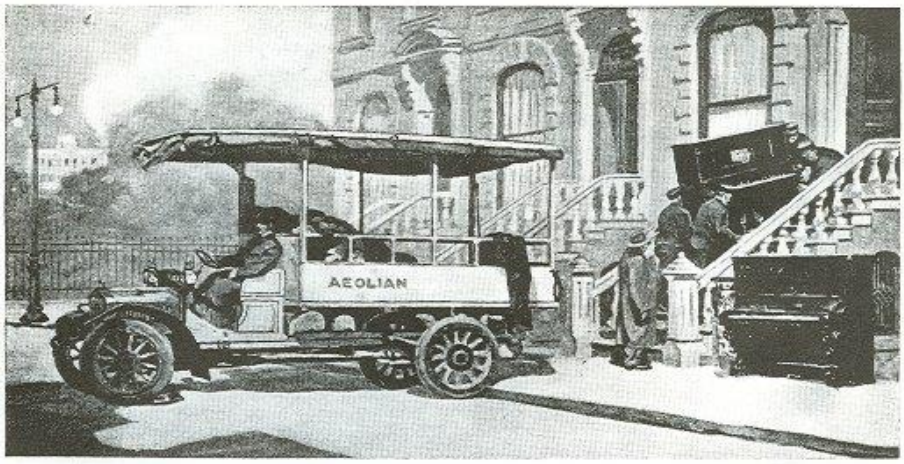
Advertisements for player piano technologies are useful artifacts for many reasons; they describe the instrument and its intended uses in simple language, flaunt additional musical features, reveal what the general discourse was around the instrument, and situate in a particular historical moment.[19] The advertisement included here for the Pianola Piano from the Aeolian Company declares pianos of the old type to be metaphorically dead, and a new age of musical appreciation aided by modern invention to be dawning. Crucially, it emphasizes the active participation and "intelligent co-operation" between the performer and the instrument: "It does not merely play itself–the performer plays it; puts into the music the best expression that is in him, and takes keen personal satisfaction in the musical results that he achieves."[20]

[18] Patteson, "'The Joy of Precision.'" 27.

[19] Jordi Roquer González, "Media Discourses and Marketing Strategies in the Advertising of the Pianola," *Popular Music* 40, no. 1 (February 2021): 42–57, https://doi.org/10.1017/S0261143021000106.

[20] "The Passing of the Silent Piano". The Aeolian Company. c. 1900. Source: http://www.pianola.com/aeolian9.htm.

The Passing of the Silent Piano



A daily scene in all the world's large cities—the Pianola Piano displacing the piano of older type.

THE whole world is awakening to an appreciation of music. In America and abroad—England, Europe, far-off Australia—instruments of modern invention, designed to furnish music for the home, are daily becoming more popular. Foremost among these is

THE PIANOLA PIANO

The Piano that anyone can play

No other musical instrument ever devised makes so intimate and so general an appeal as the Pianola Piano.

The average person of today wants to take an active part in his pleasures—does not want too much done for him.

The Pianola Piano demands intelligent co-operation on the part of its performer. *It does not merely play itself*—the *performer* plays it; puts into the music the best expression that is in him, and takes keen personal satisfaction in the musical results that he achieves.

Supplanting the Piano of older type

The piano has long been the favorite home instrument. In recent years the home has hardly been deemed complete without it.

And yet, splendid instrument though it is, the piano that can be played only by hand is almost always disappointing—it is far too hard to play for many to enjoy it.

All that has made the old piano so popular and *more*—is offered by the modern pianoforte,—the Pianola Piano.

It has the same keys for hand-playing and practice; the same wealth of tone; the same dignified and beautiful appearance.

In addition, it has the wonderful Pianola within its case—the one piano-player which enables *anyone* to play like an artist; which alone has those wonderful devices for expressing art in music—the Metrostyle, Themodist, Graduated Accompaniment and Sustaining Pedal Device.

See NOW about getting a Pianola Piano

The time has come for *you* to notice what is going on all over the world; for you to take steps to introduce music into *your home*.

If you have no piano you certainly want one. To be without is almost a reproach. And surely if you buy one now, you want the latest and best—the Pianola Piano.

If you have a piano of the old type—"the silent piano"—now is the time to relinquish it. Never will it be worth so much in exchange for a Pianola Piano as at this present moment.

The Importance of the Player

When you come to buy the Pianola Piano, however, make sure it is the *Pianola Piano* that you secure, for only in this way can you obtain the advantages of the famous *Pianola*.

No matter how good the *piano* may be, the music will be no better than the *player* contained in the piano makes it. You should consider the piano—but consider *first* the *player-action*, for it is that which either gives you, or fails to give you, the *full enjoyment of the piano's possibilities*.

There is but *one* player action which has received serious musical recognition from the world's master musicians—Paderewski, Strauss, Josef Hofmann, Moszkowski, Rosenthal, Debussy, and three hundred others of the greatest living composers, pianists and teachers. *This player-action is the Pianola.*

There is but one Pianola. It is made only by the Aeolian Company. It may be obtained either as a detachable cabinet piano-player, or in a single case with the piano—in this form known as

THE STEINWAY, WEBER, STECK, WHEELOCK, OR STUYVESANT PIANOLA PIANO

Send for Catalog "B"

Upright Pianola Pianos **$550.** up — Prices slightly higher on the Pacific Coast.

Grand Pianola Pianos **$1500.** up — Moderate monthly payments.

Pianolas, as separate instruments, adaptable to any piano **$250.** up — Allowances on other pianos taken in exchange.

Send for Catalog "B"

Pianola Pianos are sold by the leading music houses in the principal cities throughout the world

The Aeolian Company maintains its own establishment in the following cities:

CHICAGO	ST. LOUIS	CINCINNATI	INDIANAPOLIS	DAYTON	FORT WAYNE
202 Michigan Boulevard	1004 Olive Street	25 West 4th Street	237 N. Pennsylvania St.	131 West 3rd Street	Washington Street

THE AEOLIAN COMPANY AEOLIAN HALL, 362 Fifth Avenue, Near 34th Street, New York
Largest Manufacturers of Musical Instruments in the World

Unlike any 21st-century misconception of the Pianola as a reproducing device only, this description of the device acknowledges the ludomusical interaction between operators and their instruments. The advertisement also claims that in recent years a home has "hardly been deemed complete" without a piano, but that it is so difficult to learn that the instrument often lays silent. Hence the Pianola Piano is not presented just as a replacement for a standard piano but as an upgrade, with the same tone, feel of the keys, and overall appearance. This indicates a clear conceptualization of the player piano as an instrument, not just a machine. The piano is deemed still popular, impressive, and culturally vital, but unfortunately obsolete because most people cannot extract from them the quality of music they wish to hear, and thus cannot "use" it to its full potential. The Pianola, then, inherits the cultural value ascribed to the piano, with the added advantage of accessibility and unconditional enjoyment.

The Pianola would have standardly had multiple control levers including a tempo lever (to control how fast the music roll would scroll), a gear lever (to re-roll the music, or set the instrument to "silent" or "play"), graduated accompaniment levers (bass subduing lever and treble subduing lever), a soft pedal lever and a sustaining pedal lever. Tempo could be communicated as a number printed at the beginning of the roll as well as musical terms printed on the roll throughout the piece. The advertisement lists supplemental features which assist in musical expression including these levers, and the Metrostyle and Themodist. The Metrostyle[21] was an invention which allowed for the temporal expressiveness of a performance from a specific composer or pianist to be recorded, with a red-inked pen attached to a guide finger which inscribed a wavy line on the music roll as the piece was played through. Even if the

[21] The Miriam and Ira D. Wallach Division of Art, Prints and Photographs: Picture Collection, The New York Public Library. "The Metrostyle Pianola." New York Public Library Digital Collections. Accessed November 16, 2023. https://digitalcollections.nypl.org/items/510d47e3-33b3-a3d9-e040-e00a18064a99

pitches and rhythms of a piece were not hand-recorded as they would have been for a reproducing piano, a piece could still be Metrostyled by a composer or pianist, and the beginning of the music roll would feature that artist's signature in confirmation that the Metrostyling is approved.[22] Any future Pianolist with this roll could then use the red line as a guide in conjunction with control of the tempo lever to (attempt to) recreate a performance of a piece 'exactly' as it was played by those famous figures–in terms of temporal expressiveness, at least. This is a fascinating experience in comparison with the more fully automated reproducing pianos, because with Metrostyling the music still had to be enacted by the user. It was not just about re-playing a recording, but offering an opportunity for anyone to re-embody a respected musical figure and their individual performance, by way of temporal fluctuations (here deemed as markers of the performer's internal interpretation of the music). As opposed to witnessing a musical ghost play a piano from across the room, a Pianolist using a Metrostyled roll could attempt to personally reanimate that ghost. In this way the limits of partial automation lead to novel methods of musical interaction.

As a final example, player pianos eventually had their pneumatic mechanism split into the bass and treble registers of the piano, and the Themodist took advantage of this split for thematic and dynamic phrasing. Snake-bite style perforations along the left and right sides of the music roll would automatically result in power being apportioned more to the treble or the bass. This in conjunction with players' own well-timed use of the bass and treble subduing levers would result in enhanced musical expressiveness in terms of both overall volume and selected thematic emphasis.

[22] *Arabesque No. 1 - Metrostyled and Autographed by Debussy | Player Piano*, 2023, https://www.youtube.com/watch?v=HNmMYIa68H8.

Imagine a Pianolist pumping the instrument's treadles, watching the holes in the piano roll run by accompanied by various other markings–a red Metrostyle line, thematic perforations, lyrics to the popular song they are performing–and coordinating their actions according to the oncoming flow of information. Such coordinated action is not entirely dissimilar to that which is encouraged by musical games of today. The playing of a Pianola is different to the traditional way of making music at a piano, but it is still an interactive and expressive way to feel the pleasure of musical performance and to bring music into the home. The Pianola claims to circumvent the issue of the piano being "far too hard to play for many to enjoy it" while still satisfying the "average person of today" who "does not want too much done for him."[23]

As another Pianola advertisement issued in 1904 reads: "A great factor in the Pianola's world-wide popularity is the fact that it brings pleasure, not merely to one or two members of the family, but to *all*."[24] In terms of LeBlanc's taxonomy of game pleasures, Pianolas allow a player to focus on the "sensation" and musical "expression" of performing a piece, without a preoccupation with the accuracy and extreme dexterity often expected of piano playing. But it does not completely remove the element of "challenge" either, so the player should still feel a sense of achievement at their successful "submission" to the mechanics of the mechanical instrument. And if played successfully, the emotional/sonic "narrative" of a piece should come across similarly to if it were performed in the traditional manner, and the "fellowship" brought on by listening and dancing to music in the (turn of the century) home will be more accessible than ever. While other musical technologies of the time like reproducing pianos and the phonograph were intended more for listening purposes, the interactivity of the Pianola shows that

[23] "The Passing of the Silent Piano".

[24] The Miriam and Ira D. Wallach Division of Art, Prints and Photographs: Picture Collection, The New York Public Library. "The present of a Pianola is a present to every member of the family." The New York Public Library Digital Collections. 1904-12. https://digitalcollections.nypl.org/items/510d47e3-3354-a3d9-e040-e00a18064a99

adding mechanical elements to musical instruments can accentuate the ludic aspect of musical play, as the human and machine co-operate to produce a pleasurable musical experience.

The Pianola reached its peak popularity around 1910, by which time it had widely begun to be appreciated as not a mechanical gimmick but a new and valuable musical instrument. An article in *Music and Letters* from 1925, for instance, documents how players were attempting to develop the best Pianola playing technique, and composers were writing specifically for the sound and capabilities of this new instrument rather than just rearranging works in the same way they would for the old model.[25] Due to economic factors such the Great Depression and the World Wars, and competition from the constantly improving gramophone, unfortunately mechanical piano technologies dropped off drastically over the next couple of decades. Over a century since that article in *Music & Letters* article claimed that the player piano had "arrived at perfection,"[26] in a time when electronic piano toys and games are widely disseminated and often pocket sized, it is important to remember that the playfulness and novel artistic abilities provided by keyboard innovations–that is, ludomusicality–is not only an achievement of the digital age.

The "Little Smart Super Sound Works"

The "Little Smart Super Sound Works" is a toy musical instrument released in 1996 as part of Vtech's "Little Smart" line. Toy instruments based on pianos, xylophones, and keyboards generally are plentiful, but the "Little Smart Super Sound Works" features a surprisingly wide array of musical capabilities with an easily understandable interface. This instrument has a library of 44 different sounds (animal sounds, musical instruments, miscellaneous), each with their own button featuring a cartoonish image representing the concept

[25] Sydney Grew, "The Player-Piano," *Music & Letters* 6, no. 3 (1925): 236–47.
[26] Grew, "The Player-Piano," 1.

behind the sound. These figurations of the sounds can be quite literal, such as an image of a cat or French horn, or more abstract like the image of a conductor for the sound of a full unison orchestra, or the image of something bouncing off the ground for a “boi-oing” sound. These sounds can be played on 24 different piano keys (ranging from F4 to E5 on the standard piano setting), and there are also 4 large buttons triggering different drum sound effects or loops. There is a metronome, up and down controls for tempo and volume, and even “sound creator” buttons to add vibrato and alter its frequency–which seems to be done by panning the sound between the left and right speakers–or its amplitude. There is also the capability to record your own homophonic or multiphonic tune and play it back, though it can only be up to 30 notes long and allows no rhythmic variation–no matter what rhythm you give to the notes during recording, they will be played back to you at evenly spaced intervals.

There are five different play modes, labeled as “5 Activities”, selected via a sliding window above the middle of the keyboard. The first “activity” is the standard free play mode. In which the user employs any of the aforementioned features. The second “activity” allows the

selection of one of 14 nursery rhymes, represented as small images of related narrative scenes for each song above each of the white keys. Pressing one of those keys will activate a red light to appear under the key representing the first note of that song's melody, and once it is pressed the key corresponding to the second note will light up, and so on until the entire melody has been played. The third "activity" also allows the selection of one of the 14 childrens' tunes, but this time the device will demo a more advanced multi-part arrangement of the song, with the keys lighting up red with just the melody again for the user to visually or physically try to follow along (though since this version is pre-recorded you do not have control over what is played, and the piece carries on without your input). The fourth "activity" is like the first free play mode except that it allows the player to assign one type of sound to the first half of the keyboard, and a different sound to the second half of the keyboard. The fifth and final "activity" is the same as the second, except that each correct note of the melody can be heard by pressing any one of the keys as opposed to the actual one that lights up red, perhaps in an attempt to make even extremely young children feel that they can play their favorite songs while they work to improve their motor skills.

In reference to the taxonomy of game pleasures, I can remember very well the satisfaction in musical "sensation" I personally got from this instrument as a child. The vast library of timbres brought an element of absurdity to the simulation of an instrument often perceived as very serious. Most sounds were brief but the organ allowed for much longer duration of notes, and I would explore the keyboard by holding down multiple keys at a time, noticing when certain combinations sounded like they fit together more neatly than others (an early introduction to the concepts of consonance and dissonance). Both the sound library and the selection of playable familiar melodies satisfied my sense of "discover"-y and enabled me to

participate in musical "expression" without formal training. Brave and curious players may also "challenge" themselves to play music on this mini keyboard beyond what is already programmed. In my case I experimented with sound at this keyboard until I learned how to play "Hedwig's Theme" and "My Heart Will Go On," at which point my parents upgraded me to formal piano lessons, exhibiting the capability of such an instrument to inspire future musicians and musicologists.

In *Keys to Play* Moseley points out the connection between the Greek words for child (*pais*), play (*paidia*), and pedagogy (*paideia*), and writes that "As educational method and outcome, play can afford a childlike clarity of vision into the workings of the world."[27] Play involves exploration and decision making, absorption of and exploitation of rules, construction and navigation of worlds, tests of memory and creativity. Simultaneously pleasurable, interactive, and informative, play is inherently a learning experience and it seems almost obvious that it would be employed as a pedagogical device. This does not only mean that elements of play should be incorporated into formal educational settings, but that we should remain aware of the value inherent in childlike play experiences that already surround us.

Toys commonly mimic real-life objects or actions with the intent of teaching a child some degree of skill. There are toys to help children become comfortable walking, toys that simulate modern technology like phones, laptops, or cash registers, dolls with which to simulate care and social interaction, and of course toys to help children learn about music. In addition to this keyboard, the "Little Smart" series featured toys which teach about the body, animals, letters, and more. The introduction to user manuals of similar "Little Smart" toys say that "When it comes to providing interactive products that enlighten, entertain, and develop minds, at

[27] Moseley, *Keys to Play*, 20.

VTech we see the potential in every child," and that "all of our electronic learning products are uniquely designed to develop a child's mind and allow them to learn to the best of their ability."[28] It is notable that in designing a keyboard instrument to entertain and enlighten children's minds, they did not program in scale and arpeggio exercises, nor did they have the toy only sound like a piano. Instead the focus is shifted onto familiar and popular tunes which capture the user's interest, and the player is given a wide amount of timbral control to encourage exploration of not only what the keyboard can do for music, but what it can do for *sound*. This child-inspired perspective on keyboard interface design can increase opportunity for ludomusical learning, by stripping down certain sound features (such as pitch range) and expanding upon others (such as timbre), and by offering various explicitly playful modes of activity.

Magic Piano

While the connection between music and games has been underlying this chapter so far, this third example of ludomusical technology will bring it to the forefront. *Magic Piano* is an app released in 2011 by Smule, specifically for Apple mobile devices (iPhone and iPad). What it offers is a completely simulated and fairly abstract piano experience, unlike a player piano which simultaneously functions as a standard piano. Instead of starting from a musical instrument and turning it into a partially automated, low-skill interactive music experience, *Magic Piano* took smartphones/tablets that were not inherently musical and brought them towards a semi-automatic musically interactive experience in the opposite direction. The music is presented as colored dots of light which move from the top to the bottom of the screen, with each of the dots' horizontal location on the screen reflecting the positioning of piano keys, although piano keys

[28] "VTech Little Smart Explore My School User's Manual" (VTech, 1997).

are not actually visualized during normal gameplay. Interestingly this happens to combine both the scrolling vertical movement of player piano music rolls and the dots of light which appear within the plastic keys of the VTech toy electronic keyboard.

The only physical action required of the player to perform a piece of music is to tap their fingers on the device's screen corresponding to the colored dots of light. Only one (which will appear pink), two (blue), three (green/yellow), or four (orange) dots can appear simultaneously, so the game can always be played with the fingers on one hand. On "easy" difficulty the arrangement of a piece will have two simultaneous notes maximum, on "medium" it can have up to three simultaneous notes, and on "hard" it can have four simultaneous notes (and there is a "practice" mode which entails only single notes). At any difficulty, the amount of fingers tapped on the screen may not always actually correspond with the number of distinct notes heard, because the musical arrangement used in the game will often need more than four simultaneous notes in order to sound like an appealing enough recreation of the original. For example, the piano arrangement of Edvard Grieg's "In the Hall of the Mountain King" used in the game, like

the orchestral original, slowly evolves to use a wider pitch range and higher quantity of notes over the iterations of its famous theme. So towards the end of the piece, at some points 5 or more simultaneous notes are heard in a chord even though only four dots of light appear.

In order to get the highest score possible, the player must try to tap the same number of fingers as dots that appear, at the same location in which they appear, timed with when they cross the horizontal line seen about ⅔ of the way down the screen. The strictness of these parameters, however, is very low. A tap much too far to the left or right of a note light will result in a "too far left" or "too far right" warning on screen and the note played will be slightly off pitch. Since there is quite a bit of leeway on how precise these taps have to be, this mistake is not very common. If more fingers are tapped than are necessary at once, the player will receive a "too many fingers" warning and a wrong note will be heard along with the correct notes. This is probably the most common mistake especially in fast-paced pieces which alternate between single notes and clusters of notes very rapidly–"In the Hall of the Mountain King" is a good example of this as well.

The tempo-keeping aspect of this game can potentially be frustrating for an experienced musician, because it is quite inexact. Unlike in other musical games such as *Guitar Hero* (2005), *Rock Band* (2007), or *Tap Tap Revenge* (2008), the dots of light in Magic Piano do not scroll down the screen at a steady pace and then disappear, but instead rush down towards the bottom and wait there until you tap them. This is particularly noticeable when there are supposed to be rests between phrases of music but the lights do not wait for that amount of time to pass. Game parameters do attempt to keep some sense of musical flow; if a player taps very quickly without letting the lights reach the horizontal line, they will receive a "play slower" warning, and if they let the lights sit still at the bottom of the screen too long they will receive a "play faster"

warning. There is also a points multiplier to reward longer play without mistakes, which reaches a 4x multiplier maximum. These design choices indicate that the gameplay is being aimed slightly more towards a simulation of the experience of performing a piano piece, rather than solely towards a quantifiable game result. If the player does not cause any of these warnings to appear, they will receive a "perfect" score for their performance of a piece. The player also has the ability to unlock and choose different instrument sounds with which to play a piece other than the default sound of "Grand Piano: Classic Piano sound in a pocket-sized package,"[29] out of a small selection featuring mostly timbres of other keyboard instruments. If the player plays the correct notes and not additional miscellaneous notes (taps the correct location with the correct number of fingers) and uses their control over rhythm and tempo to play steadily but expressively (taps at the correct time and keeps the accuracy multiplier going), they will be rewarded triply with a high game score, the sound of an impressive musical performance, and the satisfaction at themselves accomplishing the task.

Outside of this standard mode of play, accessed by selecting a song from the "songbook" tab or by participating in the daily challenge, the app also provides other playful opportunities. There is a "solo" mode in which players can freestyle on a now-visible keyboard either in a standard left to right layout, spiral, or a circle. They can also freestyle into the black void familiar from the main gameplay, and the piano keys corresponding to the note being played will temporarily become visible. You can play absurdly high or low notes if you tap your fingers close to the sides of the screen, but no images of piano keys will pop up as they are well outside of normal piano range. There is a "composer" mode in which one can program an arrangement or original composition by placing the colored dots on a dotted grid, and then publish the pieces

[29] *Magic Piano*. Smule. iOs, 2011.

to be played by others around the world. On the subject of the world-wide reach of this app, there is also a "world" tab in which users can listen to performances being done by others and see where they are on the globe. They can give these performances a like, or choose "play" in the top right corner to begin their own performance of the same piece. In terms of LeBlanc's taxonomy of pleasures, *Magic Piano* features all of the elements in ways previously discussed, but "fellowship" is accomplished uniquely by how it digitally connects players from around the world–a signature feature of Smule's app designs.[30]

In order to define what makes a game a "music game," Michael Austin's chapter in *The Cambridge Companion to Video Game Music* plots music games on an axis based on the extent to which they are procedural ("interacting with musical materials and procedures"), and conceptual ("explicitly themed around music-making contexts.") [31] Music games can be strictly procedural if they require precise action and have a right or wrong answer, which pitch or rhythm matching games generally do, such as *Beatmania* (1997) or *Tap Tap Revenge* (2008). They can also be loosely procedural if they encourage more free musical exploration, with the far end of this spectrum being musical sandbox games like *Incredibox* (2016). *Magic Piano* (2011) is a pitch-and-rhythm game, so it would be procedurally musical. Conceptual music games include for instance games where your player character is a musician or music fan, and games which have music-related narrative themes such as *Legend of Zelda: Ocarina of Time* (1998). As *Magic Piano* is explicitly meant to mimic playing of a real-life musical instrument, it would be conceptually musical as well. While the answer is often not so simple, *Magic Piano* can safely be called a music game.

---

[30] Ge Wang, "Ocarina: Designing the iPhone's Magic Flute," *Computer Music Journal* 38, no. 2 (2014): 8–21.

[31] Michael L. Austin, "Music Games," in *The Cambridge Companion to Video Game Music*, ed. Melanie Fritsch and Tim Summers, Cambridge Companions to Music (Cambridge: Cambridge University Press, 2021), 152.

In articles from around the app's release in 2010, reviewers called *Magic Piano* a "fun app for musical wannabees" and pronounced that "iPad owners that wish they could make music with a piano, but don't want to take lessons are in luck."[32] The tagline for *Magic Piano* on Smule's own website also reads "Practice and improve your piano skills with *Magic Piano* by Smule! Choose from popular hits and old favorites and play like a pro, no lessons needed!"[33]

This promise of facilitated access to musical prowess is reminiscent of advertisements from the heyday of player-pianos, such as one Pianola advertisement which reads:

> Supposing you possess a piano, and are desirous of making it the source of pleasure it is intended to be, two courses are open to you–either you must learn to play by hand, or purchase a Pianola. The first means years of drudgery before you can attain any degree of proficiency. If, on the other hand, you decide on having a Pianola, the ability to play any and every kind of music becomes yours immediately.[34]

Players would supposedly be enticed by the idea of a shortcut to piano performance, but it is also clear that the ludomusical elements of the play experience are what encourage users to play again and again. All three of the piano-based technologies described here aim to simplify access to piano playing and facilitate fun in the playing experience. If they may on the surface seem oriented towards producing a culturally validated musical product in the accurate performance of a musical work, experientially the value really lies in their provision of the repeatable and endless process of musical play.

Ludic Music-Making

From mechanical musical instrument to children's toy to mobile game, each of the three technologies featured in this chapter takes inspiration from the piano and creates a new highly

---

[32] "Smule Magic Piano iPad App Review - The Gadgeteer," accessed November 17, 2023, https://the-gadgeteer.com/2010/05/13/smule-magic-piano-ipad-app-review/.

[33] "Magic Piano | Smule," accessed September 11, 2023, https://www.smule.com/apps.

[34] "The Pianola: The Connoisseur". The Orchestrelle Company. c. 1900. Source: http://www.pianola.com/aeolian2.htm.

ludomusical experience. The Pianola keeps piano playing expressive and interactive, but sets it as an immediately achievable challenge rather than something which requires years of practice. Pianola advertisements emphasize how they enable performance approaching that of famous pianists, thus still showing reverence towards the cultural value ascribed to classical music training. But rather than virtuosity, major selling points of this technology were the ability to hear yourself play your favorite songs, to sing and dance with friends in your home, and to feel the rush of having personally brought that music forth. A Pianola Piano could also still function as a standard hand-played piano, preserving the option of traditional practice and training. The respect and validation placed upon the piano was heavily sought after by its spin-offs: "All that has made the old piano so popular and *more*—is offered by the modern pianoforte,—the Pianola Piano."[35] The Pianola wanted to follow in the long lineage of respected keyboard instruments such as the organ, harpsichord, and modern pianoforte, but it distinguished itself by the physical manner of playing. Playing the Pianola is evocative of later musical games in which you watch a sort of notation scroll by and respond accordingly with hand and foot actions, except in this case it is a piano roll and levers attached to a pneumatic mechanism, rather than symbols on a digital screen and inputs on a game controller.

Unlike the Pianola, the "Little Smart Super Sound Works" and *Magic Piano* have not been situated as direct successors to the piano, though they did benefit from their thematic connection to the piano for other reasons. Any instrument, but keyboard instruments in particular bring a sense of both familiarity and control to musical experiences.[36] While these technologies specifically do not require musical training and in fact promote themselves as a

[35] "The Passing of the Silent Piano".

[36] Emily Dolan, "Toward a Musicology of Interfaces," *Keyboard Perspectives 5*, 2012, 9-11.

gateway into musical ability, they do both benefit from the familiarity many have with the piano. Previous familiarity with the instrument could prime you confidently interact with a piano toy or game, but familiarity with the elite status and difficulty of the piano could also increase the excitement at the novel experience of performing piano pieces for a user without musical training. As a toy intended for use by children, the "Little Smart Super Sound Works" keyboard taps into a very familiar instrument but allows for more exploration of sound and musical experimentation than does classical training on that instrument. This device can instill musical curiosity in a young player, and encourage continued participation by giving them a sense of accomplishment. And a choice does not have to be made between this style of musical learning and more traditional training. In 1906 Sousa predicted that the mechanization of music would bring about the end of musical curiosity and amateur musicianship, writing that "Just so far as a spirit of emulation once inspired proud parent or aspiring daughter to send for the music teacher when the neighbor child across the way began to take lessons, the emulation is turning to the purchase of a rival piano player in each house, and the hope of developing the local musical personality is eliminated."[37] However, my personal history with the "Little Smart Super Sound Works" can attest to the continuing ability of innovative piano interfaces to inspire children to more advanced and traditional musical training.

One might think that this catastrophizing is old-fashioned, and that with the plethora of musical games and simulation devices nowadays, the idea that accessible musical technology would bring the downfall of musical society would have been disproved. Yet, as Kiri Miller describes, critics and musicians at the time of *Guitar Hero* and *Rock Band*'s popularity would often propose similar ideas. They would say that people should play "real" music instead, that these games would discourage learning of "real" instruments, and overall spout the sentiment

[37] Sousa, "The Menace of Mechanical Music," 281.

that these games symbolize all that is wrong with the younger generation and modern state of society.[38] The "fun app for musical wannabes"[39] description of *Magic Piano* seems a bit more generous, but implies the same fear that these accessible and built-for-enjoyment musical technologies are not gateway drugs to musical learning, but will give people their musical kicks briefly and send them on their way– all this under the assumption that disciplined musical learning is a moral necessity. In her ethnography of *Guitar Hero* and *Rock Band* players, though, Miller found that most player-interviewees had past or ongoing experience on traditional musical instruments.[40] Between "real world" musicians who enjoy the game, players who might be encouraged to learn instruments from playing their virtual counterparts, and the many people who would plainly not have the time and resources for traditional musical training but want to experience the adrenaline rush and creative satisfaction of performing through games like these, the catastrophizing does not seem to hold much water.

Moreover, the creative experience of playing these types of games is really not that far from playing "real" instruments, aside from the physical technique. Some players feel like they are just pressing buttons to enact what musical symbols have already been programmed in for them, and thus are not really being creative.[41] But pressing buttons (or keys or strings) to enact signs is just another way to describe the playing by notation that is the core of musical pedagogy and profession. Similarly, players can either sight-read or practice to get better at certain songs in these games, resulting in both a better-sounding performance and a higher game score. Many players perceive what they are doing as purely ludic, and not musical at all. Among recent scholars trying to dispel this bias, Peter Schultz for example writes in "Music Theory in Music Games" that "Although music games do not usually teach musical skills and concepts directly,

[38] Miller, "How Musical Is Guitar Hero?" 97-104.
[39] "Smule Magic Piano iPad App Review - The Gadgeteer."
[40] Miller, "How Musical Is Guitar Hero?" 106.
[41] Miller, "How Musical Is Guitar Hero?" 107.

nor do they generally employ traditional Western instruments or notation (…) they nonetheless prompt players to master semiotic domains related to traditional musical pursuits, and to examine those relationships critically."[42] Pianolas, the "Little Smart Super Sound Works," and *Magic Piano* in their clear reference to keyboard instruments and the piano specifically, are undoubtedly ludomusical in their haptic designs, semiotic structures, the learning they promote, and the different kinds of pleasures they elicit. These three exemplars of ludomusical instruments as "The Piano(s) that anyone can play,"[43] emphasize and expand upon the ludic aspects of piano playing, resulting in wider enjoyment and accessibility of musical performance. While there has been a fair amount of focus on ludic practices and objects being musical, less focus has been put on practices and items which are already accepted as musical for how they are ludic. Work at the intersections of game studies, organology, sound studies, and ludomusicology have begun to recognize and study the ludomusicality of instruments, but there is still much area for growth.[44]

[42] Peter Shultz, "Music Theory in Music Games," in *From Pac-Man to Pop Music* (Routledge, 2008), 180.

[43] "The Passing of the Silent Piano".

[44] Cristina Guzmán Anaya, "On the Organological Potential of Video Games: A Preliminary Cataloguing Card Model for the Examination of Ludomusical Instruments," *Journal of Sound and Music in Games* 4, no. 3 (July 1, 2023): 53–86; Moseley, *Keys to Play: Music as a Ludic Medium from Apollo to Nintendo*; Miller, "Schizophonic Performance: Guitar Hero, Rock Band, and Virtual Virtuosity"; Dolan, "Toward a Musicology of Interfaces"; Shultz, "Music Theory in Music Games."

Chapter 2

Playing Games, Playing Music, Playing God:

Listening and Voicing in *My Singing Monsters*

My Singing Monsters is a game created originally for mobile device by Big Blue Bubble in 2012. The goal of this game is to collect and breed species of monsters who each sonically contribute to the musical environments of different islands. As the welcome screen says, the player is intended to "breed them, feed them, and listen to them sing!"[45] It is a very simple premise and seemingly innocent premise, but the gameplay actually relies upon and is emblematic of complex listening practices, and normalizes troubling social dynamics of sound and voice.[46] This chapter will explore what the game's three titular words first reveal; that the inhabitants of this game are defined by their lack of power and will, their musical vocality, and their monstrosity. These ideas are not only told to us, they are also shown and implied through the actual gameplay experience. These three facets of the game then provide the context needed for a discussion of how and if we can consider the monsters in *My Singing Monsters* to have voice(s), and how they are used.

After studying this game's particular relationship to voice, this chapter will show how gameplay dynamics of power and control can serve as a useful microcosm of larger issues concerning voice. In analysis of such a game, we gain further insights and examples of these

---

[45] *My Singing Monsters.* Big Blue Bubble. iOs. 2012.

[46] Some people have taken note of the powerless nature of these monsters, for example MattShea on YouTube titled a video of himself playing the game "I Enslaved Monsters and Forced them to Sing and Breed (My Singing Monsters)" and in the description wrote "The screams of the tortured sound an awful lot like singing to me". *I Enslaved Monsters and Forced Them to Sing and Breed (My Singing Monsters)*, 2021. https://www.youtube.com/watch?v=PB5638QD64Y. Accessed May 2023.

dynamics playing out in a scope that is more easily manageable than the human social world. I do not mean to "call out" this game; it is not bad, or unenjoyable. In fact it is quite a popular game, with the Google Play app store as of May 2023 showing that *My Singing Monsters* has over 50 million downloads, and a 4.8 star rating with 2.14 million reviews.[47] It also remains in the top 10 free games in the music category in the Apple app store despite being over a decade old.[48] The millions of people who have played this game of singing and subjugation likely feel no guilt for exerting their godly will upon these innocent monsters, and it is not to say that they necessarily should in this context. *My Singing Monsters* is not responsible for our listening practices or our relationships to the idea of voice, however it does have a way of highlighting them if we decide to look/listen.

It paradoxically seems obvious to say that a being which sings must have a voice, but also that a collection of pixels in the shape of a cartoon monster cannot really have one. When it comes to wondering whether these singing monsters really *have* voices, and how voice may be used in the game overall, there are actually multiple ways to ask and answer such questions. Voice as a term can have many different ambiguous meanings, but there are three main ones which will be examined in relation to this game. These will be voice as the differentiated musical parts within a piece, voice as the emblematic sound of a particular being, and last but certainly not least voice as a sign of will and agency. These will be discussed and defined in more detail later in the chapter, but it is first necessary to gain a deeper understanding of the gameplay environment to truly understand how to analyze the types of voice present within *My Singing Monsters*.

[47] "My Singing Monsters - Apps on Google Play." Google Play. Accessed May 6, 2023.
[48] "My Singing Monsters," App Store. Accessed May 6, 2023.

These creatures' identities are primarily based around their voices and musical output, and yet they reap none of the benefits of having a voice. The monsters' possession of voice is an illusion created by the player/listener, and this illusion carries implications outside the scope of the game. This is not merely a question of where the sounds materially originate or who they belong to. One could argue that the sound attributed to the monsters 'really' comes from the speakers within your mobile device or headphones, i.e. the hardware. Or perhaps on an even deeper level the sound originates in the encoded digital information, i.e. the software that the game runs on. Additionally, one could reference the sound recordings which are assigned as the in-game monsters' voices as their true origin. I will not pretend that these "behind the scenes" aspects of the game do not exist or can't be important subjects of study, but they are not able to assist in the method of inquiry this chapter will be attempting, at least not as a focus.

As Nina Sun Eidsheim discusses in her book *The Race of Sound*, "it is not possible to know voice, vocal identity, and meaning as such; we can know them only in their multidimensional, always unfolding processes and practices, indeed in their multiplicities."[49] There is not an unequivocal locus, meaning, or identity behind voice, in human interactions or in this game. We like to assume that we can hear truth in a voice, that it speaks from someone's soul, and tells us their gender, age, where they come from, etc. It is not to say that these features do not have possible linguistic signifiers, but it is a combination of performance or programming and perception which creates that 'voice'. Along these lines, I also do not want to fall into a trap Eidsheim describes whereby one dismantles a perceived incorrect interpretation of a voice or

[49] Nina Sun Eidsheim. *The Race of Sound: Listening, Timbre, and Vocality in African American Music*. Refiguring American Music. (Durham, NC: Duke University Press, 2019), 3

vocal event only to then reassign it a new, "more correct" interpretation, which just brings a new set of imposed cultural listening baggage with it.[50]

It is necessary to acknowledge the multiplicity and experience-based nature of voice, and to meet *My Singing Monsters* on its own terms. The player is assigned a semi-omnipotent role in relation to the monsters, and thus the game here will be discussed also as an experience of power dynamics and perceptual assumptions. Steven Feld coined the term acoustemology, a combination of the words acoustics and epistemology, to "theorize sound as a way of knowing. In doing so it inquires into what is knowable, and how it becomes known, through sounding and listening."[51] Feld uses terms such as contextual, experiential, and relational to describe the production of knowledge through sound, and I argue that the suitable way to discuss ownership of voice in an analysis of this game is on these terms. Truths and insights are found not just as simple, solid answers to questions, but in *how* this information is known, and specifically in this context how it is known through sound.

With this game players are from the beginning given an answer to where the voices are coming from. We do not open the app to find a blank screen playing us strange looping sounds, leaving us to wonder what they are and where they are coming from. We are presented with characters called monsters, and we are both told by the game's instruction prompts and made to experience for ourselves that these monsters are expressing musical sounds. The monster designs often feature humanoid mouths, hands, or other familiar mechanisms of music-making or vocalization, which further solidifies our perception of these fictional creatures "making" sound. Though the attribution of voice to these monsters is likely not as strong as the illusion of

[50] Eidsheim, *The Race of Sound*.

[51] Feld, Steven. "Acoustemology." In *Keywords in Sound*. (Durham, NC: Duke University Press, 2015), 1.

attributing voices to certain people and identities in everyday life, given the level of suspension of disbelief that players would naturally bring to a game it is unlikely that a player (as opposed to an academic analyst perhaps) would consciously question the validity of this attribution.[52] However this does not mean that there are not still perceptual politics at play and that the player can't be on some level surprised at the monsters' voices, which I will discuss more later in this chapter. In summary, as Eidsheim succinctly writes, "Voice's source is not the singer; it is the listener".[53] This holds true as we see that the monsters are attributed voices *via* the players' perceptions, and we will see this to be even more true as we dig further and find that the players of this game hold an even more disproportionate amount of control than standard listeners.

"My"

The title of this game at the outset assigns an explicit power relationship between the player and the game's inhabitants. It is not a coincidence that the game is not just titled "Singing Monsters." Assigning player ownership over a game or game world is a common and important part of mobile gaming, which we can see in other popular mobile titles from the early 2010s. *Pocket God* (2009), *Pocket Frogs: Tiny Pond Keeper* (2010), *Tiny Zoo Friends* (2011) and of course *My Singing Monsters* (2012) are just some of the games which come to mind when I think of my childhood playing mobile games in that time period. It is notable that these and many other games for mobile-device use contain words like "pocket", "tiny", "my" or "mini" etc. in their titles. These words tap into the fact that mobile devices are small, able to be carried on

[52] It also is true that we to a certain extent perceive technologically-produced voices in the same ways that we perceive standard human voices, in the sense that we make assumptions of things like gender, age, and emotional state based off of both types of voices.
Nass, Clifford Ivar, and Scott Brave. *Wired for Speech: How Voice Activates and Advances the Human-Computer Relationship. Computer-Human Interaction.* (Cambridge, MA: MIT Press, 2005).
[53] Eidsheim, *The Race of Sound*, 9.

your person, and thus exist under your ownership more than practically any other piece of technology. Mobile devices have colloquially become known as extensions of ourselves,[54] and mobile games quickly tapped into the novel idea of having whole worlds available at your fingertips, and kept within your pockets. Many of these games are based on the act of collecting, whether it be collecting frogs, zoo animals, or monsters. This style of gameplay, as opposed to more narrative-based or spatially and temporally immersive gameplay, requires much less work in terms of game design, it allows the player to pick up and put down the game at will without much affecting game progress, and it puts the player in a unique situation where they can play god with little to no perceived consequences.

So once someone actually begins playing the game, how do they perform this ownership and control over the monsters? By downloading and opening the game, we bring our version of the game world into existence. We open and close the game at will–as an extreme example I personally opened the game only a handful of times in the decade between being an avid player and beginning this analysis–all the while the monsters are theoretically just lying in wait to be able to sing/exist again. Once the game is open, we are guided by the built-in game prompts but it is ultimately up to the player to choose when to buy or breed monsters. Once monsters are bred, they can be incubated, and then they can be placed on the respective islands. However, none of these steps are automatic, and after breeding and incubating, the player has the choice to sell the monster eggs instead of bringing them fully into being. The monsters who do happen to be created and placed on an island then begin singing. What they sing on each island is predetermined, looping, and almost entirely unchanging. They have no choice on whether they

[54] Morgan Quinn Ross, and Joseph B. Bayer. "Explicating Self-Phones: Dimensions and Correlates of Smartphone Self-Extension." Mobile Media & Communication 9, no. 3 (September 1, 2021): 488–512. https://doi.org/10.1177/2050157920980508.

sing, what they sing, when, and for how long. This is not just because the sounds were pre-recorded and built into the game, but again because of the power relationship the game creates with the player.

There are a few methods by which the music can change, and they all rely on the players' decisions. The player can choose to individually mute monsters, which is surely the ultimate display of power aside from just breeding new monsters and selling/deleting existing monsters altogether. The monsters automatically begin singing when they are borne unto an island, and if they are muted they remain silenced until when and if the player chooses to or even remembers to manually unmute them. A player can also buy a few structures to place on the islands: for instance, a structure called a "Time Machine" allows players to "warp" time. This is presented as a way to change the tempo of the song on the island, though it warps the islands' time cycle as a whole, so the monsters speed up both in sound and in their movement animations, and their voices become higher pitched. There is also a Recording Studio, which allows players to record "real world" sound to replace the sound that emanates from chosen monsters. This structure was introduced to the game for iOs in 2014 (and is currently still not available for the Steam version of the game), with its description reading "Prolonged contact with the human universe has spurred the invention of the magical Recording Studio!"[55] There is not really a gameplay incentive to use this structure, though, especially if the player enjoys the original music from the monsters on that island. But if chosen to be used, then not only would a monster be forced to sing in the ways previously described, but it would be directly dictated what to sing by the player.

[55] *My Singing Monsters.* Big Blue Bubble. iOS. 2012.

Lastly comes an even later addition to the game: the Composer Island in 2016. Instead of a player recording their own sound to overwrite the monsters' 'voice' (meaning the signature sound the creature outputs) like with the Recording Studio, this island allows a player to make specifically musical arrangements using the monsters' original sound banks. The player is presented with a musical staff where they can place notes at certain pitches within a 15 semitone range and also control duration of notes (aside for some percussive monsters for which duration change does not apply). The musical part for each individual monster must be monophonic, meaning multiple notes cannot be placed vertically above or below each other on the staff. The player can also control key signatures and time signatures to certain extents. The potential for creative freedom is of course limited as it is still a game meant for casual use and accessibility by children, and this limited freedom only exists on the one Composer Island, not the 22 other islands (27 if you count mirror islands) which currently make up the game. In this main version of the game as well, you must pay diamonds, a very valuable in-game currency, to create more than one song. A separate spin-off game released in 2018 called *My Singing Monsters: Composer* expands upon the ideas of Composer Island with even more compositional possibilities, but that game would require its own experiential analysis outside the current scope of this chapter.

The structures discussed here which have been released during the ongoing lifespan of *My Singing Monsters* show that with increased popularity of the game, the power over the soundscape of the islands has been shifted not only away from the monsters and from the game itself, but even more towards the individual player. The player of this game is not just listening to the monsters in the passive sense, but exerting ownership over and manipulating the monsters individually and the game world's sonic environment as a whole. This is made possible by man-

made technologies both behind the game and within the game's fiction, which are not only used towards an end of sonic voyeurism, but even further and more unsettlingly toward sonic enslavement. The specific sonic nature of this subjugation separates *My Singing Monsters* from some other similar games in that it is revealing of not only how people assert power over things like plants and animals, but how humans knowingly or unknowingly assert control over other humans via music, voice, and sound.

"Singing"

How do we know that the monsters are singing, and why does it matter? Well, of course the game tells us that they are singing, but in many cases we also hear a very familiar sound of human-voiced singing coming from the monsters. We also often see familiar visual signifiers of voicing in the monsters' design. Most if not all of the monsters with humanoid voices (and even most that emit other types of sounds) have visible mouths which move as the monsters emit their music. From a player's perspective here we could say that if it sounds like it's singing, and it looks like it's singing, then it is singing. It is interesting to note, however, that the game is specifically titled *My "*Singing" *Monsters* despite the monsters making all sorts of musical sounds, vocal, instrumental, and otherwise. For the sake of alliteration the game could theoretically have been called something like *My Music-Making Monsters*, but instead the game developers decided to attribute the concept of voice to all of the monsters no matter what material sound they emitted.

It is also valuable to note that this game has the monsters singing and making music, as opposed to otherwise vocalizing (i.e. speaking). This way the monsters' output is able to loop easily, and the game and the monsters don't have to be actually communicating anything new to the player. Some of the monsters sing nonsense syllables such as "hey na na", "bum", "doo", "la

la", etc. There are a few exceptions to this, including Brump on the Wublin island who repeats the short sentence "We got the Wublins," but I primarily feel compelled to mention the Werdos. The Werdos are four Legendary monsters–Parlsona, Tawkerr, Maggpi, and Stoowarb–added to the game between 2017 and 2020 who sing full intelligible song lyrics and are available on the five original Natural Islands (Plant, Cold, Air, Water, and Earth islands). The song lyrics are fun and sometimes even intriguingly existential, but here is where the subject of looping is once again relevant, because whatever information the lyrics could signify as poetry separate from the game is functionally transmuted into musical rather than linguistic meaning by nature of its repetition (and because the game tells us that the goal of the game's sound are to be heard musically/aesthetically, not as verbal discussion). As the sounds loop, our focus shifts and the sound increasingly becomes an object for aesthetic appreciation. The Werdos are subjected to the same gameplay fate as all the other monsters,[56] so their state of vocal agency is not really changed by the fact that their vocalizations include sounds with semantic meaning to English-speaking players.[57]

It is also relevant that the Werdos were added to the game quite a few years into its existence, and even still are quite difficult to attain for new players, so they are not as universally experienced by players as many of the other monsters might be. Their very name implies a portmanteau of "word" and "weirdo", suggesting that even if they functioned on a different level than the other monsters, it would be as exceptions to the behavioral rules, not as a way to throw a wrench into the whole previously existing power structures of the game. The narrative structure of this game is very loose, and the game mainly consists of ritual clicking actions to breed, feed,

[56] With one interesting exception being that the Werdos' voices cannot be recorded over in the Recording Studio.

[57] A game like *My Talking Tom*, another extremely popular title from 2013 whose main feature is that a user speaks into their device's microphone and Talking Tom repeats it back in a silly voice, makes clear that a game creature emitting verbal sounds in itself does not imply vocal agency either.

and place monsters, and aesthetic–rather than explicitly referential–appreciation of sounds and singing. Analyses that may be attempted in relation to this game and others like it are not necessarily altered by every exceptional addition to a game, especially if the way that most players actually experience the game world has not changed, or does not change until they have already made a lot of progress and spent quite a bit of time within the game world in its original state.

"Monsters"

Monstrosity can imply that the creatures are extraordinary in size, extraordinarily ugly, aberrant from some natural form, have the appearance of an already known monster, or otherwise seem strange or wrong. The monsters in this game all certainly fit at least one of these categories visually. The main categories of inspiration for the monsters' visual designs are humans[58]/human body parts,[59] animals,[60] musical instruments,[61] plants,[62] or pre-existing types of monsters.[63] They also often incorporate things like genre signifiers,[64] jobs/activities,[65] materials,[66] and more as part of their designs. And of course, the designs usually incorporate more than one of these elements, plus an extra creative twist to make them unique to the game. The mish-mosh appearance most of the monsters have strongly contributes to the aesthetic of monstrosity. Some less referential and more strange designs have appeared on new islands,

[58] i.e. Shugavox, Boodoo
[59] i.e. Maw, Toe Jammer, Theramind
[60] i.e. Fwog, Pango, T-rox
[61] i.e. Reedling, Bowgart, Quiddler, Thumpies
[62] i.e. Potbelly, Oaktopus, Shrubb
[63] i.e. Mammot, Cybop, Wisp
[64] i.e. Riff, Shugabush
[65] i.e. Deedge, Pompom
[66] i.e. Quarrister, Jeeode

especially with 'rare' versions of monsters released in more recent years, but they of course remain monstrous. The referential nature of the majority of monster designs highlights the aberrance-from-a-norm meaning of monstrosity. They remind us of familiar categories of living or nonliving things, but then subvert those categories in sometimes cute, often grotesque ways (in this way the game is eerily reminiscent of Heironymous Bosch' depiction of hell in his painting *The Garden of Earthly Delights*).[67]

The monsters also convey this sense of uncomfortable incongruence sonically/vocally. Though I stick to the premise that the player situationally perceives the voices and sounds as belonging to the respective monsters, this does not mean the player can't be conscious of how those voices fit or don't fit visual expectations. Humans make assumptions about voices via appearance or vice versa in the real world, so of course we do this in reference to characters in our game worlds as well. These assumptions often relate to categories like gender, age, race, health and other perceived markers of identity. In human-to-human relationships these assumptions can carry harsh consequences, and also be very difficult to confront. When a player hears a human-sounding voice emanating from a potted plant, or a bird, or a blue blob with toes all around its circumference, they could understandably be surprised. But since part of our perceived identities of those three beings is that they are monsters, we are more willing to accept the incongruousness we feel about their vocal timbres.

Nina Sun Eidsheim and Schuyler Whelden write about the tension a listener feels when their assumptions of a person's vocal timbre don't line up with their perceived visual identity specifically in terms of race, and they call this the timbre-race disequilibrium.[68] With this game

---

[67] Heironymous Bosch. *The Garden of Earthly Delights.* 1490-1510. Oil on oak panel. *Museo del Prado*, Madrid.

[68] Nina Sun Eidsheim and Schuyler Whelden. "'Where Were You When You Found Out Singer Bobby Caldwell Was White?': Racialized Timbre as Narrative Arc." In *The Oxford Handbook of Timbre*, edited by Emily I. Dolan and Alexander Rehding. (Oxford University Press, 2021). https://doi.org/10.1093/oxfordhb/9780190637224.013.29.

as a model, I would say that when we feel a dissociation between timbre and expected identity, this is a way of monster-izing the subject of our listening. We are perceiving their voice and body or identity as being aberrant, and not fitting into our mental schema of who and what they are or should be. The consequences of our listening practices and assumptions aimed towards this game's creatures are of course not as harsh as when they are aimed towards other human beings, but the actual perceptual process is surprisingly similar, and the effect is much like the timbre-race disequilibrium. A dark parallel could even be drawn between the power dynamics of performing and listening involved in this game and those involved in the practice of minstrelsy, with the idea of a singing act being put on under a curated performative identity for the pleasure of more-empowered listeners, and that performed identity being perceived as aberrant, monstrous, and othered. Assumptions of gender are also extremely salient within *My Singing Monsters*, with many of the monsters emanating voices which fit into the commonly assumed[69] binary of gendered voices and those monsters often having visual designs which correlate to those assumed identities. Pompom for example is designed to look and sound like a bubblegum-pink female cheerleader, in a way caricaturing femininity and calling it monstrous.

Importantly, in the real world if somebody has a voice which is not immediately identifiable as fitting into one side of the assumed gender binary, or if someone perceives their voice as not matching their visual appearance, the vocalizer is often treated as monstrous. Another term coined by Eidsheim is her 'listening to listening' methodology,[70] describing the need to listen to/analyze how we listen to and perform voice, instead of just listening to a source and trying to identify it the most accurately. Becoming aware of the way we project aberrance,

[69] Stephan Pennington. "Transgender Passing Guides and the Vocal Performance of Gender and Sexuality." In The Oxford Handbook of Music and Queerness, edited by Fred Everett Maus and Sheila Whiteley. (Oxford University Press, 2022).
[70] Eidsheim, *The Race of Sound*, 22.

monstrosity, other-and-wrong-ness, etc. onto people for not confirming and conforming to our expectations is a vital form of listening to listening practice outside of the game world as well.

Voice in *My Singing Monsters*

Now that we have a clear idea of the influences coming at a player of this game as well as coming from them, we can hone back in on a specific discussion of voice within the game. I propose three ways of using the word voice in relation to this game. Possibly the simplest way, which the monsters get as a freebie, is to refer to the different musical "parts" which layer together to create a musical piece. The sounds the monsters make are explicitly musical, all of the monsters are called "singing" monsters no matter what type of sound they emit, and the main goal of the game is stated to be filling out the musical soundscapes of the different islands, so we can indeed say the game presents the monsters as the different 'voices' of the songs.[71] The simple attributions of the word voice to the game end here, though.

Possibly the most common usage of the word voice would be to refer to the sounds produced by humans or other animals from their vocal organs, or "sound produced by *and characteristic of* a specific person/animal".[72] Do the monsters have this kind of voice? At the beginning of this chapter we dealt with the fact that, while materially the cartoon monsters made up of pixels on a screen are not living beings with control of their bodies and sound production, the player acoustemologically attributes the heard sounds to individual monsters. However, we have also throughout the title-based analysis sections confronted Eidsheim's formulation that

[71] "Song" is a word which can have a very specific meaning for musicians/music scholars etc. but it is also used casually in a more general way. *My Singing Monsters* uses this term to refer to the musical pieces on each island so it will be used in that way here as well.

[72] Amanda Weidman. "Voice." In *Keywords in Sound*. (Durham, NC: Duke University Press, 2015), 1

"Voice's source is not the singer; it is the listener",[73] as well as the amount of power either the monsters lack or the player holds over the in-game voices. If a human's voice is sourced to the listener, then the monsters' voices are even more strongly sourced to the listener as player/omnipotent game-owner. So if we are 'listening to our listening' we can say that the monsters are in a way granted voices, but only via the player and the way they attune to the monsters and the in-game sounds, not as inherent ownership.

This brings us to a third meaning of voice, probably the most intriguing and relevant one to this game, that being the idea of voice as a possession of agency and power in relation to a lived world. In the "Voice" chapter of the book Keywords in Sound, Amanda Weidman writes that "Attributing voice to nonhuman entities (…) is a powerful way of making them intelligible, of endowing them with will and agency".[74] This implies that the idea of possession of voice being the same as possession of agency is a linguistic trick, an illusion, stemming from our urge to pretend our top-down interpretations are actually bottom-up expressions of truth from the objects/beings we are discussing or perceiving. In the case of this game, any agency that the monsters might be perceived to have is definitely an illusion, whether we look at it materially or situationally. Though the game and the player attribute voice to the monsters, almost nothing about the gameplay practices give validity to the possibility of the monsters having will or agency over the usage of their voice, particularly not in terms of speaking any truth to power.

In any case, the monsters do not seem to have any agency over themselves or their voices. For example Eidsheim discusses voice as an ongoing performance which is informed not only by a listener's perceptions but by a vocalizer's listening and self-editing. The assumptions

[73] Eidsheim, *The Race of Sound*, 9
[74] Weidman, "Voice.", 1.

and perceptions the listener/player imposes on the monsters are salient in this game, as are the culturally referential identities given to the monsters in their auditory and visual designs, but one portion of this 'ongoing performance of voice' which is missing is the self-monitoring. The monsters, unlike living vocalizers, do not have the ability or urge to change anything about their sound production based on how it is received by others. Changes can be enacted by game producers after receiving feedback (such as the addition of new themed islands or monsters, or the invention of the new structures), and they can be enacted by the player (such as muting, recording over in the recording studio, or altogether selling a monster if their voice is experienced and not enjoyed), but the monsters don't functionally hear themselves or each other. The monsters are locked into an unheard metronome, this being the time structure built into the game. Let's say a monster's singing part lasts for only the first quarter of the whole song loop. No matter if that monster is singing with a full group or a capella due to the player getting trigger happy with the mute buttons, it will always sing the exact same thing at the exact same time. No part of the methods by which it does this include hearing or listening to the other monsters. We also know through the fact that the monsters exhibit looping musical sounds but do not communicate information with the player that the player does not situationally perceive the monsters as having personal will or agency either. It seems safe to say that voice as agency is something that in this case is an illusion, if not explicitly nonexistent.

Nina Sun Eidsheim writes in "Sensing Sound" that we tend to reduce sound and sound events to simple signifiers, which is helpful in terms of navigating the world but "it is nevertheless important to be constantly aware of the ways in which shifting forces and dynamics

of power inscribe themselves onto the perspectives and processes of this reduction".[75] Our listening practices are not without consequence in the human world, and the ways in which we actively respond to voices and sounds certainly are not either. We can at different times or all at once have the power to listen, to voice, to silence ourselves or others, to encourage or control new sonic outputs, or to misinterpret sounds to dangerous ends. Eidsheim also points out that we look for certainty and knowability from sounds and their possible meanings and categorizations, and thus this ossification of the concept of sound trickles on to the concepts of voice and music as well. She encourages the conception of sound, music, and voice as not static objects but as relational and dynamic events which would be best understood not through nouns but through verbs such as singing/listening. *My Singing Monsters*, by nature of being a game, presents a different way of interacting with sound than attending a concert, listening to voices and sounds you walk by on the street, or having a conversation for example. It is an explicitly power-based experience, in a way that we feel comfortable with and in fact entitled to as players. Exerting power as listeners over our perceived sources of sound is of course not unique, hence a necessity for continued work illuminating such relationships and practices.

This chapter is about singing cartoon monsters in a game primarily played on peoples' phones. The game is undoubtedly silly, lighthearted, and not something that really stands out as unusual or problematic to most people. But this at first innocuous game can serve as a microcosmic case study of our behavior towards voice, sound, and music on a larger scale. The power we exert as listeners is made explicit via the inherent relationship between a game and its

[75] Nina Sun Eidsheim. *Sensing Sound: Singing and Listening as Vibrational Practice*, 2015. https://doi.org/10.1215/9780822374695, 2

player/owner. In fact it is the main pull of this game, and our job is to play god over creatures who we otherize as monsters and whose identities are based around being sonic beings. The meanings we are made to interpret from these sounds are limited, namely musical (harmonic, rhythmic, timbral) and character identity-based. Of course performance of and perception of things like gender, race, class, etc. are extremely complicated and consequential in our real-world listening practices, whereas this game only explicitly asks us to listen for caricatured creatures singing us a cute little song. Thinking deeper about what is going on (doing Eidsheim's listening-to-listening) is not explicitly asked of the player, but if attempted it can yield very valuable results. The simplicity of what the game requests of players/listeners as well as the conceptually voice-rich game environment can actually make it an accessible and understandable example of our sonic privileges, power, and assumptions, and we can thus use it to help conceptualize and critique these practices as they are enacted in the 'real' world.

Chapter 3

From the 1800s to 8-bit:

Music Boxes and Chiptune

The first time I arranged a piece of music to be played on a music box, it was a tune called "Sea Shanty 2" from the online role-playing game *RuneScape*.[76] It is a fan-favorite, extremely catchy, and simple enough to be manageable within the limited capabilities of a 15-note DIY music box that I got for around $20 on Amazon. From then on I experimented with arranging several other tunes, finding success with pieces such as "Castle Cornelia" from *Final Fantasy*, the "Palace Theme" from *Zelda II: The Adventure of Link*, and the original theme music from *Tetris*. I hadn't done it on purpose, but upon reflection I realized that almost every tune I successfully arranged was from a video game. Within this I also noticed a particularly strong presence of music from the chiptune or 8-bit era of early video game music. As someone who pays a fair amount of attention to video game music, my academic and personal interest may have played a role, but as I will argue throughout this chapter I do not believe this connection to be a mere coincidence. With this chapter I aim to explore cultural and medial connections between chiptune and music for mechanical music box.

I will begin with music boxes, focusing on how they work, their inextricable link to concepts of childhood and nostalgia, and what it means to create new work for such a device. Then I will discuss how video game music and chiptune in particular carry almost identical associations and also operate quite similarly to music boxes in terms of musical structure and

[76] My digital arrangement of "Sea Shanty 2" for music box: LINK.

limitations. I will use my own experience arranging video game music for DIY mechanical music box to aid in illuminating this connection. Finally these threads will wrap up with the sentiment that arranging/composing for music box or chiptune today is an impressive way of playing with nostalgia by creating anew within technological and conceptual constraints.

Music Boxes

First I will briefly describe the types of music boxes circulating in the last three centuries in order to contextualize a music box that is available still today as an easily accessible sound-producing object. Music boxes are part of a long genealogy of mechanized music, and thus are related to a range of musical machines including carillons, barrel-organs and musical clocks, from the 16th-century water organs to 18th-century singing automata, and so forth. [77] Within such narrative, music boxes occupy a smaller time frame, stemming from musical clocks and snuffboxes and evolving into standalone musical boxes in the early 19th century, and then becoming common and affordable household items by the later end of the century.[78] Within the broad history of mechanical music there have been not only many different instruments but multiple different methods of storing and encoding musical information for playback. All systems of notation, recording, or playback are in some way imperfect, unable to convey certain patterns or potential aspects of a sound. But not every notation system or musical technology necessarily needs to be able to realize every possible aspect of a sound. This chapter will focus

---

[77] Ellen M. Snyder-Grenier, Murtogh D. Guinness, and Morris Museum of Arts and Sciences, eds., *Musical Machines and Living Dolls: The Murtogh D. Guinness Collection of Mechanical Musical Instruments and Automata ; [Catalog of a Permanent Exhibition in the Morris Museum, Opened on Nov. 3, 2007]* (Morristown, NJ: Morris Museum of Arts and Sciences <Morristown, NJ>, 2011); Arthur W. J. G. Ord-Hume, *Clockwork Music; an Illustrated History of Mechanical Musical Instruments from the Musical Box to the Pianola, from Automaton Lady Virginal Players to Orchestrion* (New York: Crown Publishers, 1973); Annette Richards, "Automatic Genius: Mozart and the Mechanical Sublime," *Music & Letters* 80, no. 3 (1999): 366–89.

[78] Ord-Hume, *Clockwork Music; an Illustrated History of Mechanical Musical Instruments from the Musical Box to the Pianola, from Automaton Lady Virginal Players to Orchestrion*, 66-67.

on musical limitations presented by the methods of programming and playback in music boxes and in chiptune, but also remain aware that these two types of music in certain ways move beyond these "limitations," creating iconic and culturally meaningful sound worlds of their own.

This chapter will cover three main methods by which music boxes encode and reproduce music, in the form of a cylinder, disc, or paper roll. It is relevant to discuss these slightly different modes of music box design because the physical capabilities of and materials used in music boxes' designs affect not only the overall sound and timbre of the instrument but also how a programmer/composer/arranger would interact with the instrument and what musical decisions they might make. The most common way of encoding musical information for a music box (namely pitch and temporal location) is as protrusions or pins on a metal cylinder. When turning on its long axis, the cylinder's protrusions will pluck a set of contiguous metal tines, tuned to precise pitches. Another method stores the musical data on a flat metal disc rather than a cylinder. Perforations made to the metal disc result in many tabs of metal sticking out on the underside, which similarly pluck the teeth of a metal comb as the disc rotates. In both of these cases (as noted in Chapter 1), the length and density of musical information were limited by circumference, though this issue could often be circumvented by removing and replacing the cylinders/discs with others programmed for different pieces or subsequent movements of a longer musical work. The type of music box common today, though, would most likely contain one non-exchangeable metal cylinder and therefore only be able to play one pre-determined tune. Aside from cylinders and discs, a third method of storing musical information resembles that of the player piano in that the music is stored as holes punched into rolls of paper. Besides being easier to reproduce, store, and disseminate, the paper rolls are inherently interchangeable and

also much less limited in terms of duration, though in being a lightweight material like paper these rolls did sacrifice a bit in terms of durability.[79]

While the specifics of how the music is encoded may differ, these three types of music boxes are similar in terms of how sound is physically produced. There have been some forms of musical boxes which included the ringing of bells or striking of glass rods in their inventory of sound-producing actions, however the music boxes I am discussing in this chapter all produce sound via the plucking of the tuned teeth of a metal comb. In the parlance of organology they are all plucked idiophones, or more specifically lamellophones, referring to the fact that the comb has many individual limbs (lamellae) stemming from one connected piece of material, and that these are plucked to produce sound.[80]

Music boxes are in multiple ways referential to times gone past. In their functional design they are reminiscent of the era of mechanical innovation which popularized them, and in their conceptual associations they are linked to individual and collective childhood memories and nostalgia. As is written in the description of a music box listing from Kikkerland Design Inc., "The charm of a music box still lingers to this day."[81] Music boxes are connected to a literal historical past and to direct or indirect memories of that past, and they are also connected to imagined pasts. I will now discuss the association of music boxes with childhood in terms of the

---

[79] Images of cylinder, disc, and paper-roll music boxes can be seen at these links:
Cylinder Musical Box "Two per Turn," 2017, https://www.youtube.com/watch?v=4V6KBcEJjro.
Interchangeable-Disc Music Box | Instrument Demonstration, 2020, https://www.youtube.com/watch?v=SUMakTB1FeA.
"What Is a DIY Music Box? - Music Box Guides," accessed April 23, 2024, https://musicbox.fun/guides/diy-music-box.

[80] Erich M. von Hornbostel and Curt Sachs, "Classification of Musical Instruments: Translated from the Original German by Anthony Baines and Klaus P. Wachsmann," *The Galpin Society Journal* 14 (1961): 3–29, https://doi.org/10.2307/842168, 16.

[81] "Make Your Own Music Box Kit," Kikkerland Design Inc, accessed April 13, 2024, https://kikkerland.com/products/make-your-own-music-box-kit.

sonic timbre of the music they produce, the types of musical pieces that are usually chosen to be played, and the ways in which users interact with the music box and its design.

Timbres, Tunes, and Tactility

One of the most iconic and identifiable features of a music box is its distinct timbre. Whether operated by cylinder, disc, or paper roll, the signature sound of a music box is generated by the plucking of the tuned teeth of a metal comb within a small resonance chamber (if any). It is this sound, even more than the object itself, that has been consistently used as a point of cultural reference: the soft metallic twinkling which unfailingly conjures the innocence and ephemerality of childhood. Such conjuring power has been consistently exploited in audiovisual media as the sound of a music box is such an efficient generator of affect, whether a cute and innocent form of nostalgia or, unempathetically, horror.[82] There is something about the very materiality of this type of sound which has become representative of childhood: a number of instruments meant for children or otherwise as toys have this metallic, staccato sound to them, like the glockenspiel or the "toy piano." The durability of metal parts plays a role, as well as their consistent quality of sound and the ability to create this sound in physically simple ways such as striking a metal bar, ringing a bell, plucking a lamella. Whatever the original practical reasons for selection of these materials for children's musical objects, by today the association between twinkling metallic sounds and childhood (at least in Europe and North America) has been cemented and is employed in a variety of contexts.

Whether recorded from a physical mechanism or composed using a digital sound library, music box sounds have been frequently utilized in audiovisual media such as film and video

[82] Michel Chion, *Audio-Vision: Sound on Screen* (Columbia University Press, 2019), https://www.jstor.org/stable/10.7312/chio18588.

games.[83] As mentioned above, the sound of a music box is associated with the affective sphere of childhood and nostalgia; for example in the animated film *Anastasia* (1997) a music box containing a specific lullaby plays a pivotal role in jogging the memories of and reuniting Anastasia and her grandmother. In addition to being used to evoke memory in pleasant or bittersweet ways, the strength of the bond between music boxes and childhood is further proven by how often it is employed ironically to subvert feelings of familiarity or innocence and make a listener feel ill at ease. For a thorough examination of the relationship between children, music/sound, and the horror genre in film, find for example Stan Link's chapter "The Monster and the Music Box: Children and the Soundtrack of Horror" in *Music in the Horror Film.*[84] The use of music boxes and other children's music making in horror film trailers is also discussed in Nick Redfern's "Sound in Horror Film Trailers."[85] This now-common trope also extends past films and film trailers into other forms of media, and I will now dive into a specific example of the use of the music box to create an affective atmosphere of horror via connotations of childhood in a video game.

Five Nights at Freddy's is a virally popular point-and-click game in the survivor horror genre, where you must survive five nights as the night guard at a pizza place against its homicidal animatronic mascots—with some of the specific gameplay mechanics and plot points changing throughout the game's sequels. With the setting of a pizza place which appears to be primarily used for children's birthday parties and lore that involves the murder of children and subsequent possession of animatronic mascots, *FNaF* is a prime example of the use and

[83] For example, Spitfire Audio includes the music box in its sample library: "LABS LABS Music Box," accessed April 13, 2024, https://labs.spitfireaudio.com/music-box.
[84] Stan Link, "The Monster and the Music Box: Children and the Soundtrack of Horror," in *Music in the Horror Film* (Routledge, 2009).
[85] Nick Redfern, "Sound in Horror Film Trailers," *Music, Sound, and the Moving Image* 14, no. 1 (2020): 47–71.

subversion of childhood to create a nostalgic but terrifying media environment. In the context of this chapter the use of animatronics is also very interesting, due to the close relatedness in mechanics and historical origin between mechanical instruments and automata. These associations are highlighted in the original game if the player allows the building's power to completely run out, leaving themselves without control of lights, cameras, or doors and therefore with no way to defend themselves. In this occurrence the player sits in darkness as all background electronic noise (which has likely gone unnoticed up to this point) fades out to silence. Then the sound of a music box rendition of the Toreador Song from Bizet's *Carmen* begins to play, as animatronic eyes flicker on and off in the corner of the screen. The amount of time the music plays for varies each time the game is played, but at some point the music is abruptly cut off, there are a few more seconds of complete silence and darkness, and then the titular animatronic character Freddy Fazbear jumpscares the viewer and the screen cuts to static.[86] The choice of music here appears to be not specifically tied to the actual tune (the Toreador Song) as much as to the association of the music box timbre the children and the horror genre, as well as a sense of acousmatic terror that both humanoid automata and mechanical musical instruments may operate on their own accord. The classic children's toy Jack-in-the-box is a great encapsulation of this suspenseful experience, and it is referenced even more explicitly in this game's sequels.

The music box is foregrounded as an object in subsequent games in the series, first appearing in *Five Nights at Freddy's 2*. In this game a music box is located in a room named "Prize Corner" playing Henry Clay Work's 1876 song "My Grandfather's Clock," and the player

[86] Compare: *Five Nights at Freddy's 1 Power Runs Out (Jumpscare Warning)*, 2021, https://www.youtube.com/watch?v=w0h4YNI_aHI;
Shortest Freddy Power Outage Attack in FNAF 1, 2022, https://www.youtube.com/watch?v=rsqM8wH52rg.

must consistently wind back up the music box (by clicking a box on the screen that says "Wind Up Music Box") so that the music never stops playing. If the music box is left to wind all the way down, this will trigger an animatronic known as The Puppet or The Marionette to find and kill the player. In the lead up to this attack, the game music switches to a fast-paced rendition of "Pop Goes the Weasel," aptly referring to the experience of playing with a Jack-in-the-box wherein a child pleasantly churns out a tune on their mechanical toy/instrument only for it to unavoidably result in a jumpscare by a puppet.[87] These two examples show that the music box' timbre is its primary method of evoking childhood (and whatever may come with that evocation), but that specific choice of tunes can also play a role, as well as incorporating the familiar action of winding up a mechanical musical toy.

An important counterpart to the timbre of a music box is this choice of repertoire, or as I named it in the header of this section, the tunes. Music boxes are usually associated with lullabies, such as Brahms' "Wiegenlied" or "Once Upon a December" from the movie *Anastasia*. Today they also often feature childhood favorite tunes from Disney or Studio Ghibli movies, or from other nostalgic films like *The Sound of Music* or the *Harry Potter* series. Other types of songs one would likely hear from a music box would be nursery rhymes or folk songs such as "You Are My Sunshine" and "Greensleeves," as well as select tunes from classical music repertoire which have today become associated with childhood.[88] Beethoven's *Fur* Elise and Tchaikovsky's *Dance of the Sugar Plum Fairy* are recognizable examples, the latter of which also which fits in well conceptually with the ballerina figures that accompany many

[87] *FNAF 2: Marionette (The Puppet) Jumpscare*, 2021, https://www.youtube.com/watch?v=7vI_xT6dBrQ.
[88] Examples of which songs/tunes are prioritized for music box can be seen at these pages: "Music Box Song List (For Our Traditional Music Boxes)," accessed April 13, 2024, https://sandednbranded.com/pages/music-box-song-list-for-our-traditional-music-boxes; "MUSIC TUNE LIST -Listen to the Music | The Music Box Company," April 12, 2020, https://themusicboxcompany.com/tune-list/; "Vintage Music Box," Etsy, accessed April 13, 2024, http://www.etsy.com/search?q=vintage+music+box&explicit=1&ref=guided_search_2&guided_search=1.

jewelry/music boxes (and which evoke *The Nutcracker*, a ballet also heavily associated with children). Whether lullabies, nursery rhymes, folk songs, or excerpts of classical music, most pieces programmed for music boxes are reminiscent of either individual childhood or of a past era, or both.

The third element in this section's alliterative heading is tactility, referring to the way a user would physically interact with the device, and what ideas or affects this may elicit. The most common methods of powering a music box would be consistent hand-cranking or a preliminary wind-up, though today they can sometimes be controlled by electronic motors as well. These wind-up and hand-cranking actions are manageable by children, especially with the miniature size of many music boxes. This would provide a small sense of physical control over and connection to the production of the music, without requiring prior musical training or adult dexterity. A box may be re-wound whenever one likes, and in the case of hand-cranking one could even control the tempo. Pertinently to the FnaF cases study, music boxes with these modes of operation are also reminiscent of other famous toys like Jack-in-the-Box (or any of the plethora of wind-up toys in existence). This tactile link to mechanical toys further cements the music box in the world of children's play, and is a way of physically enacting nostalgia rather than experiencing it solely as a listener.

Music Boxes and Nostalgia

In her influential 2001 book *The Future of Nostalgia* Svetlana Boym introduced the idea of "restorative nostalgia" as a desire to recreate, relive, and restore a beloved mythical past and free it from the fuzzy world of memory. This of course falls for the fallacy that one remembers the past accurately, and even that the time and place one is nostalgic for ever existed. This type

of nostalgia is often tied to nationalism, and as Boym says, restorative nostalgics "do not think of themselves as nostalgic; they believe that their project is about truth."[89] This can relate to music boxes in the wider context of mechanical musical instruments, specifically in terms of durability and consistent reproduction of sound. While musical notation or audio recording technologies can tell us much about musical expectations and habits, the repeatability inherent to mechanical instruments endows them with a unique kind of fidelity to their own past. Mechanical instruments are fascinating musical capsules of style, ornamentation, and timbre. The instrument's performance is not mediated through a human interpreter, at least not after all of the mechanics and the notation are set. However durable metal cylinders and discs may be in comparison to things like wax cylinders or sheet music, it would be a mistake to say that mechanical instruments are impervious to degradation; the thin paper rolls of a player piano eventually rip or disintegrate, and even the protruding metal pins of a barrel organ may get bent or shoved out of place.[90] But as long as all of the physical pieces are in place, the musical rendition given by an orchestrion at a fairground in the 19th century or in a museum in the 21st should remain the same.

In the case of the music box specifically, there certainly is an element of this hopeful immutability; music boxes which are mass-produced today are primarily of the metal cylinder variety, which should require no upkeep or alterations, last a long time, and have near-infinite replay value. However in terms of Boym's nostalgia, the music box and the effect it has on listeners is more relevant to "reflective nostalgia." As opposed to the teleological view of the

[89] Svetlana Boym, *The Future of Nostalgia* (New York: Basic Books, 2001), 41

[90] See for example of degradation this video of the final fatal performance of a piano roll: *Player Piano Roll Disintegration (Read Description)*, 2019, https://www.youtube.com/watch?v=58FpljbiAWE.

past by "restorative nostalgia" as a single perfect snapshot to which the present should aspire, Boym writes of "reflective nostalgia":

> Reflective nostalgia is more concerned with historical and individual time, with the irrevocability of the past and human finitude. *Re-flection* suggests new flexibility, not the reestablishment of stasis. The focus here is not on recovery of what is perceived to be an absolute truth but on the meditation on history and the passage of time. To paraphrase Nabakov, these kind of nostalgics are often 'amateurs of Time, epicures of duration,' who resist the pressure of external efficiency and take sensual delight in the texture of time not measurable by clocks and calendars.[91]

While Boym's "restorative nostalgia" emphasizes *nóstos* (home), "reflective nostalgia" on the other hand revels in the *álgos* (pain), a wistful lingering in a state of longing, memory, ruins, and dreams. While "restorative nostalgia" may help conceptualize the promise of timelessness of music boxes and other mechanical musical devices, it is "reflective nostalgia" that better accounts for the user's experience of musical listening or creation involved with these instruments. The timbre and tunes emanating from a music box may seem to resonate from historical pasts and imagined childhoods, and contemporary creativity such as arranging music for music boxes plays within—"takes sensual delight in"—this sense of memory, while remaining aware of its inherent contradictions. The sound of a music box manifests the -algia of Boym's nostalgia, and by interacting with the device one could play with this bittersweet feeling of loss and comfort, imbue new music with it, or subvert it altogether. The relationship between music boxes and nostalgia is multifaceted, and it is particularly interesting to consider how this may come through in present-day creativity around the instrument, such as musical arrangement.

[91] Boym, *The Future of Nostalgia*, 49.

Making for Music Box

A readily accessible and personally programmable version of the music box nowadays is fed a roll of paper rather than a rotating cylinder or disc, and the pitches and rhythms of notes are programmed via holes punched into the cardstock-like paper. It is distributed under various commercial titles, like Kikkerland's "Make Your Own Music Box Kit," but it is commonly referred to as a "DIY music box."[92] The Do-It-Yourself element is the selection and programming of the piece(s) played by the device, and the specialized paper and hole-puncher are standardly provided upon purchase of the device. The DIY music box is often marketed as a birthday gift, with a pre-programmed roll of paper featuring "Happy Birthday" often included with purchase as an example tune.[93]

While rotating cylinders and discs are not present, the holes in this paper do trigger a different rotating element called a star wheel. This term in this context refers to a row of tiny individually rotating metal discs (stars) with protrusions, each aligned with the tuned teeth of a metal comb. As the paper runs across the star wheel, punched holes catch onto individual stars' protrusions, and as it pulls it causes the caught stars to rotate, thus forcing one of the other protrusions on the same star to pluck its associated tine. Music box mechanisms are often referred to as movements, a term which comes from the instrument's historic link to clockwork and musical clocks.[94] DIY music boxes are most commonly available with 15, 20, or 30-note movements. This refers to the number of tuned tines contained within a movement—number of

---

[92] "Make Your Own Music Box Kit," Kikkerland Design Inc, accessed April 13, 2024, https://kikkerland.com/products/make-your-own-music-box-kit.

[93] "Make Your Own Music Box Kit."

[94] Ord-Hume, *Clockwork Music; an Illustrated History of Mechanical Musical Instruments from the Musical Box to the Pianola, from Automaton Lady Virginal Players to Orchestrion*;
Ellen M. Snyder-Grenier, Murtogh D. Guinness, and Morris Museum of Arts and Sciences, eds., *Musical Machines and Living Dolls: The Murtogh D. Guinness Collection of Mechanical Musical Instruments and Automata ; [Catalog of a Permanent Exhibition in the Morris Museum, Opened on Nov. 3, 2007]* (Morristown, NJ: Morris Museum of Arts and Sciences <Morristown, NJ>, 2011).

lamellae on the metal comb--and therefore the range and quantity of pitches available to be used, though it is also important to point out these are not just fully chromatic pitch ranges. A 15- note movement has a two-octave range tuned to a C Major scale, containing all notes of the scale within that range (C4-C6). A 20-note movement extends this range on the upper end by five whole steps (C4-A6). A 30-note movement provides the widest pitch range and has a more complex layout. From its lowest to highest pitch it spans three octaves and two whole steps (C3-E6) and unlike the other two types of movement this one does contain a chromatic sequence of pitches, however the chromaticism does not exist at the bottom and top of this range.[95] The exact pitch sequence and arrangement for each movement range can be seen here:

15-note movement:

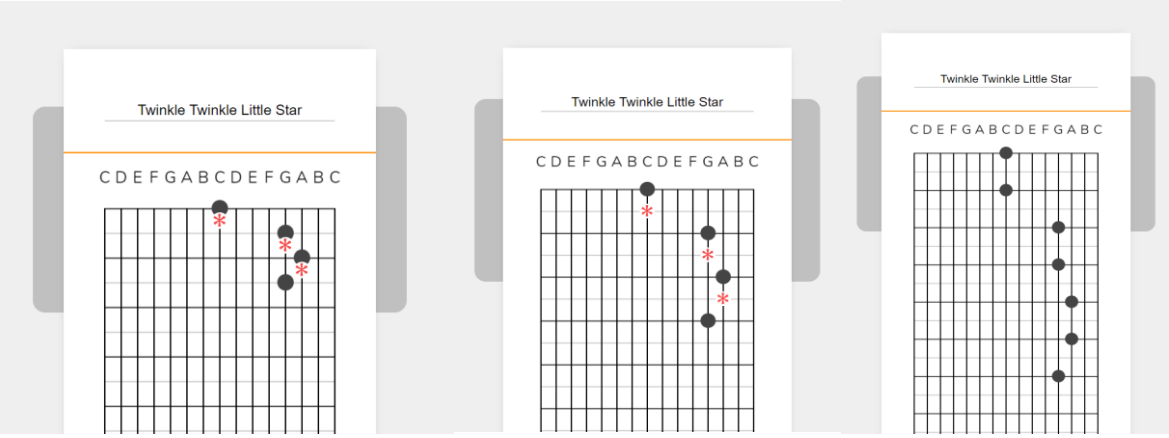
20-note movement:

30-note movement:

Now I will describe the process of arranging or composing a piece for DIY music box as informed by my personal experience. While theoretically one could begin by working on the paper strip directly, this is risky, and not advisable. There are fortunately some free software available online to help with the arranging/composing process before actually putting pen or hole-punch to paper, such as "Music Box Maniacs" or "Music Box Fun".[96] The latter is the one

[95] The images included here showing the various pitch selections were captured from https://musicbox.fun.
[96] "Create," *Music Box* Maniacs, accessed April 12, 2024, https://musicboxmaniacs.com/create/; "Music Box Fun - Online Music Box Maker," accessed April 12, 2024, https://musicbox.fun.

which I am most familiar with, and a feature of it is that it provides a model for the exact look of the hole-punch paper. Some factors to keep in mind pitch-wise when creating for music box are that it is generally most convenient to compose within or transpose a piece into C Major (or A minor) in order to maximize the available useful pitches. Relatedly, I may alter which octaves important notes are in so that there is chordal support or emphasis where I deem necessary. "Music Box Fun" only shows available pitches, so I find creating directly within this software to be most convenient. The DIY music box also presents rhythmic limitations in that the same pitch cannot be repeated too quickly, because there needs to be enough time for the star to rotate and another of its protrusions to get hooked by the hole in the paper. The "Music Box Fun" interface indicates if a virtual hole-punch is put in a place which would not be physically playable by showing a red asterisk instead of a black circle.[97] The images below for instance show how the first half-phrase of "Twinkle Twinkle Little Star" would have to be arranged to be playable on a DIY music box:



[97] The images included here of various "Twinkle Twinkle Little Star" arrangements were created by the author and captured from https://musicbox.fun.

The software also had audio playback capabilities so you can listen to what you've created so far and make sure your note placements are all where you intended them to be–the blank grid system can be difficult on the eyes in both digital and physical form so misplacements are common. All of these limitations mean that some pieces require a lot of inherently musical problem solving and creative editing to maintain the recognizable contour of a tune while adapting it to this device.

Once a piece is fully laid out in its digital 'draft copy,' it can be converted into its material form on paper. Some people have come up with ways to print and cut out the notation out directly using technology like the Cricut®,[98] however I still go about this step in a more manual way.[99] The first step is to copy the notes onto the paper with a pen or marker, and triple-check my work before beginning to perforate the paper in the correct locations with the specially made hole-puncher. The physical grid paper has alternating solid and dashed lines, but it can also be helpful to mark the spacing of individual measures or phrases, in order to more easily check on certain sections of the piece and judge the overall length. If I want the spacing of the notes to be as even as possible I try to center the holes perfectly with the grid, but they can also be placed slightly before or after the gridlines to achieve a result of slightly early or late note articulation—for example if I want every distinct note in a final chord to be audible I might punch each hole ever so slightly farther than the others for a rolled chord or glissando effect.

Mistakes are bound to be made, but there are ways to work around them. If a hole has been punched in the wrong spot, tape can be placed on the underside of the paper to block the

---

[98] *Using a Cricut to Make DIY Music Boxes*, 2020, https://www.youtube.com/watch?v=apcsggbbBFw.

[99] My methodology of working with a paper-roll music box is very similar to that which is explained quite nicely in this YouTube tutorial from Wintergatan:
How To Program a Music Box - Hole Punch Tutorial, 2017, https://www.youtube.com/watch?v=HjBhO9iqEc0.

punched hole from catching the star wheel. If a hole is punched just slightly too early, then it can be fixed by extending the hole to where it was supposed to be, as a star will only be pulled once the hole ends and the paper pulls it along. Moreover, multiple strips of paper can be combined to extend the length of a piece, or to splice together different sections if large edits need to be made. At this point, the piece should be ready to be run through the DIY music box mechanism, which may or may not be contained within an actual box. Where the mechanism is mounted, if anywhere, will greatly affect overall resonance and discernibility of certain notes, particularly on the lower end of the pitch range. The mechanism is standardly hand-cranked, turning copper or nylon gears which help to pull the paper through the mechanism and past the star wheel. The metal gears are more durable but do tend to make more noise, so these factors will also affect the overall auditory playback experience.

Where composing within a DAW using a music box sound library allows for experimentation with timbre, pitch, rhythm, dynamics, duration, envelopes, attacks, decays and more, creating for mechanical music box is bound to its signature sound and programming capabilities. This does not mean that composing for physical music box has to be creatively limiting, however. As Roger Moseley writes in *Keys to Play*, "Via the strategic deployment of pegs and pins, the tripping of keys, or the flipping of bits, digital technologies from the music box to Ableton *Live* open sonic events to playful manipulation and intervention, allowing players not only to play them back but to *recreate* (with) them."[100] Establishing constraints is a common way to spur creativity, and the strict parameters when it comes to the capabilities of music boxes result in a technologically small but conceptually rich situation for musical creation. On a material level the punched-paper method also allows for some interesting experimentation and

[100] Roger Moseley, *Keys to Play: Music as a Ludic Medium from Apollo to Nintendo* (University of California Press, 2016), https://www.jstor.org/stable/10.1525/j.ctt1kc6k47.

re-creation to occur, for example making different forms of musical inversions very visible and tangible. A melodic inversion or retrograde can be achieved simply by running the paper through the music box mechanism backward, upside-down, or both (with these spatial manipulations of course being akin to those found in twelve-tone technique, or crab canons, or early electronic musical artists' work with magnetic tape). In my personal experience I have found this to be not only humorous but a very helpful way to take a step back from a piece I've created and consider how else I could work with its forms and patterns.

As a result of this creative activity I have also found a perhaps ironic suitability of chiptune video game music to the music box. While a mechanical musical instrument and video game music of the 1980's may seem at first glance to occupy very separate worlds, on a musical and technological level they are actually quite similar. They also share much in the way of conceptual and emotional associations with childhood and nostalgia, connections which I will discuss in greater detail below.

Chiptune and Early Video Game Music

Sound in early video games (early referring to the 1970's, 80's, and some of the 90's) was primarily produced by a sound chip. Composers would create music and sounds using machine code, as they didn't have access to the kinds of graphical user interfaces or DAWs that composers would use today. In fact, the composers of much video game music early on were often programmers who designed and encoded the music just as they would any other aspect of the game's design.[101] Music produced by sound chips particularly in that early video game era

[101] James Newman, "Before Red Book: Early Video Game Music and Technology," in *The Cambridge Companion to Video Game Music*, ed. Melanie Fritsch and Tim Summers, Cambridge Companions to Music (Cambridge: Cambridge University Press, 2021), 12–32, https://doi.org/10.1017/9781108670289.003.

has come to be known as chiptune. The term chiptune is complicated firstly by the fact that it can refer to both music generated by an actual sound chip and music *emulating* that sound, and secondly because it implies that all sound chip-generated music sounded the same. In actuality each console would operate slightly differently, for example the Nintendo NES/Famicom had four oscillator-based sound channels (with the possible waveforms being two pulse, one triangle, and one noise), while the Commodore 64 had three (which had waveform variability between saw, pulse, triangle, and noise).[102] There was a general sound these consoles had in common, though, characterized by 'bleeps and boops' and a geometric, sometimes grainy timbral quality.

While compositional styles across consoles, games, and composers of course varied, there was also a shared experience in terms of unique technological capabilities requiring different music-making techniques than would apply in other compositional genres. Sometimes this resulted in pieces being quite simple and based around a memorable melody, while in others the music would take advantage of the large pitch range and rapid rhythmic capabilities and create soundscapes that would likely never have been created on traditional instrumentation. As Kenneth McAlpine writes in a section heading of the introduction to his book *Bits and Pieces: A History of Chiptunes*, the new avenues of creativity coming from the constraints of chip tune technologies may result in "Minimalism… to the Max!"[103]

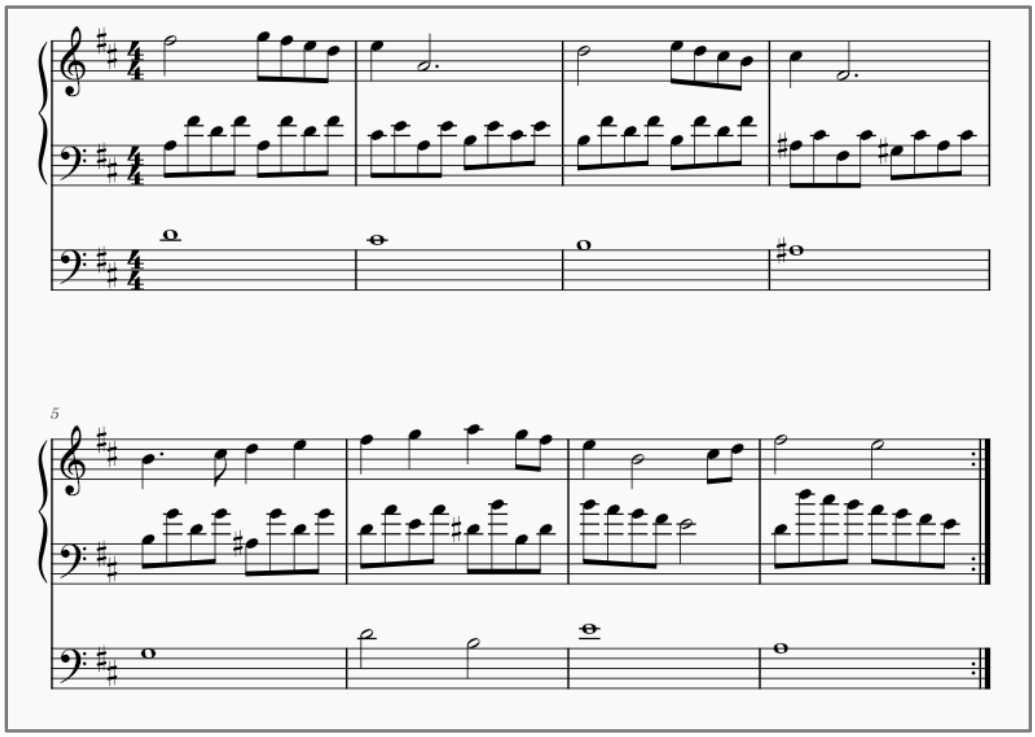
To show how the limits of early video game music sound chips affected the composition of certain pieces, and how these limits compare to those of the mechanical music box, I will use my arrangement of "Castle Cornelia" from the first *Final Fantasy* game as an example. This game was originally released on the NES/Famicom console, and early video game consoles such

[102] Newman, "Before Red Book," 20.

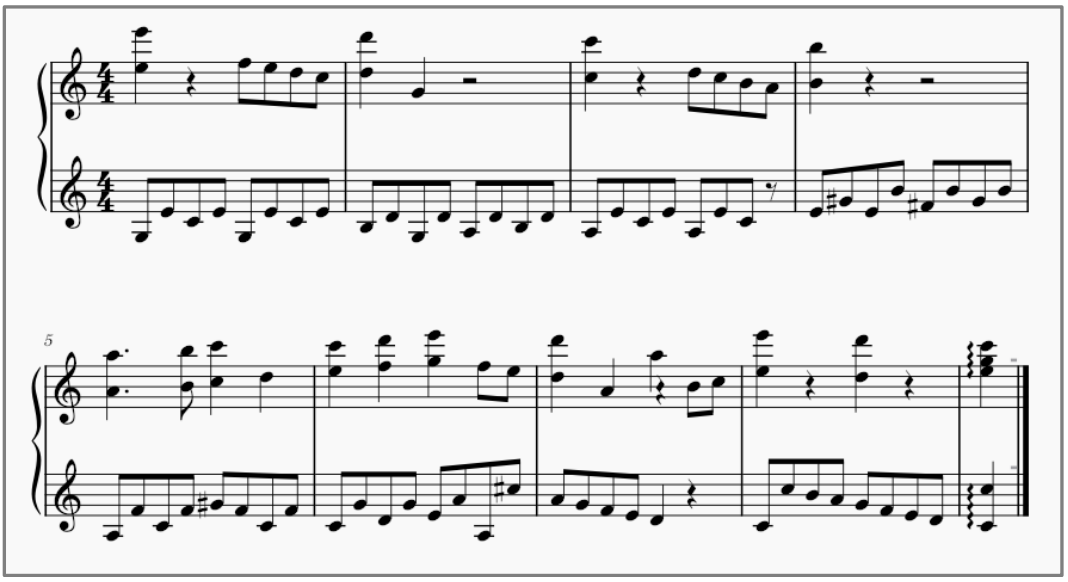
[103] McAlpine, Kenneth B. *Bits and Pieces: A History of Chiptune*. New York, NY: Oxford University Press, 2019.

as this one allowed for very few simultaneous sound channels. With the NES' four-channel layout, it was common for the two pulse wave channels to be used for the main melody and for a countermelody/supporting line/embellishment, while the triangle would be used for a bass part, and the noise channel could serve as percussion. The noise channel does not have a correlate on the music box, but the bass-melody-countermelody structure of many 8-bit tunes often lends itself well to arrangement for music box. Early video game music is also usually quite short and relies on looping, again due to limited data storage, making it manageable to convert into physical form on the paper roll.

"Castle Cornelia" is a piece which does not have a noise channel/percussion part, and is only eight measures and about 20 seconds long before it loops. Included here is a transcription of the piece in its chiptune form, and then a transcription of my arrangement of one loop for DIY music box. The original is in D major, and consists of a slowly moving bass line, a melody, and a third part occupying a pitch range between these two which outlines the details of each chord.



Transcription of "Castle Cornelia" – original version



Transcription in staff notation of the paper-roll music box arrangement of "Castle Cornelia"

The music box arrangement is transposed to be in C major, as the F# and C# present in the original D major are not available in the lower and higher ranges of even the 30-note music box movement. It does not have a separate bass line, because notes cannot be held out for any duration and the note which would have been the bass part almost always appears in one of the other moving lines anyway. Some sections of the melodic line appear to have been left out of this transcription as well, because those notes were also overlapping with what was being played in the mid-range part. The melody remains completely audible, though, especially if the listener is familiar with it already. The use of staff notation here is imperfect, because the music box is one polyphonic instrument not multiple separately playing parts, and the limited range of pitch makes it much more likely that patterns of pitches will overlap than if they were played on the piano for example.[104] In the middle voice here (which is operating as a kind of Alberti bass)

[104] The distinction of where notes are 'left out' of a musical line point to the subjective and imperfect nature of not only arrangement but also transcription, as the sections of a three-part chiptune piece become a blurred combination of notes on the single-timbre but polyphonic music box, which then gets forced back into staff notation for ease of viewing in this chapter. The music box arrangement in its tablature-like form can be accessed online here.

some of the notes had to be brought up an octave to keep them in a consistent range, and I made the choice to double the melody in two octaves when convenient to make it stand out more since there is no timbral differentiation. I also added a rolled chord at the end, which gives a sense of finality to the tune and is a commonly heard embellishment for music boxes in general. The final alteration can be seen in measure 6 where the melody is supported by pitches a 6th higher rather than an octave higher, because E is the highest pitch available—and because I thought it sounded pleasant and added a bit of depth to the piece, as an arranger is wont to do.

The musical technology of early video game music admittedly had many other capabilities which are not showcased here and which would align less well with music box arranging. Many pieces included extremely wide pitch range and rapidly repeating notes (as well as more common musical functions like extended note durations and vibrato), such as the *DuckTales* "Moon Theme" or the "Fight Theme" from *Mike Tyson's Punch-Out!!*.[105] Early video game music could also slightly alter the timbre of each sound channel by changing the duty cycle between 12.5%, 25%, 50%, 75% (corresponding to how long a waveform's signal is 'on' vs 'off'), and might employ left-to-right stereo panning. However, I chose to focus on *Castle Cornelia* in order to showcase the ways in which the technologies are indeed similar, as well as places where creative arranging is necessary.

From the 1990s into the early 21st century consoles like the *PlayStation* and *Xbox* began to strive for realism in both the visual and sound design of games, leading to the cinematic quality of much recent video game music, with soundtracks often even being recorded by live instrumentalists. Chiptune-esque music did not disappear, though, and today it has become its

[105] *DuckTales Music (NES) - The Moon Theme*, 2009, https://www.youtube.com/watch?v=KF32DRg9opA; *Mike Tyson's Punch-Out!! (NES) Music - Fight Theme*, 2009, https://www.youtube.com/watch?v=VE8vKLEK6A8.

own subgenre of music. Similar to music boxes, the sound of chip-generated music is emblematic of a particular era regardless of when it is actually created, and also conjures a strong sense of nostalgia in its listeners. Childhood is evoked by the timbral quality, recognizable tunes, and of course with specific personal memories of playing the games which pieces of music originally accompanied. As with the music boxes, though, not everyone who enjoys chipmusic and feels 'nostalgic' toward it actually grew up playing those games, and many were not even alive in the era in order to have direct memories of it. The community built around chiptune/chipmusic/8-bit music is often referred to as the chipscene, and this scene has its share of internal factions, particularly around the controversial topic of 'fakebit' music and authenticity. Fakebit is a term used to describe (often derogatorily) chiptune style music made with more modern hardware and software, thus "faking" the 1980s 8-bit chipmusic. Some listeners and creators of contemporary chiptune music were alive and playing video games in the 1970s and '80s, but there are also many who were not. However, the controversy over fakebit and authenticity in the chipscene does not necessarily fall into this binary categorization.

Scholars of chipmusic have documented the chipscene as so far containing roughly three 'generations.'[106] The first generation, coming mostly out of the '80s, were quite purist and tended to focus on creating impressive code and music on the original, technologically-limited hardware.[107] The second generation which came about around the beginning of the new millennium put less emphasis on using only specific technology and focused more on the artistic aspect of creating chipmusic. They began to embrace different gaming technologies including

[106] Marilou Polymeropoulou, "Chipmusic, Fakebit, and the Discourse of Authenticity in the Chipscene," *Widerscreen,* April 15, 2014; Matthias Pasdzierny, "Geeks on Stage? Investigations in the World of (Live) Chipmusic," in *Music and Game: Perspectives on a Popular Alliance*, ed. Peter Moormann (Wiesbaden: Springer Fachmedien, 2013), 171–90; Kenneth B. McAlpine, *Bits and Pieces: A History of Chiptune* (New York, NY: Oxford University Press, 2019).
[107] Polymeropoulou, "Chipmusic, Fakebit, and the Discourse of Authenticity in the Chipscene",, 9

the Game Boy mobile console which varied in both hardware and software from what earlier chipmusic would have used. They also embraced both online community and public musical festivals, were more open to influences from popular music and culture, and allowed for imitation and arrangement of existing chipmusic and sounds rather than creating only original musical material.[108] The third generation coming about in the 2010's create chiptune or fakebit music on any platform, making frequent use of chip sound emulators and sometimes even incorporating acoustic instruments rather than strictly relying on early chiptune technology and the tinkering-within-limitations that comes with it.[109]

While to first generation programmers/musicians this tinkering was fundamental to chiptune, Polymeropoulou writes that "the debate on fakebit and chipmusic authenticity slowly becomes a phenomenon belonging in the past. Chipmusic in the second decade of 2000s is defined by 8-bit timbre, regardless of the medium, and fakebit comprises a subgenre of chipmusic that is composed using modern computers and other digital equipment."[110] As with music boxes, the material processes and technological limitations hold great importance, but the timbre and evocative sound of chiptune or music box music may matter even more in the long run in terms of solidifying that music's identity. To connect this back to the discussion of nostalgia, Boym writes that "restorative nostalgia does not think of itself as nostalgia, but rather as truth and tradition," and "reflective nostalgia dwells on the ambivalences of human longing and belonging and does not shy away from the contradictions of modernity." Moreover, "reflective nostalgia" contains the possibility of irony and humor,[111] which are both particularly important to the

[108] Pasdzierny, "Geeks on Stage?," 179; Polymeropoulou, "Chipmusic, Fakebit, and the Discourse of Authenticity in the Chipscene", 12
[109] Polymeropoulou, "Chipmusic, Fakebit, and the Discourse of Authenticity in the Chipscene", 13
[110] Polymeropoulou, "Chipmusic, Fakebit, and the Discourse of Authenticity in the Chipscene", 19
[111] Boym, *The Future of Nostalgia*, 49

culture of third-generation, internet-savvy chiptune artists as they aim to subvert the traditional practices of their predecessors in the manner of an internet trickster or 'troll'.[112] In this case, it certainly seems that the first generation of chiptune musicians have more restorative tendencies, and that those involved in what could be called 'fakebit' are engaging in more reflective nostalgia. However I hesitate to say that the 'generational' differences align exactly with restorative and reflective nostalgia.

Even though the first generation has a loyalty to the original technology, they put great importance on creating new music. I would argue that creative human musical activity like this can never be merely restorative, particularly in terms of arranging, which brings music perhaps from different genres or times and imbues them with the longing and nostalgic memory of this new chosen musical style. "Reflective nostalgia cherishes shattered fragments of memory," and this retro-nostalgic musical practice can be aptly described as playing with "fragments of memory," putting them back together in ways that linger in the feeling of the past but create something entirely new.

The connection between video game music and music boxes has been made by some other artists and companies as well. For example Square Enix, the video game company behind series such as *Final Fantasy* and *Kingdom Hearts*, sells pre-programmed cylinder-type music boxes of tunes from their various games as branded merchandise.[113] Another example is Video Game Music Box, a series of arrangements of video game music by Filipino composer Diwa de Leon, a project consisting of music made digitally with the sound of a music box rather than

[112] Polymeropoulou, "Chipmusic, Fakebit, and the Discourse of Authenticity in the Chipscene", 14.
[113] "Music Box," accessed March 18, 2024, https://na.store.square-enix-games.com/merchandise/accessories/music-box.

actual physical music boxes. The tagline on this project's website is "Gaming Nostalgia Refined,"[114] which aptly sums up in the way of a marketing slogan, that the sound of a music box has the power to take pre-existing nostalgia around video games and 'refine' and distill it musically.

Nowadays, the type of music that stems from mechanical music boxes or 80's video game consoles is not experienced solely, or even primarily, by children. However the sound of both creates an *effect* of childhood, and along with it an effect of technological and affectual simplicity. In his book *Keys to Play* Roger Moseley writes, "From barrel organs and music boxes to *beatmania* and *Guitar Hero*, the digital mechanisms and programs implicated in these models of recreation have themselves been criticized as monotonously jejune and thus symptomatic of phylogenic immaturity, reflecting the disparagement of play as a childish waste of time and other valuable resources."[115] The "disparagement of play" relates to a view of chiptune and music box music as overly simplistic and silly, coming from monotonous tchotchkes and games/toys, views which ignore the immense emotional and memorial value these musical items and processes can hold. The act of creating musical arrangements which cross these genres and technologies is also importantly a form of play and experimentation, which doesn't interact meaninglessly with the evocations of childhood and nostalgia, but refines them.

I argue that "reflective nostalgia" can be described as playful. It allows for creativity, experimentation, humor, doubt, failure, and can be always re-played and "re-flected," possibly revealing something new. Even more than reflective, the act of arranging music within and

[114] "Video Game Music Box," Video Game Music Box, accessed March 18, 2024, https://www.videogamemusicbox.com.
[115] Moseley, *Keys to Play*, 10

across music boxes and chiptune could even be considered re*fract*ive, as a way to see, hear, or imagine something anew by passing it through a different medium. Similar to how a glass prism doesn't let white light pass through intact, or reflect it directly back to its' source, the act of arranging across music boxes and chiptunes make perceptible the components and commonalities of each, whether in terms of music composition, technological design, or cultural connotations.

Conclusion

This thesis throughout has critiqued the disparagement of ludomusical interfaces and activities as "monotonously jejune" or "a childish waste of time" (to borrow turns of phrase again from Roger Moseley).[116] A game like *My Singing Monsters* is almost designed to be that way; of course it is intended for users to enjoy its repetitive, non-challenging, "casual" nature and to purposefully 'waste' their time playing it, so the negative connotation is not intended, but the descriptors fit nonetheless. As Chapter 2 showed, though, even with such a game design, there are more deeply consequential perceptions and behaviors at play than either the designers or users may be aware of. The devices designated as "Pianos that Anyone Can Play" by Chapter 1 exhibit innovative ludomusical design with an end goal of widely accessible musical play. Explicitly pedagogical or just generally accessible play would be a meaningful goal in itself, but these devices also potentially hold meaning in other ways, from creative expression to impressive technique or social value. Music boxes and chiptune music as material methods of music making but also cultural concepts were explored in Chapter 3, with a focus on their shared associations with childhood, nostalgia, and limited technical capabilities. This chapter espoused the potential of these objects/musical methodologies primarily in terms of new creativity that finds its value and fanbase not despite, but because of, the cultural ingrained connotations and unique technical capabilities.

The devices and interactions discussed in this thesis have involved various amorphous identifiers, such as ludic and musical, casual and hardcore, voicer and listener, simple and complex, childish and sophisticated, silly and serious. These chapters focused mainly on specific technological interfaces and player interactions, though personal identities did also play a role

[116] Moseley, *Keys to Play*, 10

(musician/gamer, player/monster, child/adult, etc.). Future evolutions of this work could also incorporate the study of player identities more explicitly; for example it would be pertinent to incorporate the study of 'girlhood' as an identity influenced by both the treatment of children and women, and which has many direct ties to musical and ludomusical practices (at the piano especially).[117] The idea that children's ludomusical practices hold more value than is usually appreciated is already present in this thesis, but a more intersectional discussion of identity could be attempted. The focus on certain musical items or activities as was done in these chapters is one part of such a discussion, but so is the fact that the human identities behind these practices are inherently not 'taken seriously,' with the multifaceted identity of 'girl' as one primary example.

On the subject of nostalgia, it is salient to point out this author's nostalgic and otherwise personal connections to the subjects of these chapters. The "Little Smart Super Sound Works" keyboard from Vtech was a beloved childhood toy of mine, which allowed me to discover and explore musical patterns and concepts all on my own, until a point—at around ten years old—when my parents decided I would benefit from actual piano lessons. In other words, I may not have become a musician or musicologist at all without that keyboard. *My Singing Monsters* (2012) and *Magic Piano* (2011) were two of the favorite mobile games of my early teen years, as I continued to form an identity as a practitioner of music but also an avid fan of games that might be seen as "casual." This was particularly due to the sense of accomplishment that comes with

[117] Relevant work that would inform this direction of further study would include:
Ruth A. Solie, "'Girling' at the Parlor Piano," in *Music in Other Words*, 1st ed., Victorian Conversations (University of California Press, 2004), 85–117, https://www.jstor.org/stable/10.1525/j.ctt1pp6qz.6.
Elizabeth Natalie Morgan, "The Virtuous Virtuosa: Women at the Pianoforte in England, 1780–1820" (Ph.D., United States — California, University of California, Los Angeles), accessed April 18, 2024.
Kiri Miller, "How Musical Is Guitar Hero?," in *Playing Along: Digital Games, YouTube, and Virtual Performance*, The Oxford Music/Media Series (Oxford: Oxford University Press, 2012).
Kyra Gaunt, "Ch 3 Mary Mack Dressed in Black: The Earliest Formation of a Popular Music," in *The Games Black Girls Play: Learning The Ropes From Double-Dutch to Hip-Hop* (New York: New York University Press, 2006).

accurately performing a difficult *Magic Piano* piece or curating a lush island of singing creatures, both experiences which were enjoyable in solitude but also able to be shared with friends and family. Perhaps I would not have found ludomusicology without experiencing these games. Player-pianos, music boxes, and chiptune are comparatively recent objects of my academic fascination, built upon a markedly nostalgia-based curiosity for technology and musical time periods which I had not myself experienced. These personal and nostalgic connections are relevant because they are the foundation for why I take these objects and experiences so 'seriously', and what pushed me to expand that treatment to a broader academic level. I hope these chapters have struck a satisfactory balance between academic rigor and individual history, since the deeply personal, experiential nature of ludic and musical technologies makes bridging that dichotomy particularly important.

Bibliography

Austin, Michael L. “Music Games.” In *The Cambridge Companion to Video Game Music*, edited by Melanie Fritsch and Tim Summers, 140–58. Cambridge Companions to Music. Cambridge: Cambridge University Press, 2021. https://doi.org/10.1017/9781108670289.011.

Bosch, Heironymous. *The Garden of Earthly Delights*. 1490-1510. Oil on oak panel. *Museo del Prado*, Madrid.

Boym, Svetlana. *The Future of Nostalgia*. New York: Basic Books, 2001. http://swbplus.bsz-bw.de/bsz278919251inh.htm.

Cheng, William. *Sound Play: Video Games and the Musical Imagination*. Oxford University Press, 2014. https://doi.org/10.1093/acprof:oso/9780199969968.001.0001.

Chion, Michel. *Audio-Vision: Sound on Screen*. Columbia University Press, 2019. https://www.jstor.org/stable/10.7312/chio18588.

Colt, C. F. “Early Pianos: Their History and Character.” *Early Music* 1, no. 1 (1973): 27–33.

Costikyan, Greg. “I Have No Words & I Must Design: Toward a Critical Vocabulary for Games.” edited by Frans Mäyrä, 9–33. Tampere: Tampere University Press, 2002.

Dolan, Emily. “Toward a Musicology of Interfaces.” *Keyboard Perspectives 5*, 2012. https://ecommons.cornell.edu/bitstream/handle/1813/111329/Dolan%20-%20Toward%20a%20Musicology%20of%20Interfaces.pdf?sequence=2.

Eidsheim, Nina Sun. *Sensing Sound: Singing and Listening as Vibrational Practice*, 2015. https://doi.org/10.1215/9780822374695.

Eidsheim, Nina Sun. *The Race of Sound: Listening, Timbre, and Vocality in African American Music*. Refiguring American Music. Durham, NC: Duke University Press, 2019.

Eidsheim, Nina Sun, and Schuyler Whelden. "'Where Were You When You Found Out Singer Bobby Caldwell Was White?': Racialized Timbre as Narrative Arc." In *The Oxford Handbook of Timbre*, edited by Emily I. Dolan and Alexander Rehding. Oxford University Press, 2021. https://doi.org/10.1093/oxfordhb/9780190637224.013.29.

F., C. "The Musical Amateur." *The Art Amateur* 2, no. 1 (1879): 21–21.

Feld, Steven. "Acoustemology." In *Keywords in Sound*. Durham, NC: Duke University Press, 2015.

Fowler, Charles B. "The Museum of Music: A History of Mechanical Instruments." *Music Educators Journal* 54, no. 2 (1967): 45–49. https://doi.org/10.2307/3391092.

Gaunt, Kyra. "Ch 3 Mary Mack Dressed in Black: The Earliest Formation of a Popular Music." In *The Games Black Girls Play: Learning The Ropes From Double-Dutch to Hip-Hop*. New York: New York University Press, 2006.

Gibbons, William. "Nostalgia and Videogame Music: A Primer of Case Studies, Theories, and Analyses for the Player-Academic, Edited by Can Aksoy, Sarah Pozderac-Chenevey, and Vincent E. Rone." *Journal of the American Musicological Society* 77, no. 1 (April 1, 2024): 226–28. https://doi.org/10.1525/jams.2024.77.1.226.

González, Jordi Roquer. "Media Discourses and Marketing Strategies in the Advertising of the Pianola." *Popular Music* 40, no. 1 (February 2021): 42–57. https://doi.org/10.1017/S0261143021000106.

Gordon, Bonnie. *Voice Machines: The Castrato, the Cat Piano, and Other Strange Sounds*. Chicago, IL: University of Chicago Press, 2023. https://press.uchicago.edu/ucp/books/book/chicago/V/bo192181142.html.

Grew, Sydney. "The Player-Piano." *Music & Letters* 6, no. 3 (1925): 236–47.

Guzmán Anaya, Cristina. "On the Organological Potential of Video Games: A Preliminary Cataloguing Card Model for the Examination of Ludomusical Instruments." *Journal of Sound and Music in Games* 4, no. 3 (July 1, 2023): 53–86. https://doi.org/10.1525/jsmg.2023.4.3.53.

Hornbostel, Erich M. von, and Curt Sachs. "Classification of Musical Instruments: Translated from the Original German by Anthony Baines and Klaus P. Wachsmann." *The Galpin Society Journal* 14 (1961): 3–29. https://doi.org/10.2307/842168.

Hunicke, Robin, Marc LeBlanc, and Robert Zubek. "MDA: A Formal Approach to Game Design and Game Research." In *Proceedings of the AAAI Workshop on Challenges in Game AI*, 4:1722, 2004.

Jonson, G. C. Ashton. "Mechanical Piano - Players." *Proceedings of the Musical Association* 42 (1915): 15–32.

Kikkerland Design Inc. "Make Your Own Music Box Kit." Accessed March 18, 2024. https://kikkerland.com/products/make-your-own-music-box-kit.

King, A. Hyatt. "Mozart's Works for Mechanical Organ: Their Background and Significance." *The Musical Times* 88, no. 1247 (1947): 11–14. https://doi.org/10.2307/933795.

LeBlanc, Marc. "Mechanics, Dynamics, Aesthetics: A Formal Approach to Game Design." Lecture at Northwestern University, 2004. http://algorithmancy.8kindsoffun.com/MDAnwu.ppt.

Link, Stan. “The Monster and the Music Box: Children and the Soundtrack of Horror.” In *Music in the Horror Film*. Routledge, 2009.

“Magic Piano | Smule.” Accessed September 11, 2023. https://www.smule.com/apps.

McAlpine, Kenneth B. *Bits and Pieces: A History of Chiptune*. New York, NY: Oxford University Press, 2019.

Miller, Kiri. “How Musical Is Guitar Hero?” In *Playing Along: Digital Games, YouTube, and Virtual Performance*. The Oxford Music/Media Series. Oxford: Oxford University Press, 2012.

Morgan, Elizabeth Natalie. “The Virtuous Virtuosa: Women at the Pianoforte in England, 1780–1820.” Ph.D., University of California, Los Angeles, 2009. https://www.proquest.com/docview/304852420/abstract/EBBC1B064E456BPQ/1.

Moseley, Roger. *Keys to Play: Music as a Ludic Medium from Apollo to Nintendo*. University of California Press, 2016.

“Music Box.” Accessed March 18, 2024. https://na.store.square-enix-games.com/merchandise/accessories/music-box.

“My Singing Monsters - Apps on Google Play.” Google Play. Accessed May 6, 2023. https://play.google.com/store/apps/details?id=com.bigbluebubble.singingmonsters.full&hl=en.

“My Singing Monsters,” App Store. Accessed May 6, 2023. https://apps.apple.com/us/app/my-singing-monsters/id521671873.

Nass, Clifford Ivar, and Scott Brave. *Wired for Speech: How Voice Activates and Advances the Human-Computer Relationship*. Computer-Human Interaction. Cambridge, MA: MIT Press, 2005.

Newman, James. “Before Red Book: Early Video Game Music and Technology.” In *The Cambridge Companion to Video Game Music*, edited by Melanie Fritsch and Tim Summers,

12–32. Cambridge Companions to Music. Cambridge: Cambridge University Press, 2021. https://doi.org/10.1017/9781108670289.003.

Novak, David, and Sakakeeny Matt, eds. *Keywords in Sound*. Durham, NC: Duke University Press, 2015.

Ord-Hume, Arthur W. J. G. *Clockwork Music; an Illustrated History of Mechanical Musical Instruments from the Musical Box to the Pianola, from Automaton Lady Virginal Players to Orchestrion*. New York: Crown Publishers, 1973.

Patteson, Thomas. "'The Joy of Precision': Mechanical Instruments and the Aesthetics of Automation." In *Instruments for New Music*, 18–51. Sound, Technology, and Modernism. University of California Press, 2016. https://www.jstor.org/stable/10.1525/j.ctt1ffjn9k.6.

Pasdzierny, Matthias. "Geeks on Stage? Investigations in the World of (Live) Chipmusic." In *Music and Game: Perspectives on a Popular Alliance*, edited by Peter Moormann, 171–90. Wiesbaden: Springer Fachmedien, 2013. https://doi.org/10.1007/978-3-531-18913-0_10.

Pennington, Stephan. "Transgender Passing Guides and the Vocal Performance of Gender and Sexuality." In *The Oxford Handbook of Music and Queerness*, edited by Fred Everett Maus and Sheila Whiteley. Oxford University Press, 2022. https://doi.org/10.1093/oxfordhb/9780199793525.013.65.

Polymeropoulou, Marilou. "Chipmusic, Fakebit, and the Discourse of Authenticity in the Chipscene." *Widerscreen*, April 15, 2014.

Redfern, Nick. "Sound in Horror Film Trailers." *Music, Sound, and the Moving Image* 14, no. 1 (2020): 47–71.

Richards, Annette. “Automatic Genius: Mozart and the Mechanical Sublime.” *Music & Letters* 80, no. 3 (1999): 366–89.

Richardson, Ingrid. “Pocket Technospaces: The Bodily Incorporation of Mobile Media.” *Continuum* 21, no. 2 (June 1, 2007): 205–15. https://doi.org/10.1080/10304310701269057.

Romero, Sergio Ospina. “Ghosts in the Machine and Other Tales around a ‘Marvelous Invention’: Player Pianos in Latin America in the Early Twentieth Century.” *Journal of the American Musicological Society* 72, no. 1 (April 1, 2019): 1–42. https://doi.org/10.1525/jams.2019.72.1.1.

Ross, Morgan Quinn, and Joseph B. Bayer. “Explicating Self-Phones: Dimensions and Correlates of Smartphone Self-Extension.” *Mobile Media & Communication* 9, no. 3 (September 1, 2021): 488–512. https://doi.org/10.1177/2050157920980508.

Rowland, Roy, director. *The 5,000 Fingers of Dr. T*. Columbia Pictures, 1953. 1 hr, 28 min.

Sousa, John Philip. “The Menace of Mechanical Music.” *Appleton’s Magazine*, 1906.

Shultz, Peter. “Music Theory in Music Games.” In *From Pac-Man to Pop Music*. Routledge, 2008.

“Smule Magic Piano iPad App Review – The Gadgeteer.” Accessed November 17, 2023. https://the-gadgeteer.com/2010/05/13/smule-magic-piano-ipad-app-review/.

Snyder-Grenier, Ellen M., Murtogh D. Guinness, and Morris Museum of Arts and Sciences, eds. *Musical Machines and Living Dolls: The Murtogh D. Guinness Collection of Mechanical Musical Instruments and Automata ; [Catalog of a Permanent Exhibition in the Morris Museum, Opened on Nov. 3, 2007]*. Morristown, NJ: Morris Museum of Arts and Sciences <Morristown, NJ>, 2011.

Solie, Ruth A. "'Girling' at the Parlor Piano." In *Music in Other Words*, 1st ed., 85–117. Victorian Conversations. University of California Press, 2004. https://www.jstor.org/stable/10.1525/j.ctt1pp6qz.6.

Sterne, Jonathan. "Part VI: Voices." In *The Sound Studies Reader*. London: Routledge, 2012.

Taylor, Timothy D. "The Commodification of Music at the Dawn of the Era of 'Mechanical Music.'" *Ethnomusicology* 51, no. 2 (2007): 281–305.

The Miriam and Ira D. Wallach Division of Art, Prints and Photographs: Picture Collection, The New York Public Library. "The Metrostyle Pianola." New York Public Library Digital Collections. Accessed November 16, 2023. https://digitalcollections.nypl.org/items/510d47e3-33b3-a3d9-e040-e00a18064a99

"The Passing of the Silent Piano". The Aeolian Company. C. 1900. Source: http://www.pianola.com/aeolian9.htm.

"The Pianola: The Connoisseur". The Orchestrelle Company. C. 1900. Source: http://www.pianola.com/aeolian2.htm.

Video Game Music Box. "Video Game Music Box." Accessed March 18, 2024. https://www.videogamemusicbox.com.

Wang, Ge. "Ocarina: Designing the iPhone's Magic Flute." *Computer Music Journal* 38, no. 2 (2014): 8–21.

Warfield, Patrick. "John Philip Sousa and 'The Menace of Mechanical Music.'" *Journal of the Society for American Music* 3, no. 4 (November 2009): 431–63. https://doi.org/10.1017/S1752196309990678.

Weidman, Amanda. "Voice." In *Keywords in Sound*. Durham, NC: Duke University Press, 2015.

Ludography

Animal Crossing: New Horizons. Nintendo. Switch, 2020.

Beatmania. Konami. Arcade, 1997.

Call of Duty. Infinity Ward, Activision. Windows, 2003.

Candy Crush Saga. King. Multiplatform, 2012.

Dark Souls. FromSoftware, Namco Bandai Games. Multiplatform, 2011.

Destiny 2. Bungie, Activision. Multiplatform, 2017.

DuckTales. Capcom. NES, 1989.

Final Fantasy. Square, Nintendo. NES, 1987.

Final Fantasy XIV. Square Enix. Multiplatform, 2013.

Five Nights at Freddy's. Scott Cawthon. Windows, 2014.

Five Nights at Freddy's 2. Scott Cawthon. Windows, 2014.

Guitar Hero. Harmonix, RedOctane. PlayStation 2, 2005.

Incredibox. So Far So Good. iOs, 2009.

Legend of Zelda: Ocarina of Time. Nintendo. Nintendo 64, 1998.

Magic Piano. Smule. iOs, 2011.

Mike Tyson's Punch-Out!!. Nintendo. NES, 1987.

My Singing Monsters. Big Blue Bubble. iOS, 2012.

My Singing Monsters: Composer. Big Blue Bubble. iOs and Android, 2018.

Pocket Frogs. NimbleBit. iOs and Android, 2010.

Pocket God. Bolt Creative. iOs, 2009.

Pokémon Go. Niantic. iOs and Android, 2016.

Rock Band. Harmonix, MTV Games. Multiplatform, 2007.

RuneScape. Jagex. Browser, 2001.

Tap Tap Revenge. Nate True, Tapulous. iOs, 2008.

Tetris. Alexey Pajitnov, Nintendo. NES, 1989.

Tiny Zoo Friends. TinyCo. iOs, 2011.

Words With Friends. Zynga. Multiplatform, 2009.

Wordle. Josh Wardle. Browser, 2021.

Zelda II: The Adventure of Link. Nintendo. Famicom, 1987.

Videography

Arabesque No. 1 - Metrostyled and Autographed by Debussy | Player Piano, 2023. https://www.youtube.com/watch?v=HNmMYIa68H8.

Cylinder Musical Box "Two per Turn," 2017. https://www.youtube.com/watch?v=4V6KBcEJjro.

DuckTales Music (NES) - The Moon Theme, 2009. https://www.youtube.com/watch?v=KF32DRg9opA.

Five Nights at Freddy's 1 Power Runs Out (Jumpscare Warning), 2021. https://www.youtube.com/watch?v=w0h4YNI_aHI.

FNAF 2: Marionette (The Puppet) Jumpscare, 2021. https://www.youtube.com/watch?v=7vI_xT6dBrQ.

How To Program a Music Box - Hole Punch Tutorial, 2017. https://www.youtube.com/watch?v=HjBhO9iqEc0.

I Enslaved Monsters and Forced Them to Sing and Breed (My Singing Monsters), 2021. https://www.youtube.com/watch?v=PB5638QD64Y. Accessed May 2023.

Interchangeable-Disc Music Box | Instrument Demonstration, 2020. https://www.youtube.com/watch?v=SUMakTB1FeA.

Mike Tyson's Punch-Out!! (NES) Music - Fight Theme, 2009. https://www.youtube.com/watch?v=VE8vKLEK6A8.

Player Piano Roll Disintegration (Read Description), 2019. https://www.youtube.com/watch?v=58FpljbiAWE.

Shortest Freddy Power Outage Attack in FNAF 1, 2022. https://www.youtube.com/watch?v=rsqM8wH52rg.

Using a Cricut to Make DIY Music Boxes, 2020. https://www.youtube.com/watch?v=apcsggbbBFw.