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Music making, teaching, and learning in Chiptune communities

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Abstract

Music education has long identified "life-long and life-wide" musicianship within community contexts as a primary goal of formal music instruction. In music education research, scholars often seek out (and study) musical communities to inform formal curricula and pedagogy, with the goal of better preparing students to participate in musical communities outside of formal institutions. In this study, I explore music learning practices at play in one corner of contemporary musicianship—chiptune. Chiptune is music that references videogames and videogame music, using videogame consoles as a sound source or simply evoking the aesthetics of videogame sound.

The purpose of this study is to better understand music making and learning in chiptune communities by addressing four questions: what does musicianship in chiptune communities look like? What role does community play? What are the music learning practices of chiptune musicians? What, if anything, can be learned about contemporary musicianship by inquiring into chiptune culture? To address these questions, I make use of an auto/ethnographic method, drawing on online ethnography (Hine, 2015) and autoethnographic inquiry (Ellis & Bochner, 2011). Findings take the form of a dialogic, performative text which embodies the fractured nature of online communities. I adopt a rhizomatic (Deleuze & Guattari, 1987) heuristic which highlights how chiptune community is flat, center-less, and facilitates mapping as learning. I offer implications for music education research and practice, and suggestions for future research into relationships among communities and nonhuman actants.

Preface

This document is organized unconventionally. A standard format makes it easy for readers to seek out information relevant to their needs; in this case, I became concerned that a conventionally organized document would fundamentally fail tom reflect the methods and findings at play in my research. Rather than choose the reader over my project or vice-versa, I decided to split the difference. You will find below a summary of the different sections, with notes on what information each contains. My hope is that, if you choose to read this document cover-to-cover, that you will be able to engage with the findings in a way that is informed, but also (mostly) unhindered by overwrought theoretical language. More importantly, I hope that you are able to engage with the findings exploratively and inductively rather than seeking out definitive answers to well-defined questions. By providing this preface, I also hope that if you are looking for specific information you are able to find it without reading the whole document.

Chapter One includes justification, the purpose of the study, research questions, and a short positioning statement. Added on to these more or less typical introductory components is a short literature review of chiptune (to provide context) and a brief overview of methods used in the study (just enough that you know what to expect going into Chapter Three).

Chapter Two is an inscription of data generated over the course of this study. It is a narrative that includes reflective episodes and conversations constructed out of curated participant quotations. The structure of the chapter is built around a narrative that traces my experience learning to make chiptune.

Chapter Three is an in-depth discussion of the epistemological and ontological foundations of the study. It defines the theoretical frameworks at play, shows how these ideas are borne out in methodological choices, and explains how these choices are manifest in the preceding inscription. If you are curious about why this study takes the form that it does, this is the chapter to read.

Chapter Four is a review of literature, detailing important frameworks which have informed scholarly inquiry into musical communities.

Chapter Five puts the project in context within the field of music education, offering a heuristic for understanding chiptune communities as well as implications for theory, research, and practice informed by chiptune culture.

Introduction

Music education has long identified "life-long and life-wide" musicianship within community contexts as a primary goal of formal music instruction in and outside of public schools (Elliott, 2012; Jones, 2009; Mantie & Tucker, 2008; Myers, Bowles, & Dabback, 2013; Myers, 2007; Veblen, 2007). In music education research, scholars often seek out (and study) musical communities to inform formal curricula and pedagogies, with the goal of preparing students to participate in musical communities outside of formal institutions (Baker, 2012; Barrett, 2005; Green, 2002; Jaffurs, 2004; Peluso, 2014; Ruthmann & Dillon, 2012; Tobias, 2013b; Tobias & O'Leary, 2016).

Community music takes many forms; choirs (Russell, 2002), old-time jams (Dabback & Waldron, 2012), community bands (Mantie, 2012), and online groups (Gee & Hayes, 2010; Jenkins, Clinton, Purushotma, Robison, & Weigel, 2009; Tobias & O'Leary, 2016) have all been subject to scholarly inquiry. Music learning practices in these community spaces—which also take many forms—are relevant to educators, policy-makers, and researchers, in part because they define musicianship in students' lives outside classroom spaces. Of particular interest are practices of contemporary musicians in nonclassical genres; scholars have looked closely at genre-specific musical practices (Green, 2002; Tobias, 2013b), the role of music in youths' lives (Ruthmann & Dillon, 2012) as well as music learning practices in contemporary cultures (Kruse, 2013; Kruse & Veblen, 2012; Miller, 2012). Frameworks for analyzing community—communities of practice (Lave & Wenger, 1991), participatory cultures (Jenkins et al., 2009), semiotic social spaces (Gee, 2005),

or affinity spaces (Gee, 2005)—have played an important role in these inquiries into community music learning, and have informed researchers' recommendations for how teachers and students might engage with music outside the classroom.

Contributions by the above scholars have been invaluable to the field of music education as we try to make sense of contemporary musicking and what it means for teaching music. However, there are few examples of researchers participating fully in musical communities in contemporary culture. Some scholars provide rich, detailed accounts of music communities from an outsider's perspective (Dabback & Waldron, 2012; Waldron, 2011; Walser, 1993, 1995). Other researchers provide autoethnographic accounts of learning music in communities, but often as a newcomer navigating unfamiliar terrain (Kruse, 2013; Miller, 2012). Still other scholars provide accounts of musical community or music making practices from within contemporary music communities, but without explicitly attending to music learning practices at play in those spaces (Polymeropoulou, 2011; Yabsley, 2007).

Purpose and Research Questions

In this study, I explore music learning practices at play in one corner of contemporary musicianship—chiptune. Chiptune is music that references videogame sounds and videogame music. I provide this reductive definition hesitantly—it belies the diversity of aesthetic and musical practices within chiptune communities. Some chiptune artists make music for videogames, while others release stand-alone albums and play live shows. Some use digital tools, like VSTs and synthesizers to produce their music, while others use videogame consoles running after-market software on game cartridges.

The eponymous chips at the center of videogame consoles have harsh sonic limitations. Most tunes are limited to three or four voice polyphony, and musical tools are often limited to eight bits of data, creating textures that sound primordial compared to high-resolution, high-fidelity contemporary pop or electronic music. Limitations imposed by console hardware are what produced the unmistakable sounds of late 20th-century arcade and console games. Despite strong connections to videogame sounds and videogame music, chipmusicians make music in a wide variety of styles—punk rock, metal, synth-pop, rap, EDM, indie music and more can all be found under the tag "chiptune" on music hosting sites like Soundcloud and Bandcamp.

The purpose of this study is to better understand music making and learning in chiptune communities by addressing four questions: what does musicianship in chiptune communities look like? What role does community play? What are the music learning practices of chiptune musicians? What, if anything, can be learned about contemporary musicianship by inquiring into chiptune culture? Borders between online communities can be contested or unclear (Gee, 2005; Hine, 2015); rather than put forth an arbitrary definition of what, where, and who is involved in chiptune culture, I instead choose to let a working definition of chiptune community emerge from my own lived experience as a participant in chiptune. As such, "chiptune community" (for the purposes of this study) is not defined in terms of a set of web platforms, locations, or musical practices. This study of chiptune community is autoethnographic, a "study of self" (Clair, 2011, p. 118).

I chose to study chiptune for a number of reasons. At the fore is my love for chiptune music. The flipside to that love is my own obsessive pursuit of chipmusic-related skills and knowledge, as evidenced by a laundry list of equipment—soldering irons, flash carts[1], tri-wing screwdrivers, spare buttons, RCA audio jacks—and hundreds of hours bent over dismantled carcasses of Gameboy consoles. But there are other points of interest that make chiptune suited to scholarly inquiry. Chiptune is a genre of music, defined in equal parts by sound and compositional practice (Paul, 2014). It is an aesthetic (Driscoll & Diaz, 2009) rooted in a nostalgia for retro videogames and cultures surrounding them. Chiptune is what Waldron (2013b) might call a "convergent on- and off-line community" (p. 102) living across multiple web platforms. It is new and old; musicians use notation long made obsolete by state-of-the-art software in conjunction with contemporary electronic music techniques.

A Brief Overview of Chiptune

Most scholarly definitions of chiptune fall somewhere along a continuum from "music made using videogame consoles" (Paul, 2014, p. 507) to "a collection of related music production and performance practices sharing a history with video game soundtracks" (Driscoll & Diaz, 2009). Chiptune is perhaps most productively defined by its historical context. Chiptune grew out of the "demoscene," in which gamers would pirate and modify commercially-available games, redistributing them to different audiences (Carlsson, 2009). These games identified their creators through

[1] Flash cartridges fit into game consoles and run software. Importantly, flash cartridges can be programmed to run different kinds of software depending on what the user loads onto it. My flash carts plug into my computer, and I can load ROMs (games) onto it to then play on my Gameboy from 1989. It also allows me to back up songs on my computer.

opening animations featuring original soundtracks. As these "demos" became more and more elaborate, composers began to make music on game cartridges to be played through videogame consoles. The demoscene is still active today and is characterized by a commitment to creative manipulation of software under severe hardware constraints.

Emerging out of the demoscene, chiptune evolved along a trajectory parallel to those of home computing and gaming technologies. The earliest digital composition programs, called trackers, were developed by game designers to streamline the music composition process (Hopkins, 2015). Contemporary digital audio workstations (DAWs) like Ableton Live emerged out of the confluence of digital trackers and recording studio hardware. Trackers were promptly appropriated by chiptune communities and represent one of the primary compositional methods used by chipmusicians today (Driscoll & Diaz, 2009; Paul, 2014; Yabsley, 2007). As different innovations in computing and electronic music (e.g., MIDI controllers, DAWs) continued to appear, chipmusicians adopted them while maintaining a commitment to the sounds of early videogame consoles. Contemporary chipmusicians use combinations of digital and analog tools ranging from contemporary to vintage to create and perform music. Performance practices take on the histories of hip-hop DJs, house music (Pasdzierny, 2013) and others as chipmusicians curate highly individualized workflows based on what might be characterized as "intergenerational" toolsets.

Chiptune as a music genre is broad and diverse. It is associated with super-genres (e.g., 8-bit, lo-fi), parallel genres (e.g., vaporwave, synthwave, nerd rap,

fakebit[2]) and subgenres linked to specific consoles like the Sega Genesis or the Nintendo Gameboy. It should be noted that these genre designations are by no means settled. They are dynamic and contentious, and it is likely that many artists will disagree with the categorization I have provided. Some point to hardware—game consoles—as the defining characteristic of chiptune music (Polymeropoulou, 2011; Tomczak, 2008) while others rely on a common aesthetic (Paul, 2014) or set of practices (Driscoll & Diaz, 2009).

Scholars have discussed chiptune from a variety of perspectives. Driscoll and Diaz (2009) detail a history of chiptune as a musical practice and genre, a "name and aesthetic" (p. 1). Driscoll and Diaz trace chiptune from home computing to online platforms. This paper contextualizes chiptune as sharing a common history with home computing, computer games, the internet, and online community formation. It also sets up a set of divergent narratives, which scholars follow along different threads as the internet becomes a more and more important aspect of chiptune culture. Chiptune might also be described as an independent music scene. Connell and Gibson (2003) write about how interactions online have decoupled independent music from locality, allowing for virtual scenes to emerge. Despite the "imagined" nature of offline communities, locality, history and discourses of authenticity tied to these narratives all play important roles in holding scenes together.

Another discussion of authenticity revolves around hardware. Polymeropoulou (2011) conducted a "multi-sited" ethnographic inquiry (p. 9) in which web interactions related to chipmusic and fakebit were tapped for data. In this

[2] Fakebit is music that imitates the sounds of early videogame consoles using contemporary tools, like digital synthesizers and DAWs.

study, authenticity is discussed as a relative term, defined by three generations of chiptune musicians. Tomczak (2008) also discusses authenticity, suggesting that in addition to unique sonic possibilities, console hardware itself is what makes chipmusic authentic.

Polymeropoulou (2011) and Tomczak (2008) both offer a hardware/platform-oriented definition of authenticity. Certainly, many musicians offer similar definitions of chiptune based on tools and sounds which comprise it. However, authenticity in online communities is often a moving target; boundaries might be characterized as "highly permeable and dynamic" (Jarvenpaa & Lang, 2011). Because such communities lack a central organizing authority, such boundaries must be socially constructed by content-creators. The person who decides whether or not a musical artifact belongs to a certain genre is often the authoring musician themself, as they apply tags that categorize their work on platforms like Soundcloud, YouTube, or Bandcamp, or by joining forums and websites devoted to chiptune. Discussions of authenticity, therefore, are necessarily disconnected from individuals who make chiptune. They are instead connected to tools that mediate chipmusic and the platforms that host it—objects that are forever changing, forever up for debate among musicians who use them. The flexible and dynamic borders of online communities have been linked to increased "generative capacity"—their "ability to engage in acts of rejuvenating, reconfiguring, reframing and revolutionising within a particular goal-driven context" (van Osch & Avital, 2010, p. 5). Labels like "chiptune," then, are more useful as points of *departure* than points of arrival.

Positioning Statement

I came into this inquiry as a participant-observer. Before encountering chiptune, I was engaged in informal learning online as I practiced producing electronic music and building electronic musical instruments. I entered chiptune culture through modifying game console hardware as an extension of my experiences in the maker movement (Dougherty, 2012; Halverson & Sheridan, 2014). Before beginning this research, I had been participating in chiptune community for two years by reading and contributing to forums, listening to podcasts, and following musicians on social media. As I made chiptune music of my own, using content posted online to help me learn new things about the tools and techniques used by other musicians, I came to know many individuals' backgrounds and orientations toward music. Screen names became familiar, and I felt that I was a small part of a large and robust community. Because of my privilege as a white, cisgender, straight male, I never felt unsafe in these online spaces.

I also found myself comparing my experiences learning in chiptune communities to my experiences in academic spaces. I had been playing classical saxophone for far longer than I had been making chiptune, but I liked the autonomy and openness of the informal chiptune communities compared to the structure and tradition I encountered in academic music spaces. As I trained to be a teacher, the contrasts between my two experiences became more and more important to my ideas about music teaching and education (Stringham & Stapleton, 2016). I became curious about how other people in my community learned music, the relationship of informal communities to music learning in contemporary culture.

A Brief Discussion of Methods

The purpose of this study is to address four questions: what does musicianship look like in chiptune culture? What role does community play? What are the music learning practices of chiptune musicians? What, if anything, might be learned about contemporary musicianship and music learning through chiptune? To address these questions from my position as participant-observer, I used autoethnographic methods (Ellis & Bochner, 2000) alongside techniques of virtual ethnography/nethnography (Braga, 2009; Hine, 2015). I generated data from three nodes: a group of six participants, users of three web platforms associated with chiptune, and my own lived experiences. The six participants were selected using purposive convenience sampling (Merriam & Tisdell, 2016). They are musicians who I knew indirectly through social media prior to the study. They were prominent chipmusicians in my sphere of chiptune engagement, and I was curious about their music learning practices. I contacted them through social media or email and conducted interviews over the phone, internet-mediated voice chat, or in one case direct message on Twitter. The three web platforms were selected in a similar way; they were prominent forums in my experience as a learner in chiptune culture. I deployed a survey[3] to these three sites (chipmusic.org, battleofthebits.org, and reddit.com/r/chiptune). Fifty-four people responded to the survey.[4] Making use of multiple methods (e.g., autoethnographic inquiry, interviews, surveys, content analysis) helps online ethnographers check for bias and triangulate conclusions (Baym, 2000).

[3] See appendix for sample survey
[4] See appendix for complete aggregate data

As I participated in chiptune communities, I engaged in many of the behaviors that characterize web ethnographies/nethnographies. I was immersed in chiptune communities for a significant period of time (Hine, 2015), I "lurked" on forums (Garcia, Standlee, Bechkoff, & Cui, 2009), and participated fully in the culture under inquiry (Baym, 2000). Once the study began, I communicated with individuals and took seriously the many forms data in online spaces takes (Williams, 2007). Supplementing these ethnographic methods was autoethnographic attention (Birkerts, 2015)—a sensitization to my own experiences as a participant in chiptune community.

The text that follows this chapter is an auto/ethnographic inscription of my experience as a learner in community with chipmusicians. I use the term auto/ethnographic to reflect my positionality (auto) alongside the methods which were used to generate data (ethnographic). I am a participant in the study (auto) alongside participants who relate other facets of chiptune culture beyond my personal experiences (ethnographic). In dialogue with others over an extended period of time (ethnographic), I come to know myself (auto) (Bakhtin, 1984).

Ethnographic texts make a researcher's voice and position explicit, position participants as complex and "impossible to know in their totality" (Hine, 2015, p. 19), and use narrative to relate lived experiences (Ellis, Adams, & Bochner, 2011). My narrative is filtered through lenses that include of memory, politics, privilege, scholarship. My experience is also filtered by internet search algorithms, my own search history, and platforms that mediate my participation in chiptune culture—infrastructures that often go unnoticed but that have profound impacts on

internet cultures (Hine, 2017). This text is not intended to communicate a master narrative about chiptune community. Instead, it seeks to evoke the fractured, disorienting, and dialogue-driven nature of participating in chiptune community. Like many other ethnographic inscriptions, form follows experience (Denzin, 2003b; Gingrich-Philbrook, 2005).

Along with other musicians I spoke with during this study, I find myself on a path that is intimately bound up with my own values and ideas about what constitutes musicianship, who teaches and learns music, and why all of this matters. Even though this story about chiptune is deeply personal, it is not just my story to tell. Over the last several years, I have learned from coders, designers, technicians, composers, children, consoles, songs, and sounds. I have spoken to musicians who place themselves at the center of chiptune culture, and others who see themselves as outside of it. These voices, rather than acting as characters who play a part in my narrative, are participants in a dialogue that takes place online, in person, and in my own imagination. Some of these voices are embodied by people. Some speak from fictional avatars, objects, or through websites and digital platforms. Many are heard in the music itself. These experiences cannot be reduced to a narrative arc, a set of figures, or a theory. Experience is all of these things, even in their contradictions.

In the following chapter, I seek to communicate my experience of chiptune culture, and what music learning looks like in one corner of contemporary culture. It is a performative text—a rendering of data generated through interviews and my own lived experiences as a learner in chiptune culture that adopts a performance-oriented,

aesthetic tone. Like other performative texts, it is both analysis and method (Madison, 1999), a guidepost for understanding as well as a tool for generating insight.

I created this text using materials generated through interviews, personal reflection, social media analysis, and the aforementioned survey. The text is primarily comprised of in vivo (verbatim) transcriptions of conversations, or media pulled from data sets. I spliced and combined pieces of conversations in order to put different voices in conversation with one another, creating a "dialogic text" (Denzin, 2003a; Rabinow, 1986). In other words, the conversations rendered in the next chapter are not faithful transcriptions of dialogues which I facilitated as researcher—they are imagined dialogues, constructed using faithful transcriptions of participants' individual voices. Participants' quotes are necessarily taken out of context to create these dialogues. To ensure that participants' ideas are not misrepresented, I attended to meaning conveyed in interviews, as well as the context into which quotations were inserted. I also conducted member checks (Merriam & Tisdell, 2016) with all participants to ensure that their ideas were represented faithfully. Conversations among participants—constructed out of interview fragments—are separated by vignettes or reflections indicated by italics. My intention is not to use "dialogicality" (Denzin, 2003a; Rabinow, 1986) as a badge of reflexivity or representation of truth. Rather, my goal is to let my voice speak alongside others.

Findings

A few years ago, I became obsessed with the Nintendo Gameboy. I had come across this video of a chiptune musician who has four Gameboys hooked up to DJ mixer and an effects engine, where he basically plays a DJ set with tunes tracked out for the consoles. It enchanted me. It seemed at once impossibly precious and mysterious—effervescent, nostalgic melodies alongside mangled, unpredictable, pixelated glitches. The stream had a live chat running at the bottom; rather, the screencast recorded a live chat in addition to recording the live set. Someone wrote "What the heck is he doing? Are those Gameboys?" and then this guy replies and explains that he wrote the songs on the Gameboys, says "this is the software, you can check it out here if you want to." I dusted off all of the old videogames that I hadn't played since middle school and brought them to the local game store. My stack of used games was worth just enough to buy a Gameboy, a fat grey DMG from 1989.

I arranged my tools in advance. A tri-wing screwdriver, a spool of grey lead solder, my soldering iron gradually heating off to the side. Two RCA jacks that would sit on the surface of the enclosure. Thin, threadlike wire in two colors. Replacement capacitors in a variety of sizes, all dark blue with a thick white band above one of its leads. A wet sponge sat in a small cast iron bowl, specks of solder embedded in its fibers from previous projects. Several blogs pulled up on my computer, each with a different piece of wisdom to offer. I unspooled a length of solder and held it against the iron. After a few seconds, the iron was hot enough to melt the metal. A white cloud of smoke drifted up from the molten lead, unfurling around my face and filling the room with flux-resin incense. I exhaled gently.

The modification took three hours. Afterwards, my back ached from hunching over the console's carcass. Looking up from the PCB, my living room wouldn't come into focus;

too much time spent staring at tiny solder joints, routing threadlike cables through empty spaces within the enclosure. I stood up and paced around my house for a couple of minutes, shaking off solder-fume haze and trying to find my standing legs again. I made my way back to the work table and halfheartedly rearranged the detritus produced by my project. Sharp steel spindles trimmed from capacitors, bits of lead solder too small for me to use without burning my fingertips. The buttons and screws that still needed to be put back in place within the enclosure. I sat and began re-assembling console, retracing my steps. Put the buttons back in, fasten the front PCB. Slide the ribbon cable into its housing, align the halves of the console. The wires I added in the modification made the fit a little tighter than I was comfortable with, but it was too late to find a better way to route them. I painstakingly turned the stripped tri-wing screws, sealing up the enclosure and completing the illusion of console-ness. All that remained of my efforts were two RCA fixtures mounted to the bottom left-hand corner of the enclosure—foreign hardware betraying a hidden identity.

I switched on the console, and the red light flipped on as 'Nintendo' drifted slowly from the top of the screen. My memory produced the familiar bell sound that accompanies the logo, despite the fact that the speaker had been amputated over the course of the modification. It sat inert, among the rest of the leftovers. I plugged the console into my speaker and loaded a bass patch. No sound. I felt for the volume knob. The console whispered with its new voice. I turned the knob further. Capacitor leads and solder fragments fell and vibrated above the floor as the unrendered sound crawled out of the speaker and pressed against windows, sat on my chest, shook the air.[5]

[5] The narrative above refers to after-market modifications commonly performed on Gameboys when they are being used for music-making. The Gameboy is capable of a diverse set of sounds, but the console sends audio through a stereo amplifier to drive both the small speaker mounted within the enclosure as well as the headphone output. The amplifier often degrades the audio signal, decreasing

Jon: This story is about learning to make chiptune music. There are a lot of voices who have something to say about this, so you'll hear from them, too.

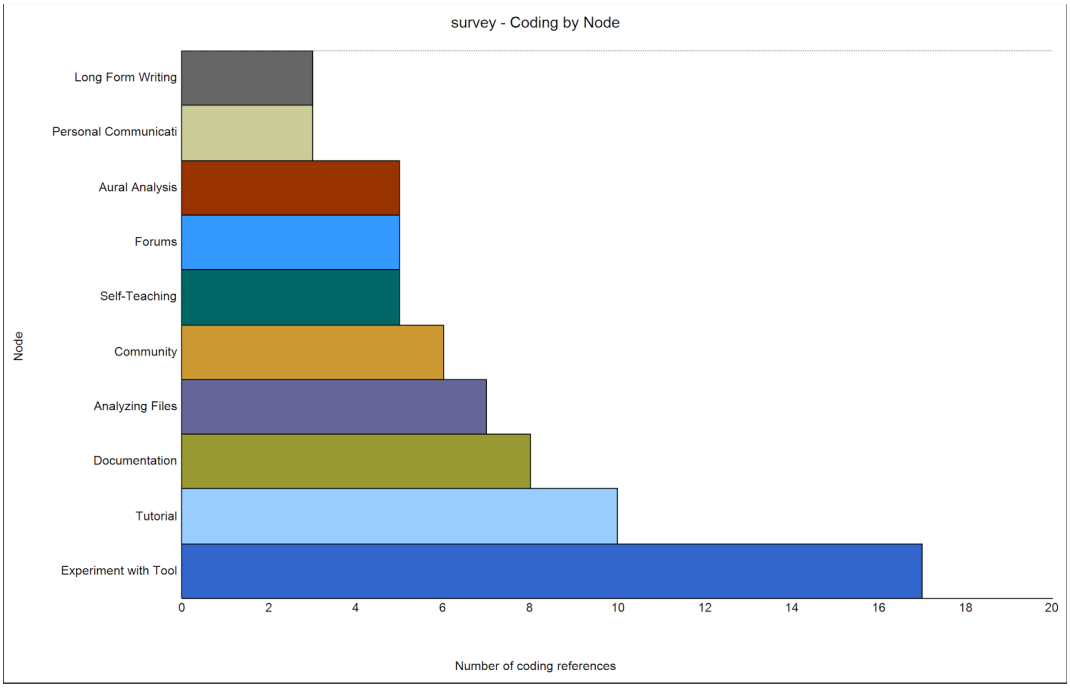
I snapped the flash cart into the console and flipped it on. The game loaded and I saw a large grid that took up the entire screen. The grid had four column and many other rows. Hieroglyphs.

Jon: So as a part of this study, I sent out a survey[6] to a couple of chip forums about how people learn stuff. Here's the breakdown:

bass frequency response and clarity. To solve this problem, many musicians perform a "pro sound" modification, using tutorials like this one. It involves tapping into the audio line before it enters the amplifier and redirecting the audio to an external jack. These jacks are mounted into holes drilled through the plastic. "Re-capping" is another common procedure performed on videogame consoles; it involves replacing all of the electrolytic capacitors on the circuit board. As consumer electronics age, the components which make up their circuits slow degrade with use. Electrolytic capacitors are particularly prone to small changes over time which decrease the efficiency of electrical mechanisms. These components, which appear in a "film canister" variant on the Gameboy circuit boards, are often replaced to solve problems related to power supply efficiency, audio quality, and old displays. Replacing these parts often returns the console to like-new functionality, provided the modification is performed correctly.

[6] Survey was posted on chipmusic.org, battleofthebits.org, and reddit.com/r/chiptune. See Appendix for survey questions and aggregate data.

Figure 1: Self-reported learning practices of chipmusicians (n=54)



Marissa: I feel like a lot of people, um, get into chiptune by listening and then they try to find out more about how it's made.

Jon: Yeah, that also plays out in the survey responses.[7] Some people listened to music, got exposed to the culture through visual art or game dev communities, or just found it by accident. They want to make chiptune so they might decide "I'm gonna, I'm gonna try to, I'll like download a tracker, or I'll download a soundfont or something and work on, work on making my own." But then they have to figure out how to bridge the gap between what they're hearing and what they can actually do. Because the tools aren't always super easy to use.

Aaron: For me it was just exploration, like my friend and I, you look at the 3x OSC in Fruity Loops, and you're like "What are these different shapes?" And my friend is

[7] See appendix for full survey data set.

like "I think it's the shape of the sound wave it's making" and I'm like "Oh!" lightbulb goes off.

@nelward: i remember back in 2010 when i was trying to emulate a sampled voice but I didnt know wat a sampler was so I went into forums asking what VST would make the sounds i heard on rugrats

Sylv: I actually googled, and I was Youtubing like "how to use LSDJ" and shit like that. And it's still like, totally backwards. Like, so I'm just trying my best, I was reading, not reading, I read about Roboctopus's tutorial on LSDJ, didn't know what the fuck he was talking about, had to YouTube it because I'm a more visual learner, that wasn't really working either, I mean I got, I mean I learned how to input notes and shit like that, but... for the most part, I kind of learned how to make the music on the Gameboy, but first playing on the piano. So like, I would play it, memorize it, make it on the Gameboy just like the chords and that stuff, like the harmonies, go back to the piano, try to fix it, and maybe do a couple commands and shit like that. Keep doing that until like, I made a song.

Aaron: I was, I was in that, I was like reading every LSDJ tutorial ever, I was listening to like every LSDJ album that anyone had ever made. And lot of people will provide save files for their work too, a bunch of those were instrumental for me, like the Ground Zero EP, the Roboctopus Jelly EP… They would provide their save files so you can take a peek, a lot of that stuff was kind of mind blowing. And I spent a lot of time Googling.

Jamie: There's like this running joke in the scene where its like everyone's first LSDj track sounds the same, and people will post it and call it "my first LSDj".

Sylv: I bought a Gameboy on Ebay, I bought a LS, I went to Kitsch-Bent, specifically buying one of those Gameboy cartridges with LSDJ on it, and like pressing my first note and being like "Oh shit, this is difficult." But like, from a, from a pianists perspective, I'm used to playing on keys.

Jamie: It is tricky, when you already have like, "Well I kind of already have my way of writing and I have to put it into this different medium and try to replicate that. For me, that was hard. I would just keep practicing, I used to bring it to work all the time and during those days that was like before... it was just so much of practicing and looking at tutorials.

Sylv: I finally bought a midiNES, I bought it a year, two years ago probably. And I didn't know how to use it whatsoever, but my first time actually using it and feeling comfortable I was like "Yes! I will only use this, fuck the Gameboy, the Gameboy is way too hard," because I'll feel in my fingers, and how to play it, and I'll just play the music out on the Nintendo system first.

Jamie: I also do a lot of trial and error. So like, if I'm like working with any sort of instrument, I put so much into like, I'll watch tutorials, and I'll do a lot of stuff just messing around, and listening, and just trial and error.

I pulled up the LSDj manual and started reading through it. That helped a little. I found the section on sync options and read about keyboard sync. It let you play notes in real time rather than entering them into the tracker. This sounded a little bit more my speed. I also kind of liked the idea of showing up to an open mic with a Gameboy and improvising some solos. I read a little more about it, then looked up a video. I also found a blog post

through a forum that had a lot of helpful information. Setting up keyboard sync required that I splice the PS-2 cable from a pre-USB-era keyboard (not piano, keyboard as it typing) to the Gameboy link port. I made a mental note to drop by Goodwill and the game store in the next week or so. I looked at my closet and wondered if I still had any games packed away that I could sell.

Jon: Why do you think people post all of these tutorials?

Marissa: I would say the chiptune community is really willing to just show anybody who's willing to learn. If you're willing to learn, they're willing to give you a manual and this tracker, or somebody has a YouTube video to you know, how-to just to get started… People are really willing to share you know, "this is how I made this sound, this is how I made this effect."

Jamie: I think that just, asking for help is such a good way to break barriers, and the chances of someone giving you a snarky comment are pretty low, and if they do there are 50 people backing you up.

Aaron: I really value the whole, aspect of sharing knowledge and it's cool to see that there's a lot of that out there, and then also feel like "Oh, I have stuff to contribute too." And I don't know, it's just cool to see people succeed at it. If they're asking me or whatever like "Hey what, you know give me some constructive criticism" like, I'll be like "Yeah, I would do this," not in an attempt to try to take you down and be like "Oh, you suck" or whatever, like but like, "Oh well this is good, here's what you need to work on, maybe think about these things that you have that are possibilities".

Jamie: I did this thing for chipwin where I wrote about the basics of playing your first show. So I was writing about like, I suffer from anxiety, and I am very like, neurotic and I get inside my own head. And I'm just like "Oh, I just can't have anything mess up." And that's obviously going to happen. So I literally just made a checklist of what to know about your first show, bringing like backup cables in case your cable dies. Like, how to talk to a mix engineer, talking about like terminology, or whatever. It was really weird because for me I've played so many shows now, but I remember how it was and I still get nervous when I play shows. So bringing a more emotional level to this thing that's logical, preparing for a show, the act of doing. But like fact that i was talking about anxiety, so many people were more receptive to it, and they were like" oh my god, I suffer from anxiety too, and I always feel like I have to not talk about it because people don't understand." And some people were like "Oh, I never thought about bringing an extra cable with me, that's such a good idea" like, "I'm playing my first show next month," and you could tell everybody feels the same way about playing their first show. Everyone's so nervous, and people were also kind of giving information like "Oh, you guys should also do this," or "you folks should also do that." I only had one person who wrote something like, kind of like a snide-ass comment like "You plug in and press play" And I was like "Yeah, not everyone is just pressing play on their Gameboy and jumping around, not everybody does that and even if they do there's a lot more that goes into it."I think just knowing that like, I think especially the chiptune community is so diverse that, you know, people will talk about their issues and it's so rare to find somebody who's not, someone, it's so rare to find someone who isn't a good person. You're not going to

have like, these people how are super hateful and transphonic, or sexist, or whatever. That's not common, it's so diverse. So I really appreciate that community, and if any sort of adversity comes up, or someone makes a racist comment it's like 50 people on top of it, just fighting against it.

Some undergrads were working on a technology project—looking into different DIY/DIY-adjacent boards and instruments for a conference presentation. One of these boards was Teensy. This board is made by PJRC and it's kind of a musician's microcontroller that lets people easily build MIDI controllers, digital synthesizers, and other stuff. I actually first heard of chiptune through researching projects for this board. It's been the center of a lot of projects I've done for chipmusic and other stuff, and so their advisor asked me to help them learn how to use it.

I was incensed by this request. Propelled by my outrage I started listing reasons why I wouldn't help, why they didn't need my help, why their ignorance was their problem and not mine. I don't think I actually said anything like that out loud, but I was repulsed by the idea of teaching them how to use the tool. Why couldn't they just look online like I did? If they really wanted to talk about this stuff, they should do the work themselves. I'm not a search engine, I'm not going to email them links when they could find information for themselves. If they aren't interested in DIY music enough to get involved online, then they shouldn't be talking about it at all. I told their advisor I felt taken advantage of, that I didn't have time to help them, that they needed to do the work for themselves.

My insult and upset goes against all my instincts as a teacher. I believe that there are lots of entry points to learning, and people should use whatever vectors they want to get at

new ideas and new musical practices. I can be pretty irreverent when it comes to classical music; one of my favorite things to say when people talk about "respecting the composer's intent" or "capturing the essence of the piece" is that the person who wrote the piece isn't in the room, so they don't care what we do. But as soon as someone wanted me to teach them about DIY electronic music, something I care deeply about, it became obvious that I had some baggage. Why? What was different about teaching this stuff?

I think the position of teacher made me uncomfortable. Teacher have a lot of power; they simply know more things. I think the students saw me as being close to the center of this community of DIY musicians. I know a lot about making MIDI controllers, and a lot about the boards that musicians might use for making instruments. But I don't see myself as a gatekeeper. I don't even see myself as an expert! There are so many people who know so much more than me, people who have been my indirect mentors as I stumble through soldering my first circuit board, burning my hands on a hot iron, compiling broken code over and over again until it finally works as if by accident. Amazing, miraculous projects that conjure mysterious sounds and procedures from invisible scripts running on tiny computers. Electronics sometimes feel like magic; I know how it works, but I can't see the electrons oscillating back and forth on the audio lines, tugging on the magnet that pulls on the air that pulls on my eardrums such that my mind makes me hear music. I can't even feel the current, it's so small. The capacitance of my body changes the circuit when I touch it, when I get near the right spots. The circuit seems to leap to life when I plug in the battery. I can hear the sounds change when I squeeze capacitors, changing how many electronics it can store at a time. I know how it works, but even as I build these little machines they play with my

expectations and conjure new sounds of out thin air, coaxed by barometric pressure and radio waves and electromagnetic radiation.

How do I teach that? Should I try? I don't own that magic. It belongs to everyone, all the people who taught me and everyone else who learned from them, too. How do I direct learners through a field of multiplicities, not knowing what they want to do? I would be lost if I tried to lead them. I couldn't offer them my map of DIY music; they would have to go out into the world and make their own.

Jon: In my other music learning experiences, it seemed like teachers were more interested in protecting community standards than helping newcomers.

Sylv: I wanted to pursue music, but a part of me said "Nah, it's too chauvinistic." I would see people on the train like studying music, and be like "You know damn well you don't know what the fuck you're doing. Like stop." Go to the practice room, and be reasonable.

Aaron: I don't know, sometimes I feel like almost the academic stuff can kind of, it's, it's like, sometimes I don't know like "Is this music, or is like an elaborate troll?" like sometimes the stuff you hear you're just like "Are you actually serious right now?" Because like some of that stuff is like, it's so esoteric that you wonder who even is going to appreciate it.

Nelward: I'm just a little bit sour about these people telling me "Well when you get the Real World™ they're not going to put up with you…" you know, playing Donna Lee too slow or something.

Marissa: I think there's that stigma of, you know like, "We'll teach you this, but you have to be really serious, and you have to do it, you know, you can't be an amateur,

you have to be, you know, practicing, and you have to be learning and like, this has to be your music life.

Aaron: I can do something else and have this be on the side as the thing I like to do, I didn't like the idea of having a full-time music gig and then being burned out from that so much that would never be able to like, make the, the music that I really wanted to make.

Marissa: Whereas sometimes in the academic world, it's like "No, this is how you do it. This is how it's played, there you go."

Nelward: Yeah, and it, obviously outside of the academic world that's not a thing. People are a lot more liberal, there's not like a checklist of rules you have to follow.

Aaron: I'm in Indiana and there is a chiptune festival that has been put on for the last several years called Little Sound Assembly. I was Googling around and trying to find anyone in my city that was doing chiptune, like in Indianapolis, I would've thought like "Oh, this is a capital city, there's got to be somebody here doing this already," and I couldn't find anyone. Evansville is where this festival is happening, and I'm like "Oh, whoa somebody else even in my state is doing this, I should probably hook up with them." so I went to the festival just to check it out, and my mind was blown like, that was the first real experience that I had going to a live chipshow. It's just something else to see that stuff and like, hear what people are doing. Seeing that definitely changed everything and it gave me a real of like "Oh, I want to write music..." Coming from an advanced sort of classical and jazz background, my tendency was always to make the weirdest sounding stuff possible. It can tend to be kind of alienating. So now I'm like "Oh, I want my stuff to be dance-y. I want it to

kind of speak to people regardless of their background." And there's also this whole part where I guess, I like catchy melodies, as it turns out? And I've heard of some elitism in certain sub-chip communities, like subcommunities, certain people that are using certain tools or whatever that can be kind of like, "Oh, learn what you're doing before you, you know, step in our circle or whatever." I haven't encountered that.

Jamie: I don't know. I think that it used to be more of a big deal, I feel like now people are kind of like whatever.

Aaron: I wonder if it's just because Gameboy music is so easy to access.

Marissa: Those of us who are musicians, and who like that style of music, we can still dig their Gameboy that lasted this many years out of their closet and go "Hey, there's this little cartridge you plug in, and you can make this music, you know that you grew up with, that you love so much." Um... whereas, Logic, not everybody just goes "Hey, I'm going to go..."

Jon: 'Yeah, go get Logic, I'll just pick it up from Wal-Mart,' that's not really how it works.

Marissa: Yeah, and even though trackers have their own kind of learning curve if you're not a musician and you don't really understand, you know, how that all works.

Aaron: And it's not like you're sitting here with this kind of obscure program that you're looking at it and you're thinking like how, this is really esoteric, how can I wrap my head around this, oh there's no help.

Jamie: Specifically with Gameboys I feel like if you understand how to write music, it could be an advantage but there are so many people in the chiptune scene who are

like... they'll be like "Oh, I'm a programmer, and I just like listening to music, I've never written." So for them, LSDj is the first language that they're learning so a lot of those people, they're just so good at LSDj, and it's like if you come from a writing background you might not necessarily have that benefit.

Marissa: It's a very accessible way of writing music, so people can pick it up and just make sounds. There's not really any formal learning that has to be done.

Aaron: Or maybe just the pioneers of the scene like, Bitshifter or somebody was like "Yeah, we'll share our save files, yeah we'll share our stuff."

Jon: Yeah, and you see that all over platforms like chipmusic.org, reddit, Chiptunes=Win…

Jamie: Interestingly enough, there are some people who do not like ChipWin. And I don't think the people who run it would be mad at me for saying that. They think that ChipWin is like washed down, and it's like they let too many people in, it's not exclusive enough, everything sounds the same and it's like no, everything can't sound the same, it's like 3,000 people posting their work. You can't say everyone sounds the same. But these are toxic people saying these things. The people who run it want to make a healthy environment for people.

Keffie: chiptune is pretty inclusive, i think, even across the various sub-places. it is mostly male for whatever reason, but v high proportion of trans women (for whatever reason).

Jon: Yeah, I definitely got the sense that chiptune is pretty male dominated. Out of the fifty-four responses to my survey, just two identified as female.

Jamie: ChipWin just does so much work just trying to make it feel like a safe place for people. Because so many online communities are really shitty for people who, just like people now, there are just people who are really, really crappy online, but there are a lot of of people in communities, like I'm a girl, and there are people who will bully me for being female and I feel like I'm the only one with like a sword, and no one is backing me up. And so much of music, and sound, and gaming and internet culture is a boy's club. And when I say that, I'm not shitting on anyone for being interested in videogames, or sound, or music, or anything. I'm just saying that like, when I say boy's club I literally mean it's super sexist. But then it's like, you know that doesn't happen in Chipwin because there's a community of people who just don't stand for that.

Keffie: theres cis/trans women that have active roles in chip community and theres no particular focus on it, they occupy more-or-less the same functional roles as men etc. seems to b that way on racial lines as well, i guess its easy to get along when everyone is there for an extremely specific and not particularly money-oriented hobby, theres not the same paranoia that very large, vague umbrella communities have, everyone p much knows eachother individually

Aaron: nobody's trying to make a living so there's no real competition over who needs to succeed or who needs to fail, like you can't, nobody's trying to keep someone else off the scene because, oh, another chipmusician means another dollar out of my pocket.

Trash80 is the internet moniker of a chipmusician who invented Arduinoboy[8], a device that sends and receives MIDI data from the Gameboy. Arduinoboy integrates Gameboys into complex networks of musical instruments; I've seen people control modular synthesizers with Gameboys, play improvised solos using MIDI controllers, and weave the sounds from the console into electronic textures, everything in sync through MIDI. In a sense, it transforms Gameboy music-making from a exercise in historical reenactment into a performance of an alternate narrative in which game consoles were musical instruments first.

I had already been creating my own MIDI controllers with Teensy, a device similar to the one at the heart of Arduinoboy. It seemed like a perfect project for me, combining my coding skills with chiptune. I excitedly downloaded the code for the device (to be precise, it was a version of the code which was modified by noizeinabox to run on Teensy) and pressed 'compile and upload.' No dice. The console spat orange error messages, many of which were completely indecipherable. I checked my code and tried again, same result.

I wasn't going to be discouraged, though. I started scouring the internet for help. Endless Google searches. "gameboy MIDI sync diy"; "gameboy Ableton diy"; "gameboy lsdj MIDI"; "arduinoboy MIDI diy"; "teensyboy diy compile error"; "lsdj keyboard mode diy"; "gameboy sync cable pinout"; and on and on such that my questions themselves became alchemical experiments devoid of semiotic meaning, designed to tease out new information from the morass of online data.

I circled back through the life of Arduinoboy and Gameboy sync projects. Trash80 invented Arduinoboy, Noizeinabox took this idea and ported it to Teensy, little-scale made

[8] The name "Arduinoboy" comes from Arduino, a microcontroller marketed to DIY enthusiasts, hobbyists, and amateur engineers. Microcontrollers are small computing devices which can interface with sensors, using coded scripts to create outputs or complete tasks using inputs from these sensors.

small devices that worked similarly, but were often designed for more focused uses in specialized contexts. All of these hardware devices were built to communicate with LSDJ, a community-built software tracker made to run on the Nintendo Gameboy. I stared at trash80's hand-drawn schematic as I tried to figure out the pin configuration on my link cable (colors and pin locations can be rather inconsistent). I scrolled endlessly through the code, tweaking small parameters hoping that it would lead to a miraculously successful compilation. No such luck. Most of all, I sifted through hundreds of forum posts on chiptune websites, trying to locate the fossilized remains of another musician grappling with the same problem as me. I left messages behind, time capsules to be dug up by a future musician looking for answers to my questions. Over time, I began to see the people who I learned from as my teachers. I wondered what they thought of people like me, their students. Trash80 and I never spoke, but scaffolding of his project served as a mentor for me in my own journey. I suppose that scaffolding was my teacher, if not the person behind the moniker.

Nelward: I was like, should I do garage rock, should I do progressive rock, should I do this blah blah... like it was, it was a big thing over the many years I was like "I don't know what, what to stick with." And one day someone was like, "You would like Maxo, you should check out Maxo." So I checked out Maxo, and it was like I peering into like this alternate universe... 'cause I was always wondering like what is my niche, what should I you know, where do I fit in.

Aaron: For me it was the Kind of Bloop album, um which was a cover album of Kind of Blue by Miles Davis, but that featured like Shnabubula and Vert, and Disaster Piece, and a couple other musicians where I was like "Oh, you're doing chiptune

jazz? Now this is right up my alley." I think that was one of the key things for me where I was like "Who are these people?" Because I didn't have the sense that there were any real virtuosic chip musicians that were fluent in jazz vocabulary. That I think is what really blew my mind.

Nelward: When I heard Maxo, I was like "Oh my god, this it. This is what I need to be doing. Pretty much exactly what this guy is doing." I would analyze other people's songs, too. I would transcribe them. I transcribed a lot of Maxo, transcribed some of Keffie's songs, transcribed like... I don't know, other stuff too.

Keffie: luckily most of the musicians i admired were easy to contact so i did, lol. and then befriended them. hahah me and a few friends saw a few of them like gods. we were a bit culty and constantly asked them for their module files and old or obscure music to "archive". which was weird cuz they were just people.

Sylv: Oh, like fearofdark, I used to listen to his music like a whole lot back in like 2010 and all that shit, only to find out you know a couple years later, I'm just you know, speaking to him face to face and we're hanging out having drinks and all that shit. So... it's pretty surreal.

Nelward: Yeah, fearofdark, just these really slick arrangements. There's a lot of really musical stuff in the chiptune scene.

Jon: Like there's this guy, trash80 who, he like invented the MIDI Gameboy thing, I use that a lot. And I was like "Oh my god, trash80..." and I was like on a forum and I asked a question, and he answered my question, and I was like "Oh man, this is crazy!" And then I looked, and he's like, he's like just on these forums, and answering

everyone's questions and stuff and I was like "Oh, this is just like how it is, it's not, not a big deal."

Keffie: but thats often what happens when u r young and without any conventional religious belief and u meet someone like that. but yeah, idea trading and mentorship for sure (whether they wanted to b mentors or not).

Nelward: Yeah, it wasn't a direct mentorship, it was more like...Well, like the most important thing was like, just pushing me to get my musicality up. It was like "Okay how do I get this sound, or what, what makes this music good?" But yeah, not a direct mentorship because you're not seeing these people in real life.

Keffie: tho there r small friend circles from here that meet irl on occasion, and they enjoy it very much

I looked around my room. Two basses hung on the wall; a guitar sat across my reading chair. A mixer, some guitar pedals, cables in dense tangles spread out on the floor. Small pieces of solder and capacitor leads still stuck in the carpet. My resolution in the summer of 2018 was to start making music regularly again. Since starting college, I hadn't really produced any electronic music. When I bought my Gameboy, it was a down payment on getting back into making my own music. But now I was unsure how to begin.

Aaron: I was never productive at creating music until you know, I really started doing chip because, the limitations forced me to focus on things.

Marissa: I always try to hold myself to is not to have too many tracks, and um, make sure that any any little changes to the waveforms… like occasionally, for example, I'll

put like a guitar pedal on it, but I don't make it so outlandish that it sticks out, and somebody goes "There's a guitar pedal on that track". I definitely try to keep everything more fundamentally chiptune-sounding, even if it's not fundamentally chiptune, literally.

Aaron: if I were to go back and do a traditional DAW like Ableton or something like that try to navigate through a bunch of like drum samples, I'm like I was in this world at one point in time, but now there are so many possibilities here that I don't even know like where to start or where to finish, and there's so many things to mix, like, to get the mix right, and it's just like "Ugh."

Jamie: I mean it's different for everyone but if I have a synthesizer in front me, having that direct contact it's like, "oh this is like more organic" and for me there's this connection, the chances of me getting distracted are so much less because I'm focusing on something that isn't necessarily like, one gigantic LED screen.

Jon: It sounds like the hardware plays a big role in scaffolding creativity for you all. What role does the community play in that regard?

Keffie: a lot of music i write is based off write-a-longs in communities i go to that have themes that i have to creatively integrate into the work, usually evocative as an image or w certain samples.

Nelward: Yeah, I found that stuff later through a website called Battle of the Bits, actually, it had a lot of music where people uh, a lot of the people who use that website make music that's pretty harmonically dense and structurally dense. I guess there's this sense of healthy competition where, like "Okay, you got these cool chords, well check this out, blah blah."

Keffie: http://battleofthebits.org is one of the biggest ones i write in. i've also started a few of my own, and have a generally large/active discord server based around my twitter ramblings

Nelward: In 2015, I had kind of a quarter-life crisis so I decided "Okay, I'm going to start releasing one track a week." And yeah, forcing myself to release a track every week really got my chops up, so by the end of the year you can hear the difference in the production. Uh, you can hear a really big difference in between like, uh, what I was doing at the start of the year and what I was doing at the end of the year, and I think there's no other, like 2016 I continued to progress, but there's no other year where there's so much growth like that. So when I was doing a song a week, a song a week is a lot of stuff. So you're allowed to do this in this scene, to release a track that you know, loops. That's okay.

Jon: Jamie uses WeeklyBeats,[9] I image it's a similar kind of scaffold for creativity.

Keffie: i sorta took it up again a couple years ago with a few musicians id befriended from teh early days (and a bunch of new ones) and we release compilation albums every so often

Nelward: When I joined Deskpop actually, I think that helped me with my mixes a lot and you know, I learned a lot about, about a lot of cool stuff talking with those people. Just through the group chat, we'll share mixes and be like "Hey, what's wrong with this." That helped a lot, too.

[9] This line is in my voice because Jamie and I didn't talk about WeeklyBeats in our interview. WeeklyBeats is a site where producers post a new track every week.

My friend and I sat down to figure out what we would play, and I started perseverating on what instruments we would use. I definitely wanted to use Gameboys, but how many? I could write a 2xLSDj set, or I could write a backing track for one console and play the other one in real time using mGB, and I while that's going on I could play drum set, but what would I do with the noise channel, then? I could play bass, but when should I use Gameboy sounds for the bass and when should I use bass guitar or another synth? If I'm using Ableton to control the MIDI going to the Gameboy, why not use other synths and digital effects, too? I became paralyzed by choice, and I couldn't figure out what set of tools would strike the right balance between original and creatively constrained. I started to become anxious—if I wasn't making use of the constraints imposed by the Gameboy, what was even the point of using it? Did I even want to make chiptune? I felt beholden to the Gameboy, which I saw as a badge of my chiptune-ness.

Nelward: Look, my music isn't chiptune.

Jon: What? You're kind of in the scene, though, right?

Nelward: I mean, I don't use a tracker, I don't use you know, hardware, LSDJ and all this other stuff. I don't wear the videogame stuff on my sleeve. Sometimes I'll see an artist and there'll be a pixelated picture and it says 'Videogame Boy 2007', like uh, that can help, but, it can help like market yourself to a certain niche but you pigeonhole yourself and I'm not interested in doing that. But I'd say that the chiptune scene has been extremely inviting, and extremely friendly. And that's honestly where I got my start, like, my music wouldn't be as good if I didn't get my start with the chiptune scene.

Keffie: there is very little in the way of a shared narrative in communities online nowadays. its changed a bit from really wanting to get involved, to, once i got a bit more senior and most of the narratives abt being in a community fell away, just seeing ppl as friends or acquaintances. i had got it into my head that we shld make all the new contests have more entries every year and more and more ppl shld b using the site, and the music shld get better and moer ambitious etc. like fantasising abt NEW GENERATIONS OF MUSICIANS etc, there had been a kind of canon centered around certain old musicians for a while (from places like 8bitcollective) and i wanted to be in it as well. but once teh old prog chip ppl i looked up to took more of a backseat in the community my desire to write epic sectional fusion stuff faded and i started having to find new things to amuse me lol.

Jamie: Back when 8bitpeoples was a thing, they were like a label, and they were like a, really like exclusive group of people who were like writing music, they were like super innovative people who were doing all this stuff, creating software, writing all these things, whatever. I think that all those people always have respect, and a lot of people were using hardware. And when I see people physically playing live with hardware I think it's so cool. But then if I'm listening to a recording or something I'm not going to not listen to something just because they used a plugin or something.

Marissa: Yeah, I and that was one thing that even for myself, I mean, just getting tossed into the community, I was like "Oh I don't, I don't know if I'm going to be accepted as like a chiptune artist because I'm not using a Gameboy, I'm not using a tracker."

Aaron: But there's other stuff too, like Famitracker is free and um, that's also totally valid, and there are lots of different free VSTs that you can use to emulate those kinds of sounds and stuff too.

Marissa: But then seeing that other people have done it that way in Logic, and have you know, created the synths themselves and everything…

Jamie: Thinking back to when my first album came out in 2014, that's when so many people were like, I don't know it was so annoying. People were just nonstop talking about it. When I review artists or interview artists about releases that come out, I am really interested in like the hardware that they use, or how that they produce any of their music whether it be digital or analog because that's part of what I love so much about music. I love talking about things like that, I love sound design, I love figuring out how they make that sound. But I mean if someone were to say to me like "Oh yeah, I mean like I wrote everything in you know, Logic or Garageband even and I used like, the YMCK 8-bit plugin.." I would just be like "Cool, like obviously I'm reaching out to you because I like this album, so like whatever. Would you like to expand on how you created some of those specific patches." I would totally talk about that.

Nelward: There's a hundred different, music is really tough and there's a hundred different ways you can do things.

Jamie: As long as people have like the passion to do something, I think that there's a million ways to do it. It's just a matter of figuring out where to put your content and how to ask for help.

Keffie: there prlly is little to b gained by demanding everyone write in the same style.

Sylv: Like you could have classical chiptune, you could have hardcore heavy metal chiptune, it's not like one set idea. Kind of like with electronica. What the fuck do you mean electronica? Talking about like, Philip Glass type of electronica, are you talking about what's that kid's name, Madeon or whatever his name is type of electronica, like what kind of electronica are you talking about?

Marissa: the community eats it up no matter what it is. You know, everybody's just so excited about you know "Oh, new chiptune that was made this way, new chiptune that was made this way."

Nelward: I got SNES soundfonts, and I would use them in my music occasionally, but one day I made a track with only SNES soundfonts. And this might sound a little cynical, but it got a really good response compared to most of my tracks. It got like 700 plays in a week, and I was like "Whoa!" And people were commenting on it, and they were talking about, 'cause before people would just be like "Oh, I like this. This sounds good." People were actually commenting on it, and saying "Oh I like this atmosphere, I like this chord here." And I was like "Whoa! He's actually, they're actually listening to it."

Marissa: I kind of wrote my first EP with no intention of... I don't know, anything I just wrote it for fun and put it up on Bandcamp just, because, you know what else do you do? Anyway I got this email two days after I released the EP from one of the writers on the blog and he was saying "Hey can I interview you, can i do a piece on this this EP?" And that was really how I was thrown into the group, um... maybe not

thrown in, but just pulled in. Yeah, um... and, and it was great to know that there was such a community and that they were actively looking at new things.

Sylv: I was making little chiptune songs on the side, it wasn't anything that cool or important or whatever, and then I decided to upload this one song, it was this one weird-sounding song, it was just a part, I called the name of it, it was like a whole bunch of like, weird melodies and sounds all collapsed together. Close 8bitcollective, open it the next day, and like I see like a plethora of just fucking comments, just like "What the hell is this nonsense? People actually listened to this shit!" And so I just kept on posting, kept on making it, I didn't even know how to make real chiptune music.

Jamie: I got into chiptune through a game dev gig. These developers posted "We're looking for a chiptune artist to write the score for it" and I was like "What the fuck is chiptune?" So I looked it up and I was like "Okay, how I would do that 'cause right now I'm running an iMac," like I didn't know what to do. So that whole score that I did, I did it using a, like a plugin, like technically “fakebit,” but that's how I did it, because I didn't know that you could write music on Gameboys. I just didn't know. So I did that, and I was like" This kind of sound like me. This is what I grew up with, and I really love the sound, and now maybe I found my sound."

Jon: Going to this project I was like "Okay, I've gotta find this archetypal chiptune community, with artists who weren't in, who weren't taking lessons in high school, and didn't audition for schools of music or whatever, I've gotta find this person who really good at chiptune” and like for example I came across this video of an LSDj tune playing on a Gameboy…

Sylv: That's me!

Jon: … and I thought, "Oh I should definitely talk to this guy."

Sylv: But I mostly post videos of me improvising on piano, playing my keyboard compositions.

Jon: And I immediately assumed that you were classically trained.

Sylv: I mean one thing led to another but, it wouldn't be something that was formal. It was just all self-taught.

Jon: I got kind of down about it. I started keeping track in my head, like to what degree does this musician fit my definition of "informal" musician versus someone who learned in more formal spaces.

Nelward: My electronic production is self-taught, but my harmony and all that stuff is, well like my traditional music education, I guess is academic or whatever.

Jon: Right, it became really complicated. And every time I saw a post or something I would update my list. But it got so tangled I had to stop keeping track.

Keffie: smth like that is a bit difficult to sustain indefinitely. eventually ppl moved in and out of the site for various reasons, numbers of people stayed abt the same and i got a bit more wabi-sabi abt the whole thing.

Jon: I'm finding that it's so much more common for people to have a mix, to be kind of between in some way. And some people feel like they're kind of rejecting their life as academic musicians because of some kind of trauma or whatever, or some people are trying to distance themselves from chiptune because they want to be seen as legitimate. Or, or where they say "Well these are both part of my life, and I can't... I can't put on or the other, I'm not trying to like, reconcile this identity."

Marissa: I mean you put it really well the fact that we're like, straddling the contemporary-musicianship-academia-world and the chiptune community.

Keffie: there is probably a lot of fundamental differences btwn famitracker chiptune and classical music…

Marissa: But it isn't to say that chiptune artists aren't classically trained, or that they aren't contemporary musicians. I mean I am myself, I went to school for composition, and here I am doing chiptune.

Nelward: Yeah, I'm not sticking to one like, I don't try to stick too much with one niche. I try to bring all my influences, and they, they kind of all complement one another.

Jon: I'm finding that it's so much more common for people to have a mix, to be kind of between in some way. Sometimes I feel like I'm kind of rejecting my life as an academic musician because of some kind of trauma or whatever. But instead I found people like you, who say:

Nelward: All my interests are kind of like, it's a what's a Venn diagram or something? It's like a Venn diagram where they all overlap.

Sylv: So I'm working on a sonata, kind of like a sonata, kind of like a symphony or whatever, for an NES and piano. Kind of like a duo, like a duet, like cello/piano but just a stupid NES. And before maybe, I would say 10 years ago if I had the chance, I'd probably say "Oh I'll just make music for like a cello." But now I'm like "Oh, instead fuck that. Cellos are big, no one cares about it. I can play this NES by myself, just press the play button. I can just make music with that." And it'd be different, for

the most part. It's that, that aspect of being different and original but at the same time paying a homage.

Jon: Being part of a relationship.

Sylv: Yeah, it's like, it's kind of like classical music, but if... Yeah, it's like if I was a classical musician but if I wasn't dead.

Methods

The purpose of this study is to better understand how people learn to make music in chiptune communities, what role community plays in that process, and how musicianship is framed in the context of community. It became clear over the course of the study that experiences of these phenomena are highly local. Despite the personal nature of music learning in chiptune communities, diverse objects, platforms, tools, musics, and people all have a stake in structuring and enacting music learning. These actants (Bennett, 2010), including nonhuman agents, can all be regarded as community-members who contribute to a community-wide discourse. In an effort to respect and reflect interactions which take place in chiptune communities, the methods I used in this study embraced what Bakhtin (1984) calls "dialogicality." Dialogicality refers to the mutuality of language, particularly how writers embed consciousnesses into characters and generate social relationships among characters, authors, and texts. Researchers (Hassenzahl, 2011; Rabinow, 1986) have applied Bakhtin's (1984) dialogics to broader contexts, bringing attention to the mutuality of all kinds of texts, from websites to research reports.

Dialogues are polyvocal assemblages of actants' (Bennett, 2010) voices speaking simultaneously in a recursive cycle of response. These voices are embodied by texts; I cannot access essential aspects of participants' experiences, so engaging with these voices is fundamentally hermeneutical. Texts embody and extend the consciousnesses of persons associated with them. For example, a web developer's sensibilities are embodied by web pages they design; a teacher's pedagogy embodies the teacher's vision of what constitutes music and musicianship.

In music, texts are multiplicitous and are not limited to written, western notation or lyrics. Recordings, especially digital recordings, symbolize sound just as notation does; recordings, then, are also textual. MIDI information is textual, both in music and as code. In fact, any sequence of code toward the creation of a musicking text (sound, recording, image, physical action) is textual. Technologies themselves, the existence of which implies subjective users on whom they exert constraints that shape musicking practices, are textual.

Any particular example of these texts—a James Brown record, a Gameboy, a drum—embodies consciousnesses in dialogue with other embodied consciousnesses—those of musickers and those of other texts. When people interact with texts, they also engage subtexts, social contexts, consciousnesses of others embodied by texts, and their own consciousnesses. A "musician," then, is not a person *using* a tool to achieve aesthetic ends—they are a participant in a dialogue with subjective Others embodied by objects, engaging with histories and values *baked into* the object itself. Dialogues give rise to discourses, and discourses give rise to cultures; cultures among others, which in turn are in dialogue. Relationships among subjects and objects (above, agents; also cultures) are dialogical—decentered voices speaking simultaneously—rather than monological, where a dominating voice tells a dominant narrative. Dialogical relationships, in contrast to Hegel's (1816) dialectic, do not tend toward synthesis or resolution. Rather, dialogues continually expand, unfold, and (re)connect.

Scholars point out human actors behind texts as sources of consciousnesses. In this paradigm, texts are socially situated--discourses emerge out of these social

relationships mediated by texts (Gee, 2010). However, Bennett (2010) notes that objects possess "thing-power," contributing to dialogue with human and nonhuman actants in ways that may not always be attributed to social contexts. The presence of consciousnesses embodied by texts suggests that texts themselves have agency in musical processes. The myriad implications of this notion are beyond the scope of this document. Bennett (2010) unpacks this "object ontology," and her work profoundly informs my thinking in this area. For the purposes of this study, however, it is enough to consider the voices embodied by (or at least represented within) texts as contributing to dialogues taking place in musical communities. Rather than disempowering persons within communities, a broad conception of "text" grants descriptions of actions as "musical" to a broad range of culture-participants. Under this definition, coders, web developers, hardware hackers, gamers, DJs, forum moderators, designers, and artists (sonic and visual), who in their practices are interacting with musical artifacts and processes, are themselves musickers generating musical knowledge.

Theory Into Method

I consider dialogues like the one taking place in chiptune communities as polyvocal. Polyvocal assemblages voices speak simultaneously and discourses resist reduction and representation (Bakhtin, 1984). The incompressible nature of polyvocal discourses is resonant with Deleuze and Guattari's (1987) rhizome, which is infinitely connectable, center-less, and un-diagrammable. The voices in polyvocal dialogues originate from many different sources. Learners create content, and their content is hosted on web platforms. Community members' interactions on websites

are mediated by algorithms which direct certain individuals to certain locations, which mediate connections between people and communities. All of these actants, and many others—people, algorithms, tools, sound—play a role in chiptune communities.

Hine (2017) calls for attention to the Internet as a "socio-material complex" (Gillespie, Boczkowski, & Foot, 2014). Hine writes that "a singular, closed notion of the meaning and purpose of a particular technology is always to some extent in doubt," and that ethnographic inquiry into the social agency of technologies like the internet is warranted given how influential such objects are in mediating social interactions. Contemporary communities which overflow into various web platforms and physical spaces are generated by dialogue among human community members, search engine optimization algorithms, web servers, designers, and countless others. Musical communities, which have profound relationships with tools, fold objects into creative processes. These objects—musical instruments—also generate community through dialogue with other actants. Online platforms are "vibrant matter," self-organizing agents which participate in online communities (Bennett, 2010). While this study does not answer Hine's (2017) call for ethnographic inquiry into the social lives of technologies, I take seriously the fact that my relationships with these actants are borne out in my own lived experiences. My path into online communities emerges out of dialogue with the technologies which mediate my wandering.

Auto/ethnography

Methods I used in this study are fundamentally qualitative. I drew on methods of web ethnography and autoethnography to generate data that contain multiple

perspectives, folding the polyvocality I experienced in chiptune culture into the methods used to structure inquiry into that same culture. I use the term *auto/ethnography* to reflect my orientation toward ethnographic inquiry paired with attention to my positionality and how my experiences are situated in my own local context. In this way, I embrace the bricolage of postmodern research methods (Kincheloe & Berry, 2004), which calls on researchers to adopt robust methodological combinations which suit local contexts and the purposes of the inquiry in question. My own journey into chiptune culture cannot be replicated, and my notions about music learning practices in chiptune communities are shaped by own, unique experiences. By weaving my personal journey as a chipmusician into this study, alongside others' stories, I hope to implicate myself in the generation of data while simultaneously situating myself in relation to other participants.

Like all texts, this study embodies my consciousness as a writer (Bakhtin, 1984). My vision of what music learning is and should be can be found throughout this document. Beyond the fact that any piece of writing I generate is inextricable from my own experiences and perspective, my journey into chiptune culture is deeply personal. When I go online, algorithms deployed through my social media feed mediate my interactions with other community members. When I search for information online, the search engine collects data and shapes my journey by serving pages and offering advertisements for products it believes I will buy. Given the fact that I cannot escape my lens as a music educator, researcher, web user, and musician, and given the fact that the culture in question is generated by an ethic of participation, any inquiry into chiptune culture that emerges out of my experiences is

directed at and situated within me—that is, I regard such inquiries as autoethnographic. Autoethnographic methods regard the researcher as the site of inquiry, as opposed to other qualitative methods which ask researchers to look outward to others' experiences (Ellis et al., 2011). Autoethnographies are related through narrative; these narratives are evocative, storied, and employ metaphors as templates for transferability.

The autoethnographic inquiry at the heart of this study is supplemented by "nethrographic" methods (Braga, 2009). Nethrographies, which are also called virtual ethnographies, online ethnographies, or cyber ethnographies (Hine, 2015) direct inquiry at cultures and communities mediated by online interactions. At first narrowly defined as inquiry into communities bounded by the internet—that is, groups of people who only interact online (Baym, 2000)—online ethnographers are now less interested in distinguishing between on and offline engagement (Hine, 2015). Instead, they regard social interactions in online communities as multi-modal (Robinson & Schulz, 2009), and subsequently apply appropriate methods (e.g., mediated as well as face-to-face interaction). Hine (2015) describes an internet that is "embedded, embodied, and everyday" (p. 23); this description of the internet's role in communities further blurs the lines separating online and offline social life.

Web ethnographies are characterized by immersion in communities (Baym, 2000), participant observation, agility in methods, and appreciation for data in multiple forms (Hine, 2015). Web ethnographers often make use of diverse media to supplement textual data as they deploy various means of gleaning information from community members (Baym, 2000). Online ethnographies, like traditional

ethnographies, draw legitimacy from directness of experience and the researcher's immersion in the online culture (Hine, 2015).

I participated in chiptune community for a number of years; I lurked on forums, read tutorials, engaged with other community members on forums, and made music. Inquiries into participatory culture (Jenkins et al., 2009; Tobias & O'Leary, 2016; Waldron, 2013a) also make use of these methods as a way of accessing participants in diverse geographical locations and to situate participants' practices in an authentic social context.

In order to to generate rich data about individuals' experiences in chiptune communities, I identified six participants with whom I conducted interviews about their experiences learning and making music. I also looked to social media content produced by these participants for additional context. The participants were selected using purposive convenience sampling—I came into contact with them on various platforms (e.g., Twitter, forums, podcasts, blog posts, Bandcamp, Soundcloud) through my engagement in chiptune communities. I contacted them through email or social media, and after they expressed interest participants signed consent forms which outlined the purpose of the study and their rights as participants. A survey was also deployed on web platforms which I interacted with in my journey (chipmusic.org, battleofthebits.org, reddit/r/chiptune) as a chiptune community member. Survey responses are anonymous and present themselves in aggregate form in the appendix. This study was approved by the James Madison University Institutional Review Board (IRB).

Validity and Trustworthiness

Given the design of the study, the community it engages, and the theoretical framework within which it is situated, there is a high burden placed upon me to establish confidence that the study communicates participants' stories and that voices of participants are not being misappropriated. As discussed above, my voice is omnipresent in the study itself; to ensure that the study maintains internal validity, transferability, and trustworthiness, I had to practice reflexiveness beyond what it required in more highly structured qualitative research designs. I employed member-checks to ensure that I did not misrepresent participants' intended meaning in interviews. I also made conscious efforts to consider quotations in interview contexts as well as the context of this study before including them, and documented these efforts in journals and drafts. I treated participant quotations as in-text citations, taking care that their ideas were not assimilated by my own research agenda.

Internal validity here means the degree to which the research design is congruent with the research questions, the degree to which conclusions are congruent with data, and the ease with which readers follow threads of meaning from narratives to conclusions. To ensure that internal validity is maintained and communicated, this study was reviewed by a committee made up of James Madison University faculty. I also made results from this study available to participants in an accessible form, and incorporated feedback generated by member checks.

Transferability refers to how easily readers are able to transfer the conclusions presented in the study to other situations. While the results of this study are in no way generalizable, thick descriptions and detailed reports of relevant data ensure that

readers have access to enough information to place themselves in the context of the study and understand the study from multiple perspectives.

Ultimately, I am responsible for facilitating trust between myself and readers. By providing detailed reflections, a comprehensive audit trail, and a thorough positioning statement, I ensure that my position as researcher is fully disclosed and that the power afforded me by my role of investigator is not leveraged against participants' voices.

Form of Findings

Hine (2015) writes that "ethnography derives its authenticity from the directness of the experience that ethnographer had of the setting and from the intensity of immersion in it, rather than aspiring to the production of objective facts" (p. 20). In rendering the findings of this study in a textual form, I hoped to provide an account of chiptune community that is commensurate with my own experience within it. Using unconventional forms to achieve alignment between representation and experience has been the project of ethnography and autoethnography for the better part of two decades. Rabinow (1986) called for dialogic texts through which participants speak alongside researchers, as opposed to monographs which communicate master narratives. Contemporary ethnographers (Denzin, 2003b; Ellis & Bochner, 2000; Gingrich-Philbrook, 2005) call for evocative texts which combine narrative and storytelling with the goals and values of ethnography to better conjure rich, experiential insights into ethnographic inquiry.

Art-based inquiries and performance scholarship have also prompted researchers to consider nontraditional representations of qualitative data. Kelly (2013)

generated a novella out of qualitative inquiry into jazz education; Baker (2012) draws on narrative research to relate stories of learning in informal music settings; Madison (1999) explores theory through embodied performance. These and others (see Knowles & Cole, 2007 for a selection of writings) provide diverse and evocative models for rendering qualitative inquiry as aesthetic, creative work.

Following the lead of these scholars, I chose to represent the findings of this study in a performative text generated through autoethnographic reflection and data generated in dialogue with participants. The conversations among myself and the participants in the study were created by placing "in vivo" quotations in conversation with one another, bringing to life imaginary dialogues that highlight important themes as well as resonances and tensions between participants. This "cut up" method of representation is resonant with contemporary remix practices which shape my own musicianship, as well as with the experience of social media in online communities. The people on my Twitter feed are put in conversation with one another by my following them; in this way, I construct discourses out of others, mediated by social media objects and technologies. Alongside these conversations, I include an fictionalized narrative about my own musical development in chiptune culture. All of the events in this narrative are true as remembered, but my experience of these episodes is not one which creates a well-defined plot structure. Rather, my autoethnographic narrative serves as another data point as well as a structure which puts conversations among participants in context.

In addition to the textual representation found in this document, this study will also be represented on a web platform that allows readers to experience music

learning according to chiptune ethics while interacting with data in a point-and-click adventure game.[10] Presenting data in a multimedia format allows sound, interaction, text, pacing, and images to play a more central role in the communication and interpretation of data generated in this study.

[10] The game files can be found at github.com/staplejm

Review of Literature

There are many ways of describing how people learn music with one another. As digital tools have made it easier to interact across physical and cultural divides, people have learned to interact and, ultimately, learn in and through music in diverse ways. Musicians learn and teach in person, but also through videos hosted within online platforms. Musicianship is still "performed," though boundaries between performing the role of "musician" and performing roles like videographer, pedagogue, curator, entrepreneur, and scientist are blurred. Music still happens in community, but these communities' borders extend so far beyond specific musical practices that they are often unclear or even invisible to participants. These musical practices have challenged researchers and practitioners to broaden definitions of what constitutes music, what constitutes musicianship, and whether *expertise* is a valid high-water mark for musical achievement. Small's (1999) call for a broader conception of musicianship resonates with this diverse, multiplicitous landscape of musical engagement in contemporary society.

Sociocultural theories of education (e.g., Vygotski, 1980; Dewey, 1929; Papert, 1980) have been extended to reflect the complexity of contemporary music learning and teaching practices. At the same time, sociological frameworks for understanding how individuals relate to one another have evolved to accommodate online cultures and communities (Gee, 1999, 2005, 2010; Hine, 2015; Jenkins et al., 2009; Lave & Wenger, 1991). These two fields, or rather facets of similar phenomena, intersect and refract one another. Tension between realities of learning "in the wild" and learning in more structured environments is welcomed by many, but it also

prompts discussion over what the role of formal education is relative to social life (Kratus, 2007; Turino, 2008), and how responsive teachers should be to developments in contemporary culture (Green, 2002; Tobias, 2013b; Wilson, 2003). Music education, like other disciplines, often finds itself in the middle.

What follows is a dialogue among relevant literatures—writing that discusses three theoretical frameworks designed to guide inquiry into learning communities. The narrative is necessarily linear; textual media obscure many points of resonance and dissonance among these frameworks. Rendering a synthesis of these ideas in a linear way means favoring some connections over others—despite the fact that I present communities of practice, affinity space, and participatory cultures as separate and reified frameworks, it is important to note that many scholars (Miller, 2012; Peluso, 2014; Tobias & O'Leary, 2016) have used them in robust combination. As such, frameworks discussed below should be taken as dialogical, as decentered voices speaking simultaneously in dialogue rather than moving toward synthesis (though the purpose of a literature synthesis is, in part, to obscure this reality and draw general conclusions about extant literature). In this synthesis, I adpot literacy (broadly conceived) as common ground and use it to identify knowledges and understandings that enable performances of learning-in-community (in this case, musicking).

Ethnographies of Learning as Searches for Literacy

Policy documents in music education have often defined "music literacy" in terms of decoding western "standard" notation into sounds (National Standards Archives, 2018). This technical, narrow definition of music literacy has little to offer researchers or practitioners in music education; it ignores musical practices that take

up other skills and tools in the pursuit of making and learning about music. Literacy conceived broadly, however, offers a point of inquiry that is grounded in a sociocultural understanding of learning and community. Learning and literacy are culturally situated. As the ways by which people interact with one another evolve, so do literacies people draw upon to navigate complex social domains that exist within and through media. Gee (2010) defines literacy in terms of "social and cultural *practices*" (p. 166) to reflect this sociocultural perspective. The National Core Arts Standards make use of this designation, defining artistic literacy as "the ability to create, perform/produce/present, respond, and connect through symbolic and metaphoric forms that are unique to the arts" (National Core Arts Standards: A Conceptual Framework for Arts Learning, 2016, p. 17). Researchers who adopt a socioculturally-situated definition literacy should "follow" social, cultural, institutional, and historical organizations of people and then identify how these people "take up" literacy within these contexts (Gee, 2010).

Ethnomusicological research is built on a similar "following." Small (1999) advocates for a broad conception of musicianship, folding listening, dancing, playing instruments singing, and otherwise participating in music into his term "musicking". Walser (1993) reminds us that musical practices are situated by culture, community, time, and place. No universal conception of what music is can be imposed on any given community of musickers—music(k) is constructed internally, within communities, by practitioners. It is often beyond the scope of ethnomusicology, however, to jump beyond "literacies," (e.g., notational, aural, perceptual, technical, social, praxial) with the goal of exploring how, why, and what people learn within

these communities. Further, ethnomusicological inquiry may not be written with teachers in mind, and may resist transfer to pedagogical contexts.

Taking Up Literacy in Music Education

Music education researchers have also adopted ethnomusicological tools to bridge the gap between cultural inquiry and education, enriching music education scholarship by following learners into local contexts. Researchers have positioned themselves as following learners into their musical worlds, seeking musical and social literacy at play, and uncovering how, why, and what people learn—how they "take up" music literacy, a literacy that is broadly conceived. One example of such a "following" is popular music inquiry in music education. Many scholars have identified the relevance of popular music for music educators (Green, 2002). In efforts to incorporate popular music practices into music instruction, researchers have followed "popular" musicians into extra-scholastic learning and musicking contexts using ethnographic and case-study methodologies (Davis, 2005; Green, 2002).

Scholars also follow learners into various informal spaces outside of traditional music classrooms. Researchers in music education have spent time with rock bands (Baker, 2012; Davis, 2005; Green, 2001), hip-hop artists (Söderman & Folkestad, 2004; Thompson, 2012), old-time and bluegrass musicians (Dabback & Waldron, 2012), Celtic "trad'" groups (Waldron, 2016; Waldron & Veblen, 2008), and various online communities (Miller, 2012; Salavuo, 2008; Schmidt, 2016; Waldron, 2012, 2016).These inquiries have precipitated debate among researchers and practitioners as to how closely scholastic contexts and pedagogy should mirror these informal spaces. Other scholars have looked inward at practices of students in classrooms in order to

better understand how to develop more relevant and responsive pedagogy through inquiries into the ways young people use technology (Ruthmann, 2012; Ruthmann & Dillon, 2012; Tobias, 2010, 2012, 2013a), interactions among students in democratic learning environments (Allsup, 2002), and children's musical cultures (Barrett, 2003, 2005; Campbell, 1998, 2010).

Literacy, conceived broadly, is a useful concept to consider when inquiring into structures that learners use to generate knowledge. Participants in communities "take up" literacy to navigate their environment, while simultaneously re-creating and chasing new literacies which evolve alongside learners and communities. In this review of literature, literacy takes the place of knowledge as a product (or by-product) of learning. While knowledge might be conceived as universal or contextless—despite calls from scholars for a situated conception of knowledge (Haraway, 1988; Lave & Wenger, 1991)—literacy is context-dependent, and *belongs* to learners who generate and use it within communities (Gee, 1999). Literacy also has pragmatic implications—it is useful in that it is "taken up" as a part of a concrete act (e.g., social interaction, art-making) and connects what learners do to what learners know.

Frameworks for Considering Learning in Community

How should researchers and practitioners consider learning and literacy (i.e., learning, enacted) in musicking communities in contemporary society? Digital tools have transformed the ways people in different places with different goals, affinities, and practices organize themselves into learning communities. Many terms have been deployed to describe on- and offline communities: discourse communities (Bizzell,

1992), communities of practice (Lave & Wenger, 1991; Wenger, 1998), activity systems (Engstrom, 1993), collectives (Latour, 2004), actor-actant networks (Latour, 2005), semiotic social spaces and affinity spaces (Gee, 2005), and participatory cultures (Jenkins et al., 2009) among them. Such frameworks are grounded by discussions of literacy, though each claims a different epistemological stance.

A complete accounting of how persons develop literacies in and among learning communities is beyond the scope of this review. Instead, what follows is a detailed 'unpacking' of three sociocultural perspectives of learning, each grounded in literacy (of a kind) and literature from various fields—communities of practice (Lave & Wenger, 1991), affinity spaces (Gee, 2005), and participatory culture (Jenkins et al., 2009). These perspectives are widely cited in and outside of music education research literature, and have had important impacts on how scholars write about and understand community in contemporary culture. These perspectives should not be regarded as competing. Instead, they should be used as different lenses through which important aspects of learning-in-community are visible.

Communities of Practice

"Community of practice" is a term introduced by (Lave & Wenger, 1991) to describe communities of learners: "a community of practice is a set of relations among persons, activity, and the world, over time and in relation with other tangential and overlapping communities of practice" (p. 98). Communities of practice are diverse in classification, and overlap disciplines. Learners are "legitimate peripheral participants," moving from the edges of the community into the center by taking on apprenticeship roles under more knowledgeable community members.

Knowledge in communities of practice is situated—learners find themselves fluidly shifting across master and apprenticeship roles in different contexts. As such, inquiries into communities of practice are primarily focused on the social contexts that give rise to learning rather than cognitive processes.

Lave and Wenger (1991) framed communities of practice as a way of examining learning practices in professional settings toward pragmatic goals. In music education, scholars (e.g., Barrett, 2005; Russell, 2002; Salavuo 2008; Veblen 2005; Waldron 2009) identify various communities of practice both within and outside of music classrooms, and make suggestions as to how teachers might create favorable conditions for communities of practice in scholastic settings. Others take a more critical stance, seeking out the social practices of learners in communities of practice to challenge existing music education practices (Froehlich, 2009).

Music education researchers have adopted the term *musical* communities of practice to describe musical engagement and learning in some communities. Russell (2002) applies the notion of musical communities of practice to music learning in the case of Fijian inter-generational musical singing communities. Many scholars have investigated children's musical communities of practice (Barrett, 2005), identifying pedagogical techniques and learning practices (Marsh, 1995), legitimate peripheral participation (Harwood, 1998), and nested layers of intersecting communities of practice (Campbell, 1998). Salavuo (2008) discusses constellations of musical communities of practice(s) on interactive web platforms. Veblen (2005) connects communities of practice to praxial philosophies of music education through Elliot's (1995) *Music Matters,* calling attention to the notion that local musical contexts are in

and of themselves communities of practice, Waldron (2009) identifies old-time and bluegrass communities as online musical communities of practice. Using techniques from cyber-ethnography, she investigated how these communities of musicians transmitted knowledge and acquired musical skills in online learning communities. Later studies (Waldron, 2011, 2012, 2013a, 2013b, 2016) invoke "participatory culture" (Jenkins et al., 2009) and re-classify these communities as "convergent on- and off-line music communities" (p.102). Miller (2012) also links participatory cultures and convergent communities with communities of practice in her investigation of YouTube guitar instruction. While learning to play guitar through online tutorials, Miller uncovers instructional practices, social interactions, gender dynamics, and power relations present among YouTube music education cultures. She also finds that online communities of practice naturally extend beyond host sites—that tendrils of communities run through offline interactions as well as other online venues (e.g., forums, comment threads).

Wenger, et al. (2002) warn against romanticizing communities of practice as ideal venues for sociocultural theories of learning and education. Individuals within communities of practice have a "potential to hoard knowledge, limit innovation, and hold others hostage to their expertise" (p. 139), and that communities may develop "a toxic coziness" (p. 144). Other critics of the term community of practice express concern that the term "community" implies membership in spaces where boundaries between 'practitioners' and non-members are unclear, that it carries with it an implication that individuals always enjoy close-knit personal ties with other practitioners, and that "communities of practice" have been identified in so many

ways and in so many places that it is no longer a useful term (Gee, 2005). "Community of practice" is an intentionally broad term, useful in that it situates descriptions of learning in community in a sociocultural framework. However, it conveys little about the structures within communities and may minimize connections and overlappings between different communities, making invisible the intersections of practice, affinity, privilege, or oppression experienced by individuals.

Spaces

Gee (2005) introduced the notion of "semiotic social spaces" in response to Lave & Wenger's (1998) "communities of practice." Semiotic social spaces (SSSs) are comprised of "generators;" topics or content that individuals access through "portals." SSSs have an internal aspect and an external aspect, the former aspect relating to the generator or the portal the technical or executive elements therein, and the external aspect relating to the behaviors and interactions of or among individuals within or through the space. All of this is to say that a SSS is a space where people interact through portals around, in, or through a given topic. Internal and external grammar emerge from these interactions, shaping how individuals then interact with content and one another. Rather than focusing on practices of individuals, semiotic social spaces draw attention to the spaces where individuals interact around a particular discipline or area of interest.

Gee (2005) then introduces a kind of SSS, which he calls an "affinity space." Affinity spaces have a number of characteristics: individuals relate to each other in terms of a common endeavor or practice, newcomers and veterans share space, some portals are also generators, internal grammar is transformed by external grammar,

encourages specialized knowledge, encourages individual, dispersed, and distributed knowledge, uses tacit knowledge, has many forms of participation and routes to status, and has a porous leadership structure.

Scholars have used "affinity space" as a way of referring to places (virtual or physical) where people meet to discuss common interests (Elisabeth R. Hayes & Duncan, 2012). Literacy development (Curwood, Magnifico, & Lammers, 2013; Lammers, 2012; Lewis, 2014; Voigts-Virchow, 2012), technology in higher education (Machin-Mastromatteo, 2012), online informal learning (Lindgren, 2012), videogames (Duncan, 2010; Durga, 2012; Elisabeth R. Hayes & Duncan, 2012; Lee, 2012; Wu, 2016), and music engagement(Clements & Gault, 2014; Neely & Marone, 2016; Partti & Karlsen, 2010; Polymeropoulou, 2011; Salavuo, 2006; Veblen, 2007; Waldron, 2013a) have all been subject to scholarly inquiry. The above scholars seek to explore affinity spaces themselves as an alternative or parallel process to exploring who engages in such spaces. While Gee (2005) recognizes that affinity spaces are only small parts of larger community networks, the framework has nonetheless been productive in coming to understand the (often online) spaces that mediate community.

Viewing interactions within what Lave and Wenger (1998) call communities of practice as occurring within, among, or through semiotic social spaces is useful from an analytical perspective. By focusing on where (both literally and semiotically) individuals interact and build community, researchers are able to implicate "portals," platforms, and "generators" in the creation of art, discourse, and community.

Discourses mediated by media imply discourses with media itself, and meta-discourses about how content is delivered on given platforms.

Yet, applying the notion of "affinity spaces" might be problematic for a number of reasons. The term "affinity space," while designed to avoid imposing labels to individuals, may instead impose restrictions on what or who individuals might identify as within spaces. Just as depth or type of "membership" in a community of practice may be up for debate, the boundaries between spaces themselves is often complex and unclear, perhaps even absent to individuals in these "spaces."

Perhaps most seriously, "affinity spaces" (Gee, 2005) may make invisible the intersections of oppression experienced by many within these spaces. While affinity spaces emerge out of interactions regarding a particular topic rather than identity, some individuals may be marginalized by dominant forces at play in these interactions. By concentrating on spaces rather than practices, "affinity space" may ignore the implicit biases that are always baked in to any "generator," "portal," or "grammar."

Participation & Participatory Culture

Jenkins, et al. (2009) define "participatory culture" as:

> … A culture with relatively low barriers to artistic expression and civic engagement, strong support for creating and sharing one's creations, and some type of informal mentorship whereby what is known by the most experienced is passed along to novices. A participatory culture is also one in which members believe their contributions matter, and feel some degree of

> social connection with one another (at the least they care what other people think about what they have created). (p. 3)

Some forms of participatory culture include affiliations, expressions, collaborative problem-solving, and circulations. To illustrate these forms, Jenkins, et al. (2009) present several cases that demonstrate how participants engage in participatory cultures. These cases, in combination with the field in which participatory culture is situated (i.e., media studies and media literacy), necessarily exclude many kinds of participatory culture and should not be considered representative of every kind of participatory culture. However, the framework of participatory culture—a culture created and sustained in and by *participation*—is useful when differentiating certain kinds of community engagement from others, especially in contrast to affinity spaces or communities of practice.While Jenkins, et al. (2009) do not explicitly suggest that participatory culture takes place exclusively online, most inquiries that take up participatory culture as a framework apply it to online engagement (Burgess & Green, 2013; Chau, 2010; Miller, 2012; Waldron, 2012, 2013a, 2013b).

Chau (2010) identifies YouTube as an important site of participatory culture, and suggests that YouTube itself is a generator of participatory culture. Many scholars (Burgess & Green, 2013; Haugsbakken & Langseth, 2014; Waldron, 2012, 2013a) have investigated YouTube as a site of participation in cultures of learning and participation. Kruse (2013) and Miller (2012) conducted autoethnographic inquiries as they learned learned to play instruments using online resources and community engagement. Participatory cultures have also been described as "convergent on and offline communities" (p. 102). Waldron's (2012, 2013a, 2013b,

2016) represent a long and deep dive into bluegrass and old-time banjo participatory cultures, using online ethnographic techniques to illustrate the richness of such communities.

While frameworks like affinity spaces and communities of practice acknowledge the fluidity of sociocultural norms or "practices," the role of the practitioner is often minimized and made subservient to the role of a "master" or "expert." Participatory culture implies a more rhizomatic structure, one that lacks a central organizing point (and, conversely, a periphery on which to "legitimately participate"). Jenkins, et al. (2009) avoid the label of 'master' and 'apprentice' in favor of experienced and novice practitioners. Perhaps most importantly, participatory culture explicitly recognizes fluid practices and fluid leadership; ultimately, the culture is defined by participation, not practices or space.

Disparate definitions of participatory culture have emerged as the term has scholars have deployed it in various contexts. While some scholars use participatory culture(s) to describe communities (Miller, 2012; Tobias & O'Leary, 2016; Waldron, 2013a) others use it more broadly to describe how people interact online (Bozkurt & Keefer, 2017; Deodato, 2014; Voigts-Virchow, 2012; Waldron, Mantie, Partti, & Tobias, 2017), still others use participatory culture to describe how individuals or communities destabilize or overturn power relationships among consumers and producers (Burgess & Green, 2013; van Dijck, 2009). Some scholars use communities of practice, affinity spaces, and participatory cultures at once to describe aspects of a single phenomenon (Countryman, 2009; Miller, 2012; O'Neill, Peluso, & DeLong, 2011; Voigts-Virchow, 2012), while others discuss it in terms of education (Tobias,

2013b). Given the wide and diverse deployment of "participatory culture" to describe social phenomena, it has been necessary for researchers in music education to disambiguate particular understandings of participatory culture as it relates to musical or sonic communities.

Sonic Participatory Cultures

Tobais and O'Leary (2016) introduce the term "sonic participatory cultures" (p. 541) as a broad framework that describes the participatory engagements with sounds and music in communities across multiple platforms and contexts. Sonic participatory culture connects notions of participatory culture (Jenkins et al., 2009), participatory musicking (Turino, 2008), implicit/explicit participation (Schäfer, 2011), affinity spaces, and "playing along" (Miller, 2012), leveraging these notions against specific instances of sonic participation in, through, and around videogames while recognizing that these none of these frameworks apply to all sonic participatory cultures or kinds of participation lived by participants.

Regelski (2013) and Tobias and O'Leary (2016) link Turino's (2008) definition of "participation" to sonic participatory cultures, suggesting that musical engagements in sonic participatory cultures are inherently participatory rather than presentational, and that musick in, through, and around digital platforms invites and is sustained by participation. Turino (2008) describes musicking as being situated along a continuum from "presentational" to "participatory." While presentational forms are dominant in many institutions and schools, participatory forms are present and important aspects of music in everyday life for many people in society. Indeed, a culture in itself is sustained by participation—this kind of participation goes beyond

what are clearly "musical" engagements (e.g., performances, compositions, remixes), expanding definitions of musicking to include creating tutorial videos, blogging, contributing to forums, circuit bending, and hardware/software modification. It should be noted, however, that sonic participatory culture(s) are defined by engagement—by participation rather than "participatory" (Turino, 2008) musicking *practices.* Just because a culture is participatory does not mean that it exclusively mediates or produces participatory musick forms. There is nothing inherently participatory[11] about a digital sound file, absent a participatory culture that invites individuals to re-situate it.

Resonances and Tensions

Communities of practice (sonic and otherwise), affinity spaces, and participatory cultures—important ideas about how people form and learn within communities—have many implications for music education. As noted above, scholars have interpreted, re-interpreted, and applied many of these notions to various contexts. However, the usefulness of these frameworks should not be overstated. As terms like community of practice, affinity space, and participatory culture are used across various contextual and disciplinary borders, their descriptive power is diluted. Further, it should be noted that the scope of the seminal documents for each of these frameworks is significantly more narrow than their current applications in research and practice.

[11] As in musicking, see Turino (2008). A digital sound file does not explicitly invite active musical participation in that it is a recorded version of Turino's "presentational" form, though Small (1999) might take issue with this assertion, especially in light of how many musicians treat recorded audio (e.g., DJs, producers).

Following Literacies into Chiptune Culture

In light of these dangers, it is perhaps more useful to consider communities of practice, affinity spaces, and participatory cultures in the same way as I have considered chiptune—as a point of departure rather than a means of description or categorization. These frameworks are useful as lenses through which researchers and practitioners can look at communities, seeing how learners take up literacy in different contexts to different ends.

When viewing chiptune through the lenses of communities of practice, several important notions become clear. Unlike learners in communities of practice, chipmusicians take many paths toward participation in communities. It is difficult to identify specific skills that a learner must master before participating fully in chiptune culture; indeed, it is even difficult to identify what it looks like for a learner to participate fully versus in a "peripheral" capacity. Each community member charts a unique path as they make and learn about music. Reifying chiptune communities in terms of skills mastered and "full participation" seems limited to only the most closed, tightly niched elements of chiptune.

When I think of affinity spaces in terms of chiptune, I am reminded of how the many platforms which mediate and participate in chiptune discourse have profound effects on who is permitted to participate, and on the learning experience of community members. Who feels empowered in online spaces? And what work is being done to improve community ethics within affinity spaces? Most importantly, who does the work of creating safe spaces?

When considering participatory cultures, I am reminded that barriers to

participation are highly local phenomena; just as it is difficult to pin down skills and practices, it is difficult to identify universal barriers, support, and what constitutes mentorship. I cannot, in good faith, describe chiptune as conforming cleanly to any of these frameworks. Rather, each framework serves as a heuristic—a tool for understanding the complex phenomenon of learning in contemporary musical communities.

Discussion

The purpose of this study is to better understand music making and learning in chiptune communities by addressing four questions: what does musicianship in chiptune communities look like? What role does community play? What are the music learning practices of chiptune musicians? What, if anything, can be learned about contemporary musicianship by inquiring into chiptune culture? The vision of musicianship I experienced in chiptune communities was eclectic, local, and derived from the practice of making music. It involved diverse sets of tools, contested vocabulary, and a loose narrative authenticity that is highly situated by individuals' experiences and values. It was multiplicitous, and people's experiences were connected in surprising ways. It folded back on itself, and resisted being reduced to a clean narrative with clear conclusions to be drawn. In order to answer the above questions in the context of community, I apply a heuristic that is as fracturous as my experience as a participant in chiptune culture: the rhizome. Considering chiptune communities as rhizomatic (e.g., Deleuze & Guattari, 1987) serves as a point of departure, a way of understanding rather than a way of theorizing or defining.

Deleuze and Guattari's (1987) "rhizome" is a useful tool for understanding chiptune communities. In nature, rhizomes are root systems that spread out in the soil, each node connected to every other in a tangled web. Deleuze and Guattari use the rhizome as a way of writing through decentralized, dynamic, process-driven webs of meaning. They contrast rhizomatic and "arborescent" conceptions of the world; arboreal systems of knowledge and meaning have well-defined origins, structured hierarchies, and roots which radiate out from a conceptual "trunk", while

rhizomes have no center. They are non-hierarchical, and resist diagrammization and clear-cut explanations. Rhizomes are a map, not a tracing; rhizomes are continually becoming.

Many scholars have used rhizomes and other aspects of Deleuze and Guattari's (1987) *A Thousand Plateaus* to discuss various aspects of music and education. Wilson (2003) references the difficulty of "diagramming" rhizomatic practices in art curricula, contrasting ephemeral forms and practices emerging from participatory culture with stable diagrams already diagrammed in art content standards. Lather (1993) "probes" rhizomatic validity in research, what he describes as "a journey among intersections, nodes, and regionalizations through a multi-centered complexity" (p. 680). Allsup (2013) compares Lather's (1993) "rhizomatics" to his open philosophy of music education, where texts are situated in a dialogic network rather than as closed forms to be "traced." Gould (2012) writes about nomadic orientations to learning to destabilize origin stories and closed, exclusionary histories. Jorgensen and Yob (2013) are critical of rhizomatics as a foundation for a philosophy of music education; however, they point out that considering the rhizome as a lens on music learning phenomena can lead to valuable insights. Outside of music education, Gingrich-Philbrook (2005) characterizes autoethnographic writing as "potatoes weaving their web of rhizomes underground" (p. 313) in his discussion of autoethnographic methods. He calls for inquiry into the tangled roots of lived experience, and for researchers to resist clean and clear master narratives.

Rhizomatic communities are constantly expanding and shifting, and the practices of musicians within them can be difficult to reduce to a set of instructional

objectives. When one set of skills and practices is codified, new ones pop up around it as learners (i.e., musicians) map new terrain and connect new nodes to existing ones. Because of the ephemerality of rhizomatic communities, they are necessarily flat and decentralized. There few gatekeepers, and "mastery" within these communities is highly situated by personal contexts. While there are many points of resonance between Deleuze and Guattari's (1987) text and the findings from this study, I will focus on three facets of rhizomatic chiptune communities which have implications for considering the role of contemporary musicianship in music education: flatness, center-less-ness, and mapping as learning. I will then unpack what these facets ask of formal music education spaces, and how music education might meaningfully embrace rhizomatic aspects of contemporary musicianship in curricula and pedagogies.

Flatness

Rhizomes are flat. Deleuze and Guattari explain the flatness of rhizomes accordingly:

> If multiplicities are defined and transformed by the borderline that determines in each instance their number of dimensions, we can conceive of the possibility of laying them out on a plane, the borderlines succeeding one another, forming a broken line. It is only in appearance that a plane of this kind "reduces" the number of dimensions; for it gathers in all the dimensions to the extent that flat multiplicities—which nonetheless have an increasing or decreasing number of dimensions—are inscribed upon it. (p. 251).

After participating in chiptune culture for a while, I became curious about the "typical" chiptune musician. How do they learn about music? What skills and knowledge characterize mastery for them? I felt as though I was situated between classical music and chiptune, and I wondered what it was like for someone who was situated further from the borderlines. I knew some people like Marissa shared my background; that is, I knew some of the participants I spoke to were trained in schools of music at the university level and I suspected that they felt the same tensions I did between academic and informal music learning communities. However, I was surprised to learn that others also situated themselves on the borderlines—even those who have been participating in chiptune communities for a long time, who I thought of as central figures. Sylv is a self-taught classical pianist who has been participating in chiptune culture since the early 2000s, who feels as though his path into chiptune culture leaves him on the periphery of both classical music and chiptune. Nelward situates himself outside of the chiptune genre, despite his embeddedness in the scene and his community connections to chiptune musicians. Jamie talked about how practices that once defined chiptune are not all that important to her; she values the diversity of the community, saying that she is more interested in seeking out opportunities to learn new things. Marissa shared her initial anxiety about her choice of tool, eventually seeing that many other people sit at the borders of hardware and software just as she does. Aaron spoke about his background in classical music, and how he initially felt that few chiptune musicians shared his formal training. Each person started at a different place, and ended somewhere else along the edge of chiptune.

A flat surface has no depth. You cannot submerge yourself within a two-dimensional space—some part of you is always sticking up through the surface. Chiptune is a plane of multiplicity, and the musicians passing through it have multiplicities that extend beyond, through, and outside of chiptune. This multiplicity leads to an inclusivity—because everyone is situated on the borderline, there is no deeper layer to exclude people from. Participants in this study frequently spoke about how chiptune is a friendly, inclusive, diverse space. Jamie mentioned that while much of the misogyny that finds a home in other online and offline spaces is brought into the chiptune community, community members make conscious efforts to shut it down. She said that in chiptune, she feels as though people have her back.

Rhizomatic communities are also flat because they have multiple entry points. Perhaps the best way to explain how flatness generates multiple entry points is in terms of another heuristic for community—communities of practice. Lave and Wenger (1991) offer communities of practice as a model for developing skills and knowledge (like musicianship) in a given social context (like musical communities). In their model, learners begin at "legitimate peripheral participation" and move in away from the periphery as they learn skills valued by the community. This model is resonant with my experience in formal music education contexts. Students begin as novices, and slowly progress toward expertise. They often pass through gates (e.g., auditions) which lead away from the "novice" borderlands toward more established territory. Marissa talked about “the path” that is dominant in academic spaces, and Nelward expressed some frustration at the seemingly arbitrary criteria for success at

play in his jazz education. “The path” has one entrance, and it is narrow with few turn-offs.

Nelward, Marissa, and the other participants characterize chiptune as opposed to this closed model of learning. In chiptune, everyone is participating at the periphery, situated at their own personal frontier. Entry points to chiptune are diverse; some people, like Marissa and Sylv, are swept up by community-members who discover their music. For others, like Nelward, engagement in the community is more strategic. Keffie’s entry point was through listening and seeking out informal mentors. After entering at these different points, all of the participants in this study learned different musical practices at different times. Sylv was engaged in the community on 8bitcollective before he even knew how to make “real chiptune music.” He only recently began using trackers in his compositional practices. Jamie began making fakebit, but moved into using game hardware afterwards. Aaron began immediately with game hardware, and prefers the creative scaffold trackers provide. Marissa does not use trackers at all, preferring to draw inspiration from the sounds of game hardware rather than the hardware itself.

Flat communities directly challenge legitimate peripheral participation. Flat communities are all surface, and are completely comprised of entry points. In arboreal structures like a communities of practice, learners begin at the end of a root and trace their way to the trunk. In rhizomatic communities like chiptune, the whole assemblage is root, every node is a trunk. What is musicianship in chiptune communities? It depends on who you are and where you are going.

All of this is not to say that aspects of communities of practice are not at play in chiptune culture. Festivals book artists who are well-known and will draw crowds; forums often have a "waiting period" for newcomers which limit their ability to participate in certain spaces. In terms of music learning, it is clear that there are many entry points to chiptune culture, and many ways of describing musicianship in the context of chiptune.

Center-less-ness

Rhizomes have no center. In contrast to arboreal structures, rhizomes do not radiate out from a central point. Deleuze and Guattari (1987) write about the center-less-ness of rhizomes as an aspect of their multiplicity. There is no unity to be found in a rhizome, no origin of action, only multiplicitous multiplicities. They provide an example in a puppeteer: “Puppet strings, as a rhizome or multiplicity, are tied not to the supposed will of an artist or puppeteer but to a multiplicity of nerve fibers, which form another puppet in other dimensions connected to the first” (Deleuze & Guattari, 1987, p. 8). Hine (2017) observed that online communities host “ontological multiplicities” (p. 23), and phenomena situated within online communities are often multifaceted and regarded differently by different community members. The way I will discuss chiptune culture's center-less-ness is in terms of the relationship learners have to teachers, teaching, and learning.

Many classrooms place teachers at the center of students' learning. Most educational dialogue (at least the dialogue sanctioned by the Institution) radiates from teachers. Teachers are firmly in control of how time is spent in learning, and all students in the class share the same teacher. Students are expected to learn mostly the

same thing as one another, and teachers are expected to know more things than students. In music, at least in classes structured around ensemble playing, the role of teacher-as-center is further entrenched by history and tradition. Teachers often perform the role of "conductor" in ensemble music classes. Conductors are situated at the physical centers of classrooms, and students radiate out from them. Conductors are in control of rehearsals, and students' creative input is often limited or discouraged outright if only because allowing students to contribute in such a structure is logistically unfeasible. Positions at schools or teachers themselves might even use terms like "director" instead of "teacher" to describe music educators' roles in curricula (Shouldice, 2013). Many music education scholars have been critical of this model (Allsup, 2002; Green, 2002; Kratus, 2007), and frameworks like maker education (Halverson & Sheridan, 2014), project-based learning (Campbell, 1995; Wiggins, 2001), place-based learning (Stauffer, 2010), and critical pedagogy (Freire, 1970) offer alternatives to a teacher-centered model of instruction.

Instead of “directors,” participants described informal (and sometimes oblivious) mentors. Nelward found a kindred creative voice in Maxo; Aaron and Keffie reached out to artists for save files and advice. Jamie talked about how rare it was to encounter anyone who was not willing to offer advice, feedback, or friendship in the chiptune community. The roles of teachers in chiptune communities are diffuse. Jamie will write blog posts like the one about preparing for your first show; Keffie created a music theory lesson graphic and posted it on her Twitter page. No one even used the word 'teacher' to describe people from whom they learned; instead, they described mentors who provided inspiration, creative guidance, or in

some cases explicit instruction. For individuals, these mentors were a centering force, helping direct musical development and creative output. However, over time, these mentors often became friends or acquaintances and the power relationship that comes with a student-teacher dynamic fell away. The learners--not the teachers--were the ones who directed the terms of the informal mentorship.

Those who take on the role of teacher in creating these media artifacts are not acting as gatekeepers. In formal education spaces, teachers decide what constitutes knowledge. In center-less communities, however, community members operate under and ethic of sharing rather than a mandate to curate knowledge. Jamie stressed that this ethic of openness is sustained by conscious efforts of community leaders, like the administrators of Chiptunes=Win. By weeding out the "toxic bullying," they ensure that people feel safe and welcome to ask questions and be vulnerable while teaching and learning.

Aaron and Marissa also point to the accessibility of the tools which populate chiptune culture as a source of openness. Tools also play an important role in the music learning process of chipmusicians. Experimenting with different tools and interfaces was by far the most prominent method by which chiptune musicians I spoke with learned how to make music. Jamie brought up her "my first LSDj" tracks, which showcase the role interfaces play in the music learning process. In these experiences, tools take on the role of mentor, leading learners to different musical decisions and competencies based on barriers built into tools themselves.

Chipmusicians who take on the role of "teacher" by sharing files, creating tutorials, contributing to forums, writing blog posts, or creating other forms of media

take openness to the extreme. Rather than exerting control to protect chiptune authenticity or community standards, Aaron articulated a desire to protect the community through openness itself. Low barriers and abundant learning opportunities help learners be more successful and make better music, which in turn enriches chiptune communities. Keffie said that she felt duty-bound to building communities of people who support one another's music-making. This openness generates immensely diverse musical forms and practices. The result is that chiptune is not defined in terms of its controls, but rather in terms of individuals' relationships to one another and to their music. The flatness of chiptune creates many entry points, which also contributes to center-less, multiplicitous communities with low barriers and ethics of openness.

Mapping as Learning

The last facet of rhizomatic communities that warrants discussion is mapping. Deleuze and Guattari (1987) write that a rhizome is "a map, not a tracing" (p. 1). This map is always becoming, always being (re)mapped. Tracings are re-inscriptions of existing structures—learners who trace retread old ground, assimilating and replicating existing knowledge. In rhizomatic communities, learners are cartographers, and they wander across communities charting their own path among the tangled lines of the rhizome. Each map is situated within individuals' experiences, so maps are all different from one another. I use "mapping" to describe chipmusicians' processes of learning. While flatness and center-less-ness describe the structure of rhizomatic communities, mapping describes what learners within chiptune communities do when they learn, and the role community plays in that process.

What do learners draw on their maps? Learners in rhizomatic communities encounter waypoints left behind by other community members. These waypoints take many forms; they can be music, publications, blogs, videos, files, comments, code, discussions, or any other form of media. Community members themselves are also points of reference for other learners who make sense of their own musicianship and musical development in terms of others. Bakhtin (1984) writes that we come to know ourselves in dialogue with others; Aaron started writing dance music because of his experiences with other musicians at live shows. Nelward's relationship to Deskpop and his informal mentors and Keffie's engagement with battleofthebits.org enrich their music-making by connecting it to a group of like-minded peers. In this way, learners in chiptune culture come to their musicianship in relation to waypoints left by others. Chipmusicians learn music in dialogue with others, mapping a personal, local journey.

Mapping, rather than tracing, lets learners develop their musicianship despite the fact that "musicianship" in chiptune culture is fractured and wildly diverse. Because mapping-as-learning happens in dialogue, and chiptune communities emerge out of dialogue, learning is an ambient force in chiptune culture. No one in this study used the word "learning" to describe their engagement with other chipmusicians, just as they did not use the word "teacher" to describe influential individuals in their personal narratives. Instead, they talked about developing musicianship through making music, through developing an artistic voice. Learning practices are fleeting and episodic, part of the fabric of music-making.

While learning is ambient in chiptune communities, this does not mean learning is always unstructured. Learners often create their own scaffolds to help direct creative efforts and streamline the learning process. Community write-alongs, platforms like WeeklyBeats (a scaffold which encourages artists to release a short piece every week for a year), compilation or remix album projects, or self-made scaffolds like Nelward's self-imposed quota all help musicians take ambient learning experiences and direct them toward achievable, concrete results.

Importantly, mapping is a personal project. Sylv's goal for a piano/NES duet is not a result of being inducted into chiptune—it is a waypoint on his personal musical journey, an event and a place that others may or may not visit themselves. While community scaffolds, independent music labels, artist collectives and music festivals all contribute to the generative capacity of chiptune writ large, the musical forms and practices which emerge out of these structures are situated by individuals' personal musicianship, their own map. In this way mapping in chiptune communities is both solitary and collaborative. It helps generate learning experiences, but ultimately is not an exercise in visiting preordained destinations. Instead, learners discover new places.

Implications for Music Education: Reframing Literacy

In chiptune, flatness leads to immense generative capacity, diverse musical practices and multiplicitous musical forms. Multiple entry points mean that chiptune is open and accessible to many kinds of musicians, from self-taught pianists like Sylv to professional sound designers like Jamie. Flat communities like chiptune also necessarily situated community members on the borderlines; the participants in this study have varying levels of formal musical training, and come from different musical

backgrounds. Yet they all are a part of chiptune, and this means something different for each of them. What happens when teachers begin considering their curriculum as flat, with multiple entry points, as opposed to a linear sequence with preordained beginnings and endings?

Teachers are not the center of learning in chiptune communities—everyone is a teacher and learner, contributing to the community by creating content and helping other musicians. The participants in this study and I found teachers and mentors in many forms, including other musicians, writers, and even tools. We found our own mentors, people who inspired us and provoked curiosity. What might happen when teachers in formal spaces de-center themselves, promoting informal mentorship and ethics of openness rather than strict measures of musical mastery?

Chipmusicians do not work toward mastery of a discrete, preordained set of musical practices. Rather, the community values musical diversity and the misuse of tools to achieve personal creative goals. What happens when learners become cartographers rather than tracers, exploring waypoints and mapping personal journeys in musicianship and learning by making their own music?

Many frameworks common throughout the field of music education—praxial philosophies of music education (Elliot, 1995), music learning sequences authored by Gordon, Orff, Kodaly and others—are oriented toward inducting learners into a community of musicians through learning musical practices. The participants in this study offer a different narrative—an alternative model for music learning. Chiptune is flat, offering many entry points. It is center-less, made up of multiplicities sustained

by an ethic of openness. The participants in this study are cartographers, mapping a local terrain as they pursue personal musical goals and explore the many waypoints left behind by other nomadic musicians. All three of these facets of community in chiptune cultures are sustained by conscious efforts; participants in this study bring up over and over how other musicians in the scene are friendly and helpful, and Jamie spoke about how Chiptunes=Win purposefully creates a safe, diverse space for community members. Rather than asking novices to follow a preordained "path", Marissa and Nelward describe online communities like chiptune as open and decentralized. Other scholarly inquiries (citations) suggest that these aspects of chiptune are present in many other contemporary online communities. If schools are to respond to Dewey's (1929) call for education to mirror life, music educators must consider how rhizomatic communities might grow into classroom spaces.

Contemporary musical communities—described as communities of practice (Lave & Wenger, 1991), participatory cultures (Jenkins et al., 2009), semiotic social spaces (Gee, 2005), or affinity spaces (Gee, 2005)—are fracturous and divergent, often resisting categorization or codification. Musical practices are diverse—trap high-hats are mixed with dem bow riddims, dubstep basses accompany sugar-sweet pop vocals, procedural drones and riffs are deployed alongside punk guitars. Modular synthesis, circuit-bending, classical violin, and shoegaze effect chains can be heard on the same release, or if not, only two or three clicks away. These communities are often partly or completely situated online, and they appear and disappear with the same dynamism that characterizes other aspects of contemporary online culture. Jarvenpaa and Lang (2011) write that online communities "represent a new type of organisation

where ideas, resources and members flow in and out and boundaries are highly permeable and dynamic," where " innovation often takes a form of indirect collaboration between strangers" (p. 441).

A reorientation toward rhizomatic communities would help make classrooms more resonant with contemporary music communities. Allowing rhizomes to break up recalcitrant structures in music education may help answer Allsup's (2016) call for open philosophies of music education. Uncritically applying practices from informal communities to classrooms is always fraught (Waldron et al., 2017). However, classrooms which host musical vibrancy and diversity like chiptune does would be interesting, creative, and rich with opportunities for teaching and learning music.

Future Research

This study offers many points of departure for scholars to investigate. As music education scholars increasingly turn to online communities for new models of learning in community, they should also increasingly inquire into the social tensions at play in communities. As in all communities, individuals in online generate the social scripts that give rise to exclusionary practices. Racist, misogynist, ableist, transphonic, homophobic, and all other varieties of bigoted speech are present across the entire surface of the internet. When a community like chiptune seems, on a surface level, to be resistant to such toxicity, it is important for scholars to identify who takes on the responsibility of preserving the safety of marginalized individuals in community spaces. This study does not address this issue, and it should have. It is critical that music education scholars attend to the labor that community members engage in as they go about generating and participating in their communities.

The role of material, of the "vibrant matter" (Bennett, 2010) in musical communities also deserves scholarly attention. Scholars have been focused on persons who participate in online and offline musical communities for many years. As noted in Chapter Four, these scholars have used frameworks of community (e.g., communities of practice, affinity spaces, participatory cultures) to inquire into practices and relationships among musicians which give rise to musical communities. The roles of objects in musical communities, however, have received relatively little scholarly attention. Musicianship, particularly in contemporary online communities, exists in relationship to "vibrant matter" (Bennett, 2010), self-organizing assemblages like webpages, musical instruments, and internet search algorithms. Future research into musical communities should include inquiries into the roles that nonhuman actants play in online communities, musical practices, and particularly the role of consoles and historical narrative in chiptune.

As noted in Chapter Three, I take into account the role that non-human actants play in my experience of chiptune. I am sensitive to the fact than any autoethnographic inquiry into chiptune is shaped not only by my lens, but also by mediating technologies which guide me in my online interactions with others. Despite scholarly recognition that tools and technologies have profound effects on online community, few researchers have explored how internet infrastructures and nonhuman actants are involved in online communities. These actants' voices go unheard in interviews and autoethnographic reflections. Algorithms are often invisible to users, and many researchers in the past have let their influence go unspoken-of. Hine (2017) calls for inquiry into "internet as a technology" (p. 22). I

echo her call, directing it toward music education researchers as online communities and curricula continue to be subject to scholarly and pedagogical attention.

Non-human actants play an important role in online communities, but they are also important in music communities writ large. Instruments, digital media, recordings, and other tools often mediate musical engagement both on and offline. Despite the ubiquity of these objects in music education, there are few scholarly inquiries which pursue an ontology of musical objects. Bennett's (2010) work calls attention to the vibrancy of matter; the vibrancy of musical objects has gone understudied in music education literature. Researchers should pay attention to music's material world as an avenue for qualitative and ethnographic inquiry into music learning.

The objects of chiptune should be included in future research into the object-worlds of musical communities. Chiptune musicians who use console hardware complicate the role of objects in musical engagement—they appropriate commercial objects for creative use, make use of interfaces from the days of early computing in contemporary music practices, and interact with these objects by modifying them and altering them to better suit their role as a musical instrument. Histories of chiptune are bound up in objects, and few inquiries into chiptune fully explore how objects and historical narratives interact in contemporary chiptune communities. What stories are told in chiptune culture? How do chiptune musicians relate to historical figures? How do chipmusicians regard the role of consoles in their community? Data from this study suggest that consoles are a point of discursive tension; yet, most scholarly inquiries position consoles as an anchor point in chiptune

aesthetics and musical practices. More focused inquiry into the vibrancy of consoles, and their relationship to other vibrant matters (e.g., DAWs, synthesizers, MIDI, audio effects) in chiptune would lead researchers to insights about the chiptune scene and its position relative to its history and current practices.

Appendix: Survey Responses

Q1 – Please describe your involvement in the chiptune community

i listen to and make a small amount of music on battleofthebits.org

chipmusician

Making chiptunes, listening to them, I post on forums and also scout out events.

Listening, making, and performing chiptune music

make chiptune, listen to chiptune, post/admin battleofthebits.org, write and maintain music software

I make music myself but I listen what others make and I also work on tools to make music.

Listen to chiptune, listen to podcasts, post on forums, eventually participated in a community.

composer and listener

I make Chiptune music under the alias "havocCc". I use Nanoloop, which is a real time sequencer for the Game Boy models DMG and GBA.

Musician and fan

listen to chiptune

I compose chiptune and submit them to contests in battleofthebits, post them on my soundcloud, I listen to tons of chiptunes through youtube, and I am also involved in the battleofthebits forum (commenting entries, voting, discussing topics, showing support or admiration for fellow chiptuners)

I make and listen to music, also post on forums

I listen to chiptune, make chiptune, read about new chiptune stuff on websites, and post on forums

make chip music, listen to chip music

I run an online store selling chiptune products, and a record label for chiptune.

make chiptune music & book shows

Artist

Making chiptune music, playing in live shows, developing hardware and software, listening podcasts, posting forums

I make chiptune music, as well as listen to chiptune for inspiration.

Composer

I mostly create and listen to chiptune music, and infrequently post on forums.

I mainly create chiptunes, but I enjoy listening just as much.

composer

composer and listener with sporadic forum posts

I make chipmusic. I dream about chipmusic. When the dentist nuked my brain with nitrus, my awareness was chipmusic. I troll the internet seeking answers to highly technical data pertaining to chipmusic. I circuit bend devices to distort their chipmusic. Not that chipmusic is an actual style, It is a medium as paint or canvas.

Make chiptunes and post in forums

I make and listen to chiptune music, more recently started posting on forums

I create and post my music on fourms

produce music, live visuals, forum staff

Listen to chiptune

chiptune musician

I make chiptunes and participate in online competitions.

troll

I involve by making, listening to chiptunes. Occasionally post on forums.

All of the above.

participate in battle of the bits competitions, listen to chiptune

I've done about everything except for following the community.

I compose chip music.

I make chiptune and participate in chiptune/chiptune-adjacent communities.

Musician

I make, listen and post on fourms within the Battle Of the Bits community.

I write chipmusic EPs and albums, post on chipmusic.org, and listen to amazing albums by others

Make it, listen to it

Artist

I compose my own using LSDJ, post my music on SoundCloud, and am involved in several chiptune discord groups

Q2 - How long have you been involved in the chiptune community?

a year, about

8 years

Many years as a listener, recently as a creator.

Loosely about 5 years.

7-8 years

Over a decade, I was one of the founders of MegaDrive/Genesis music scene pretty much.

hmmm, since 2006. Heavily since 2007. But I first "chipmusic" in 1998 when I found out I could listen "nintendo music" on a pc (super mario bros 3 on winamp)

~10 years

8-9 years.

Since 2013

10+ years

2 years

~10 years

3 years

12+ years

10 years

nearly a decade

7 years

It depends how you describe community. I started in 1990 by listening chiptunes and sending them by mail with other demosceners. Started making my own in 1991 or so

I've been making chiptune since 2012.

5 years

I first started writing chiptunes in 2011, so 7 years.

My rough estimate for my time spent in the chiptune community would be around four to five years.

9 years

since 2002

Since 1982.

That is a blurry line for me... this is because I've technically made "chiptune" as far back as 2005 (and I believe December 2003 if we count the PS2's sound chip, taking the term "chiptune" literally from a video game console perspective). My earliest release was in 2005 (through VGMix), and the earliest chiptune community I can think of... was not so much a chiptune community as trying to make music for the SPC700 for a game, back in 2007. #mod_shrine from 2009 is potentially the earliest I can think of as far as a chiptune community through its OHCs...

About four or five years

4

15 years

4 years

Since 2013

12

About four months

2009

about 8 months since i started participating in battle of the bits compos, i started using sunvox several years ago but I wasn't interested in chiptune music per se back then

Roughly since 2001.

On and off, about 11 years now.

approx 8 years

8 years

Just a bit over a year

10 years

There's a community? Like a commune?

~2 years

One and a half years

Q3 - How did you get into chiptune?

i used to not like music until i started listening to old/old sounding video game soundtracks.

From googling pixelart

Games

Researching, browsing youtube and the web.

probably last.fm

Desire to make games pretty much, once you get to the music part there's no escape haha

I found redemptions, remixes of videogame musics. I thought they were super original and then I found "famicompo" (a music composition competition specifically based on the nintendo format nsf). I found legends in there, some still active like hally naruto or chibitech. Amazing chipmusicians. From there I jumped to other formats /consoles like gameboy supernintendo playstation...

playing indie games

It was mentioned in a video of a German YouTuber.

Learned about its existence on YouTube videos that used "keygen music" as BGM; I got interested. But I learned more about it when a friend introduced me BotB.

Internet + videogame nostalgia

video games (esecially the game boy gen 1 pokemon games) got me started in 8 bit music. But I really got into chiptune after listenning to outstanding chiptune artists in youtube (fearofdark, kenneth and rez), and 8 bit remixes of classical music (Bach fugues and Beethoven sonatas in particular)

thanks to old games and cracktros

I wanted to learn how to make retro game music, and I found a whole world of early computer music

The Amiga demoscene.

Someone posted a link on a forum

learned about it from my brother

Read an article on 'Game Boy DJs'

Demoscene crackintros and demos

I played a bunch of Commodore 64 games and thought that the sound design was unique. I also found YouTube videos of 8-bit remixes.

Shareware games

I originally started arranging video game music, and started to appreciate the simplicity of the chiptune sound, and I was then driven to actually create my own chiptunes, and went from there.

Artists like Saskrotch and James Roach really piqued my interest for the genre.

hearing other chip musicians

I stumbled across packs of xm and impulse tracker songs from chiptune.com in about the year 2002. That and the old micromusic website.

By playing video games as a child.

I have a real SNES, and thus my fandom comes from that particular console.

I've always loved video game music, especially the chiptune stuff. But my first time hearing non-vgm chiptune was on a video game stream where the player was listening to Norrin Radd's masterpiece of an album, Anomaly.

Youtube

heard some stuff done on a game boy and liked the sound of the noise channel

Watching Trainer Tips - https://www.youtube.com/channel/UCrtyNMe3xtv3CLg5QR78HzQ - on YouTube introduced me to Kubbi - https://kubbi.bandcamp.com

interrobang pi tumblr

Sony Vegas Cracktro

80s kid

By finding out the keygen music, I just happened to love the sound of the square wave.

Pause Netlabel

kfaraday's music

I like videogames and the way they sound. Audio synthesis is fun.

I loved old games, and their sounds. I also played in band as a kid, but didn't like playing whatever the teacher chose, so I wanted to experiment and write my own work.

I stumbled upon anamanaguchi in 2010

Making stuff in my spare time

I thought the Megadrive was cool and thought "How do I make music for it?"

A small indie game called Seiklus had a completely chiptune-based soundtrack, and I loved the music so much that I became a fan of the style and genre as well

Video games and drugs

Friend showed me famitracker

Danimal Cannon was the last thing that inspired me! I grew up playing gameboy games and listening to game soundtracks!

Q4 - How often do you post online about chiptune? What kinds of things do you post?

i post 1 hour (to make) chiptunes unfrequently

Rarely, rehearsal videos

Fairly often. I post forum posts or tracks I have made.

Only in times when I have a new track I'm confident enough about posting.

sporadically

I am no longer very active, in past there was a new thing every few weeks but now only few things a year. Most of my music is a mix of spacesynth, italo-disco, eurobeat and some other genres I like. The result I describe as "Tiidobeat"

Not much these days becuase you grew old. but I visit the sites, and try to keep current.

not as much lately. in the past, maybe a few times a week; mostly feedback on other people's music.

I'm active in some forums and facebook groups. I mostly post my own music there, or obscure stuff that might catch the interest of other people interested in Chiptune.

Very rare nowadays

never

It depends on the time, sometimes I'll be a very productive composer, sometimes I will just rather play the guitar and the piano.

I post my music on YouTube once every few months, I check the chipmusic forums regularly and reply if I like something - don't know how often, I'd say about once a month or two?

I usually post new chipmusic every other week, or ask for information every now and then.

Very rarely, it's often too political ("is this real chiptune") or too dull ("how can I do this easily googleable thing?"). When I do post, it's about interesting a novel software, techniques, etc.

I mostly post stuff related to my store on my store's facebook page

pretty rarely these days to be honest.

Once a week. I reply to discussion threads where people are asking for help.

about everyday. helping other people with their problems/questions, talking about techniques and sounds in chiptune

I'm pretty active when I post chiptune onto my YouTube account, and many other music competition sites.

Often. Links to songs.

I usually only post about chiptunes when I have released a new tune, which seems to be every 3 or 4 months or so...I should probably be a bit more active.

I seldom post about chiptunes, but when I do, it's usually when I release a new track.

weekly, mostly talk about music in general though

Perhaps once every 3-6 months if an FM related synth or software comes along. Sometimes I'll post information about setting up vintage DOS and Win98 sound hardware and software..

weekly

It varies wildly from year to year. I most often do the SNES, but I've done other sound chips thanks to Battle of the Bits exposing me to more kinds of chips.

Until recently I've mostly promoted my own music to my friends, but I've posted other artists and a few composition-type posts too.

Once a month and the majority is original

semi-daily/ tips & tricks, sarcasm, etc

I just "lurk"

usually just my works, or on battle of the bits. maybe a few times per week

Probably once a month, I post music.

like always for like 10 years

Not very often. Been thinking of uploading my works on Youtube in the future.

About twice weekly

none

I don't really post about chiptune that much anymore. "Chiptune" also suggests a specific genre of music. "Chip music" is more appropriate.

I don't post about chip music, I just post my chip music. These days I don't release more than maybe three or four works a year.

I haven't posted as much lately because my tastes have shifted towards non-chiptune genres, but I still interact with people in the chiptune scene at least every few days.

I don't post specifically about chiptune, but music-related posts are decently often

I participate in BotB about once a day.

I post sparingly, usually only if I have some new music to share or want to comment on a new album I like

Idk... Mainly pics of my D.

Every few months

I post new music on SoundCloud around once a month. I've got a twitter account that I almost daily post chiptune stuff on.

Q5 - How do you learn about making chiptunes?

youtube videos of people's songs and the ways that they made them

Youtube came to be, a curiosity was born. Aftermarket software had apparently been made for the dmg brick gameboy. The warez evolved.

youtube and talk to people

When I first began, simply through having a copy of a chiptune's original tracker/sequencer and studying the construction of a song's routine and instruments. Nowadays I'll download a tracker and just read the documentation.

videos, forums, and wikis.

Tutorials, listening to other chiptunes.

Turtorial videos from various artists such as Danimal Cannon and Rainbowdragoneyes

trial & error

Through a lot of trial and error, and reading up on effect command lists in Famitracker.

The earliest one I have simply used a soundfont. The earliest authentic one I have (for the SNES, not counting the PS2 music)... took a few tries to get right, since I didn't have a proper grasp on filesize, and was done in correspondence with the developer of SNESMod, mukunda/ekid.

Self-teaching and the community "Battle of the Bits"

Self taught

Sabrepulse Tutorial

Research and experiment.

Reading the LSDJ manual, and the 8bc.org forums (now gone).

Read up documents of whatever software you want to use

Most of the techniques I know are what I've discovered messing around in LSDJ.

Module music was shared as modules rather than modern mp3s, so was essentially open source. Anyone who listened to module music inside a module tracker was exposed to the techniques of the original composer.

ModPlug Tracker

messed with famitracker myself

lsdj

Lots of trial and error with freely-available tracker software like ModPlug. I studied the mod files of other chip musicians to learn techniques

listen to what other people do, look up references for effects in various trackers, download modules if they're doing something that sounds unfamiliar

In early days by looking other peoples tunes (.mod format), nowadays by exchanging ideas with other composers, watching tutorials etc

I've always had an ear for music, no formal education though, but that's enough.

I taught myself through exploration of several midi trackers.

I learnt the tools, and how to open the original files to see how they were composed (eg mod files, or ftm files) but music theory didn't come easy to me. In particular I

joined one of the one hour battle communities and I realized 1 hour was not only difficult but exaspering (sp?) it made me anxious.

i learned from reading the manuals for lsdj and nanoloop

i found out one of the chiptunes i liked was on battleofthebits, and then i started going there.

I follow DJ Cutman on Soundcloud - https://soundcloud.com/djcutman - to hear the latest mixtapes to get ideas and while I want to get into LSDJ, I just mess around with emulators and "chiptune" plugins to get a basic idea of how things sound

I find a piece of software I like, then it's trial and error mostly

I don't remember how I found out about it, but I started on the FamiTracker forums back in 2011, and learned how to use the program from a popular tutorial (danooct1's). From there, it was a matter of technique refinement.

Help from community and self teaching

Forums, tutorials, friends...

forums, google searches, tracker documentation

Feedback from other composers on SoundCloud, twitter, Facebook, instagram, and discord. I also watch a lot of YouTube tutorials and read the LSDJ manual a lot.

Electronic music, the nannerwebs, and counter culture.

don't remember!

dj scotch egg

digging through old japanese manuals

By trial and error; trying to figure out how to use softwares like Famitracker, OpenMPT, etc.

By observing other people's works (especially the ones I love), studying their way of doing chords, melody, instruments, volume control.

By hand, raw experimenting with the software

BotB :D/

Analyzing other people's modules in open source trackers (especially milkytracker in my case), and learning from them

Q6- Gender	**Q7- Age**	**Q8- Race**
male	15	white
Male	22	Caucasian
Male	24	white
Male	24	White
Male	28	Hispanic
Male	35	White
Male	26	Human
Male	23	White
male	22	white
Male	32	i dunno :o
Male	20	White
Male	27	white
Male	18	Unknown.
male	28	caucasian
male	26	caucasian
Male	32	white/black
male	29	White
male	40	White
Female	19	Caucasian
Male	18	White
Female	28	White
male	19	Black
Male	24	whiteboy
Male	33	Kekistani
Male	22	white
Male	20	Asian
male	37	the only good one
Apache Helicopter	34	(white)
male	23	Asian
Male	17	Hispanic
fucking MAN	32	White
Male	20	White, Eastern
Male	28	European
male	23	Asian-american
Male	35	Caucasian
Male	25	White
Male	21	Caucasian
Male	20	5k
Male	15	Caucasian
Male	24	Caucasian
Male	Oooold	
Male	17	
Male	21	

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