Digitisation, Dissemination, and Reception of Percussion Performance:

Evaluating YouTube Videos of John Cage's *Third Construction* Through Analysis and Case Studies

by

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Abstract

This dissertation investigates the digitisation, dissemination, and reception of percussion performance on YouTube. It examines three questions: 1) How has YouTube impacted the percussion field? 2) What are the available audiovisual recordings of John Cage's *Third Construction* (1941) on YouTube and would analysing them illustrate consistencies and divergences in the performance practice of the work? 3) How would undergraduate percussionists who have never performed *Third Construction* evaluate selected performance videos of the work? Would their opinions on performance quality or accuracy of interpretation change if they watched these videos under differing conditions (e.g., with and without the musical score)?

Chapter 2 describes academic research on the topic of YouTube, and summarizes the current video content pertinent to percussionists. Despite a well-established and thriving percussive

subculture on the site, discussing YouTube as educational resource has not been substantially addressed within music performance scholarship.

Chapter 3 presents a corpus study on performance videos of John Cage's *Third Construction* (1941). In addition to outlining the processes of navigating, collecting, and analyzing data on a dynamic, digital environment, this corpus study presents qualitative and quantitative data on how percussionists have chosen to interpret Cage's quartet.

Chapter 4 presents the findings from a case study conducted on nine undergraduate percussionists. The participants were first asked questions about their uses of YouTube in a precursory survey. Participants then examined five excerpts of YouTube videos of *Third Construction* under two differing conditions: first, by simply watching them and; second, by following along with the musical score. Each viewing condition included questionnaires that solicited their opinions of the video excerpts.

Chapter 5 summarizes the research findings. Despite the wealth of concerns to be had about the world's largest tech corporations (e.g., data privacy, cyber security, censorship, anti-trust/monopolization), online videos of music performance present opportunities for future generations of scholars, educators, and students. Rather than seeking to reconcile the concerns with and benefits of these digital experiences, the author advocates that they should become a greater part of the discussions held within academic environments.

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Table of Contents

List of Figures

List of Tables

List of Appendices

Chapter 1

Why YouTube?

Introduction

Recording technology allows performers to access previous interpretations of musical works. An audiovisual medium of recording may be more useful to percussionists than audio recordings; the relationship between the visual and audial elements of their performance becomes apparent and informative. One can observe the performing body engaging in the process of: 1) the preparatory movements made before striking instruments; 2) sticks, mallets, or hands making contact with these instruments to produce sound and; 3) physical gestures made after sound is produced, be they effective (i.e., movements necessary to create more sounds) or ancillary (i.e., expressive gestures).[1] Percussionist and author Steven Schick wrote that, "Anyone who has ever attended a percussion concert can tell you that the experience of percussion music involves the eyes as well as the ears."[2] But what if one were to observe percussion performance through a digital medium?

Earlier forms of audiovisual recordings (e.g., VHS, DVD, Blu-ray) have long since transitioned to the Internet, and YouTube has consistently been the number one online video-sharing website, worldwide.[3] Although the site has existed since 2005, the digitization of music performance has become an increasingly relevant topic of research, especially considering the COVID-19 pandemic's impacts on the performing arts.

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[1] Schutz, Michael and Fiona Manning. "Effectively Using Affective Gestures: What Percussionists Need to Know About Movement and Preparation." *Percussive Notes* (March, 2013), pg. 26.

[2] Schick, Steven. The Percussionist's Art: Same Bed, Different Dreams. Rochester, NY: University of Rochester Press (2006), pg. 140.

[3] <https://www.alexa.com/topsites>, Accessed 19 July, 2021. It is important to note that YouTube is a website that is publicly accessible. While it is true that TikTok has come to rival YouTube in terms of usage (in certain countries), its platform is an application-based social media network in which videos can only be readily accessed by those who have an account.

This dissertation examines three primary questions: 1) How has YouTube impacted the percussion field? 2) What are the available audiovisual recordings of John Cage's *Third Construction* (1941) on YouTube and would analysing them illustrate consistencies and divergences in the performance practice of the work? 3) How would undergraduate percussionists who have never performed *Third Construction* evaluate selected performance videos of the work? Would their opinions on performance quality or accuracy of interpretation change if they watched these videos under differing conditions (e.g., with and without the musical score)?

1:1 Context

In order to understand the rationale for conducting this research, I will first begin by briefly summarizing the parallel histories of percussion repertoire and recording technology, as well as discussing the development of YouTube since its launch in 2005. Although the primary focus of this dissertation concerns the dissemination and reception of percussion performance on YouTube, the overarching theme centres on the effects of the digitisation of music performance, and its further acceleration as a result of the COVID-19 pandemic.

1.2 Intersections of Percussion Repertoire and Recording Technology

In the Western classical tradition, music for percussion ensemble began with Edgard Varèse's *Ionisation* (1933). Following Varèse, American composers of percussion music included Henry Cowell (1897–1965), Lou Harrison (1917–2003), and John Cage (1912–1992). Of the three, Cage was the only one to significantly incorporate recording technologies into his compositional output. His use of microphones helped amplify and bring attention to the sounds

of objects found in nature (*Child of Tree*, 1975; *Inlets*, 1977), and his use of phonographs and radios (*Credo in US*, 1942; *Imaginary Landscape No. 4*, 1951; *Radio Music*, 1956) brought both past recordings and real-time radio broadcasts into the concert hall experience. After the Second World War, percussion music greatly expanded with composers blazing trails in varying directions. Karlheinz Stockhausen (1928–2007) designed large percussion set-ups where both pitched and non-pitched instruments were simultaneously played by one performer (*Zyklus no. 9*, 1959) and sought to revolutionize electro-acoustic music by exploring the intersections and combinations of electronic and acoustic sounds (*Kontakte*, 1959–60; *Mikrophonie I*, 1964). Stockhausen considered *Mikrophonie I* to be a personal breakthrough in his artistic and electronic explorations.[4] The work requires four performers to use household items to create various sounds from a large tam-tam, then move microphones near and around the instrument's surface to highlight certain frequencies; simultaneously, two audio engineers follow the score to appropriately "filter and shape" the sounds picked up by the microphones.[5] The compositional output of Steve Reich (b. 1936) was also influenced by recording technology; his explorations of reel-to-reel tape technology resulted in works such as *It's Gonna Rain* (1965) and *Come Out* (1966), which led to the development of a compositional technique known as "phasing."[6] Reich also used the affordances of recording technology to create optional versions of works that could sidestep the need to have duplicated ensembles[7] or multiple performers on the same instrument.[8]

[4] Maconie, Robin. "Stockhausen's Mikrophonie I: Perception in Action." *Perspectives of New Music* 10, no. 2 (1972), pg. 101.
[5] Maconie, Robin. "Revisiting "Mikrophonie I"." *The Musical Times* 152, no. 1914 (2011): pgs. 96–97.
[6] Hartenberger, Russell. *Performance Practice in the Music of Steve Reich*. Cambridge: Cambridge University Press, 2016, pg. 107. Notable acoustic/instrumental works that feature the 'phasing' technique include: *Piano Phase* (1967) and *Drumming* (1971).
[7] Works including *Triple Quartet* (1998) and *Double Sextet* (2007).
[8] Works including *Violin Phase* (1967), *Vermont Counterpoint* (1982), *New York Counterpoint* (1985), and *2 x 5* (2008).

Today, there are many works in the percussion repertoire that implement pre-recorded media (audio, visual, or audiovisual), and utilize computer programs that process sound in fixed or real-time contexts (e.g., Max MSP). Steven Schick describes percussion repertoire and performance throughout the 20th century as a succession of evolutions where instruments, techniques, and aesthetic ideas are imported from the outside and eventually become incorporated into and established as part of the practice.[9] This brief history has required contemporary percussionists to continuously adapt to change within their art, as well as responding to and incorporating the developments of electronic and recording technologies.

1.3 Recording Technology

In less than 150 years, the methods of capturing and disseminating sound, most profoundly in the form of music, have transformed from concrete objects to digital files "floating" in a virtual environment. Thomas Edison's "talking box" (the phonograph) of 1877 gave humanity its first recording technology. Thirty years later, record companies and their products had become both economic and cultural forces.[10] Record and radio broadcasting companies dominated for just over half of the 20th century until the introduction of cassette tape technology in the 1960s. In certain parts of the globe, the inclusion and use of cassette tapes helped curb the record industry's monopoly over the creation and dissemination of music and shifted that control to a more local and individualized levels.[11] Compact discs in the 1980s

[9] University of California Television (UCTV), "On the Bridge: The Beginnings of Contemporary Percussion Music with Steven Schick -- To Be Musical." YouTube video, January 31, 2013. <https://www.youtube.com/watch?v=-lkAOZC1w3g>. Accessed 05, August 2020.

[10] Garafolo, Reebee. "From Music Publishing to MP3: Music and Industry in the Twentieth Century." *American Music*, Vol 17, No. 3 (Autumn,1999), pgs. 323–329.

[11] Katz, Mark. *Capturing Sound: How Technology Has Changed Music* (Berkeley: University of California Press, 2004), pgs. 12–14.

became another stream of revenue for commercial music labels, but by the mid 1990s music had entered the digital realm. The mp3 format enabled music to be downloadable and shareable—both legally and illegally via the Internet—and then saved onto computer hard drives and music listening devices (e.g., the iPod). These evolutionary changes to formats of music recordings have shaped listening habits, as well.

Before the advent of recording technology, experiences with music were only available in a live performance context tied to a specific time and place. With the erosion of the patronage system for composers and musicians in 18th century Europe, music performances began to appear more in public settings—what was once meant to primarily display one's socioeconomic status became more available to the general public, particularly the growing middle class of society at that time.[12]Attending a concert today can still be seen as a social event; attendees are expected adhere to the ritualistic and socially engrained rules of "proper" concert etiquette (i.e., no talking or whispering, applauding at appropriate times, etc.). With the arrival of the phonograph, the listening experience was made available to individual households. Nonetheless, phonograph parties were indeed similar to the concert experience; family and friends would gather around in chairs, someone would drop the needle onto a vinyl record, and upon the completion of its playing, the listeners would applaud for more.[13] Radio broadcasting in the early 20th century also influenced listening experiences with scheduled programming that helped foster routines, and perhaps unspoken rituals, within a household. With the arrival of cassette tapes and compact discs, music could be listened to in both public or private contexts—in automobiles, on boomboxes or stereo systems, or with the use of headphones and a portable media device such as

[12] Bonds, Mark Evan. *Music as Thought: Listening to the Symphony In The Age of Beethoven* (Princeton: Princeton University Press, 2006), pgs. 3–4.
[13] Katz, Mark. *Capturing Sound: How Technology Has Changed Music*, pgs. 8–9.

a Walkman. The iPod has been dubbed as the last, true "music playing device", and at the present, smartphones are equipped to access recorded music through the use of mobile phone applications (i.e., apps).

Today, the majority of music consumption has moved to a digital medium that can be shaped for and catered to listener tastes. As early as 2009, the trend of "streaming" music was growing amongst teenagers. This sharply contrasted with the mp3 crisis of the early 2000s which resulted in the digital piracy and file-sharing of recorded music—severe legal rulings were handed down to companies that mediated the process (e.g., Napster, Limewire). By 2012, a study by the Nielsen "Music 360" report concluded that young people used YouTube more than the radio when searching for new music to listen to.[14] K.E. Goldschmitt and Nick Seaver (2019) discuss how the functions of streaming music have been developed and implemented through computational, mathematical, and human functions. Rather than based on the perceived tension between human curation and algorithmic implementation of streamed music, Goldschmitt and Seaver consider the process to be sociotechnical: the combination of human and machine capabilities in relation to music. [15] One example of the first "recommenders" for listeners was iTunes' "Genius," and the initial processes of streaming music depended on pre-installed software that would allow a company access to a user's music library, including their listening "history."[16] An important aspect of music streaming services is that the collection of data on what users are listening to signifies a dramatic change to the privacy of one's experience—the

[14] Cited in Goldschmitt, K.E. and Nick Seaver. "Shaping the Stream: Techniques and Troubles of Algorithmic Recommendation." In *The Cambridge Companion to Music in Digital Culture*, pg. 63, edited by Nicholas Cook, Monique Marie Ingalls, and David Trippett. New York: Cambridge University Press, 2019.
[15] Goldschmitt and Seaver. "Shaping the Stream: Techniques and Troubles of Algorithmic Recommendation," pg. 65.
[16] Ibid., pgs. 65–66.

act of listening itself can be private, but the collection of data is not, and thus, can shape one's future encounters.[17]

Recording technology has been a succession of hierarchical destabilizations from corporate entities to individual users by the increases in its affordability, portability, and accessibility. What were once tangible objects have developed into invisible bits of data that are now primarily accessed through commercial music streaming services all at the control of a listener's fingertips. Although the beginnings of YouTube were rooted in online video-sharing, it has become the most utilized platform for listening to and streaming music.[18]

1.4 YouTube

Darcy DiNucci's article, "Fragmented Future" (1999), foreshadowed an evolved form of the Internet—the Web 2.0: a digital landscape featuring an increase in connection speeds, accessibility, and portability that will inevitably multiply.[19] Text-based information was the foundation of the Internet, images were incorporated next, and the increases in computer memory and bandwidth allowed for the addition of sound and video, respectively.[20] The first appearance of social network sites (SNS) began in 1997, and have become a focal point of daily Internet use and an area of interest for academic research.[21] Through the development of SNSs, the consumption of online information and media "moved away from being a 'read-only' activity

[17] Goldschmitt and Seaver. "Shaping the Stream…,"pg. 67.
[18] "Surprise! YouTube is the most popular music streaming service." musically.com, 22 March, 2021 <https://musically.com/2021/03/22/surprise-youtube-is-the-most-popular-music-streaming-service/>. Accessed 28 June 2021.
[19] DiNucci, Darcy. "Fragmented Future." *Design & New Media*, pgs. 32, 221–222.
[20] Carr, Nicholas. *The Shallows: How the Internet is Changing the Way We Think, Read, and Remember*. London: Atlantic Books Ltd., 2011, pgs. 83–85.
[21] Boyd, Danah M. and Ellison, Nicole B. "Social Network Sites: Definition, History, and Scholarship." *Journal of Computer-Mediated Communication,* Vol. 13 (2008), pgs. 210–230.

to a 'read-write' one."[22] The simultaneous ability to search, communicate, and create through this medium has become an example of what Henry Jenkins describes as a "participatory culture"[23]—but in an instantaneous and highly interactive manner.

YouTube was founded and launched in 2005 by three former PayPal employees, and by October of 2006, Google acquired the site for the price of 1.65 billion dollars.[24] In its beginning, YouTube made explicitly clear that it was an aggregator and circulator of video-content generated by its users, and not a producer of content itself.[25] Michael Strangelove (2010) noted that well-established forms of audiovisual media (e.g., film, television) are driven by commercial or entertainment enterprises, and reinforced that YouTube's initial focus was on average, everyday people who created amateur videos.[26] The website's first slogan, "Your Digital Video Repository," was short-lived and "Broadcast Yourself" came to embody the individualistic expression available to YouTube users and content creators. Although this ideal focused on the platform's "bottom-up" perspective, where the content is collectively produced, shared, and consumed by its participants, mainstream media outlets and other large corporations began their own YouTube channels—the slogan "Broadcast Yourself" was dropped by 2010.[27] This duality of both top-down and bottom-up perspectives—a sort of David and Goliath complex—began within a few years of YouTube's launch and its present relevance cannot be overstated.

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[22] Burgess, Jean and Joshua Green. *YouTube: Online Video and Participatory Culture*, 1st ed. Cambridge: Polity Press, 2009, pg. 48.

[23] Jenkins, Henry. *Convergence Culture: Where Old and New Media Collide*. New York: New York University Press, 2006, pg. 290.

[24] La Monica, Paul R. (October 9, 2006). "Google to buy YouTube for $1.65 billion". CNNMoney. CNN. <https://money.cnn.com/2006/10/09/technology/googleyoutube_deal/>Accessed 1, August 2020.

[25] Burgess, Jean and Joshua Green. *YouTube: Online Video and Participatory Culture*, 1st ed. Cambridge: Polity Press, 2009, pg. 8.

[26] Strangelove, Michael. *Watching YouTube: Extraordinary Videos by Ordinary People*. Toronto: University of Toronto Press, 2010, pg. 3.

[27] Burgess, Jean and Joshua Green. *YouTube: Online Video and Participatory Culture*, 2nd ed. Cambridge: Polity Press, 2019, pg. 7.

1.5 The Digitisation of Music Performance, COVID-19, and Me

The digitisation of music performance was greatly accelerated by the COVID-19 pandemic. By March of 2020, much of the world began implementing lockdowns, and businesses deemed "non-essential" by governing authorities were ordered to close—some of these businesses went under and never reopened their doors again. The performing arts suffered a similar fate as well; concerts of live music were postponed indefinitely or cancelled altogether. Over the course of the summer months of 2020, both professional ensembles and university institutions began to asses the future directions of their programming by figuring out ways to still create music, which would primarily occur through digital mediums (i.e., audiovisual recordings broadcasted online). Composers, performers, and ensembles were prompted to adapt their ways of creating and producing music performances in digital spaces. While it is fairly certain that writings and documentation about the impacts of the pandemic on music composition and performance will be forthcoming, I will only speak to my personal experiences with music making during the 2020–2021 academic year at the University of Toronto.

The fall semester of 2020 was spent mostly in isolation from my colleagues; our percussion ensemble activities were shifted to virtual environments, and our repertoire was commissioned accordingly. Before any of our work began, however, we were encouraged to acquire our own recording equipment (e.g., microphones, audio interface). Once we had these tools in our possession, we were able to facilitate the recording processes ourselves. Initially, our percussion ensemble contemplated the possibility of playing chamber music virtually through the use of soundjack.eu, but these efforts proved to be more difficult than expected; in addition to the necessary audio equipment (e.g., microphones, audio interface), one would have to have a high-speed Internet connection with a fast upload speed in order to avoid issues with latency.

Rather than going in this direction, our ensemble ultimately went down a path of lesser resistance; our commissioned works for the fall (October 2020) and early winter (January 2021) concerts were designed to have the performers record their individual parts in isolation, either with a stopwatch or to a click-track. Once the individual performers executed the task of recording themselves, their respective work was compiled together to create the finished compositions which were then broadcasted online. As a teaching assistant for the percussion ensemble, handling the productional aspects of our online concerts became the primary portion of my responsibilities: assisting any students who needed help with recording themselves, audiovisual post-production (i.e., editing), and promoting our online events through our social media channels. Although much of the 2020-21 academic year was spent making and presenting music through digital means, my interest in YouTube's relationship to the field of percussion had already existed—nonetheless, the pandemic has certainly acted as a catalyst for furthering the digitisation of music performance.

1.6 Rationale for This Research

My first semester of high school was in the fall of 2005, coincidentally the same year that YouTube was publicly launched. At the time, I did not really take much notice of the site; my "flip phone" did not have access to the Internet, network servers at my high school blocked students from accessing the site, and I didn't spend much time online while at home. I began my undergraduate university studies in the fall of 2009, but experiencing YouTube on a more conscious level came in 2013 when I had received my first smartphone. These first memorable experiences came from watching along with friends on their devices; some of this viewing was casual in nature, but we primarily watched videos that pertained to the repertoire that we were

working on as students. The most vivid memory I have of this pastime was the reception of and reactions to a particular performance video of Askell Masson's snare drum solo, *Prim* (1984).

A colleague of mine shared with me a few performance videos of the piece, which he was working on for an upcoming recital. Having practiced the piece for a few weeks, he was curious to see what interpretations were on YouTube—one in particular caught his attention. A performance of *Prim* by a renowned percussionist sparked intense discussion; we elaborated on the performer's playing techniques, the tuning of their snare drum, and their interpretation of the score. At one point while we were watching, my colleague exclaimed, "This part isn't even in the score! They are just improvising nonsense."

Since that particular discussion and others that followed, I started to realize that YouTube could become another sphere of influence in one's performative craft. Up until that point in my education, my spheres of influence included: my applied teachers, my colleagues, live performances or masterclasses from visiting guest artists, and recorded music in the form of CDs or mp3s. My relationship with and opinions of YouTube as an educational resource became more or less a love-hate one over the next several years. A comprehensive way to illustrate this relationship would be to discuss my experiences learning and performing two established works in the solo percussion repertoire: Iannis Xenakis' *Psappha* (1975) and *Zyklus no. 9* (1959) by Karlheinz Stockhausen.

The most important aspects of *Psappha* from a logistical standpoint are the tasks of instrument choice and their physical arrangement/proximities with one another. The score calls for 16 instruments in total: five groups each containing three instruments of similar timbres or materials plus one more instrument. Although the instrument choices are left up to each performer, these decisions can affect the way in which they are spatially arranged; Xenakis'

score does not offer any prescribed or suggested diagrams on how a percussionist could set up their instruments. I wanted to be careful about what instruments I chose and how I oriented them so I would not derail my progress in learning the work. I had begun to realize how valuable YouTube could be as an educational resource and decided to look for any video uploads of *Psappha*. Coincidentally, the first upload of the work in its entirety was a performance done by percussion virtuoso, Steven Schick. This video of Schick's live performance, uploaded by a user named *qtpipi*, still remains the most-viewed of all other performances of *Psappha* that exist on YouTube.[28] Being able to obtain information about his selection of instruments, stick/mallet choices, and instrument set-up did assist me and influenced my own choices.

Contrasting to *Psappha*, Karlheinz Stockhausen's *Zyklus no. 9* (1959) includes a specified list of instruments needed for performance, as well as a suggested diagram of their physical arrangement. Perhaps the most important difference between these two works is the freedom of choices that Stockhausen gives to the performer—the score itself is reversible. The player can: 1) choose to read it in one direction or flipped upside down and in the opposite direction; 2) the performer can start at any point in the piece and; 3) certain groups of gestures can be played in any order selected by the performer. Although I had made up my mind as to where I would start in the piece and which direction I would go in, I still perused through YouTube to observe some performance videos of other interpretations. I certainly remember that I had seen two videos of Schick performing the work, but do not recollect if I had watched many others at all. What changed my attitude about YouTube with regard to *Zyklus* came from observing a live performance of the work. In the spring of 2015, Schick gave a masterclass at a

[28] qitipi, "Xenakis – Psappha." YouTube video, May 26, 2007. <https://www.youtube.com/watch?v=Yge7GNl5p_k> Accessed 21, November 2020. While this video has garnered nearly 172,000 views, an upload from percussionist Ying-Hsueh Chen appears to be closing the gap; her upload of *Psappha* has about 110,000 views.

percussion festival where one student performed *Zyklus*. Within the first thirty seconds, I realized that this performer was essentially recreating and emulating Schick's interpretation; they began in the same spot in the score as he did, and their stick/mallet changes, physical gestures, and even facial expressions looked like outright mimicry, in my opinion. After the masterclass, I spoke with my percussion teacher and expressed my dissatisfaction with seeing other percussionists my age copy a performer's interpretation. He understood my observations, and spoke to his own experiences; during his university studies and throughout a large portion of his professional performing career, the only way to receive both an audial and visual realization of music was by observing live performance. If anything came of this experience, I was reminded that as much as YouTube can be beneficial, it can also have a significant influence on one's craft, whether it be conscious or not.

At the present, I use my own YouTube channel to upload videos of my performances and compositions. My stature as a "content creator" is minimal, at best; I currently have 23 subscribers, most of which are personal or professional contacts. As is the case with other social media platforms, my YouTube subscribers serve as a digital extension of my "real" life. Aside from the abilities to access performance videos, connect with other percussionists or composers, and to discover new percussion repertoire, I am able to have a public portfolio of my artistic work housed online for free.

My experiences with YouTube as both an observer and a participant have led me to investigate how it has affected the percussion field. Is there an established subculture of percussionists on YouTube? Can analysing YouTube videos of percussion performance illustrate consistencies and divergences in the musical interpretation of a composition? How are percussion performance videos on YouTube being received and evaluated by today's generation

of undergraduate percussionists? What are the implications for future generations of percussionists? I will now present an overview of this dissertation and explain the contents of its remaining chapters.

1.7 Overview

The second chapter of this document will present three topics: 1) literature and research on YouTube pertaining to other fields of academic research (e.g., media studies, political science, cultural anthropology, digital culture); 2) music scholarship on the topic of YouTube and; 3) an overview and discussion of the percussion subculture that exists on the site at the time of this dissertation's completion.

In Chapter 3, I will present and discuss a corpus study of YouTube videos of John Cage's *Third Construction* (1941). Conducting a corpus study has become an increasingly popular method of research, particularly within the field of music theory.[29] Previous corpus studies have either analyzed already-established bodies of repertoire, or have been selected and analyzed by the researcher(s). I will discuss how to define and establish a corpus of YouTube videos that can be subjected to both qualitative and quantitative analysis. Rather than seeking to support broad claims about a genre of music as most corpus studies do, my research goals were to examine and analyze how performers have chosen to interpret a singular piece of percussion repertoire.

The fourth chapter will present findings from a case study conducted on nine undergraduate percussionists. The participant pool was recruited by contacting percussion professors at universities in North America, who then forwarded the information along to their

[29] Duinker, Benjamin. "Diversification and Post-Regionalism in North American Hip-Hop Flow." PhD dissertation, McGill University (2020), pg. 53.

respective students. Those who contacted me to offer themselves as participants were selected to take part in the research. The case study consisted of three parts: a precursory survey on their general experiences with YouTube and; two viewings of five excerpts of performance videos of John Cage's *Third Construction* that exist on YouTube. In the excerpt viewing portion of the case study, the participants watched the five video excerpts under two differing conditions: first, by simply watching them, and second, by simultaneously following along with the musical score. Additionally, participants were prompted to answer questions that pertained to each viewing condition. Rather than administering and proctoring the case studies individually, the participants were instructed to screen record their computers while they completed the study. This was to ensure that their submitted data was honest and truthful.

Chapter 2

Scholarship on the Topic of YouTube and the Site's Percussion Subculture

Introduction

Academic research on digital culture phenomena, such as YouTube, can only present snapshots of their growth and development. Collecting and analyzing data in these dynamic and ever-changing environments presents its challenges; as soon as one's writings have been published, their objects of study typically continue to morph and develop. The majority of research and publications on the topic of YouTube are rooted in digital culture/media studies, but there have been authors who have investigated the site's impact in other fields of study (e.g., political science, cultural anthropology, dance, etc.).

2.1 Writings on The YouTube Phenomenon

The emergence and growth of YouTube could be compared to the development and evolution of recording technologies discussed in the previous chapter. Even within the early years of its existence, the video-sharing site was viewed as a "remediation of television," which decentralized both the creation and reception of media content away from corporate television networks.[30] Michael Strangelove (2010) noted that well-established forms of audiovisual media (e.g., film, television) are driven by commercial or entertainment enterprises, and reinforced that YouTube's initial focus was on average, everyday people who created amateur videos.[31] Part of

[30] Snickars, Pelle and Patrick Vonderau, editors. *The YouTube Reader*. Lithuania: Logotipas, 2009, pg. 62.
[31] Strangelove, Michael. *Watching YouTube: Extraordinary Videos by Ordinary People*. Toronto: University of Toronto Press, 2010, pg. 3.

this media decentralization included the evolution of the audience, who were now able to become more engaged; not only can a registered YouTube user upload their own videos, but they can also subscribe to other channels, rate videos with the simple click of a "thumbs up" or "thumbs down" icon (i.e., like or dislike), or leave typed commentary on video content. In addition to changes in audience reception and participation, YouTube also impacted the more traditional "producer-consumer" relationship.[32]

The first type of videos that dominated the early years of YouTube were "vlogs" (i.e., video blogs); the prior Internet practice of personal, text-based blogging coupled with the technical ease of production—simply using a webcam and only needing basic video-editing skills—made this genre of YouTube videos flourish during the site's infancy.[33] The foundation laid by the first collective of notable video contributors and the site's active participants was short-lived; corporate entities began to create their own YouTube channels, which morphed the website's original "grassroots" environment into a "digital battlefield." A number of these "original" YouTubers felt that the large multinational companies and celebrity figures (e.g., Oprah Winfrey) who created YouTube channels were "corporate colonizers" of an environment that flourished because of the efforts made by the "original community of videomakers."[34] The relevance of this ongoing duality of both "top-down" and "bottom-up" perspectives—a sort of David and Goliath complex—cannot be overstated.

While YouTube can serve as an audiovisual representation of "convergence culture," its endless amount of content concurrently produces a "divergence culture that is fragmented, niche-

[32] Snickars, Pelle and Patrick Vonderau, editors. *The YouTube Reader*, pgs. 90–91.
[33] Ibid., pg. 94.
[34] Ibid., pg. 101–102.

oriented, fluid and individuated."[35] Although the site's initial surge and growth was primarily from the content produced by a cohort of "vloggers," YouTube quickly became a large cultural archive; the numerous genres and subgenres of videos that have emerged on the site have created an audiovisual archive with "unfiltered, disordered, vernacular, and extremely heterogenous characteristics."[36] YouTube—and the Internet as a whole—has allowed people to express themselves and share aspects of their lives, be they intimate or mundane. "Home videos" once filmed with camcorders and then produced onto VHS tapes digitally shifted and transformed into a variety of subgenres on YouTube; armed with camera phones, parents still captured the humorous moments of their children (e.g., David After Dentist[37]), but younger people began to participate as videographers, as well.[38] Videos of animals take up a large portion of YouTube's environment; clips of domesticated pets performing tricks or wild animals in their natural habitats without human interference are typically focused on emotional elements, be it the love of nature or a video curator who applies human traits or situations to animals (e.g. Two Talking Cats[39], Otters Holding Hands[40]).[41] Other popular forms of videos that have since developed on YouTube include: reaction videos, how-to/DIY (do it yourself) videos (e.g., auto/home repair, make-up tutorials, cooking demonstrations/recipes), reviews of consumer products or films, among many others.

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[35]Snickars, Pelle and Patrick Vonderau, editors. *The YouTube Reader*, pg. 65–66.
[36] Burgess and Green, *YouTube: Online Video and Participatory Culture*, 1st ed. (2009), pgs. 88–89.
[37] booba1234, "David After Dentist." YouTube video, January 31, 2009. <https://www.youtube.com/watch?v=txqiwrbYGrs> Accessed 07 July, 2021.
[38] Strangelove, *Watching YouTube*, pgs. 41–63.
[39] TheCatsPyjaaaamas, "The two talking cats." YouTube video, June 28, 2007. <https://www.youtube.com/watch?v=z3U0udLH974> Accessed 07 July, 2021.
[40] Otters holding hands, "Otters holding hands." YouTube video, March 19, 2007<https://www.youtube.com/watch?v=epUk3T2Kfno> Accessed 07 July, 2021.
[41] Kavoori, Anandam. *Reading YouTube: The Critical Viewer's Guide* (New York: Peter Lang Publishing, Inc., 2011) pgs. 58–67.

Concerns over copyright law and monetization on YouTube were evident from the site's beginnings. Despite its exemption from the Digital Millennium Copyright Act and its parent company (Google) having the means to identify illegal use of materials (ContentID), YouTube encountered many legal battles with large corporations whose copyrighted content was compromised by its presence on the site.[42] In order to deter users from uploading copyrighted material, YouTube initially created a rule that only allowed a user's video to be a maximum of ten minutes in duration; there were prior instances in which users posted videos of full-length movies, episodes of television shows, footage of sporting events, and commercially recorded music. This is not to say that copyright infringement does not exist on the site today—from my own experiences, YouTube's ContentID has detected matches between my live recital performances and commercially available recordings. This does not allow me to receive any revenue generated from advertisements if they were to be placed on my video uploads.

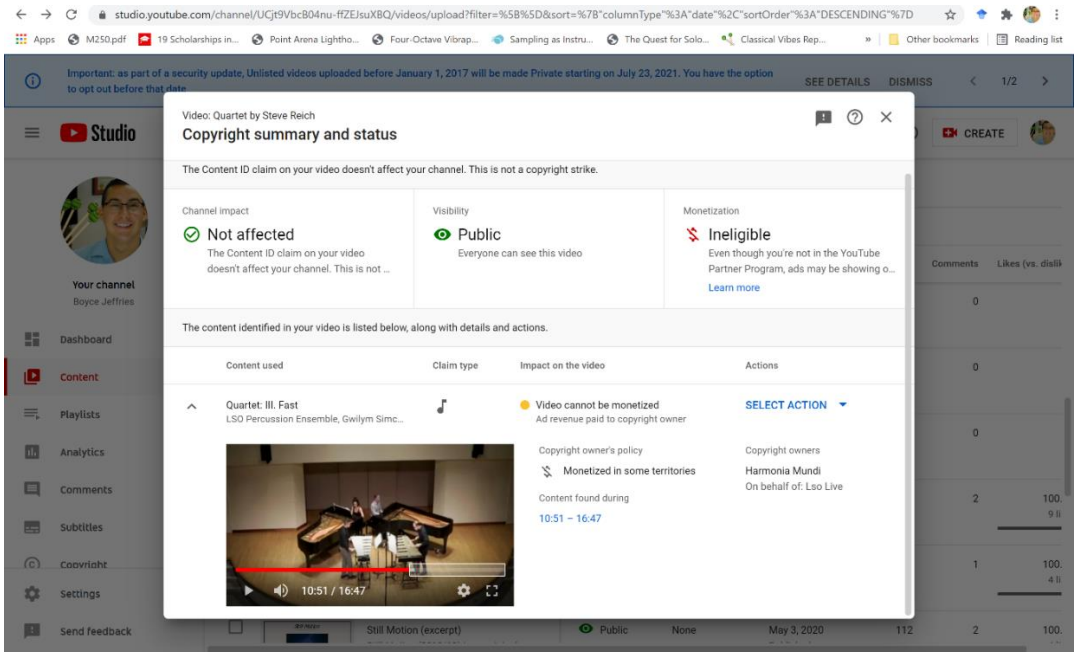

Fig. 2.1 – Screenshot of copyright infringement notice of Steve Reich's *Quartet* (2013) on author's YouTube channel

[42] Scherzinger, Martin. "The Political Economy of Streaming," pg. 287.

Within three years of its launch, YouTube incorporated advertisements within video content, as well as sections of the website dedicated to "sponsored channels," "promoted videos," and "spotlight videos," which essentially corresponded with financial resources.[43] As of November 2020, YouTube's terms of service for registered users allows for the monetization of any video; in other words, YouTube can place advertisements on whatever content they wish to. This most recent monetization policy allows YouTube to retain the entire advertisement revenue from videos or users who are not part of the site's "Partner Program." Additionally, the users who meet the necessary qualifications to be included in YouTube's "Partner Program"[44] cannot prevent the site from placing advertisements on their content.[45]

The proliferation of diverse video content was the primary vehicle of the site's growth, but the YouTube phenomenon has not been an insulated one—the site has also impacted the American political arena. Lachrystal D. Ricke's book, *The Impact of YouTube on U.S. Politics* (2014), discusses how the development of the video-sharing giant has played a role in campaign strategies and voters' access to information on candidates or political topics. The first viral political moment on YouTube came when a U.S. senator was seeking re-election in 2006; George Allen from Virginia addressed S.R. Sidarth, a man of Indian descent, with what was perceived to be a racial slur. Sidarth, who was a campaign volunteer for Allen's opponent Jim Webb, posted the video onto YouTube. Subsequently, Allen lost his re-election campaign despite outspending Webb three-to-one, and the voter turnout was the highest in the state's history for a

[43] Scherzinger, Martin. "The Political Economy of Streaming,", pg. 286.
[44] Registered users that have either a minimum of 1,000 subscribers or if their video content has accrued 4,000 hours of watch time within a twelve-month period are eligible to apply for YouTube's Partner Program.
[45] Koetsier, John. "YouTube Will Now Show Ads On All Videos Even If Creators Don't Want Them." < https://www.forbes.com/sites/johnkoetsier/2020/11/18/youtube-will-now-show-ads-on-all-videos-even-if-creators-dont-want-them/?sh=2b8bb7834913> . Accessed 09 July, 2021.

mid-term election.[46] The viral moment from 2006 came back to haunt Allen, and essentially ended his political career; when he ran for the Virginia State Senate in 2012, the political buzz of the racial slur six years prior was reignited and, ultimately, he lost the election.[47]

In 2007, YouTube and CNN collaborated to produce two debate forums for the candidates running in the 2008 presidential election; CNN would act as the debate moderator, and voters were encouraged to submit 30-second-long video questions to the candidates via YouTube.[48] The reception of this venture by CNN and YouTube was mixed. Some perceived it to encourage participation and engagement from citizens and others believed it to be no more than "flashy political stunts."[49] Although there was an abundance of citizen participation, CNN did receive criticism for how they vetted and selected which video-questions would be asked to the candidates; those within the YouTube environment felt that the most popular questions (the ones that receive the most "thumbs up") should have been asked, but CNN's staff ultimately chose which ones would be aired.[50]

As YouTube grew, so did its presence in the campaigns of political candidates, primarily concerning two key elements: information and image. Through YouTube, campaigns could have more direct and nearly unlimited communication with potential voters or key demographics; candidates could upload videos of clips from their interactions with voters in "town-hall" settings, post short videos of them addressing voter issues or soliciting campaign donations, and even include videos that would rebut controversial claims that were aired by mainstream media

[46] Ricke, Lachrystal D. *The Impact of YouTube on U.S. Politics*. Lanham, MD: Lexington Books (2014), pgs. 12–13.
[47] Ricke, *The Impact of YouTube on U.S. Politics*, pgs. 12–13.
[48] Ibid., pg. 67.
[49] Ibid., pg. 68.
[50] Ibid., pgs. 68–70. The two most popular video-questions at one event asked if actor/politician Arnold Schwarzenegger was a cyborg, and if each presidential candidate would discuss classified information pertaining to UFOs.

outlets.[51] Additionally, campaigns could continually re-evaluate their strategies by assessing the viewer reception of their YouTube content, and help bolster political support by posting videos that would seek to discredit the opposing campaign or candidate (i.e., "attack ads").[52]

In addition to the increasing access of information on candidates, Ricke discusses how the vernacular nature of YouTube played a role in shaping the image of politicians as well. A number of videos created by users that focused on the respective presidential elections of 2007 and 2012 had garnered significant attention: "Vote Different"[53] parodied Apple's 1984 Superbowl Commercial by replacing the role of the "brainwashing figure" on screen with a video of Democratic candidate Hilary Clinton; one user uploaded an original music video in which a woman was seductively singing about Barack Obama ("Crush on Obama"[54]); will.i.am of the Black Eyed Peas recruited a collective of nearly 40 celebrities to create the music video "Yes We Can"[55]; "Barack Obama vs. Mitt Romney"[56] combined comedy with hip-hop music by having actors engage in a rap-battle while they portrayed themselves as the two 2012 presidential candidates.[57] At the present time, the political parody/remix video continues to thrive as an established genre on YouTube—one particular channel that has gained quite a bit of traction in the past two years has been *The Remix Bros.*[58] The two creators from Ottawa, Canada have capitalized on the gaffes of U.S. Presidents Donald Trump and Joseph Biden by rhythmically

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[51] Ricke, *The Impact of YouTube on U.S. Politics*, pgs. 30–35.
[52] Ibid., pgs. 34–35.
[53] ParkRidge47, "Vote Different." YouTube video, March 5, 2007. <https://www.youtube.com/watch?v=6h3G-lMZxjo>. Accessed 10 July, 2021.
[54] The Key of Awesome, "Crush on Obama." YouTube video, June 13, 2009. <https://www.youtube.com/watch?v=wKsoXHYICqU> Accessed 10 July, 2021.
[55] will i am, "Yes We Can." YouTube video, February 2, 2008. <https://www.youtube.com/watch?v=2fZHou18Cdk> Accessed 10 July, 2021.
[56] ERB, "Barack Obama vs. Mitt Romney. Epic Rap Battles of History." YouTube video, October 15, 2012. <https://www.youtube.com/watch?v=dX_1B0w7Hzc> Accessed 10 July, 2021.
[57] Ricke, *The Impact of YouTube on U.S. Politics*, pgs. 37–41.
[58] *The Remix Bros* (YouTube Channel) <https://www.youtube.com/c/WTFBrahh/videos>.

altering their respective speeches, and layering them onto original drum beats and instrumental tracks that emulate the stylings of hip-hop/rap music.

YouTube's impact on the performing arts is evident as well, particularly the field of dance. Jonathan Osborn's master thesis (2009) was the first academic document to explore what the site could offer to those who study contemporary dance within an educational institution. He came to conclude that YouTube could be a useful tool for pedagogy and research that could help broaden the understanding and perspectives of movement in other cultures or social groups around the world.[59] Osborn also cites that at the time of his research, the most popular "dance" videos on YouTube were rooted in popular culture, particularly commercially recorded music/ music videos;[60] although not as visible or as metrically popular (i.e., number of views), Osborn did discover a large number of dance instruction videos of numerous styles of dance that were not available for him to study at his university.[61]

Alexandra Harlig, a dance and media scholar, authored a dissertation (2019) that focused on YouTube's role in the circulation of popular dance. Rather than attempting to linearly define a trajectory of popular dance styles within the video-sharing site, Harlig recognizes that YouTube's environment will ultimately yield a "cyclical exchange—between perpetuation and innovation, subculture and pop culture, amateur and professional, the subversive and the neoliberal."[62] Part of her research focused on the social reception of popular dance videos (i.e., comments left by users); Harlig concluded that comments left by viewers become paratexts that

[59] Osborn, Jonathan. "Personal Space: Investigating Manifestations of Dance on Youtube." M.M. Thesis (York University, 2009), pg. 5
[60] Osborn, "Personal Space: Investigating Manifestations of Dance on Youtube," pg. 7.
[61] Ibid., pgs. 69–76.
[62] Harlig, Alexandra. "Social Texts, Social Audiences, Social Worlds: The Circulation of Popular Dance on YouTube." Ph.D diss. (Ohio State University: 2019), pg. 1.

are indeed part of the video itself.[63] These paratexts, according to Harlig, can include debates on a video's validity or value, express one's admiration or excitement, or provide further information or insight all of which can be seen by those who encounter the content in the future; in other words, these user paratexts of a YouTube video can influence the perception or reception of content.[64]

The topic of YouTube within the music research field has primarily focused on the website's increased presence in library research methods, popular music, and music education. By first presenting this body of literature, I will elaborate on how this scholarship correlates to my own research.

2.2 Using YouTube to Access Recordings of Music Performance

Kirstin Dougan's publications (2012; 2014; 2016) have illustrated how YouTube's growing presence has come to affect students' research and evaluation methods, highlight perspectives and perceptions of music library collections, and even show sometimes contested relationships between music professors and the content their students find online. Beginning with students, Dougan writes that their capabilities of distinction between scholarly and non-scholarly resources are often a reflection of how they use electronic devices—their smartphones/laptops are used for both personal reasons (e.g., communication, online social networking, leisure, etc.) *and* academic information, and they do not necessarily see clear boundaries between the two.[65] A major difference between library holdings and content on YouTube, in her opinion, pertains to

[63] Harlig, Alexandra. "Social Texts, Social Audiences, Social Worlds: The Circulation of Popular Dance on YouTube," pgs. 48–56.
[64] Ibid., pgs. 56–61.
[65] Dougan, Kirstin. "Music, YouTube, and Academic Libraries." *Notes* Vol. 72, No. 3 (March, 2016), pg. 492.

the metadata of the former and the lack thereof in the latter. Library archives of music recordings can contain detailed information on the specifics of a recording (e.g., the performer(s), instrumentation, the date of recording, liner or program notes, etc.), but this information may not be present in video uploads on YouTube. Since it is the responsibility of the video uploader to provide metadata, it may be inaccurate, incomplete, or missing altogether, and not held to the same standards that more formal recording archives have.[66] Dougan highlights that in the opinions of the surveyed students—and even some faculty members—the task of obtaining a recording, be it in a physical format (e.g., vinyl record, cassette tape, CD), or digitally via a library's subscription to an online recording database (e.g., Naxos Music Library) is overridden by the ease of accessibility and "endless" amount of content on YouTube. In a 2014 survey, Dougan found that 56% of music faculty members and 46% of music librarians within her participant pool believed YouTube is, to certain degrees, easier to navigate than library catalogs.[67] She also collected data on their personal usage as well as their assumptions of how their colleagues use YouTube; Dougan asked how librarians thought faculty members were using the site, and vice versa.[68] Despite a small sample size of 79 students—only 11% of the student body at University of Illinois' School of Music from 2011 to 2012—Dougan found that 95% of the participant pool use YouTube in some capacity to search for recordings, citing the high amount of content and ease of use as their primary motivations.[69]

Katie Lai (2013) conducted a survey at Hong Kong Baptist University which asked music students about their searches and uses of recordings on YouTube in comparison to the music

[66] Dougan, Kirstin. "Music, YouTube, and Academic Libraries.", pg. 493.
[67] Dougan, Kirstin. "'YouTube Has Changed Everything'? Music Faculty, Librarians, and Their Use and Perceptions of YouTube." *College and Research Libraries* Vol. 75, No. 4 (July, 2014), pg. 582.
[68] Ibid., pg. 583.
[69] Dougan, Kirstin. "Information seeking behaviors of music students." *Reference Services Review* Vol. 40, No. 4 (November, 2012), pgs. 564–566.

library's collection. Lai found that students felt the library's collection had better quality and more "authentic performances," which they equated to being "authoritative" and "scholarly".[70] Despite their association of high quality recordings existing within the library holdings, 81% of the students indicated that their primary consultant was YouTube when preparing for lessons or rehearsals.[71] Additionally, students expressed that some benefits of YouTube recordings included remote accessibility, use of the site for "casual" listening, and providing viewer receptions (e.g., user comments) of content.[72] Lai cautions that students should be reminded that high numbers of viewers do not correspond directly to a recording's credibility or reliability.[73]

Jennifer Whitaker (2018) catalogued and analyzed results of search inquiries for uploads of wind band repertoire to YouTube. Whitaker echoed the assessments made by Dougan and Lai that YouTube's ease of accessibility and the ability to view multiple recordings of the same composition are appealing aspects of using the site.[74] An interesting feature that was incorporated into YouTube's platform was the "playlist" feature, and allows individual users to curate compilations of YouTube videos, which can help organize and share related content.[75] An important characteristic of Whitaker's research highlighted that YouTube's search engine does not allow access to lists that exceed 1,000 results, which can affect one's search methods.[76] The most important conclusion drawn by Whitaker is that numerous uploads of the same composition may reflect the programming habits of conductors, and that implications of crowd-sourcing on

[70] Lai, Katie. "How are Undergraduates Using YouTube?: A Survey on Music Students' Use of YouTube." *Music Reference Services Quarterly* Vol.16 (2013), pgs. 204, 206.
[71] Lai, "How are Undergraduates Using YouTube?", pg. 205.
[72] Ibid., pgs. 205, 211.
[73] Ibid., pg. 213.
[74] Whitaker, Jennifer. "Concert Band Literature on YouTube." *Journal of Band Research* Vol. 53 No. 2 (2018), pg. 16.
[75] Mercer, Andrew. "The Educational Uses of YouTube." *The Canadian Music Educator* Vol. 52, No. 3 (Spring 2011), 42-43. Cited in Whitaker, pgs. 16–17.
[76] Whitaker, "Concert Band Literature on YouTube," pg. 29.

YouTube feed into how content is circulated and what future viewers may perceive to be more valuable.[77]

2.3 YouTube and Music Education

In the realm of music education, there are numerous articles describing YouTube's relationship to both academic (formal) and non-academic (informal) styles of teaching and learning. Christopher Cayari has authored several articles (2011, 2015, 2018) about YouTube's effects in music education, and has conducted his own case studies through interviews and implementations in his classroom's environment. In his 2011 and 2018 articles, Cayari presented two ethnographies of "YouTube musicians" Wade Johnston and David Francois. What propelled Johnston to "YouTube fame" was an upload of him performing a cover song that was originally written by one of his idols—Wade's motivation was to expand his viewing audience by attaching his performance to an already-established name.[78] The results of this lead to further collaborations with other YouTube musicians, and the interest in his channel's videos kept growing.[79] Despite these positive results, Johnston addressed the costs of creating and uploading content onto the site by remarking on the countless hours of learning songs, recording them, and the time spent on their production—yet he still felt they were "under-produced."[80] The reward of all this work, for Johnston, was "Free exposure [on the Internet]."[81] Cayari's 2018 article discussed the work of David Francois, a Christian musician and avid YouTube user from Ontario, Canada. Francois recorded, and produced performance videos of Christian worship

[77] Ibid., pg. 23.
[78] Cayari, Christopher. "The YouTube Effect: How YouTube Has Provided New Ways to Consume, Create, and Share Music." *International Journal of Education & the Arts*, Vol. 12, No. 6 (July, 2011), pg. 13.
[79] Cayari, "The YouTube Effect…", pgs. 13–14.
[80] Ibid., pgs. 14–15.
[81] Cayari, "The YouTube effect…," pg. 12.

songs all by himself; a "virtual" ensemble made up of multi-instrumental tracks and polyphonic voice textures.[82]

Cayari conducted a case study on music education undergraduates who were tasked with creating music videos. Inspired primarily by Lucy Green's book *Music, Informal Learning and the School: A New Classroom Pedagogy* (2008), Cayari's goal was to use this project to demonstrate five principles through this informal approach to teaching and learning: 1) allowing students to choose music they will learn and record; 2) learning through the use of recordings; 3) learning in peer groups; 4) learning without strict teacher guidance and; 5) incorporating performance, composition, improvisation, and listening into the whole process.[83] Students experimented with different music-video formats (e.g., covers, instrumental exploration, activism/awareness, virtual ensembles) and were also faced with the productional tasks of creating, shooting, and editing the audiovisual content.[84] Cayari also created an online survey to collect statistical data on hours spent in the stages of production and post-production by each group and received personal feedback from the participants through an open-ended section to the questionnaire.[85]

Kiri Miller's *Playing Along: Digital Games, YouTube, and Virtual Performance* (2012) presents one chapter that focuses on traits that make up the "amateur-to-amateur" teaching and learning dynamic. Instead of seeing this as a traditional teacher-student relationship, Miller elaborates on this amateur-to-amateur (A2A) transmission, which is similar to the concept of

[82] Cayari, Christopher. "Connecting music education and virtual performance practices from YouTube." *Music Education Research*, Vol. 20 No. 3 (2018), pgs. 366–372.
[83] Cayari, Christopher. "Participatory culture and informal music learning through video creation in the curriculum." *International Journal of Community Music* Vol. 8 No. 1 (2015), pgs. 43, 54.
[84] Cayari, "Participatory culture and informal music learning…", pgs. 47–49.
[85] Ibid., pgs. 49–51.

peer-to-peer (P2P) learning.[86] The first trait of A2A transmission is the destabilization of the teacher–student relationship, in which individuals bypass "authorities" in order to gain information or access to resources.[87] Second, this A2A transmission typically raises more discourse because of the destabilization of authorities coupled with the intermixing of the personal and social lives of the participants.[88] By comparing two YouTube videos of beginning conga lessons from 2007, Miller highlights the disputes users have with the content uploaders as well as other viewers.[89] Most of this dissent appears in the comment sections of the videos, but interestingly enough, the amateur who recorded and uploaded the lesson (Nate Torres) actively responded and interacted with viewers who have left questions in the comments section.[90] This type of "pedagogy" invites creativity in order to overcome the challenges of music teaching and learning in an online-environment.[91] Lastly, A2A transmission gives the participants a "sense of mutual obligation, emotional investment, and social connection" with the abilities to instantaneously connect, ask questions, or offer varying degrees of criticism.[92]

Matthew Thibeault (2012) offers an interesting perspective on the state of music education in what he calls a "postperformance" world. The parameters of Thibeault's postperformance world are as follows: 1) most experiences with music are through a digital medium rather than experiencing live performances; 2) many pieces of music are produced in a studio that separates the performers from the audiences; 3) recordings have radically changed the

[86] Miller, Kiri. "Amateur-to-amateur" in *Playing Along: Digital Games, YouTube, and Virtual Performance*. Oxford: Oxford University Press, 2012, pg. 183.
[87] Miller, "Amateur-to-Amateur," pg. 184.
[88] Miller, "Amateur-to-Amateur," pgs. 193, 218.
[89] Ibid., pgs. 184–188
[90] Ibid., pgs. 188–189.
[91] Ibid., pg. 218.
[92] Ibid., pgs. 184–219.

way we listen and hear music.[93] This first characteristic, a music world dominated by recording, is supported by the writings of Gould (1984), McLuhan (1994), and Katz (2004)—recorded music has offered listeners with more intimate viewpoints into the music, has given listeners complete control over their own choices and listening habits, and has influenced live performance. In order to illustrate the second characteristic of the postperformance world, Thibeault draws on Walter Benjamin's (1892–1940) writings about the differences in film and stage actors; the former is removed from an audience that they will never see, while the latter is engaged in a continuous act in front of a physical audience.[94] Thibeault implores that the idea of a postperformance world doesn't exclude performance altogether, but rather recognizes that our interaction with music has shifted to accommodate the most prevalent societal behaviors. Thibeault also introduces three "eras" of learning that were first put forth by Allan Collins and Richard Halverson (2009); a home-based apprenticeship, state-controlled schooling, and lifelong learning.[95] In a musical context, Thibeault equates an apprenticeship to private guitar lessons, state-controlled schooling to a guitar class, and lifelong learning by one's use(s) of internet sites (e.g., YouTube).[96] For the last era (lifelong), Thibeault notes that it is the most flexible in terms of accessibility (anytime or anywhere), resources (sites, content), and timeframe (for the rest of one's life). As for how to incorporate a more modern curricula into the music education field, Thibeault does not offer any specific proposals and only cites a few developments at the time of his publication, which perhaps is reflective of the ongoing struggles on the subject.

[93] Thibeault, Matthew. "Music Education in the Postperformance World." In *The Oxford Handbook of Music Education,* Vol. 2., pg. 518, edited by Gary McPherson and Graham F. Welch. Oxford: Oxford University Press, 2012.
[94] Thibeault, "Music Education in the Postperformance World," pg. 521
[95] Ibid., pg. 526.
[96] Ibid.

Applying Miller's and Thibeault's concepts raises questions and considerations for those within the field of percussion, be it performance, education, or research. Content on YouTube comes from a duality of "bottom-up" and "top-down" sources, so how does Miller's idea of amateur-to-amateur transmission work with regards to videos of percussion music performance? Miller describes that A2A transmission destabilizes the power of "authorities", but the concept of authority on YouTube may not be as easily discernable, and is contingent upon several factors. The crowd-sourcing metrics of YouTube content function as a sociocultural currency, and in conjunction with viewer activity, helps fuel the site's algorithmic processes that determine a video's circulation and "position" within the environment. The more views and "likes" a video receives may indicate to future viewers that its contents are more valuable, or perhaps more authoritative in the court of public opinion. Authority on YouTube may also be reflected by one's prominence on the site, but determining this may be difficult to concretely trace; did they gain this prominence and recognition before entering the YouTube environment? Were their reputations amplified by their presence on YouTube? Or did the success of their YouTube content give way to their rise in the percussion field? How does Thibeault's concepts of the postperformance world relate to percussionists—or musicians, for that matter—who use YouTube either as viewers or content creators?

Experiences with listening to music are now primarily through digital means that have resulted from shifts in societal behavior—or even unparalleled circumstances such as the COVID-19 pandemic. If we refer back to Thibeault's discussion on Collins and Halverson's "eras of learning" (2009), then the use of YouTube would fall under the category of "lifelong" learning—one that exists outside of academic curricula, is not bound to a specific time, place, or method, and can be developed over one's lifetime. This, of course, is contingent upon the

lifetime of YouTube itself, which could suffer a similar fate that many defunct websites/social media platforms have experienced (e.g., Ask Jeeves, Myspace).

Much of the percussionist's undergraduate experience is focused on mastering the fundamentals, which simply translates to *doing*—practicing and performing on many subspecies of percussion instruments in the forms of method books, etudes, and repertoire in solo, chamber, and large ensemble contexts. Aside from *doing*, what opportunities do undergraduate percussionists have for *observing* performances? A live concert, repertoire class, or masterclass setting allows students to observe performances by their colleagues, professors, or guest artists; but these opportunities can be contingent upon geographic location, university administrations, financial resources, and scheduling. Utilizing YouTube as an educational resource for percussionists has not been adequately addressed in academic scholarship.

2.4 The Percussion Subculture on YouTube

YouTube's launch in 2005 marked a new age for Internet users, and for percussionists as well. Businesses, professional percussion soloists and ensembles, a number of notable percussionist-composers, and individual users have all contributed percussion-focused content onto YouTube. Performance videos of both standard and new percussion repertoire, product review videos of instruments, drumsticks, or mallets, videos of interviews with prominent performers and pedagogues, and educational videos have helped grow and foster what is now a thriving subculture on YouTube.

Regardless of the slight variations that exist for the term "subculture", two important aspects are prevalent: 1) subcultures can only exist within a larger culture and; 2) the features of a subculture have some degree of distinction from the larger culture. Given YouTube's position

as a circulator of video-content created by individual users, organisations, or corporations, it can be said that the site functions as the host for a mass collective of subcultures. In order to understand the duality of and the oppositions between the bottom-up and top-down nature of YouTube, we must first define and identify who the "stakeholders" are within its environment. In the first edition of their book, *YouTube: Online Video and Participatory Culture* (2009), Jean Burgess and Joshua Green outline four types of users on the site: businesses, organisations, private individuals, and participants.[97] How do their classifications of YouTube inhabitants apply to the percussion subculture that exists on the site?

2.5 Businesses

The Vic Firth Company, one of the world's largest drumstick and mallet manufacturers, launched their YouTube channel on December 7th, 2007. Presently, their channel has approximately 526,000 subscribers, and its video content has been viewed nearly 168 million times.[98] Their YouTube channel features videos ranging from product reviews, interviews with professional drum-set artists and percussionists, educational videos such as masterclass recordings, and performance videos of marching percussion activities, jazz drummers or vibraphonists, and classical or contemporary percussion repertoire. In order to help further classify their array of content for their viewership, the Vic Firth Company has three "featured channels:" Vic Firth Marching, Avedis Zildjian Company, and Vic Firth Concert.[99] Of these three, the third provides video content for academic percussionists to find audiovisual recordings

[97] Burgess and Green, *YouTube: Online Video and Participatory Culture*, 1st ed., pg. 57.
[98] Vic Firth YouTube channel, "About" tab. <https://www.youtube.com/user/vicfirthdrumsticks/about>. Accessed 1 September, 2021.
[99] Vic Firth YouTube channel, "Channels" tab. <https://www.youtube.com/c/VicFirthCompany/channels>. Accessed 2 August, 2020.

of both standard and new percussion repertoire[100], but even the entire collection of Vic Firth's YouTube content is not as organized as a more formal research archive. In comparison to other businesses that manufacture and/or sell percussion equipment (e.g., sticks, mallets, instruments), Vic Firth, by far, has the most dominant presence on YouTube. Even though some of these businesses specialize in certain product markets (e.g., marimba/vibraphone mallets, orchestral percussion instruments and mallets, sheet music publishing), the combined numbers of subscribers for ten other percussion retailing companies fail to even reach half of Vic Firth's 526,000 subscribers.[101]

2.6 Organisations

The second category of YouTube inhabitants, organisations, is not explicitly defined by Burgess and Green (2009), and requires it to be distinguished from the channels of users identified as businesses. Percussion-based organisations with channels on YouTube include professional performance groups, percussion studies programs housed in academic institutions, and societies focused on promoting percussion education and professional development.

The Percussive Arts Society (PAS) serves as the central organisation for the percussion field on a global scale. Founded in the United States in 1961, the mission statement of PAS is "to inspire, educate, and support percussionists and drummers throughout the world."[102] This

[100] Vic Firth Concert YouTube Channel < https://www.youtube.com/channel/UCPDUImPj1TyBXYEiKil1sPQ>. See also, Vic Firth Marimba Literature Library. Accessed 20 August, 2020.

[101] The ten percussion retailers / manufacturers in this figure include: MarimbaOne, Yamaha Drums, Lone Star Percussion, Innovative Percussion, Steve Weiss Music, Black Swamp Percussion, Freer Percussion, Meinl Percussion, Latin Percussion (LP), and Gon Bops Percussion. YouTube channels for each company were Accessed 3 August, 2020. It is possible that a large portion of YouTube users may be subscribed to multiple channels of percussion retailers / manufacturers, but the dominance of Vic Firth's presence on YouTube is evident.

[102] Percussive Arts Society website, "PAS History" <https://www.pas.org/about/history>. Accessed 3 August, 2020.

network of professional performers, established educators, percussion enthusiasts, and university students connect online via the organisation's website (PAS.org), through a number of social media platforms (e.g., Facebook, Instagram, Twitter), through subsidiary chapters on localized levels (i.e., by country, Canadian province, or U.S. state), or by attending an annual conference held in the United States: PASIC (Percussive Arts Society International Convention). PAS's presence on YouTube has gained them nearly 20,000 subscribers since launching their YouTube channel in 2011, and most of their content consists of highlighted performances from previous PASIC events, educational videos of exercises or practice tips to enhance performance techniques, and interviews or panel discussions with experts in the field. University percussion studies programs appear to not have as large of a presence on YouTube; it can be speculated that these channels have been created for the purposes of archiving or livestreaming audiovisual recordings of performances onto YouTube, which could also be used as a means of marketing and recruitment for prospective students.

The organisations that appear to have the most prominent presence on YouTube are professional performers. Ensembles such as Sō Percussion, Third Coast Percussion, and Sandbox Percussion, have all uploaded audiovisual recordings of percussion repertoire in both studio and live performance contexts, but concretely tracing and codifying their YouTube presence is difficult for two main reasons: 1) their subscription rates may not always directly correlate to the number of views that their video content may receive; 2) professional groups such as the ones listed above are often endorsed by or affiliated with manufacturers of percussion equipment (e.g., The Vic Firth Company). For example, Sandbox Percussion presently has nearly 1,700 subscribers, but many of their most-viewed videos were uploaded and remain on the Vic Firth Company's YouTube channel. The combination of and interplay between professional performer

and corporate sponsorship presents an interesting premise, especially in YouTube's fluid and dynamic environment, which monetizes channels, users, or videos that attract large numbers of subscribers or have high numbers of views. It appears that artistic endorsements and relationships between notable percussionists and corporate entities continue to tip the scales of YouTube dominance in their favor. The mutual benefits of these relationships for both artists and companies could be seen as antithetical to the beginning ideals of YouTube.

2.7 Individuals

Despite the large presence of business and organisations on YouTube, individual uploaders of percussion-focused content have also gained significant traction. Australian percussionist Adam Tan uses his YouTube channel to upload product reviews of keyboard percussion instruments and mallets, review performance videos, conduct interviews with renowned percussionists and educators, and discuss performance techniques, all of which have attracted almost 28,000 subscribers.[103] When compared to the first generation of YouTubers, personalities whose video content helped contribute to the website's initial surge in growth and popularity, Tan's channel can be best classified as a percussion-based vlog (video-blog).
Rob Knopper, a percussionist with the Metropolitan Opera Orchestra, launched his YouTube channel in 2011, but did not begin posting any video content until 2015.[104] Although his channel is partially rooted in a vlog (video-blog) style similar to Tan's, the majority of his content focuses on what he describes as "hacking." A large number of Knopper's YouTube videos are

[103] YouTube channel: Adam Tan < https://www.youtube.com/channel/UCb1UI8X57325r8zS1fI7uUw>, Accessed 1 September, 2021.
[104] YouTube channel: Rob Knopper <https://www.youtube.com/channel/UCLKKcZJyZjUxBihfiHQunRw>, Accessed 15 August, 2020.

subtitled as either "percussionhacker" or "auditionhacker," and this content provides tips and exercises for practicing orchestral excerpts, conducting mock auditions, and insights into the audition processes based on his own past experiences. These "how-to" videos can provide percussionists looking to pursue employment with a symphony orchestra with knowledge and advice from an established professional such as Knopper.

A number of percussionist-composers have a strong YouTube presence as well; Casey Cangelosi (8.59 thousand [K] subscribers), Gene Koshinski (9.75K), and Ivan Trevino (7.31K) all have uploaded performance videos of their own works, bypassing the more traditional relationship between composers and music publishing companies in order to reach a wider audience. Considering the launch dates of their channels[105] and their respective ages, their successes and notoriety within the percussion field could be a generational phenomenon; their compositional output via YouTube, personal websites, and/or other social media platforms helped propel their respective careers, primarily without the support from academic institutions or corporate endorsements.

Cangelosi is also the founding member of a channel called @Percussion, a podcast dedicated to "the academic, contemporary, and philosophical aspects of being a percussionist in today's world."[106] Launched in 2015, this channel contains videos of hour-long, "round table" discussions with a guest appearing in each episode of the podcast. These guests range from prominent figures within the percussion community (i.e., performers, composers, pedagogues) to

[105] YouTube channels and their respective launch dates:
Casey Cangelosi (April 29, 2007), <https://www.youtube.com/user/CaseyCangelosi>
Gene Koshinski (February 28, 2008), <https://www.youtube.com/c/GeneKoshinski80/featured>
Ivan Trevino (April 17, 2009), <https://www.youtube.com/user/popmarimba>
Accessed 1 September, 2021.

[106] YouTube channel: @Percussion, "About"
<https://www.youtube.com/channel/UCXQGSZbZ8sF7LAiVtGmUZBg/about>. Accessed 1 September, 2021.

young emerging artists and aspiring composers of percussion music. Hosted by Cangelosi, Ben Charles, Karli Viña, and Ksenija Komljenović, the @Percussion podcast has uploaded 295 episodes to their YouTube channel and have nearly 1,500 subscribers.[107] Although this channel could be classified as an organisation when using Burgess and Green's terminology for types of YouTube inhabitants, it is my opinion that the @Percussion podcast is rather a collective of individuals seeking to share knowledge and insights from the discussions with their guests.

One of the most influential individuals within the percussion subculture on YouTube is perhaps Evan Chapman. The beginnings of his YouTube channel—launched on December 29, 2006—featured videos of him performing "drum covers" of commercial music hits, playing in his high school jazz band, recording his own performances of standard percussion repertoire during his collegiate studies, and producing performance videos of his own compositions for percussion. Although Chapman remains active as a percussionist and composer, most of his YouTube presence has come through his work as the co-founder of four/ten media, a company that professionally produces audiovisual recordings of percussion performance videos. He and his media company's videos often incorporate interesting lighting effects, visual enhancements, and varying camera angles which create a more cinematic viewing experience in comparison to other audiovisual recordings of music performance on YouTube (e.g., concerts, recitals). What was initially a personal practice for curating his own content developed into a professional endeavor that has allowed Evan and four/ten media to become the foremost producer of audiovisual recordings of percussion performances on YouTube. Corporations such as the Vic Firth Company, notable performance groups (e.g., Sandbox Percussion, Third Coast Percussion,

[107] YouTube channel: @Percussion, "About" <https://www.youtube.com/channel/UCXQGSZbZ8sF7LAiVtGmUZBg/about>. Accessed 1 September, 2021.

Sō Percussion) and famous composers including Steve Reich, David Lang, and Michael Gordon have all contracted Evan and his media company to produce these cinematic recordings of percussion repertoire—unsurprisingly, Chapman and his company have also produced performance videos of other musicians and instrumentalists, as well. With this increased attention on the visual aspects of these videos, it could be speculated that audiovisual recordings of a live performance—what one would experience as an audience member in a concert hall—may be less appealing for a viewer to engage with on YouTube.

2.8 The Participants: Registered Users and Viewers

The final category of YouTube's inhabitants, according to Burgess and Green (2009, 2018), are participants. Perhaps the largest in number, this group has significant power over a video's reception which can impact its future circulation. But concretely defining the term "participant" within a dynamic, public, online website presents its difficulties. Theoretically speaking, the term "participants" implies anyone with a registered YouTube account that creates and uploads video content, which would also apply to the previous three groups: businesses, organisations, and individual users—they are all participating to some degree. In my opinion, however, Burgess and Green's definition of participants may be divided into two separate groups that still function in similar regard—primarily as consumers of video content. Registered users are what I define as individuals with their own YouTube channel who have the ability to interact with content (e.g., subscribing to channels, or rating or commenting on videos) and create/curate personal or public playlists of videos, but have not uploaded any content or have uploaded content but do not have a significant presence on the site. It can be asserted that the majority of

registered users YouTube act primarily as consumers rather than serving as producers of content; as early as 2011, YouTube engineer James Zern disclosed that approximately 30% of the site's content accounted for about 99% of the views on the entire site.[108] Registered users will have a more curated viewing experience based on their activity on YouTube; their subscriptions to other channels and traceable records of their search history, viewing history, and what videos they have rated or commented on provide YouTube with more data to use in their algorithmic processes. I consider myself to be a registered user; I have a YouTube account with video uploads of previous recital performances and my own compositions, but my twenty-three subscribers primarily consist of colleagues or individuals that I have a pre-existing relationship with.

Viewers on YouTube can simply be defined as visitors to the site who do not have their own YouTube channel. In comparison to registered users, viewers do *not* have the ability to subscribe to other channels and cannot rate (i.e., like or dislike) or comment on videos, but they may still search for and view content. These persons *without* a YouTube channel will likely have a more liberal experience on the site—by not having an account with YouTube, their experiences of searching for and viewing content are not designed to their specific interests or actions on the site, and are shaped in a more general sense. Even though their search and watch history on the site cannot be concretely tracked to a registered account, viewers are still routed to content based on YouTube's algorithmic functions. Although the main vehicle of YouTube's platform is video-uploading and sharing[109], the interactions that registered users and viewers have with content play a significant role in determining its "position" in the environment. The circulation of

[108] Whitelaw, Ben. "Almost all YouTube views come from just 30% of films." *The Telegraph*, April 20, 2011. <https://www.telegraph.co.uk/technology/news/8464418/Almost-all-YouTube-views-come-from-just-30of-films.html> Accessed 20 November, 2020.
[109] Burgess and Green, *YouTube: Online Video and Participatory Culture*, 1st. ed., pg. 58.

content on YouTube is controlled through a combination of crowd-sourcing metrics (e.g., the number of views, likes/dislikes, ratings, and comments) and algorithmic functions that are not disclosed to the public.

Despite the slight differences between registered users and viewers of YouTube, their primarily role is as members of the audience. The data gathered from registered users factors into YouTube's algorithmic processes to help curate one's viewing experiences and search interactions on the site, but viewers also contribute to the amount of view time video content receives. Content on YouTube can also be disseminated via a URL link and posted onto other social media network sites. Audiences in the YouTube environment are in an interesting position when compared to audiences in a live, in-person performance setting; viewers have control over what they choose to watch, how long they watch for, when to pause, fast forward or rewind a video, whether or not they hit the "like" or "dislike" button, or if they leave typed commentary.

2.9 Conclusions

The YouTube phenomena radically altered the traditional media landscape; the video-sharing platform has allowed everyday, ordinary persons to create, share, and evaluate content, all of which disrupted the more traditional, "one directional" method of communication and dissemination of information. Considering the pace of its development and its overwhelming breadth of video content, it is unsurprising that studying YouTube as an object of research is not readily undertaken. But considering the works and literature cited in this chapter, YouTube has provided research opportunities for numerous fields (e.g., digital culture, media studies, cultural anthropology, political science, dance, and music). Defining and understanding a subculture within YouTube's environment requires thorough investigation; Patricia Lange spent 12 years (2006–2018) interviewing 152 YouTube vloggers, analyzing 300 videos, and documenting and

uploading these ethnographic experiences on her own channel, *AnthroVlog*.[110] While there only a small number of nations that have blocked their respective citizens from accessing the site, YouTube is currently offered in 80 languages and has made 100 localized versions of their platform for countries around the world.[111] It is true that the localization of YouTube has catered to specific regions which has increased the amount of participation and accessibility; however, one has to wonder; is the reinforcement of localized culture and video content creating more selective, and more shrinking "social bubbles" on the site?[112]

Percussion performance and university education could be thought of in the same regard. The focus of most degree programs in North America is rooted in Euro-centric (i.e., Western-art) musical styles (e.g., classical, contemporary, or avant-garde), but there are likely regional differences as well—be they geographical, cultural, or aesthetically driven. American composer John Cage (1912–1992) was a revolutionary figure for music in the 20th century, especially for percussionists and our repertoire. While his notoriety certainly stretches around the world, it would be interesting to see how performers have interpreted his pinnacle work for percussion quartet, *Third Construction* (1941). How has YouTube played a role in the shaping the performance practice of this work? The next chapter will encompass a corpus study of performance videos of this composition that exist on YouTube.

[110] Lange, Patricia G. *Thanks For Watching: An Anthropological Study of Video Sharing on YouTube*. Louisville, CO: University of Colorado Press (2019).
[111] https://www.globalmediainsight.com/blog/youtube-users-statistics/ Accessed 20 July, 2021.
[112] Burgess and Green. *YouTube: Online Video and Participatory Culture*. 2nd Edition. Cambridge: Polity Press, 2019, pgs. 130–131.

Chapter 3

A Living Corpus: Analyzing YouTube Videos of John Cage's *Third Construction*

Introduction

American composer John Cage's (1912–1992) contributions to percussion repertoire—and moreover, Western-art music history—cannot be overstated. Cage is considered to be a core figure of the first generation of American composers who wrote percussion-focused works. In addition to his own compositions, Cage persistently solicited composers nationwide to write new works for percussion, many of which were performed by his own group, the "Cage Percussion Players."[113] Although *Third Construction* itself is an 80-year-old composition, the development of its performance practice and circulation within the percussion community did not concretely begin until the late 1970s.

The premiere of the work was done in 1941 by Cage's own percussion group: Doris Dennison, Margaret Jansen, Lou Harrison, and Xenia Cage, his spouse at the time and the dedicatee of the work, with Cage conducting the piece.[114] Cage and his players were amateurs who had no formal percussion training. More than thirty years after the premiere, the piece was "rediscovered" by Blackearth Percussion when the manuscript became available to the public.[115] Subsequently, other percussion groups including NEXUS (Toronto, Canada), and Amadinda (Budapest, Hungary) incorporated *Third Construction* into their performance repertoire and

[113] Miller, Leta E. "Henry Cowell and John Cage: Intersections and Influences, 1933–1941." *Journal of the American Musicological Society*, Vol. 59, No. 1 (Spring 2006), pg. 71.

[114] Williams, Barry Michael. "The early percussion music of John Cage, 1935–1943," DMA diss., Michigan State University (1990), pg. 128.

[115] Kvistad, Garry. "Blackearth Percussion Group Retrospective at PASIC 16 in Indianapolis." NEXUS blog, Jan 13 (2017) < https://www.nexuspercussion.com/2017/01/18346/>. Accessed Feb 12, 2021.

professional discographies. Additionally, other notable groups that have formed since (e.g., Sō Percussion, Third Coast Percussion) have also passed down their knowledge of the work via masterclasses, live performance, or their respective positions as professors of percussion.

The presence of the polyrhythmic material throughout *Third Construction* can give younger percussionists the opportunity to improve their own rhythmic skills, and do so within a chamber-music context. At the present time, today's percussionists have ample resources to assist and guide them in their own experiences with Cage's quartet, which has been cemented as a significant cornerstone of percussion chamber music repertoire.

3.1 Corpus Study

Conducting a corpus study has become an increasingly popular method of research, particularly within the field of music theory.[116] A corpus study's primary function is to analyze a body of repertoire in order to demonstrate patterns or trends, be they qualitative or quantitative. This body can be objectively determined by measurable metrics (e.g., sales margins, streaming statistics) or subjectively compiled lists such as the "best of rock and roll," which are curated by collectives of people or by organisations (e.g., *Rolling Stone* magazine, the Grammys). If popular music can be regarded as a "still-evolving repertoire" that undergoes "cultural canonization," [117] could I model my research on any existing corpus studies in order to analyze percussion performance videos on YouTube?

[116] Duinker, Benjamin. "Diversification and Post-Regionalism in North American Hip-Hop Flow." PhD dissertation, McGill University (2020), pg. 53.
[117] Duinker, "Diversification and Post-Regionalism in North American Hip-Hop Flow," pg. 55.

Previous corpus studies have either analyzed already-established bodies of repertoire, or have been selected, compiled, and analyzed by the researcher(s). Ben Duinker (2020), not only presents his own corpus study of hip-hop music from 1979–2017, but also elaborates on previous methodologies used to conduct similar studies within the same music genre. Through this discussion, Duinker summarizes important aspects of consideration if one is to conduct their own corpus study: 1) the resultant data must be easily read by a computer program; 2) the formation of corpora may be "hand-picked" by the author in order to support their research goal(s); 3) an effective corpus study results when analytical goals are optimized for the type(s) of data yielded and; 4) it is important to remain as objective as possible when conducting the corpus study, perhaps by having multiple researchers working independently from one another.[118]

When comparing my own research to the previous corpus studies discussed by Duinker, there are two important distinctions to consider: 1) my corpus study involves the examination of *audiovisual recordings*; and 2) my corpus study is focused on one specific work within the percussion chamber music repertoire: John Cage's *Third Construction*. Rather than seeking to support broad claims about a genre of music, my research goals were to examine and analyze how performers have chosen to interpret a singular piece of repertoire. An interesting aspect of YouTube's environment is its "still-evolving" / "living" body; this body is continually re-established as new content is added to the site. While it is true that content can be removed from YouTube, the site is generally in a state of growth and expansion, which in turn affects the site's algorithms and "flow" of video content. Perhaps videos of percussion performance may not be as dynamic in this regard, but their presence on YouTube still leaves them within an environment

[118] Duinker, "Diversification and Post-Regionalism in North American Hip-Hop Flow," pgs. 53–67.

that is nowhere near as static as other forms of music performance recordings. How would one define and establish a corpus of YouTube videos that can be further analyzed?

3.2 Defining a "Living" Corpus on YouTube

Between October and November of 2020, I began compiling data on the YouTube videos of John Cage's *Third Construction*. Navigating and collecting data on a website with a seemingly endless amount of content presents its share of challenges, but these obstacles can be mitigated to some extent. YouTube's search engine is more basic in construction, and less sophisticated when compared to online archives used in academic research. The default search setting on YouTube, as well as its parent company Google, is based on relevance to the keywords one uses. Only *after* a search is entered can various filters be used to narrow the results to more specific criteria. Of all the search filters available on YouTube, the two that may be most useful for searching for videos of percussion repertoire are "Upload date" and "View count," both of which are located under the "Sort By" tab.

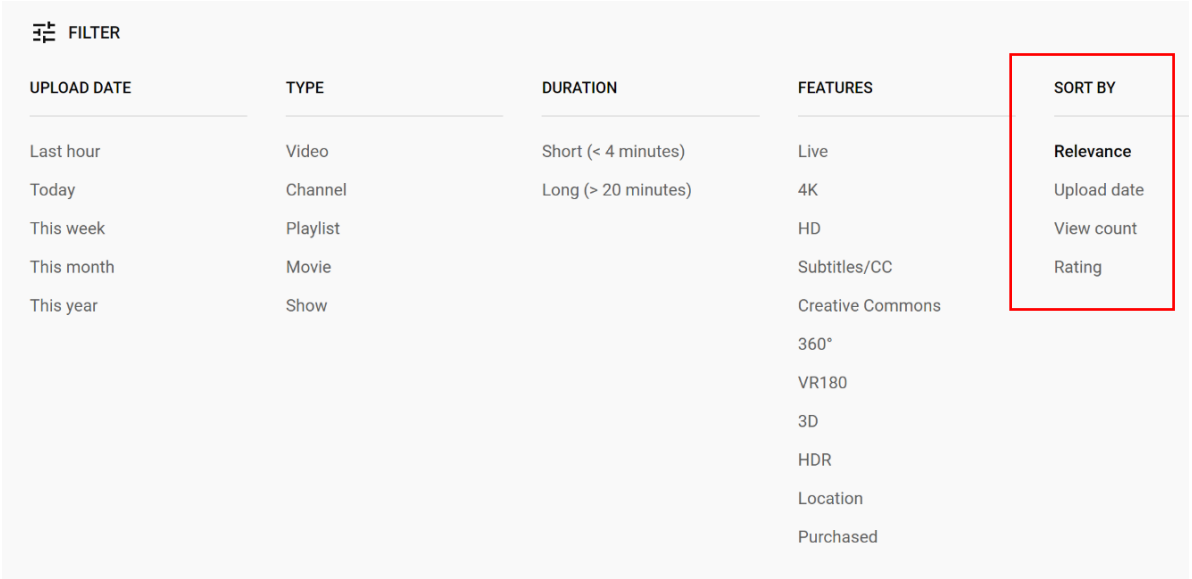


Fig. 3.1 – 'Sort by' tab on YouTube search filters

By selecting the "upload date" filter, the webpage will arrange the results in reverse-chronological order with the most recent uploads at the top and the older uploads toward the bottom. If one were to use the "view count" filter, the resultant videos will be arranged from greatest to least number of views. In order to maintain and keep track of the videos of *Third Construction*, I created a playlist through the use of my own YouTube account.[119] Playlists on YouTube can be set to one of three privacy settings: 1) "private" for one's personal use; 2) "unlisted," which grants access only to those who have the playlist's URL link, or; 3) "public," which is available to anyone on YouTube.

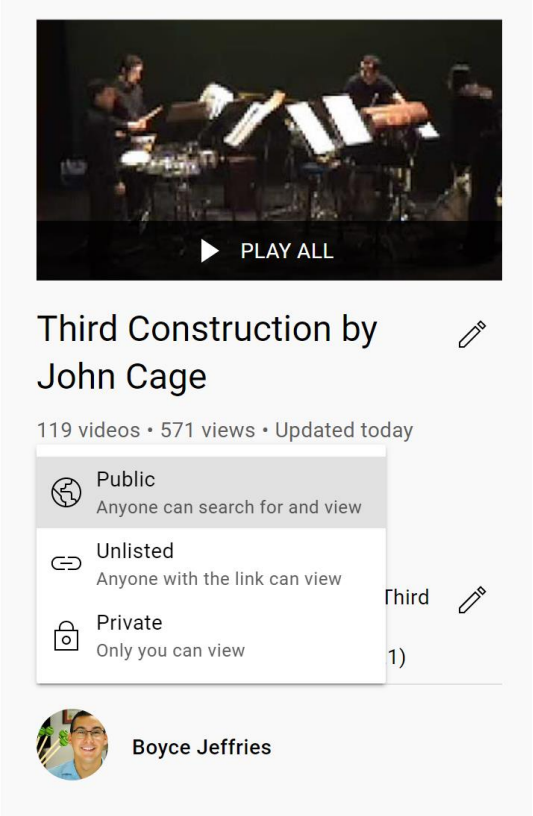


Fig. 3.2 – Screenshot of privacy settings for YouTube playlists

[119] "*Third Construction* by John Cage," YouTube playlist.
< https://www.youtube.com/playlist?list=PLDfuBk-Npt41pDREmhR8u8dmFaIn0FTI0>

Given that YouTube's default search is based on relevance of the keywords used, the search entry I chose was: "third construction john cage." Once the playlist was completed, I created a spreadsheet and transposed specific data, which consisted of columns containing the following information: 1) uploader; 2) upload date; 3) views (as of September 1st, 2021); 4) performance date; 5) location of performance; 6) performance context; 7) number of camera angles; and 8) visual quality (progressive scan; i.e., pixels). It is important to note the differences between the metadata of library holdings of recorded music performances and the metadata of video content on YouTube. The former may contain detailed information on the specifics of a recording (e.g., the performer(s), instrumentation, the date of recording, liner or program notes, etc.), but may be inaccurate, incomplete, or missing altogether in the latter. On YouTube, it is the responsibility of the user to provide this metadata, which usually is not held to the same standards as library collections or institutional recording archives.[120] A significant number of *Third Construction* videos contained little or no metadata at all—as a result, certain categories of information within my spreadsheet were left blank (e.g., performance date, performance location).

I later discovered that this playlist could be sorted through differing filters, as well. Videos can be arranged by the date they were published, their popularity, and even by when they were added to the playlist by the curator, which helped mitigate any human error that may have occurred during the compilation process.

[120] Dougan, Kirstin. "Music, YouTube, and Academic Libraries.", pg. 493.

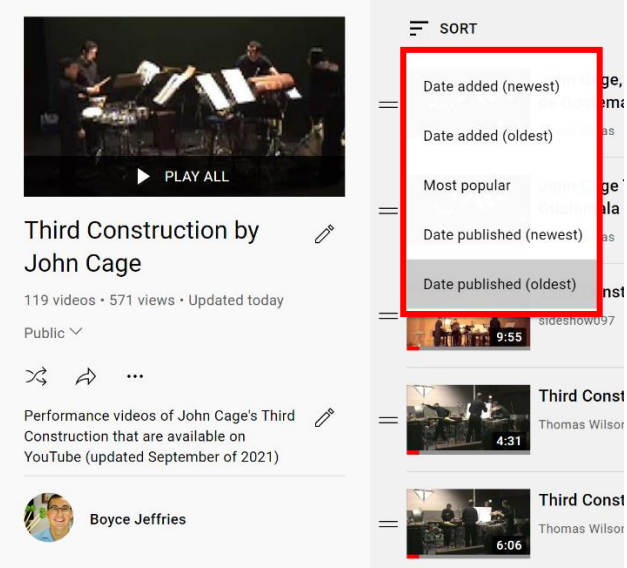


Fig. 3.3 – Screenshot of sorting filters available within a YouTube playlist

The total number of videos in this playlist is 119, but that is not entirely reflective of the number *performances* that exist on YouTube. In its early years, YouTube only allowed a maximum video duration of ten minutes between 2006 and 2010, primarily to deter users from uploading copyrighted materials (e.g., movies, episodes of television shows).[121] Of the 119 videos in this playlist, content from eight YouTube users was split between two videos in order to upload their full performance of *Third Construction*: seven of which were uploaded at the time of YouTube's 10-minute rule for video length; the eighth belonging to a longer, full-length recital video where the performance of Cage's quartet was split between two separate uploads.

[121]Fisher, Ken. "YouTube Caps Video Lengths to Reduce Infringement." *Ars Technica*, March 29, 2006. <https://arstechnica.com/uncategorized/2006/03/6481-2/> Accessed 20, November 2020.

Uploader	Upload Date
Alvaro Rodas	18 December, 2008
Thomas Wilson	2 May, 2009
Mariano Vega	15 June, 2009
Matteo Flori	17 March, 2010
Jon Nathan	6 April, 2010
Andrew Furhman	1 June, 2010
Mai Tadokoro Hessel	11 August, 2011
Kyle Stoker	9 May, 2018

Table 3.1 – Performances of *Third Construction* on YouTube that are split between two separate video uploads

Additionally, there are four instances in which the *same* performance was also uploaded onto another user's YouTube channel; most of these scenarios involve an individual member of an ensemble posting a video to both their personal YouTube channel as well as the channel of the ensemble that they are a member of.[122] When accounting for these duplicate videos, as well as the performances that were split into two separate video uploads, the number of performances of *Third Construction* that exist on YouTube is 107. One would have to spend at least 20 hours to watch all of the performance videos of Cage's percussion quartet that currently exist on YouTube. How would I determine which 20 videos to analyze for my corpus study?

[122] An example of a duplicate video of the same performance can be found on Sō Percussion and Josh Quillen's YouTube channels. Josh is a member of Sō Percussion, and the videos were uploaded to both his own and the ensemble's channels is from a live performance that occurred on January 20th, 2018. See Sō Percussion < https://www.youtube.com/watch?v=-wPld3efSaw> and Josh Quillen < https://www.youtube.com/watch?v=bZsTcrx5Zh4>.

3.3 Narrowing the Corpus for Further Analysis

After compiling my playlist of all the *Third Construction* videos on YouTube, I had to determine which twenty I would further examine for the corpus study. Given the information that I gathered about each video upload, I sought to balance my approach by considering the following criteria: view count, upload date, performance context, cinematography, and geographic region.

The simplest and most objective method would have been to examine the top twenty most viewed videos. The metric data (e.g., number of views, "likes/dislikes") associated with videos on YouTube acts as sort of sociocultural currency which, in turn, helps determine its circulation on the site. When looking at the top ten most-viewed performance videos of *Third Construction*, one can recognize how quickly one video can dominate all other uploads.

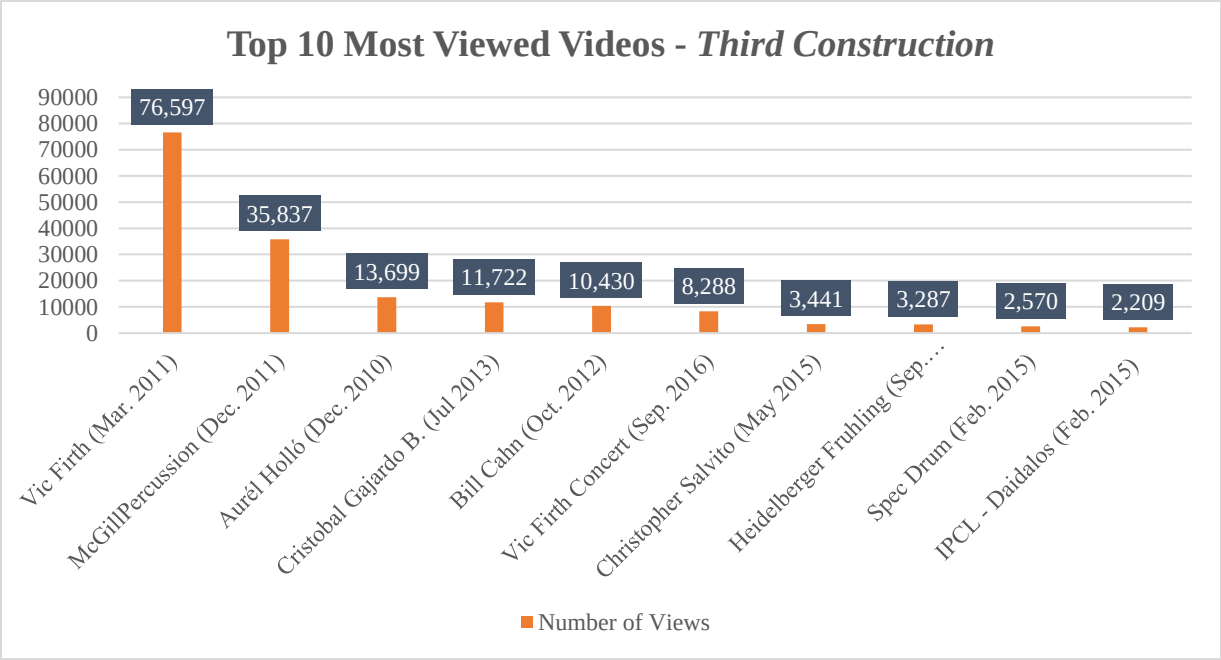


Fig. 3.4 – Chart of top 10 most viewed videos of John Cage's *Third Construction* (as of 1 September, 2021)

Scholars who have studied the YouTube phenomenon iterate that the site has allowed for the dissemination of videos made by a variety of contributors from ordinary, everyday people up to multi-national corporations and major news media outlets.[123] Prior to YouTube, it is likely that the most available recordings of music were done by professional ensembles or artists who had the technological means or financial support to do so (e.g., self-produced, grant funding, private patronage). Would it be beneficial perhaps to consider performance videos that do not have a high number of views?

The two search filters available on YouTube that can have the most correlation to one another are the "upload date" and "view count." The number of views a video has may correspond with when it was uploaded to YouTube, but this relationship may not always be directly proportional. To give an example in a percussion-focused context, a YouTube search of Mitchell Peter's marimba solo *Yellow After the Rain* returns a long list of results that YouTube does not specify in number;[124] YouTube does not allow a search results list to exceed 1,000 items.[125] When implementing the "view count" search filter, the top four results have approximately 395,000 (*The Vic Firth Company*), 115,000 (*Steve Weiss Music*), 84,000 (*Maikel2Play*), and 44,000 views (*Aly Marie*), respectively.[126] But these four videos were all uploaded at different times: four (*The Vic Firth Company*), six (*Steve Weiss Music*), eleven (*Makiel2Play*), and ten years ago (*Aly Marie*), respectively.

[123] See Burgess and Green (2009; 2018), Strangelove (2010) & Lange (2007; 2014; 2019)
[124] YouTube search, "Yellow After the Rain by Mitchell Peters," 15 August, 2020. <https://www.youtube.com/results?search_query=Yellow+After+the+Rain+by+Mitchell+Peters>
[125] Whitaker, Jennifer. "Concert Band Literature on YouTube." *Journal of Band Research* Vol. 53 No. 2 (2018), pg. 29.
[126] YouTube search, "Yellow After the Rain by Mitchell Peters," Filtered by View Count (Sort by), <https://www.youtube.com/results?search_query=Yellow+After+the+Rain+by+Mitchell+Peters&sp=CA%253D>, 15 August, 2020.

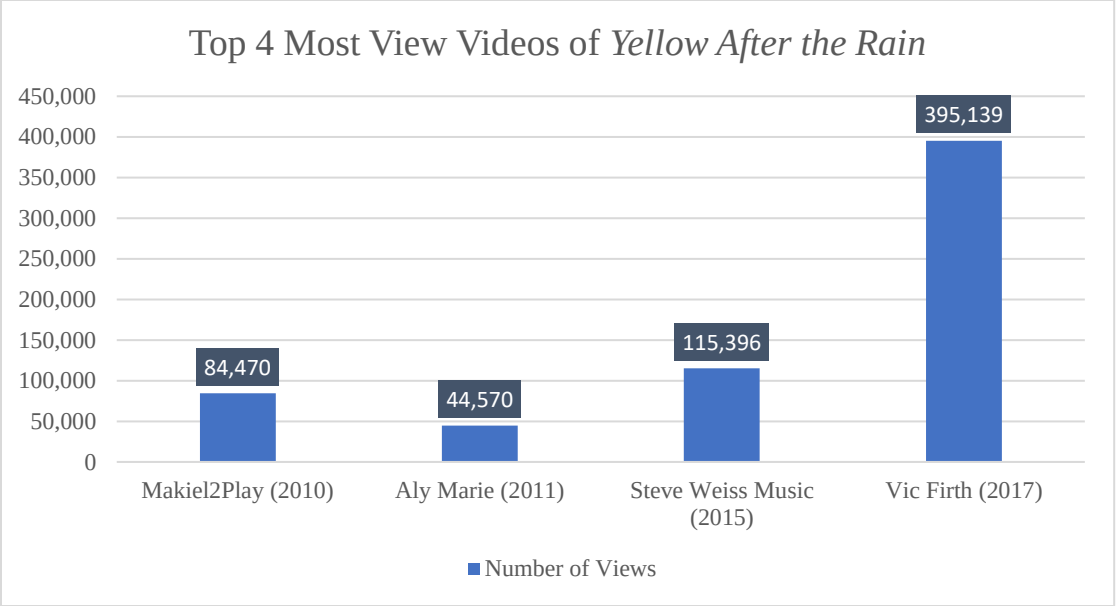


Fig. 3.5 – Top four most viewed videos of *Yellow After the Rain* (as of 1 September, 2021)

In this particular instance, and likely others as well, several factors can show how the number of views does not always correlate with when the video was uploaded to YouTube: the differing financial and technological resources behind filming and producing these videos; the top-down/bottom-up duality of corporate channels (*The Vic Firth Company*) in competition with individual users of YouTube (*Aly Marie*); older videos may be lacking high audiovisual quality when compared to more recent uploads that have been captured on newer recording devices, or when viewed by younger generations of viewers who likely have expectations for high standards of audiovisual quality.

When observing the reputation of the performers (e.g., professional, aspiring professional, university student) within the current body of YouTube videos of *Third Construction*, the vast majority were of collegiate musicians whose uploads were of their live recital performances. The concept of "liveness," particularly through a recorded medium, takes on a multiplicity of meanings. Philp Auslander has viewed the term "live" as one born out of a

historical context, and that Paul Sanden's categories of liveness (corporeal, interactive, and virtual) present different degrees of experiences for both performers and audience members.[127] Nicholas Cook arrived at the conclusion that the terms "live" and "recorded" are not strictly binary opposites that have definite boundaries when in the context of music performance.[128] But within the YouTube environment, videos of music performance all compete within the same economy, be it for sociocultural recognition and/or monetary profit. In this regard, it is important to consider the context of performance—did someone upload a live performance of music to share with their network of family and friends? Or was the video upload onto YouTube a result of carefully curated cinematography designed to serves roles of entertainment, or act as a means of preserving one's professional audiovisual portfolio? When examining the performance contexts of the *Third Construction* videos that exist on YouTube, 99 uploads are of captured live performances, eight are curated recordings, and two others could not be classified into either category.[129]

[127] Cited in Cook, Nicholas. *Beyond the Score* (Oxford: Oxford University Press, 2014), pgs. 371–372.
[128] Cook, Nicholas. *Beyond the Score*, pg. 372.
[129] Two uploads (RCSM Victoria Eugenia de Granada and FOJI Chile) were performed and uploaded during the COVID 19 pandemic. It is likely that these uploads were recorded performances or recordings intended for online broadcast, but no concrete conclusions can be made for their categorization.

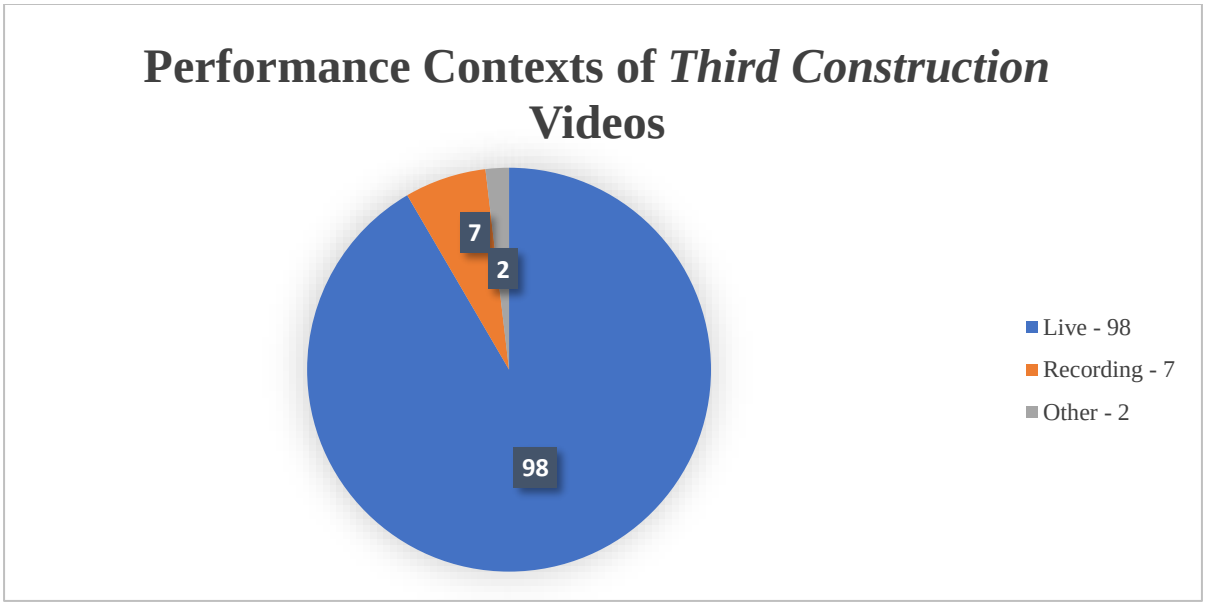


Fig. 3.6– Performance contexts of *Third Construction* videos

Recordings of live performances that are posted onto YouTube can be easily distinguishable due to their ritualized nature; performers typically wear more formal clothing, may take bows both before and after performing a musical work, and audience members' applause or extraneous noises (e.g., coughing, shuffling of concert programs) can be evident before, during, or after the performance. As for discerning which performance videos are curated recordings, two factors should be taken into account: the performance environment or location, and/or the cinematography (i.e., camera angle(s), lighting, production). Much of this involves looking beyond the immediate actions of the performers; why would the percussionists in the video uploaded by *Vic Firth Concert* set up, perform, and record *Third Construction* in the pump-operating room of what appears to be an abandoned, public swimming pool? The following image is not intended to demerit videos that are curated recordings, but rather to bring into consideration one's intentions for uploading it onto YouTube.

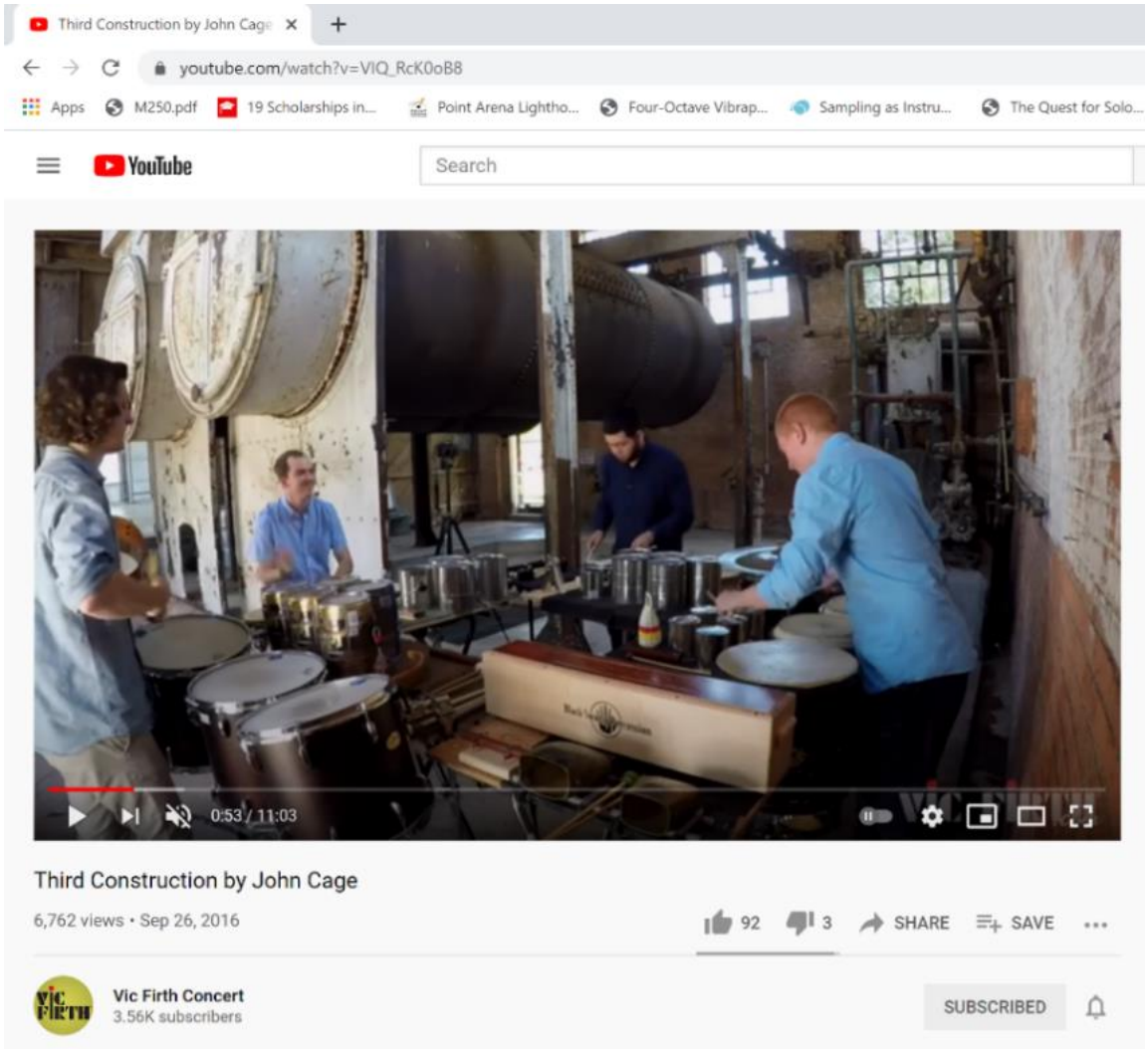


Fig. 3.7 – Screenshot of video uploaded by Vic Firth Concert

An interesting premise for videos of music performance on YouTube is the ability to encounter videos that offer multiple viewpoints—in other words, more than one camera angle. Recorded music has allowed listeners to hear previous performances or interpretations of musical works in more enhanced ways than just attending a live performance. In his book, *Capturing Sound* (2004), Mark Katz discussed one of six characteristics of music recordings: temporality. Despite his opinion that recording technology will never be as sensitive as the human ear, Katz recognized that certain intimacies can be offered to listeners *because of* recording technology

(e.g., Bing Crosby's soft singing style dubbed 'crooning').[130] Given the visual element(s) of YouTube videos of music performance, viewers are granted the opportunity to witness a new set of intimacies with their eyes. The visual perspective of an audience member attending a live concert remains, more or less, unchanged during the performance; spectators remain in their seats for the duration of the concert. With music performance videos on YouTube, there can be various levels of capturing and producing the visual elements, which are contingent upon one's resources (e.g., fiscal budget, camera equipment, recording equipment, post-production editing software, technological skills, etc.). In my data collection on the performance videos of *Third Construction* that exist on YouTube, I dedicated one column to note whether or not the video comprised of one angle or whether it had multiple camera angles (at least two or more). Four of the performance videos I discovered are what I describe to be similar to a "home-video"—although these videos only consisted of one angle, the camera operators who captured the video either panned the camera across the ensemble, or used the zoom in/zoom out functions on their devices.

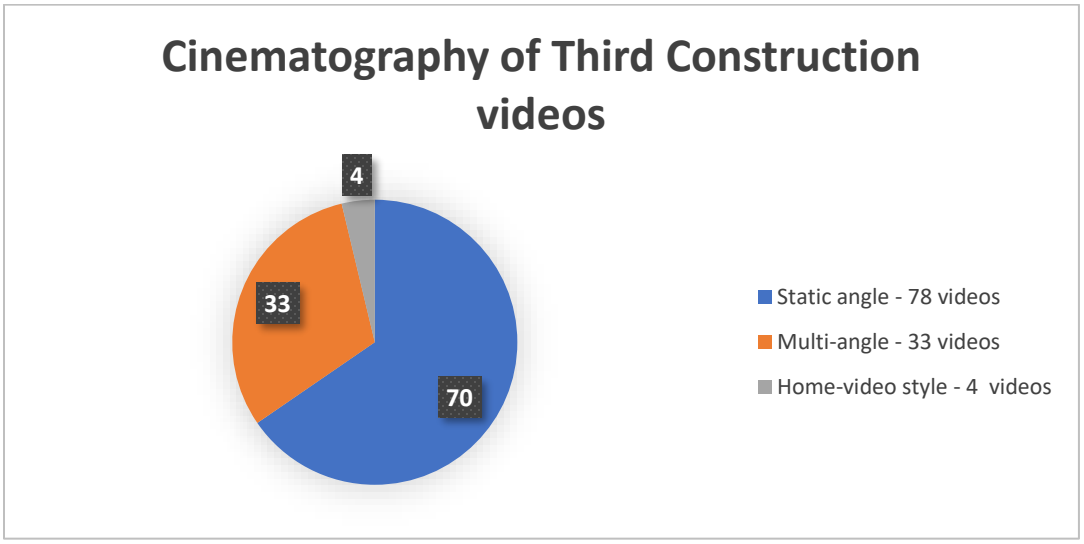


Fig. 3.8 – Cinematography of *Third Construction* videos on YouTube

[130] Katz, *Capturing Sound*, pgs. 40–41.

Lastly, it would be imperative to recognize the global impact that the Internet has had. The ability to share, search for, and examine information from around the world has had profound and foundational impacts on many aspects of modern society, particularly YouTube, which has been described as a "record of contemporary global culture."[131] A 2018 study by the International Federation of the Phonographic Industry (IFPI) revealed that 47% of global music consumption was happening on YouTube.[132] Visitors to the site can search for and observe music performance videos uploaded by musicians from nearly anywhere in the world. Although the epicentre of YouTube's creation and development took place in the United States, its reach to over 130 countries has indeed made it a global, online force. With this in mind, how are percussionists outside of North America interpreting and performing *Third Construction*?

3.4 *Third Construction* Corpus Study

As Duinker noted, selecting items in order to create corpora will inherently have elements of subjectivity throughout the process.[133] Within the YouTube environment, content is circulated based on the site's algorithmic processes that are, in turn, informed by viewership and user interaction. Had I chosen to examine only the top 20 most viewed performance videos of Cage's percussion quartet, their respective rankings are still the result of both objective statistics (i.e., number of views) and subjective opinions from viewers (e.g., "liking / disliking," commenting on videos). In order to balance my approach, the body of videos analyzed consisted of two halves: the first half being the top ten most-viewed performance videos of *Third Construction*[134];

[131] Burgess and Green, *YouTube* (1st ed.), pg. 88.
[132] News release on the IFPI website (9 October, 2018) <https://www.ifpi.org/ifpi-releases-2018-music-consumer insight-report/>. Accessed 7 January, 2021.
[133] Duinker, "Diversification and Post-Regionalism in North American Hip-Hop Flow," pg. 60.
[134] YouTube playlist, "*Third Construction* Corpus Study: Top Ten Most Viewed" <https://www.youtube.com/playlist?list=PLDfuBk-Npt40-4LExUKEkqTOwHgG-wnzb>.

the second half consisting of ten videos of my choosing that take into consideration the aforementioned criteria (view count, upload date, performance context, cinematography, and geographic region).[135] I will now briefly describe the ten videos that I selected in order to explain why they were included in this corpus study:

1) s*ideshow097* (April 10, 2009): This upload is significant because it serves as the first full performance of *Third Construction* that is contained within one video. Other videos of the work that were posted prior or around the same time did not have: 1) the full performance captured or: 2) the full performance was longer than YouTube's 10-minute duration limit at that time, which required the user to split the performance between two separate videos (i.e., part 1 and part 2).
2) *Peter Jarvis* (August 6, 2011): This video is of a live performance that occurred on January 20, 1986. In terms of chronology—outside of YouTube, that is—*Peter Jarvis'* upload is the second-oldest video of *Third Construction*; the only other video that chronologically precedes it is the upload from *Bill Cahn*, which was also a recording of a live performance that occurred in 1984.
3) *PendulumNewMusic* (October 31, 2012): The title of this video is "Construction #3," which likely has affected its circulation on YouTube—the site's default search is based on the relevance of the keywords that one types. This video features a live performance of the work by the Grammy award winning ensemble, Third Coast Percussion (Chicago, Illinois USA).

[135] YouTube playlist, "*Third Construction* Corpus Study: Ten of My Choosing" < https://www.youtube.com/playlist?list=PLDfuBk-Npt40c8IUYCZ_A_D65PJLJeqPi>.

4) *Taylor Yozwiak* (May 18, 2013): This upload is of a live recital performance by undergraduate percussionists at the University of Massachusetts–Amherst, and features multiple camera angles throughout the video's duration.
5) *Daniel Janca* (June 9, 2014): This video was chosen primarily because of the performers: students at the Franz Liszt Academy of Music. This institution is located in Budapest, Hungary which is also where the professional ensemble Amadinda Percussion is based.
6) *Sydney University Wind Orchestra* (June 21, 2014): This video is of a live performance done by Australian percussionists from Sydney University. An intriguing aspect of this video is that the performance took place in what appears to be an art gallery/museum with the audience members closely surrounding the performers.
7) *International Percussion Competition Luxembourg* (February 15, 2015): This video features the Pulsat Percussion Group (Portugal) and their appearance at the semi-finals of the 2015 International Percussion Competition in Luxembourg (IPCL).
8) *Karina Yau* (June 23, 2015): This video is a recording from a live, student recital. With its very low view count (123), it is likely that one would not encounter this upload on YouTube.
9) *percussion ensemble hkbu* (March 23, 2016): Students at Hong Kong Baptist University perform *Third Construction* at a live concert that occurred in 2014.
10) *PercaRUS Group* (August 2, 2020): Percussionists from Russia perform *Third Construction* live.

The areas of examination within this corpus study will focus on two topics: timbre and tempi. The former will present qualitative data on the instruments chosen by the performers which will open up aesthetical discussions; the latter will empirically illustrate how performers have negotiated the tempi indications within the work.

3.5 Timbre

Of the 52 instruments in total among the quartet (thirteen per player), the majority of the musical material is performed on the drums and tin cans; there are sections in which particular instruments are featured (e.g., claves, teponaxtle), but the rest of the instrumentation that is individualized to each quartet member typically serves as accompanying material or is implemented for textural purposes—perhaps the only exceptions would be Player 2's cowbells, and Player 3's conch shell, both of which have soloistic passages within the piece.

Fig. 3.9 – Shared and individualized instrumentation for *Third Construction*

The composer's affinity for timbral exploration is expressed explicitly by his indications telling the performers to strike two differing points on both the tin cans and drums (the centre and the edge/rim), and using their hands/fingers to play the instruments in certain passages, as well.

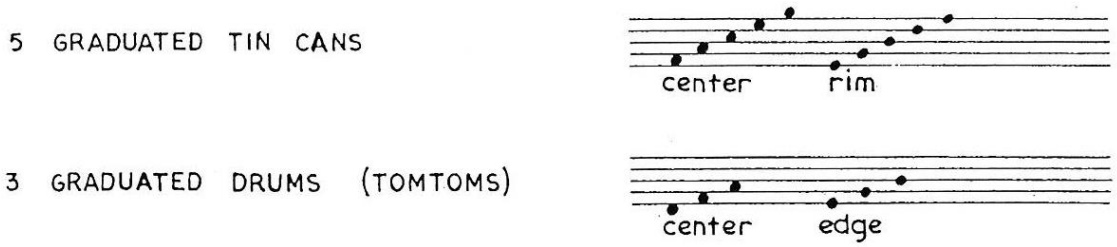


Fig. 3.10 – *Third Construction* performance notes detailing the music notation for the two striking points (center and edge) for the tin cans and drums. © 1970 Reproduced by permission of C. F. Peters Corporation. All rights reserved.

The discussion of timbre (i.e., instrument selection) regarding this analyzed corpus of YouTube videos will be divided between the tin cans and drums, respectively. It would have perhaps been pertinent to also investigate the tuning/pitches of these two instrument groups, but I ultimately chose not to. The polyrhythmic content within the work made the task of distinguishing the tuning of each percussionist's set of drums more difficult. Second, regardless of the types of tin cans one chooses, Cage's instructions for where they are to be struck (e.g., centre or rim) ultimately results in differing sounds—while it is true that the centre of a tin can may produce a "fundamental" pitch, Cage's timbral explorations of the rim and centre are frequently interspersed with one another, making their distinction more difficult to ascertain. Finally, the data I gathered on the tempi taken by the ensembles became the more weighted portion of my analysis[136]—in other words, there was more to discuss with tempi than perhaps there would have

[136] See pgs. 79–100 of this chapter.

been with examining the tuning/pitch of the drums or tin cans selected by the performers in this corpus study.

3.6 Tin Cans

Many percussionists have experimented and used varying sizes and types of tin cans in their performances of *Third Construction*: items ranging from small 16-ounce soup cans, varying sizes of paint cans, mini-beer kegs, and even large, empty oil barrels can be seen in performance videos currently on YouTube. I examined the tin can selections by dedicating four columns of a spreadsheet to the choices made by each quartet member while the fifth column indicated the ensemble's overall approach, which was either uniform or individuated.

Uploader	Player 1	Player 2	Player 3	Player 4	Ensemble
Vic Firth	Lrg. Soup Cans	Mini-beer kegs	Soup Cans	Paint Cans	Individuated
McGill Percussion	Lrg. Soup Cans	Lrg. Soup Cans	Lrg. Soup Cans	Lrg. Soup Cans	Uniform
Aurél Holló	Med. Soup Cans	Mini-beer kegs	Mini-beer kegs	Oil Barrels	Individuated
Cristobol Gajardo B.	Mini-beer kegs	Mini-beer kegs	Mini-beer kegs	Mini-beer kegs	Uniform
Bill Cahn	Lrg. Paint Cans	Lrg. Paint Cans	Lrg. Paint Cans	Lrg. Paint Cans	Uniform
Vic Firth Concert	Med. Soup Cans	Mini-beer kegs	Lrg. Soup Cans	Lrg. Soup Cans	Individuated
Christopher Salvito	Mini-beer kegs	Mini-beer kegs	Mini-beer kegs	Mini-beer kegs	Uniform
Heidelberger Frühling	Pots/ Kitchen Items	Pots/ Kitchen Items	Pots/ Kitchen Items	Oil Barrels/Large Cans	Individuated
Spec Drum	Med. Paint Cans	Med. Paint Cans	Med. Paint Cans	Med. Paint Cans	Uniform
IPCL - Daidalos	Graduated Soup Cans	Lrg. Soup Cans	Mini-beer kegs	Lrg. Soup Cans	Individuated
sideshow097	Lrg. Soup Cans	Lrg. Soup Cans	Lrg. Soup Cans	Lrg. Soup Cans	Uniform
Taylor Yozwiak	Lrg. Soup Cans	Lrg. Soup Cans	Lrg. Soup Cans	Lrg. Soup Cans	Uniform
Sydney Wind Orchestra	Small Soup Cans	Small Soup Cans	Pots/ Kitchen Items	Small Soup Cans	Individuated
IPCL - Pulsat	Small Soup Cans	Small Soup Cans	Small Paint Cans	Small Soup Cans	Individuated
Karina Yau	Small Soup Cans	Graduated Variety	Small Soup Cans	Graduated Soup Cans	Individuated
PendulumNewMusic	Lrg. Soup Cans	Pots/ Kitchen Items	Large Soup Cans	Kitchen Items / Cans	Individuated
Peter Jarvis	Lrg. Paint Cans	Lrg. Paint Cans	Lrg. Paint Cans	Lrg. Paint Cans	Uniform
Daniel Janca	Mini-beer kegs	Mini-beer kegs	Mini-beer kegs	Mini-beer kegs	Uniform
HKBU	Graduated Variety	Graduated Variety	Graduated Variety	Graduated Variety	Uniform
PercaRUS	Mini-beer kegs	Lrg. Soup Cans	Mini-beer kegs	Lrg. Soup Cans	Individuated

Table. 3.2 – Spreadsheet of tin can selection made by performers in the corpus study videos

The decision to take a uniform or individuated approach was evenly split amongst the 20 YouTube videos in this examined corpus; ten ensembles chose to have the same tin cans, and ten ensembles chose to have their own individual tin cans. What were the possible reasons for their choices?

Examining the score of *Third Construction* can present a quandary for percussionists when determining which instruments to select for their tin cans. Looking at these passages in the score indicates that they are to be treated in various contexts. There are a few soloistic passages played on the tin cans in Cage's quartet: Player 2's material in the first half of rehearsal letters "H" and "I"; Player 4 has quite an extensive passage from halfway through rehearsal letter "V" until the end of the piece in which they are to balance with Players 1 and 2, both of whom are instructed to play fortissimo dynamics on their drums. In addition to these solo contexts, the duet between Players 2 and 4 creates a passage of tin can counterpoint from the second half of rehearsal letter "O" through the first half of rehearsal letter "P." Although there is no section in the score where all four percussionists play the tin cans simultaneously, there are instances of trio passages on the tin can instruments: at rehearsal letter "A," Players 2, 1, and 4 are successively added to create a polyrhythmic texture which results in a smattering of metallic timbres; an important canon appears between rehearsal letters "F" and "G" while Players 1,3, and 4 layer in one at a time with the juxtaposition of identical material.

Cage's incorporation of "noise" and "sound" throughout his compositional output led many of his percussion compositions to have performers use "found-objects" that function *as* musical instruments. A number of ensembles within this corpus study took this Cagean aesthetic to heart, and were most experimental with their tin can selection; members of the Esegesi Quartet

(in the video uploaded by *Heidelberger Frühling*) had an array of metallic kitchen items such as mixing bowls and cooking pots, as well as large oil barrels and large paint cans.[137]

Before deciding which metallic items to select as one's tin cans, a brief discussion of a term Cage uses in the performer's notes would be helpful. In its most basic sense, *graduated* refers to items within a series or according to a scale, but can also refer to a changing contouring of colour. For percussionists, the term *graduated* most commonly corresponds to the types of mallets used on keyboard percussion instruments. In this regard, a graduated set of mallets consists of individual beaters of varying densities (i.e., hardness) that are designed for certain registers on a marimba. Would the familiarity of this concept have any implications on one's selection of tin cans for *Third Construction*?

For the majority of the ensembles in this corpus study, most performers selected the same type of can, regardless of whether not the entire ensemble took an individuated or uniform approach. A handful of performers did, however, select varying types of cans to comprise their sets of five; two percussionists in the upload by *Karina Yau,* and all four quartet members in the video by *percussion ensemble hkbu* (Hong Kong Baptist University) each had different sizes and types of cans. Although this may be the more literal interpretation of the term "graduated," it could impede one's technical facility; having instruments at varying heights could inhibit their playing.

[137] See Heidelberger Frühling, "ESEGESI Percussion Quartett beim Heidelberger Frühling 2017 | John Cage »The Third Construction«." YouTube video, September 29, 2017 <https://www.youtube.com/watch?v=rc2bziMAzzU>. Accessed 20 November, 2020.

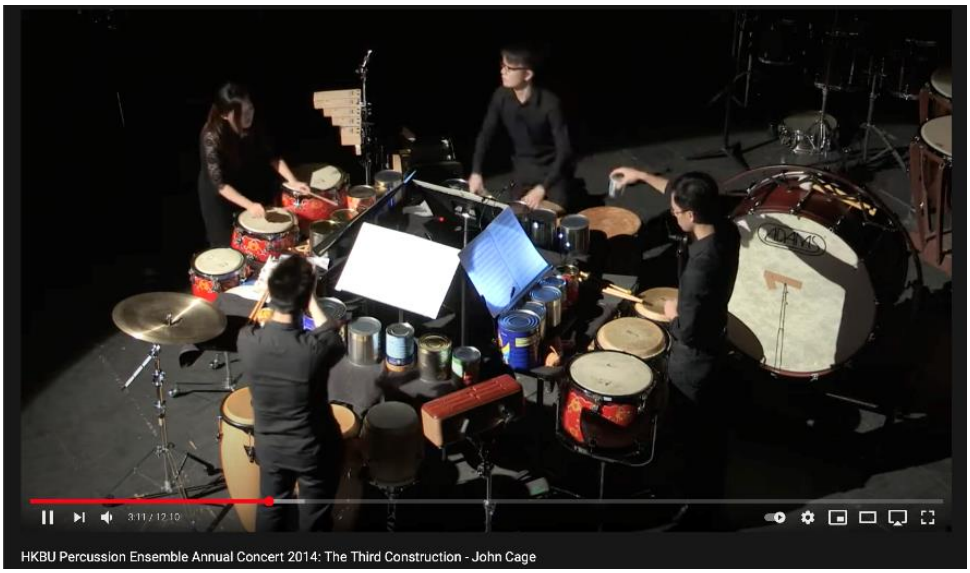


Fig. 3.11 – Screenshot of *percussion ensemble hkbu's* video of *Third Construction*

One possible solution to this problem is to secure the tin cans onto a frame which would place all their striking points at the same height. The members of the Daidalos Percussion Quartet (Germany) took this approach despite each member having the same types of can within their respective set ups; this decision to suspend their cans was likely made to maximize their resonance.

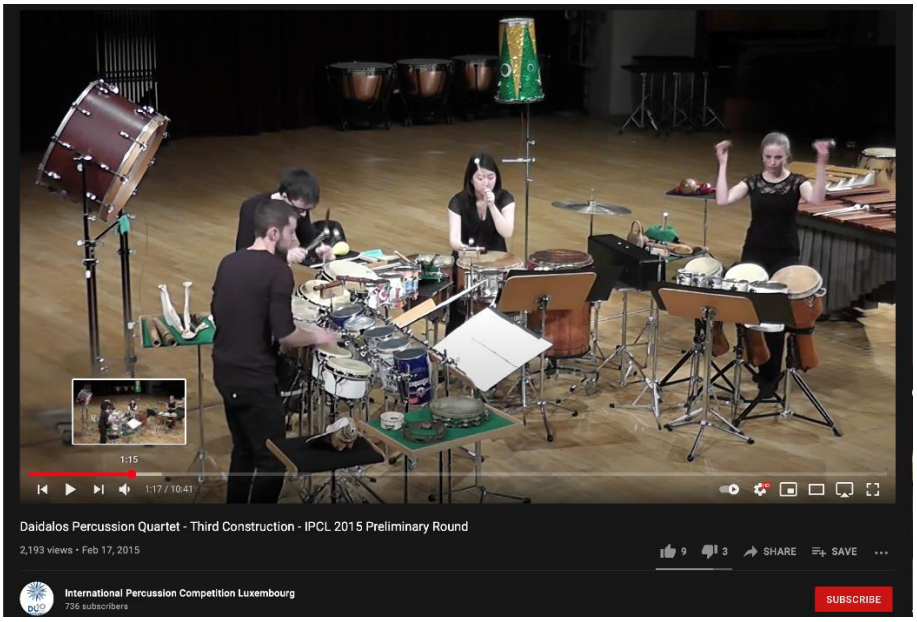


Fig. 3.12 – Screenshot of Daidalos Percussion Quartet's performance video of *Third Construction*

Most performers within this corpus of videos opted to have their cans placed onto a table-like surface. This is likely due to their relatively small sizes, but also because of one peculiar instruction in the score given by Cage.

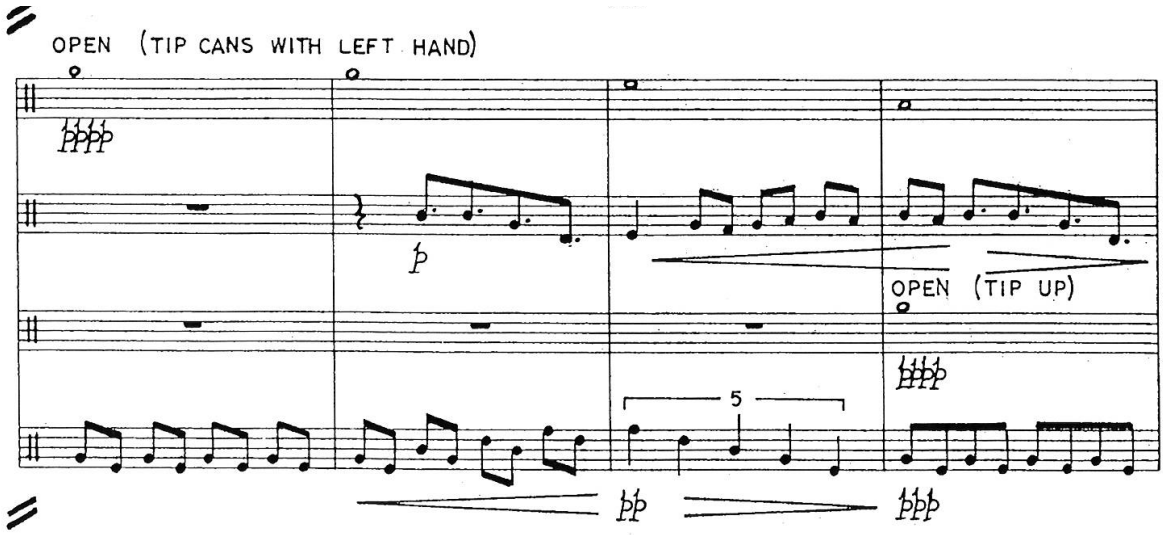


Fig. 3.13 – Page 14 (second system) of the score to *Third Construction*. © 1970 Reproduced by permission of C. F. Peters Corporation. All rights reserved.

On page 14 of the score, Cage instructs Players 1 and 3 to "open" the bottoms of their tin cans and play extremely quiet notes at the beginning of every measure. The reality of this passage is rooted more in its physical/theatrical gesture rather than its sonic result; the extremely quiet dynamic markings (*pppp*), and their relationship to Player 2's soloistic passage on the drums almost makes their sound moot and rather inconsequential.

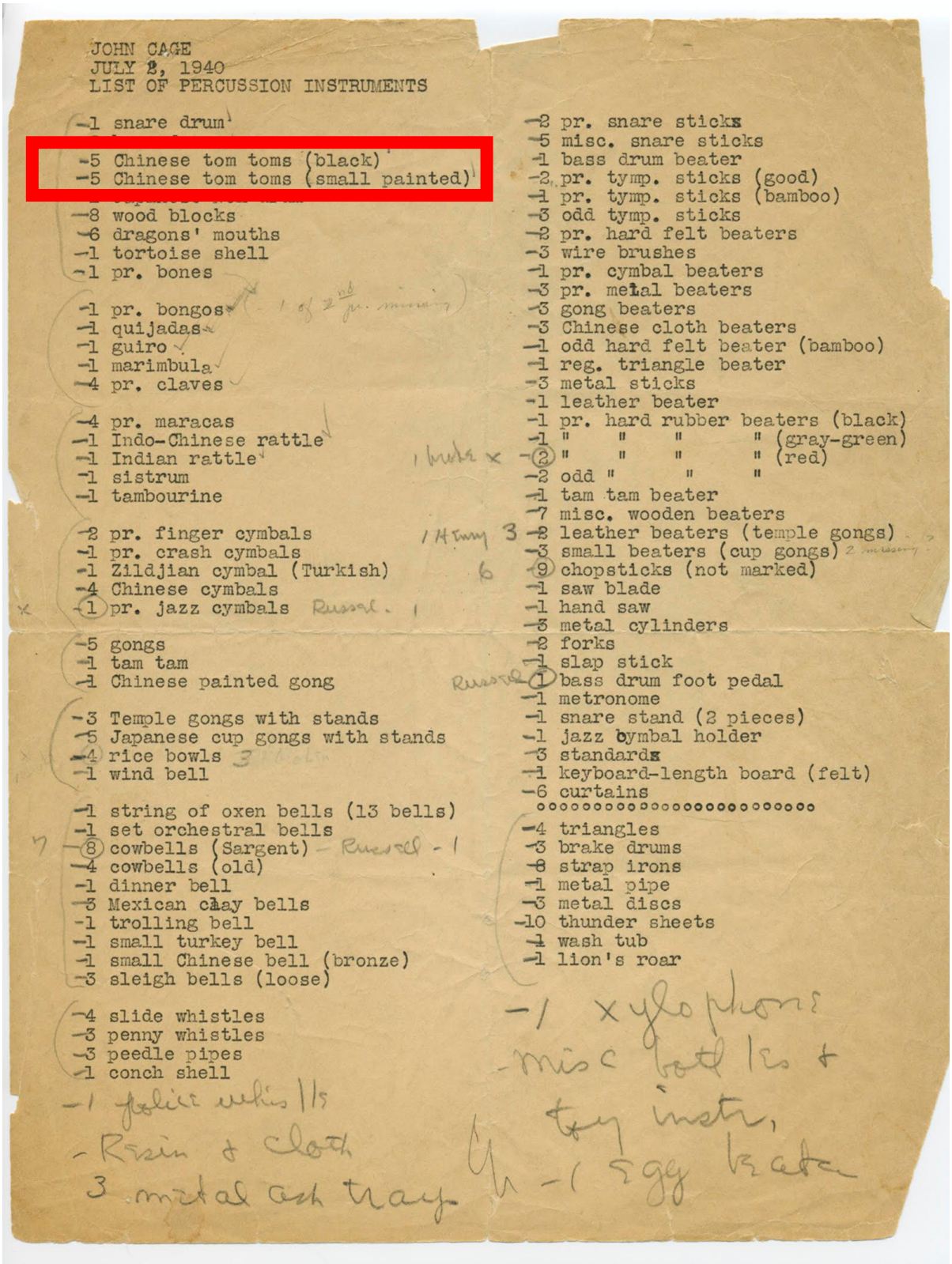
It could be said that the selection of tin cans for *Third Construction* is open to many interpretations, as evidenced by the videos within this corpus study. The term *graduated* used in the performance notes may elicit some performers to select differing types of materials to create their set of tin cans; for others, however, this terminology could simply refer to configuration of the same type of material, but whose arrangement yields a scale of pitches. Given Cage's affinity

for “sound” and “noise,” it doesn’t seem as if there are any “wrong” choices when it comes to selecting tin cans for *Third Construction*.

3.7 Drums

Cage had great interest in instruments from non-Western cultures, which significantly influenced his early years of composing for percussion. In *Third Construction*, his prescription for the set of three drums that each player uses are labelled in the performance notes as *graduated drums* with the word *tomtoms* in parentheses. For today’s percussionists, however, this instruction could cause them think of the instruments that are part of the modern drum-set. Cage, alongside his colleague Lou Harrison, were constantly raising funds to acquire an array of non-Western percussion instruments, particularly ones found in Asian import stores.[138] An image of Cage’s instrument list dated 2 July, 1940 indicated that ten Chinese drums were in his possession, which were likely the *tomtoms* used in premier of *Third Construction* (May 14th, 1941; San Francisco, CA.)

[138] Solomon, William. “Cage, Cowell, Harrison, and Queer Influences on the Percussion Ensemble, 1932–1943.” DMA diss., University of Hartford (2016), pgs. 62–63.



JOHN CAGE
JULY 2, 1940
LIST OF PERCUSSION INSTRUMENTS

-1 snare drum
-5 Chinese tom toms (black)
-5 Chinese tom toms (small painted)
-8 wood blocks
-6 dragons' mouths
-1 tortoise shell
-1 pr. bones

-1 pr. bongos
-1 quijadas
-1 guiro
-1 marimbula
-4 pr. claves

-4 pr. maracas
-1 Indo-Chinese rattle
-1 Indian rattle
-1 sistrum
-1 tambourine

-2 pr. finger cymbals
-1 pr. crash cymbals
-1 Zildjian cymbal (Turkish)
-4 Chinese cymbals
-1 pr. jazz cymbals

-5 gongs
-1 tam tam
-1 Chinese painted gong

-3 Temple gongs with stands
-5 Japanese cup gongs with stands
-4 rice bowls
-1 wind bell

-1 string of oxen bells (13 bells)
-1 set orchestral bells
-8 cowbells (Sargent)
-4 cowbells (old)
-1 dinner bell
-3 Mexican clay bells
-1 trolling bell
-1 small turkey bell
-1 small Chinese bell (bronze)
-3 sleigh bells (loose)

-4 slide whistles
-3 penny whistles
-3 peedle pipes
-1 conch shell

-2 pr. snare sticks
-5 misc. snare sticks
-1 bass drum beater
-2 pr. tymp. sticks (good)
-1 pr. tymp. sticks (bamboo)
-3 odd tymp. sticks
-2 pr. hard felt beaters
-3 wire brushes
-1 pr. cymbal beaters
-3 pr. metal beaters
-3 gong beaters
-3 Chinese cloth beaters
-1 odd hard felt beater (bamboo)
-1 reg. triangle beater
-3 metal sticks
-1 leather beater
-1 pr. hard rubber beaters (black)
-1 " " " " (gray-green)
-2 " " " " (red)
-2 odd " " "
-1 tam tam beater
-7 misc. wooden beaters
-2 leather beaters (temple gongs)
-3 small beaters (cup gongs)
-9 chopsticks (not marked)
-1 saw blade
-1 hand saw
-3 metal cylinders
-2 forks
-1 slap stick
-1 bass drum foot pedal
-1 metronome
-1 snare stand (2 pieces)
-1 jazz cymbal holder
-3 standards
-1 keyboard-length board (felt)
-6 curtains

-4 triangles
-3 brake drums
-8 strap irons
-1 metal pipe
-3 metal discs
-10 thunder sheets
-1 wash tub
-1 lion's roar

Fig 3.14 – John Cage's List of Percussion Instruments (July 2, 1940). Provided by Laura Kuhn of the John Cage Trust

What type of drums have been used by performers in the video uploads of *Third Construction* that exist on YouTube? As I did with the tin can selections made by the performers, I created a similar spreadsheet that outlines the selections of drums within this corpus of 20 videos. I will now discuss the data from this spreadsheet on both macro and micro-scaled levels.

Uploader	Player 1	Player 2	Player 3	Player 4	Ensemble
Vic Firth	Tom-toms	Tom-toms	Congas	Bongos	Individuated
McGill Percussion	Bongos + Conga	Bongos + Conga	Bongos + Conga	Bongos + Conga	Uniform
Aurél Holló	Chinese	Chinese	Chinese	Chinese	Uniform
Cristobol Gajardo B.	Chinese	Chinese	Chinese	Chinese	Uniform
Bill Cahn	Timbales + Tom-tom	Chinese	Timbales	Chinese	Individuated
Vic Firth Concert	Chinese	Tom-toms	Congas + Djembe	Bongos + Conga	Individuated
Christopher Salvito	Chinese	Chinese	Congas	Bongos	Individuated
Heidelberger Frühling	Tom-toms	Tom-toms	Congas	Bongos	Individuated
Spec Drum	Bongos + Conga	Bongos + Conga	Timbales + S.D.	Tom-toms	Individuated
IPCL - Daidalos	Djembes	Unknown	Bongos	Congas	Individuated
sideshow097	Tom-toms	Tom-toms	Tom-toms	Tom-toms	Uniform
Taylor Yozwiak	Tom-toms	Congas	Bongos + Conga	Bongos	Individuated
Sydney Wind Orchestra	Timbales + S.D.	Tom-toms	Congas	Bongos	Individuated
IPCL - Pulsat	Bongos	Congas	Tom-toms	Congas	Individuated
Karina Yau	Tom-toms	Tom-toms	Djembes	Bongos + Conga	Individuated
PendulumNewMusic	Bongos + tom-tom	Tom-toms	Tom-toms	Congas + Bongo	Individuated
Peter Jarvis	Tom-toms	Tom-toms	Tom-toms	Tom-toms	Uniform
Daniel Janca	Chinese	Chinese	Chinese	Chinese	Uniform
HKBU	Congas + Chinese	Djembes	Chinese	Chinese	Individuated
PercaRUS	Tom-toms	Tom-toms	Congas	Bongos	Individuated

Table 3.2 – Spreadsheet of drum selections made by performers in the corpus study.

The final column in the above spreadsheet discusses the overall ensemble approach to drum selection in their respective YouTube videos: individuated or uniform. For the latter, the types of drums used by each performer are the same (e.g., Chinese drums, Tom-toms). For the former, the percussionists each selected their own drums, which usually differentiate from other members of their quartet. These decisions, made either individually or collectively, will inherently have implications for how a quartet approaches their performance of the work. To what degree were their drum selections uniform for the six quartets in this body YouTube videos?

Uniformity can have varying degrees of its own within chamber music performance contexts. Coordinated bowings within the string sections of an orchestra not only unify their visual aspects, but are also intended to optimize musical interpretation. Members of a drumline competing within the Drum Corps International (DCI) circuit spend hours in the summer months refining their technique and execution to receive the highest scores possible from their adjudicators. With regard to *Third Construction*, the uniformity of drum selection manifests on a visual level and also in the technical approaches of the percussionists. The groups that chose a uniform drum configuration inherently codified their technical approaches; by selecting the same type of drums, performers knew that the uses of their hands (or sticks) would likely be similar, and thus, collectively create a more homogenous timbre. A more unified drum palate could affect the clarity of musical gestures from individual members of the quartet, particularly during the polyrhythmic textures that occur in the work (e.g., rehearsal letter "V"). As a means to mitigate this timbral homogeny, the six quartets who took a uniformed approach to their drum selection differentiated their tuning either by: 1) altering the tension of their drum heads in order to raise or lower their "pitch" or; 2) using different sizes of the same type of drum.

From the 20 videos examined, the overwhelming majority (14) chose an individuated approach to drum selection. Each percussionist using their own type of drums will inherently result in more timbral diversity, but requires more consideration, particularly regarding their balance and blend. An overview of the drum passages in *Third Construction* shows the distribution of the parts amongst the quartet members.

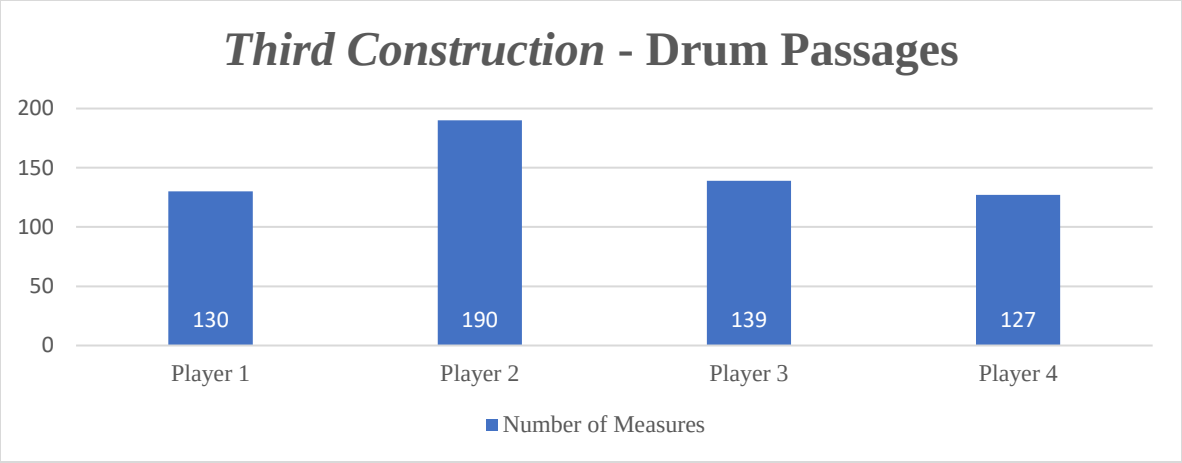


Fig. 3.15 – Number of measures of drum passages for each quartet member in *Third Construction*

Considering the context of this distribution is important to understand why a quartet would select certain types of drums for their performances. Having a diverse timbral palate could better differentiate the individual voices within the polyphonic textures of *Third Construction*: the counterpoint between Players 2 and 3 from the beginning of the work to rehearsal letter "A;" a drum trio amongst Players 1,3, and 4 just before and throughout much of rehearsal letter "D;" the interlocking, duple-based patterns shared between Players 1 and 4 shortly after rehearsal letter "U" while Player 2 later explodes into the texture with accented septuplets. Which type of drums were most popular for Player 1, Player 2, Player 3, and Player 4, within the 14 groups who took an individuated approach? Why?

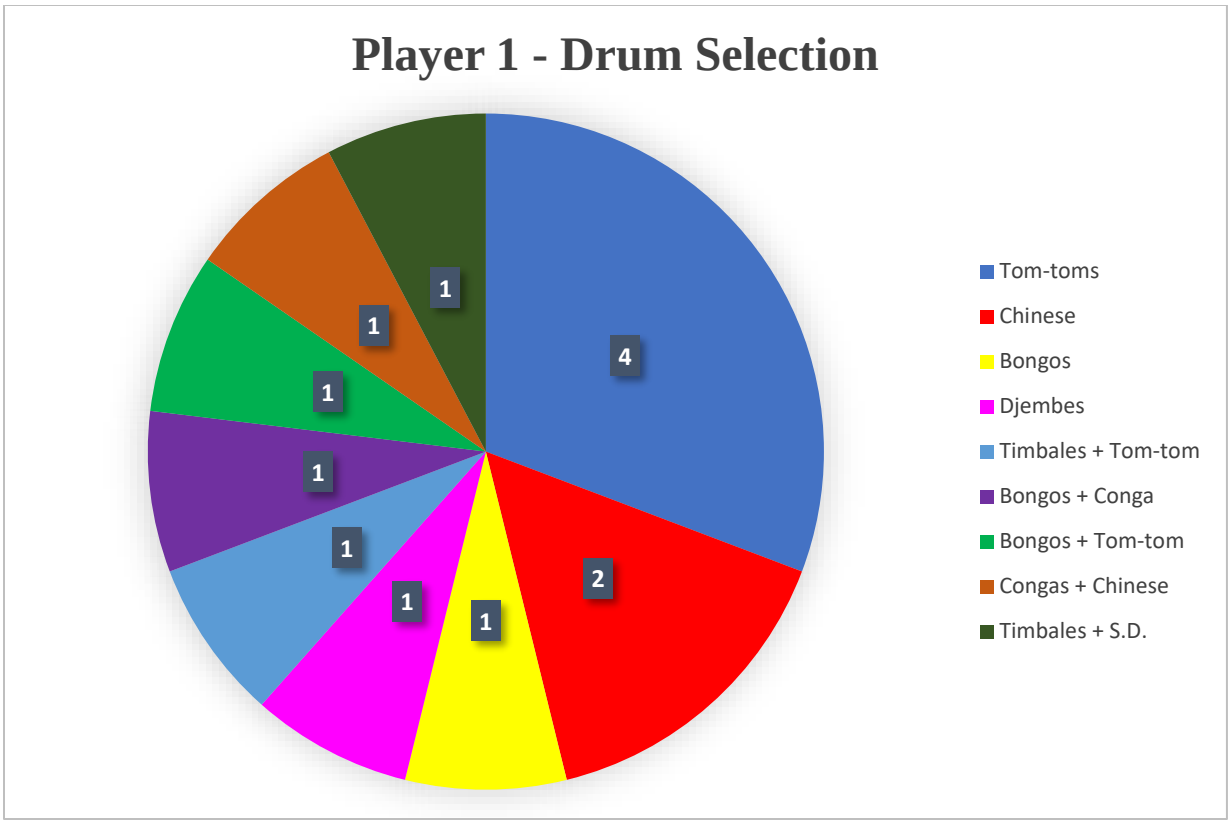


Fig. 3.16 – Player 1 Drum Selection

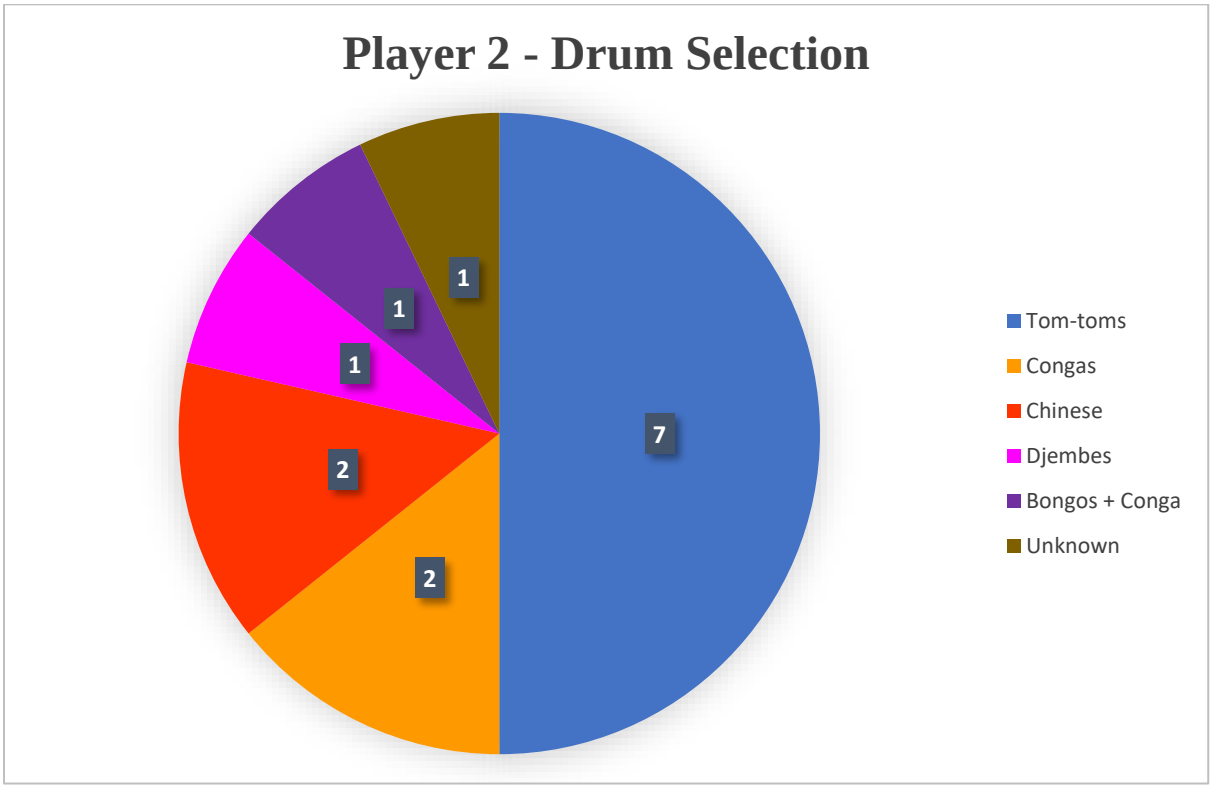


Fig. 3.17 – Player 2 Drum Selection

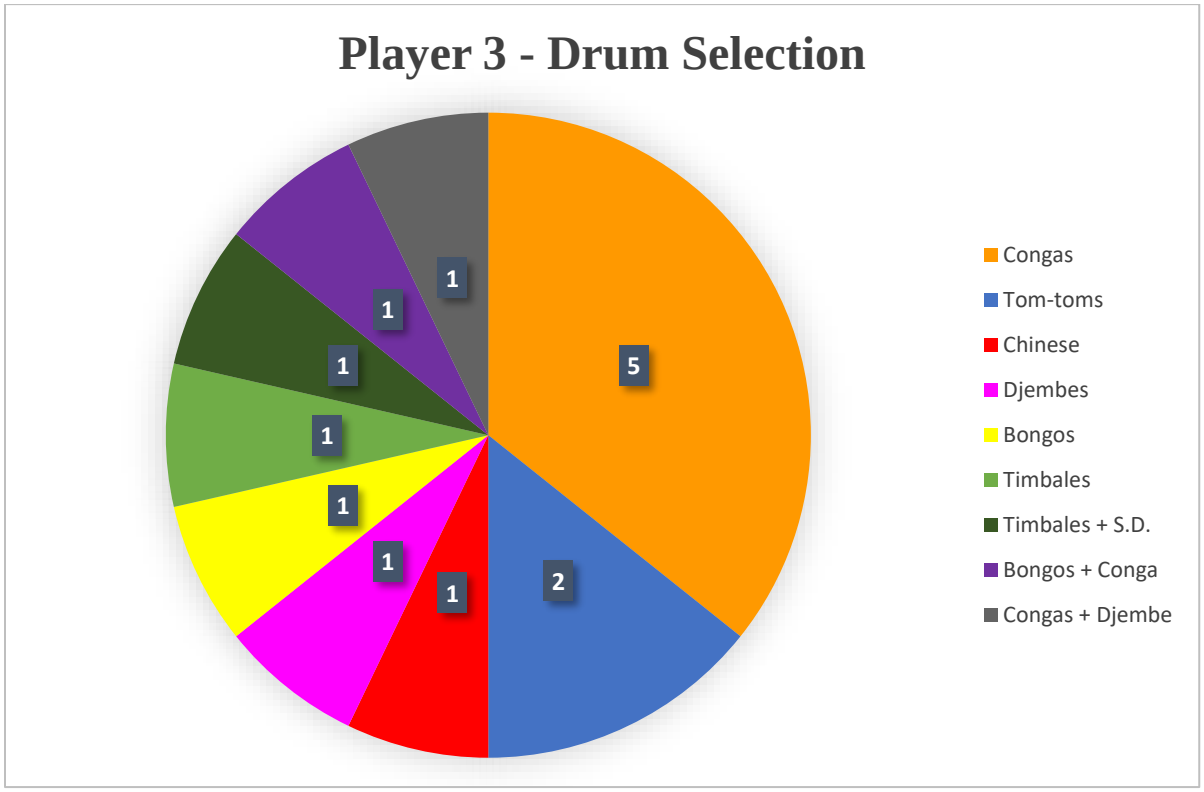


Fig. 3.18 – Player 3 Drum Selection

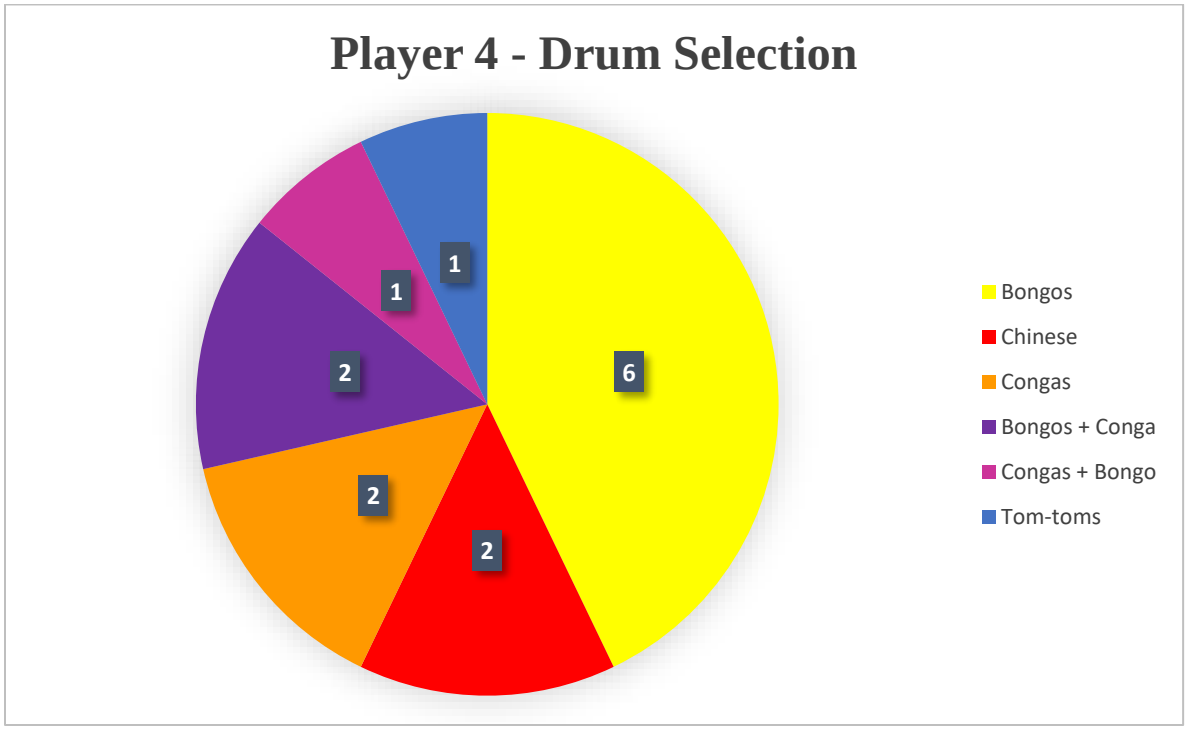


Fig. 3.19 – Player 4 Drum Selection

Perhaps the performer whose instrument choice is most exposed is Player 2—the member of the quartet who has the most amount of material to be realized on the drums (190 measures). Between rehearsal letters "E" and "H," Player 2's part features a prominent solo that is accompanied by the sonic texture of shaken instruments (e.g., tambourine, pod-rattles) and later interspersed with rhythmic tin can figures from the rest of the ensemble. In this particular passage, Cage instructs Player 2 to use "timpani sticks" on the drums, an indication that is not given to any other member of the quartet. Given the subdued mood of this passage—*pp* and *p* dynamic markings, and the rests between the soloist's phrases—selecting more resonant drums would be optimal. Of the 14 quartets who opted for individuated approaches, the 2nd player in seven of the ensembles chose instruments that are part of the modern drum-set: tom-toms—not to be confused with Cage's instruction for Chinese tomtoms. These drums, also known to percussionists as "concert toms," have synthetic heads with diameters typically ranging from 6" to 18." In comparison to other drums used by ensembles within this corpus study, tom-toms are certainly more resonant than bongos or congas; when compared to Chinese drums or djembes, tom-toms have the ability to be more resonant, but this would depend on the size of the drum and its subsequent tuning.

As for the other performers in the quartet, their selection of drums may be influenced by the material within their own part, but also by its interaction and relationship to the other members of the ensemble. Perhaps a respective pairing of tom-toms and congas for Players 2 and 3 would be the optimal choices in order demonstrate the drum counterpoint between them at the beginning of the piece. Player 4 is the only performer that Cage instructs to have their maracas strike the heads of their drums; of the 14 Player 4's in the quartets who took individuated approaches to their selection of drums, six of them chose bongos. Perhaps these six

percussionists felt that the maraca passages sounded best when struck on the surface of bongos, which are sonically drier and less resonant than the other types of drums previously mentioned.

Regardless of whether these quartets took uniform or individuated approaches to the selection of their drums, an interesting trend has emerged from the collected data. A number of performers opted to have two types of drums within their allotted number of three instruments; in other words, performers selected a pair of drums (e.g., bongos) and had a different drum to serve as their third instrument (e.g., conga).

Uploader	Player 1	Player 2	Player 3	Player 4	Ensemble
Vic Firth	Tom-toms	Tom-toms	Congas	Bongos	Individuated
Bill Cahn	Timbales + Tom-tom	Chinese	Timbales	Chinese	Individuated
Vic Firth Concert	Chinese	Tom-toms	Congas + Djembe	Bongos + Conga	Individuated
Christopher Salvito	Chinese	Chinese	Congas	Bongos	Individuated
Heidelberger Frühling	Tom-toms	Tom-toms	Congas	Bongos	Individuated
Spec Drum	Bongos + Conga	Bongos + Conga	Timbales + S.D.	Tom-toms	Individuated
Daidalos	Djembes	Unknown	Bongos	Congas	Individuated
Taylor Yozwiak	Tom-toms	Congas	Bongos + Conga	Bongos	Individuated
Sydney Wind Orchestr	Timbales + S.D.	Tom-toms	Congas	Bongos	Individuated
IPCL - Pulsat	Bongos	Congas	Tom-toms	Congas	Individuated
Karina Yau	Tom-toms	Tom-toms	Djembes	Bongos + Conga	Individuated
PendulumNewMusic	Bongos + tom-tom	Tom-toms	Tom-toms	Congas + Bongo	Individuated
HKBU	Congas + Chinese	Djembes	Chinese	Chinese	Individuated
PercaRUS	Tom-toms	Tom-toms	Congas	Bongos	Individuated

Table 3.4 – Spreadsheet of performers who selected two types of drums (highlighted)

This approach serves both logistical and musical purposes. Bongos, and timbales are most often manufactured and sold in pairs; if a percussionist wanted to have a uniform set up of either type, it would require them to set up two pairs of instruments (four drums in total). This pragmatic approach could be useful for ensembles with limited resources or for travelling percussionists who use the equipment that is available to them at performance venues (e.g., professional percussion groups performing at universities). Logistics aside, the usage of two types of drums

within one's set-up could be viewed as an implied extension of timbre. Although their respective ranges differ, the skins of bongo and conga heads are made from similar material. One could view a bongo of low pitch as an implied extension of a pair of congas; a highly tuned conga could serve as a lower extension of a pair of bongos.

3.8 Conclusions on Timbre

The notion of a "percussion quartet" only describes its performative context at a fundamental level: chamber music played by percussionists. Within this large umbrella of repertoire, there are numerous subgenres that present a wide array of aesthetics and instrument combinations. Early percussion quartets had performers filling specific roles on set-ups unique to each player (e.g., Lou Harrison's *Canticle No. 1* [1941] and *Song of Quetzalcoatl* [1941]); marimba quartets can have two pairs of percussionists sharing two instruments (e.g., Nigel Westlake's *Omphalo Centric Lecture* [1984]) or each member performing on their own marimba (e.g., Daniel Levitan's *Marimba Quartet* [1987]; works by David Lang (*The So Called Laws of Nature* [2002]) and Andrea Mazzariello (*Bot, Four Percussion Quartets* [2016]) have each percussionist using identical set-ups to create composites of both melodic and rhythmic material. Steve Reich's *Mallet Quartet* (2009) ushered in a distinctive category of percussion quartet repertoire where the combination of two marimbas and two vibraphones could be the contemporary, percussive equivalent to the string quartet. Given the freedom to select the drums and tin cans in Cage's *Third Construction*, where would it fall in this sub-categorization of percussion quartet repertoire?

The criteria for selecting the tin cans and drums used in *Third Construction* can reside in individual choices and also within collaborative contexts. Whatever decisions are made will

likely have musical and performance-based implications for the ensemble. A uniform approach to selecting the tin cans and drums would create more a homogeneous timbral palate amongst the quartet, and it would likely curb musical issues (e.g., blend, balance) through the inherent codification of performance strategies (i.e., approach, techniques, materials). The incorporation of different types of drums from around the world, however, could be viewed as complimentary to and compatible with all of the other non-Western instruments used in the work (e.g., maracas, claves, quijada, teponaxtle, Chinese cymbal, etc.). Rather than seeking to do what others have done or to emulate the most pristine recordings, groups looking to learn and perform *Third Construction* should seek optimal results for *their own* live-performance situations.

Although the work has been solidified in the canon of percussion repertoire, its modularity of instrument choices for the tin cans and drums allows for performer exploration and experimentation. Subsequently, performers and audiences can experience the work in a variety of ways by creating and hearing a wide array of sounds and timbres. Cage's affinity for "noise" and "sound" *as* music lends itself well to the art of percussion performance. His push to challenge the accepted notions of what his contemporaries constituted to be music undoubtedly blazed a trail for percussionists and composers thereafter.

3.9 Tempi

In addition to the timbral examination of the performance videos in this corpus study, I observed and analyzed empirical data relating to their respective tempi. At the beginning of the work, the indicated tempo is 108 beats per minute (BPM) with a half-note pulse. From that point onward, the score instructs performers to pick up in speed with only one exception: the *ritard* four measures before rehearsal letter I. Important landmarks of tempi indication occur at

rehearsal letters “H” (Fast), “J” (half note = 108 beats per minute), “O” (Fast), “S” (Faster), and “W” (Accelerando). To examine the tempi taken by the 20 performance videos in this corpus study, I used the recording analysis software, Sonic Visualiser. This open-source program was released in 2010, and allows for researchers to scientifically analyze various aspects of music recordings (e.g., tempo, pitch, type of waveforms, etc.). But how would I analyze audio recordings of these performance videos if they exist only on YouTube?

There are a number of third-party websites that facilitate the downloading of videos on YouTube, but questions of legality come into view. Under YouTube’s current terms of service, visitors can only access content on the site through the video playback features on the website—in other words, one can only legally view content on YouTube itself.[139] There are however exceptions to using copyrighted material under the legal doctrine of “fair use;” this allows one to use copyrighted material under certain circumstances without obtaining permission from the owner(s) of said copyright material. According to Google, YouTube’s parent company, there are four factors of consideration to constitute the legality of “fair use”:

1. *The purpose and character of the use, including whether such use is of commercial nature or is for nonprofit educational purposes.*
2. *The nature of the copyrighted work.*
3. *The amount and substantiality of the portion used in relation to the copyrighted work as a whole.*
4. *The effect of the use upon the potential market for, or value of, the copyrighted work.*[140]

Obtaining the audio from these YouTube videos of *Third Construction* for my research fell under the first criteria of “fair use;” I used this material for educational purposes, and do not intend to

[139] See YouTube’s terms of service <https://www.youtube.com/t/terms>.
[140] <https://support.google.com/youtube/answer/9783148?hl=en>

distribute it for monetary profit. Rather than using a third-party website to download the audio from these performance videos (e.g., youtubetomp3music.com), I chose to screen record my own computer while these videos were played on YouTube. Once each video was successfully recorded on my device, I trimmed away any extraneous portions (e.g., advertisements) and extracted the audio.

Through the use of Sonic Visualiser, I was able to create a "Time Instants" Layer, which allowed me to mark any points in audio that I wanted to; this was the primary tool that I used in order to delineate downbeats of each measure or individual pulses/rhythmic subdivisions if necessary. Recordings of percussion music often lend themselves well to this type of analysis. The beginnings of waveforms are illustrated very clearly since the peak of their energy occurs at the initiation of their sound—the majority of percussion instruments are in sonic states of decay once they have been activated by sticks, mallets, or one's hands.

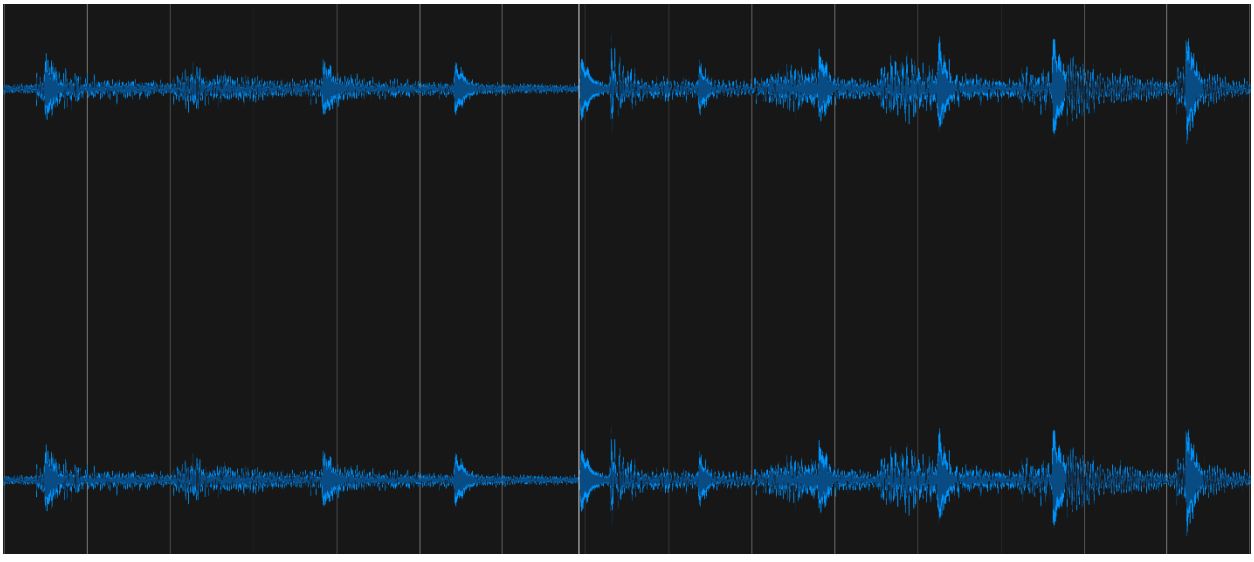


Fig. 3.20 – Image of waveforms from NEXUS' *Third Construction* performance video (uploaded by *Bill Cahn*)

The structure of Cage's quartet consists of 24 units (i.e., rehearsal letters) each comprised of 24 measures. Within these structures, each member of the quartet has varying permutations of the same set of numbers whose sum is 24:

Player 1: 2, 8, 2, 4, 5, 3
Player 2: 5, 3, 2, 8, 2, 4
Player 3: 3, 2, 8, 2, 4, 5
Player 4: 8, 2, 4, 5, 3, 2

Within this larger scope of structure, Cage closes all but five sections of the work by using what he described as "rhythmic cadences" in which the combination of musical gestures from the ensemble creates a polyrhythmic texture.[141] This concept resulted from the influence of Cowell, who had explored "consonant" and "dissonant" relationships between rhythm, metre, and harmony.[142] Cage resolves these "rhythmic dissonances" by what Barry Michael Williams (1954–2020) described as "periodic rhythms" (i.e., more stable rhythms in relationship to the metre of the work).[143]

Rather than simply taking an average BPM of entire sections (i.e., between each successive rehearsal letter), I primarily chose to do a small number of measures within each section of the work. These "tempo checks" lend well for the permutated measure structures of each player; if I were to check the average tempo within a span of 2, 3, 5, or 8 measures, the entrance of another quartet member would make the audio waveforms more visible and thus,

[141] Williams, Barry Michael. "The early percussion music of John Cage, 1935–1943." DMA dissertation, Michigan State University (1990), pg. 132–133.
[142] Nichols, David (ed). *The Cambridge Companion to John Cage* (Cambridge: Cambridge University Press, 2002), pg.75.
[143] Williams, Barry Michael, "The early percussion music of John Cage, 1935–1943," pgs. 133–134.

make the demarcation of downbeats more discernable. Examining the average tempi taken by each quartet in the corpus study occurred at the following points in the score:

m. 1 - 3
Letter A (3 mm.)
Letter B (5 mm.)
Letter C (3 mm.)
11 after D (3 mm.)
4th Bar After E (5 mm.)
5th Bar After F (5 mm.)
Letter G (3 mm.)
Letter H (5 mm.)
Letter I (5 mm.)
Letter J (4 mm.)
Letter K (5 mm.)
Letter L (5 mm.)
3rd Bar After M (3 mm.)
Letter N (5 mm.)
Letter O (8 mm.)
Letter P (10 mm.)
Letter Q (4 mm.)
6th Bar After R (3 mm.)
3rd Bar After S (4 mm.)
Letter U (2 mm.)
11th Bar After V (4 mm.)
Letter W (10 mm.)

Fig. 3.21 – List of "tempo checks" within the corpus study

In the table above, the number in parentheses corresponds to the number of measures examined in order to determine the average tempo of the respective sections. Rather than only adhering to examining the average BPM of phrases consisting of 2,3,5, or 8 measures, I also chose units of measures that would be most clear to mark, be they "consonant" eighth notes or clear downbeats from any player in the quartet. Additionally, some of these choices also corresponded to the clarity of the instruments used within these passages—the beginnings of

waveforms of drier, less resonant instruments (e.g., claves, tin cans) were much easier to see and mark than those of more resonant instruments. In order to calculate the average beats per minute (BPM), I used a simple math equation:

$$Time^{B} - Time^{A} = Difference\ (D)$$

$$D \div \#\ of\ measures = Average\ Time\ Per\ Measure\ (ATPM)$$

$$ATPM \div 2 = Average\ Time\ Per\ Pulse\ (ATPP)$$

$$(1 \div ATPP) \times 60 = Average\ Beats\ Per\ Minute$$

The two timestamps (A or B) correspond to the marks of downbeats I made using the "Time Instants" layer in Sonic Visualiser.

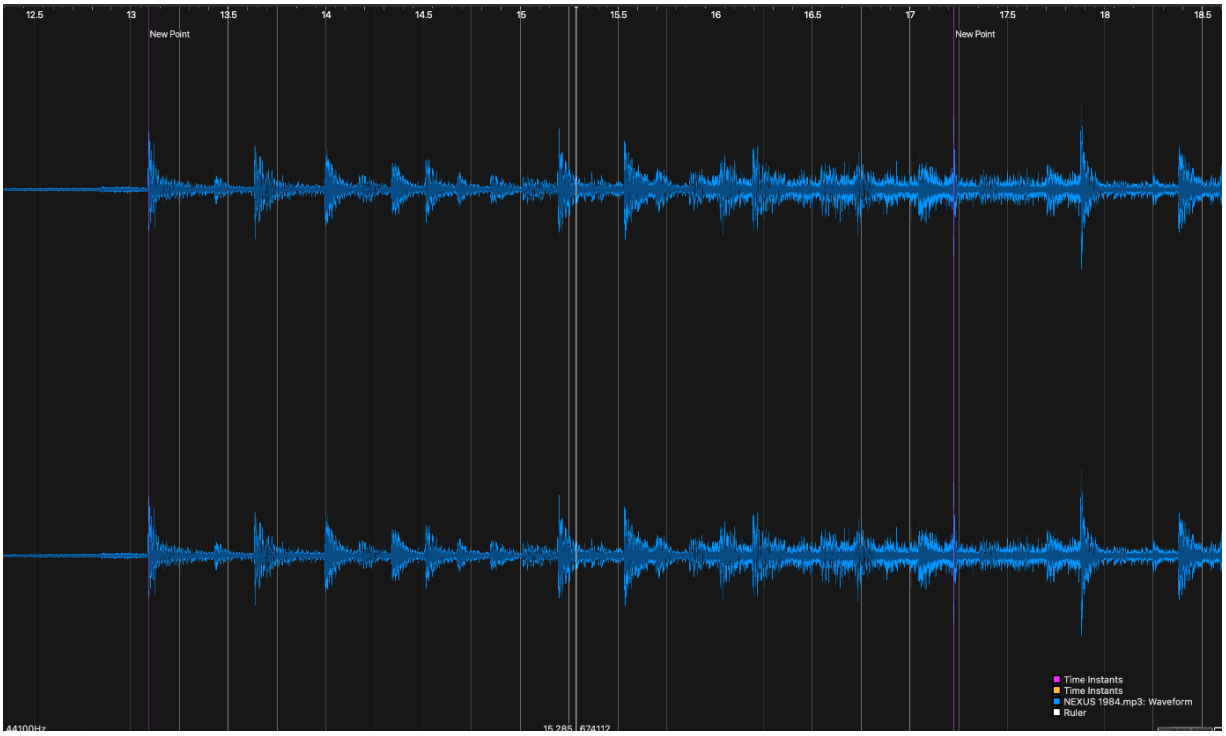


Fig. 3.22 – Image of "Time Instants" in Sonic Visualiser.

I will use the previous image from *Bill Cahn's* upload to quickly demonstrate how to execute this equation to determine the average BPM. $Time^{A}$ (left purple line) and $Time^{B}$ (right purple line) refer to the downbeats of measures 1 and 4, respectively; if one is to examine the duration of three entire measures of music, one must include the downbeat of the *next* measure as well, in this case measure 4. With the two timestamps marked, one can begin to execute the equation to determine the average BPM of measures 1–3:

$$17.226 – 13.088 = 4.138 \text{ seconds}$$

$$4.138 \div 3 = 1.379 \text{ (average seconds per measure)}$$

$$1.379 \div 2 = .690 \text{ (average seconds per pulse)}$$

$$(1/.690) \times 60 = 87.020 \text{ BPM}$$

I will now shift to discuss the findings from my analyses of these recordings including the average tempi taken by the ensembles, as well as their overall pacing within *Third Construction*.

3.10 Opening Tempo

As previously mentioned, the indicated tempo at the beginning of the piece is 108 BPM with the half note receiving the pulse. This tempo indication lasts until 12 measures before rehearsal letter "H;" at this point, Cage indicates a *stringendo* that culminates with a fermata of shaken maracas from players 1 and 4. In order to determine the overall tempi of each quartet for

this first section of the work, I found their respective averages by using the "tempo checks" that occurred within each rehearsal letter.

Uploader	TimeB (secs)	TimeA (secs)	Difference	Avg. Time (secs) (per measure)	Avg. Time (secs) (per pulse)	Avg. BPM
Vic Firth						
m. 1 - 3	13.904	10.374	3.530	1.177	0.588	102.040
Letter A (3 mm.)	41.995	38.382	3.613	1.204	0.602	99.668
Letter B (5 mm.)	71.438	65.701	5.737	1.147	0.574	104.529
Letter C (3 mm.)	96.256	92.949	3.307	1.102	0.551	108.893
11 after D (3 mm.)	134.206	130.770	3.436	1.145	0.573	104.712
4th Bar After E (5 mm.)	155.166	149.460	5.706	1.141	0.571	105.079
5th Bar After F (5 mm.)	186.036	180.253	5.783	1.157	0.578	103.806
Letter G (3 mm.)	205.155	201.664	3.491	1.164	0.582	103.092

Table 3.5 – Opening section "tempo checks" of Sō Percussion's performance video (uploaded by *Vic Firth*)

Given the numbers above, Sō Percussion's average tempo from the beginning of the work until the *stringendo* indication 12 measures before letter "H" was approximately 104 BPM. When considering this overall average, only six ensembles in this corpus performed the work at or above the indicated tempo of 108 BPM; seven quartets were within 5 beats of the tempo marking; the remaining seven groups were more than 5 beats under.

Uploader	Overall Average BPM	Rounded
Vic Firth	103.977	104
McGill Percussion	95.045	95
Aurél Holló	109.371	109
Cristobol Gajardo B.	104.150	104
Bill Cahn	84.490	84
Vic Firth Concert	108.359	108
Christopher Salvito	111.078	111
Heidelberger Frühling	81.776	82
Spec Drum	105.625	106
IPCL - Daidalos	101.947	102
sideshow097	114.685	115
Taylor Yozwiak	103.569	104
Sydney Wind Orchestra	101.273	101
IPCL - Pulsat	115.051	115
Karina Yau	101.753	102
PendulumNewMusic	109.303	109
Peter Jarvis	103.170	103
Daniel Janca	106.030	106
HKBU	95.503	96
PercaRUS	103.109	103

Table 3.6 – Overall Average BPM of opening section of *Third Construction*

If one were to objectively consider the opening tempo indication of 108 BPM, then 14 of the 20 quartets in this corpus study played below Cage's written instruction—either in error or deliberately. If their initial tempi were intentional choices, why might that be the case? The decision to play under the written tempo could be one based on both musical and technical reasons. For the latter, one could base their decisions on the material that is to be performed on the claves. Claves are a pair of short, thick wooden sticks that are traditionally played with one acting as a beater that strikes the other, which is stationary and typically perched on the knuckles of a closed fist. Selecting a certain tempo at the beginning of *Third Construction* may inform performers of how they can execute the clave gestures. Depending on the skill of the individual, the tempo marking of 108 to the half note may be too difficult for one to execute the clave gestures via the traditional playing technique.

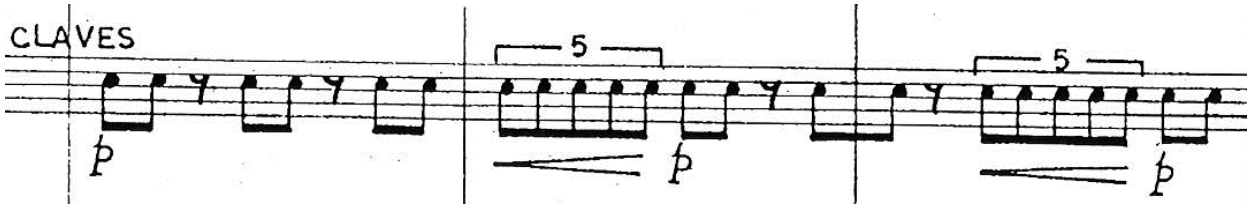


Fig. 3.23– Clave passage from *Third Construction*, page 5 of the score. © 1970 Reproduced by permission of C. F. Peters Corporation. All rights reserved.

A recurring solution found in many performance videos—both within this narrowed corpus study, as well as the current body of *Third Construction* performances on YouTube—is to use two plastic or polyurethane-based mallets to strike a single, stationary clave resting on top of a piece of foam placed on a table-like surface. Consequently, this frees the percussionist to use both of their hands to execute the rhythmic figures pictured above. As a third option, performers could substitute the pair of plastic or polyurethane-based mallets for a pair of claves which are used to strike a third clave that is stationary and securely mounted.

This is not to say that the clave material alone will dictate one's decision to play the beginning of the work under its written tempo. Perhaps the ensembles in the uploads by *Bill Cahn* and *Heidelberger Frühling* intentionally chose slower tempi in order to perform the clave material via the traditional technique. The members of Amadinda Percussion in the video uploaded by *Aurél Holló*, however, still performed the clave material by using the traditional technique despite their average opening tempo being 109 BPM. Musically speaking, the clave material does appear as far into the work as rehearsal letter "V," a point at which the tempo is to be much brisker than the work's opening section. Regardless of a performer's physical

capabilities, one has to also consider the work's opening tempi in relationship to the rest of the piece.

3.11 Picking Up the Pace - How Fast is "Fast?"

Cage indicates tempi markings at rehearsal letters "H" and "O" to be "fast," but his usage of a descriptive word presents performers with a subjective premise. In order to appropriately gauge and understand the notions of "fast" for these respective sections, we must examine the surrounding material (both before and after).

Letter "H" is the first instance of a tempo other than 108 BPM, and it is preceded by the term *stringendo* 12 measures prior (page 11 of the score). This term instructs performers to increase in speed, typically to help propel the music forward and into a climactic moment. While there are some definitions that indicate *stringendo* does not imply an increase in volume, Cage's score instructs the performers to *crescendo* throughout the passage's duration; we can safely say that the climax of this gesture—the fermata of loudly shaken maracas—is the peak of both the tempo and the volume. I measured the distance (in seconds) between each measure of the *stringendo* for each of the 20 ensembles in this corpus study; one column denotes the overall duration of the passage (in seconds), subsequent columns indicate the time of each measure (1st, 2nd, 3rd, etc.), and the final column discloses whether or not there was a break in the sound from the shaken maracas performed by Players 1 and 4; Cage does indicate a fermata over an eighth rest in this measure as well, likely to provide sonic space for the pickup eighth note in Player 2's part to be heard.

Uploader	Stringendo Total Time	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th (Fermata)	
Vic Firth	12.149	1.037	1.021	0.986	0.961	0.923	0.991	0.894	0.895	0.843	0.921	0.872	1.805	Break
McGill Percussion	14.074	0.993	1.161	1.080	1.184	1.117	0.961	1.138	1.065	1.059	1.031	1.096	2.002	Break
Aurél Holló	12.847	1.020	1.084	0.975	0.967	0.984	0.867	0.907	0.876	0.932	0.882	0.909	2.444	Break
Cristobol Gajardo B.	12.974	1.180	1.156	1.086	0.988	0.949	0.954	0.899	0.953	0.893	0.923	0.908	2.085	Break
Bill Cahn	18.939	1.385	1.391	1.332	1.267	1.306	1.228	1.214	1.320	1.260	1.528	1.914	3.794	No Break
Vic Firth Concert	15.136	1.137	1.130	1.060	1.001	1.081	0.878	0.835	0.943	0.864	0.805	0.856	4.646	No Break
Christopher Salvito	12.394	1.087	1.029	0.999	0.998	0.952	1.045	0.903	0.964	0.966	1.002	0.937	1.512	Break (Audio Edit)
Heidelberger Frühling	15.576	1.358	1.317	1.354	1.358	1.278	1.234	1.211	1.243	1.171	1.119	1.130	1.803	Break
Spec Drum	15.566	1.153	1.105	1.129	1.057	1.112	1.050	1.093	1.023	1.097	1.067	0.943	3.737	Break
IPCL - Daidalos	12.199	1.021	1.010	1.047	1.001	1.029	0.862	0.899	0.918	0.917	0.859	0.809	1.827	Break
sideshow097	12.582	0.944	0.932	0.816	0.899	0.909	0.879	0.942	0.919	0.940	0.805	0.884	2.713	Break
Taylor Yozwiak	14.077	1.115	1.143	1.126	1.025	1.123	1.019	0.987	1.045	0.946	0.998	0.904	2.656	Break
Sydney Wind Orch.	15.106	1.138	1.097	1.097	1.158	1.138	1.067	1.107	1.097	1.077	1.056	1.098	2.976	Break
IPCL - Pulsat	12.414	1.038	0.960	0.966	0.876	0.953	0.869	0.855	0.875	0.882	0.790	0.823	2.527	Break
Karina Yau	13.887	1.071	1.132	1.080	1.071	1.010	1.150	1.010	1.088	1.027	1.019	1.073	2.156	Break
PendulumNewMusic	12.237	1.030	1.001	0.940	0.932	0.893	0.878	0.994	0.842	0.834	0.865	0.891	2.137	Break
Peter Jarvis	12.418	0.975	0.934	0.987	0.952	1.021	0.894	0.987	1.057	0.894	0.905	0.999	1.783	No Break
Daniel Janca	13.689	0.991	1.109	0.969	1.001	0.984	1.005	1.028	0.937	0.972	0.907	0.969	3.007	Break
HKBU	14.150	X	X	1.152	1.284	1.234	1.204	1.205	1.176	1.175	1.176	1.262	3.309	Break
PercaRUS	13.734	1.125	1.061	1.025	0.874	1.030	0.884	0.975	0.870	0.982	0.899	0.867	3.041	Break

Table 3.7 – Stringendo pacing in corpus videos of *Third Construction*

The pacing of the stringendo gesture in all the performance videos was not consistent; groups fluctuated their pace from measure to measure, most often in the 6th, 7th, and 8th measures. The prominent voice (Player 2's part) has a few syncopated gestures as well as a few beats of rest, which likely causes slight moments of hesitation from the other quartet members to help drive the *stringendo* forward. The overwhelming majority of ensembles in this corpus study saw the *stringendo* passage as the connective tissue between the previous material and letter "H;" only a small number of quartets did not as perceivably gain forward momentum with regard to their tempo—primarily, groups comprising of university/student percussionists. There was one quartet who took the greatest exception to Cage's instructions for the *stringendo* passage: in NEXUS' performance video (uploaded by Bill Cahn), the two measures leading up to the fermata of loudly maracas were dramatically elongated—to the ear, it feels musically equivalent to a driver suddenly "stepping on the brakes."

Cage's score instructs the quartet to pick up the speed of the tempi at three other places in the score: the eleventh measure after rehearsal letter "N;" at letter "W" and; the eleventh measure of "W." This first *accelerando* marking is to occur over the span of fourteen measures until the arrival of rehearsal letter "O" (Fast). The member primarily responsible for this quickening of the tempo is Player 4, who has an extensive solo passage on their drums. Although this passage consists of eighth notes, their rhythmic beaming solicits the player to phrase them in a manner that is syncopated from the strong half note pulses.

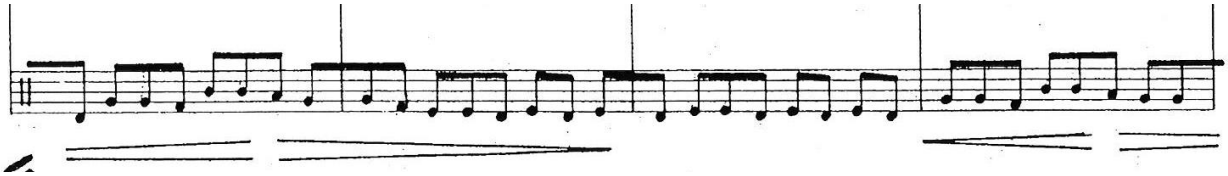


Fig. 3.24 – Excerpt of Player 4's drum solo on page 30 of the score to *Third Construction*. © 1970 Reproduced by permission of C. F. Peters Corporation. All rights reserved.

Although it is indicated in the score that the acceleration in this passage is to be consistent from its beginning until rehearsal letter "O," the analysis from the recordings shows two prevailing trends: 1) the majority of ensembles accelerated more toward the end of this phrase and; 2) the tempo taken at rehearsal letter "O," was more or less established by the final measure of eighth notes from Player 4.

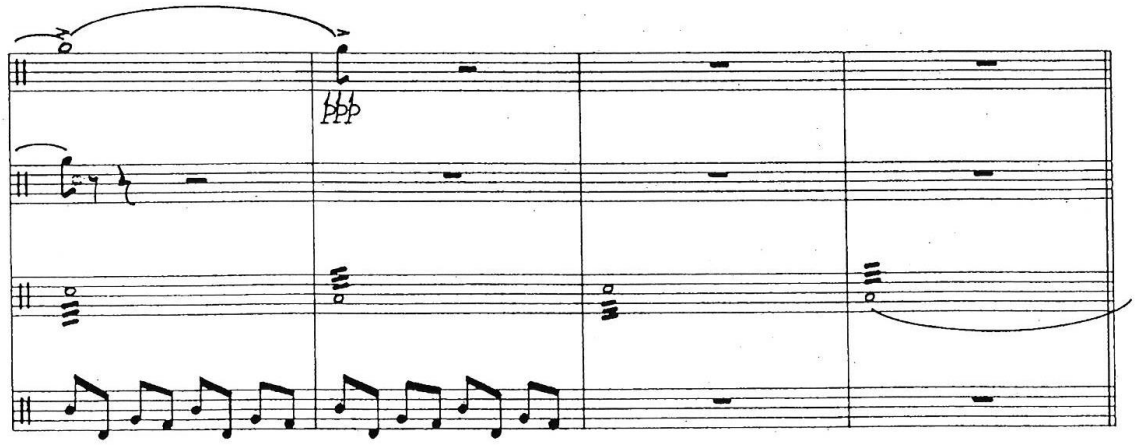
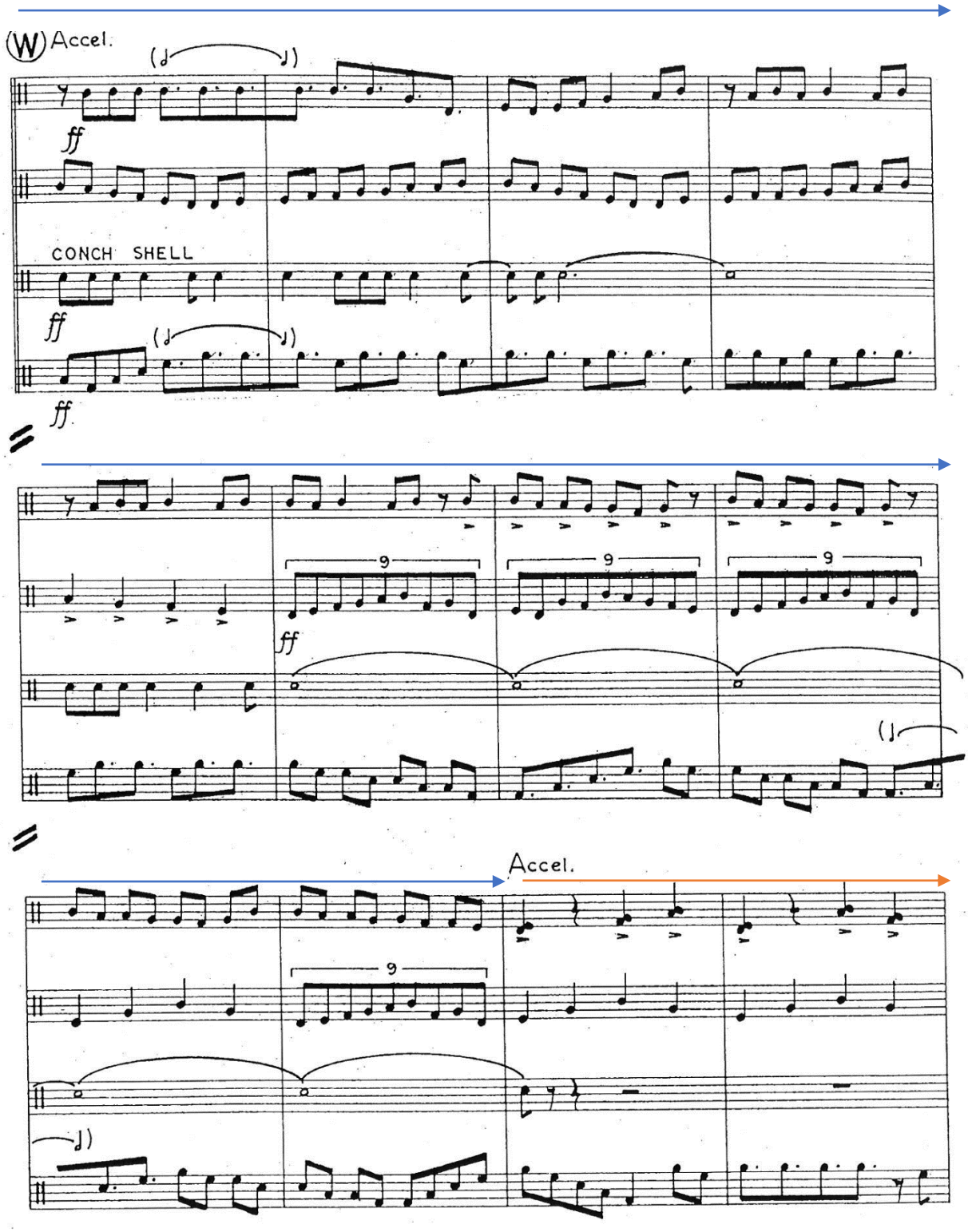


Fig. 3.25 – Four measures before rehearsal letter "O" on page 30 of the score to *Third Construction*. © 1970 Reproduced by permission of C. F. Peters Corporation. All rights reserved.

At the final section of the work (letter "W"), Cage indicates an acceleration of the tempo in two places: first at the beginning of letter "W," and again eleven measures later. It could be posited that Cage placed the second *accelerando* marking in the score to remind the performers of the first's continuation, but the analysis from this corpus of recordings indicates a different approach taken by the ensembles. Rather than a continuous acceleration from the beginning of letter "W" to the final note of the work, the majority of the ensembles within this corpus placed their respective accelerations toward the end the piece. If one were to treat Cage's two indications of acceleration as separate instructions, then the division of material would be 10 and 14 measures, respectively. If one were to examine the duration of these passages (in seconds), it would be evident that the average time per measure (ATPM) would be smaller for the latter—the time divided by 14 would be smaller than if it were divided by 10. Examining the score however, can indicate reasons as to why most of the ensembles accelerate more toward the end of the piece.

On the final page of the score, Players 1 and 2 have interlocking, consonant rhythms of quarter and eighth note subdivisions, with the final calls of the conch coming from Player 3. The fourth player, however, has syncopated figures on the tin cans, which has the potential to inhibit their ability to accelerate with the rest of the ensemble; this gesture does not continue until the end of the work, but Player 4 does not have consonant rhythms as does the rest of the ensemble only five measures from the end. The analysis of the performance videos indicates that this final section is treated and realized as the following substructure:

Letter "W:" 10 measures
2nd Accel. Marking: 9 measures
Consonant Rhythms ("Final Push"): 5 measures from the end


W Accel.
ff
CONCH SHELL
ff
ff
9
9
9
ff
Accel.
9

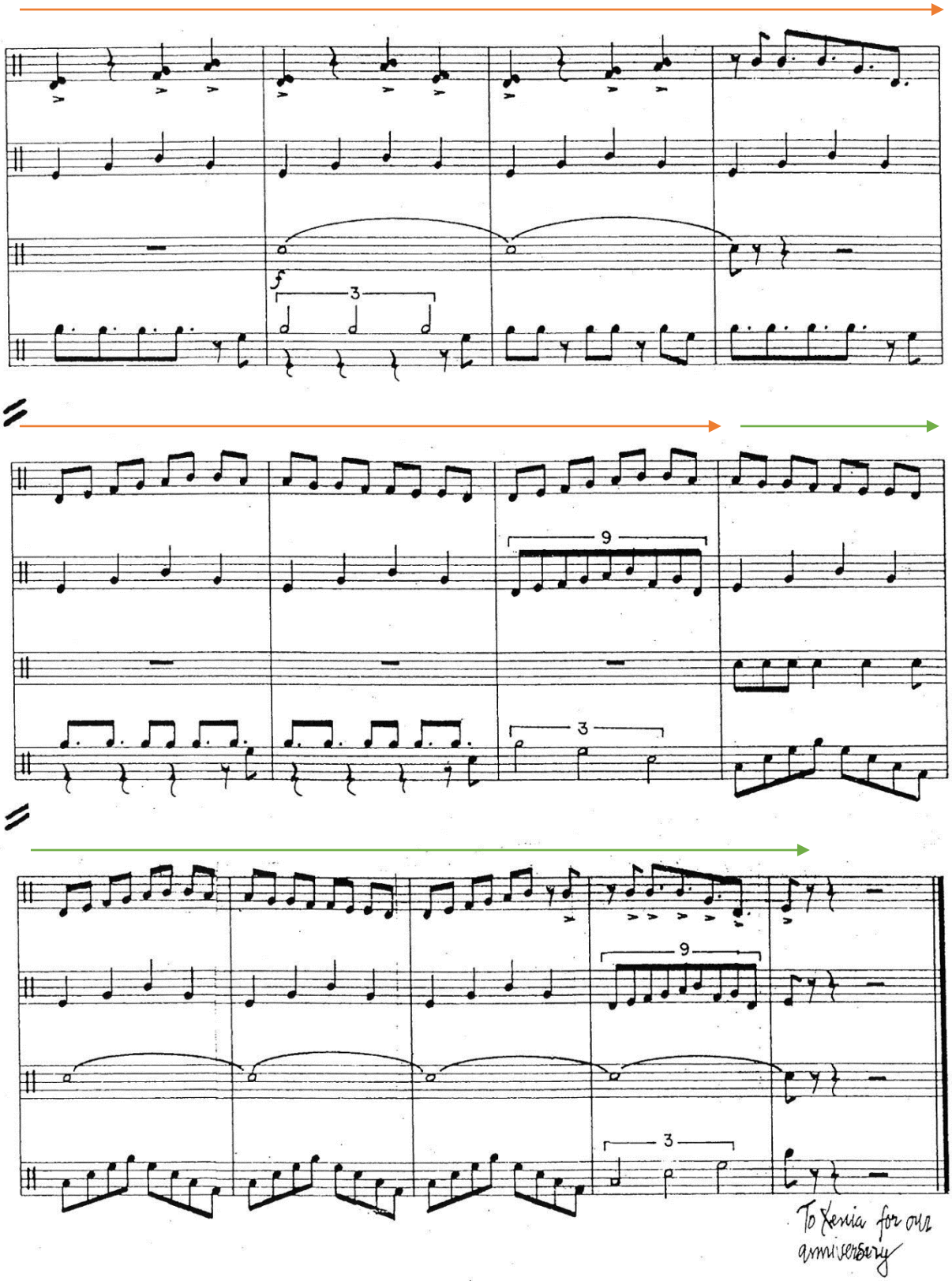


Fig. 3.26 – Subsections of letter "W" in *Third* Construction, pgs. 48–49 of the score (blue, orange, and green lines, respectively).

While the substructure outlined above can be evident to one's ear for most of these recordings, I set out to empirically verify this suspicion as well. By using the same methodology to determine the average tempi, I marked timestamps at the following points: 1) the beginning of "W;" 2) at Cage's second *accelerando* marking eleven measures after "W;" 3) the return of consonant rhythms among the quartet five measures from the end of the piece, and; 4) the downbeat of the final measure. Once these points were marked, I examined these three subsections of letter "W" as I described them above: 1) beginning of this section until the second accel. marking (10 measures in total); 2) from the second accel. marking to the consonant rhythms five measures from the end of the work (9 measures in total) and; 3) five measures from the end.

Uploader	"W" to 2nd Accel.	Avg. Time Per Measure	2nd. Accel to 5 Before End	Avg. Time Per Measure	Time Differential
Vic Firth	8.279	0.828	7.330	0.814	0.949
McGill Percussion	9.758	0.976	7.712	0.857	2.046
Aurél Holló	9.572	0.957	7.663	0.851	1.909
Cristobol Gajardo B.	9.035	0.904	7.893	0.877	1.142
Bill Cahn	11.747	1.175	9.979	1.109	1.768
Vic Firth Concert	9.044	0.904	7.213	0.801	1.831
Christopher Salvito	9.119	0.912	7.255	0.806	1.864
Heidelberger Frühling	8.629	0.863	7.693	0.855	0.936
Spec Drum	9.741	0.974	8.276	0.920	1.465
IPCL - Daidalos	9.056	0.906	7.489	0.832	1.567
sideshow097	9.056	0.906	7.931	0.881	1.125
Taylor Yozwiak	8.793	0.879	7.971	0.886	0.822
Sydney Wind Orchestra	9.793	0.974	7.748	0.861	1.989
IPCL - Pulsat	7.594	0.759	9.549	1.061	-1.955
Karina Yau	10.174	1.017	8.491	0.943	1.683
PendulumNewMusic	9.400	0.940	8.437	0.937	0.963
Peter Jarvis	8.520	0.852	7.285	0.809	1.235
Daniel Janca	10.482	1.048	8.392	0.932	2.090
HKBU	11.367	1.137	9.609	1.068	1.758
PercaRUS	9.674	0.967	8.310	0.923	1.364

Table 3.8 – Spreadsheet of Duration for Letter "W" and 2nd Accel Marking in Third Construction, pgs. 47–48 of the score.

The argument could be made that comparing these two subsections of letter "W" is not appropriate; the first consists of ten measures, while the second consists of nine. But the final column indicating the time difference between the two sections justifies their comparison. For fifteen of the twenty ensembles, this difference was greater than the average time per measure of the first subsection—in other words, these groups "made up" for the one "missing" measure within the second subsection (the second *accel.* marking), plus a little more. Although this point may be mathematically miniscule, these fractions of a second do indeed make a difference to the ear.

For the final five bars of the work, the majority of the ensembles did give one final push to the tempi within their respective recordings. In similar fashion to the *stringendo* passage before rehearsal letter "H," their respective accelerations were not consistent in pace; the most obvious trend from the analysis showed that the measure that took the greatest amount of time was the penultimate measure. Given the polyrhythmic material between Players 1, 2 and 4, it is likely that this bar was slightly elongated to ensure that the ensemble's arrival on the last note of the piece was as together as possible.

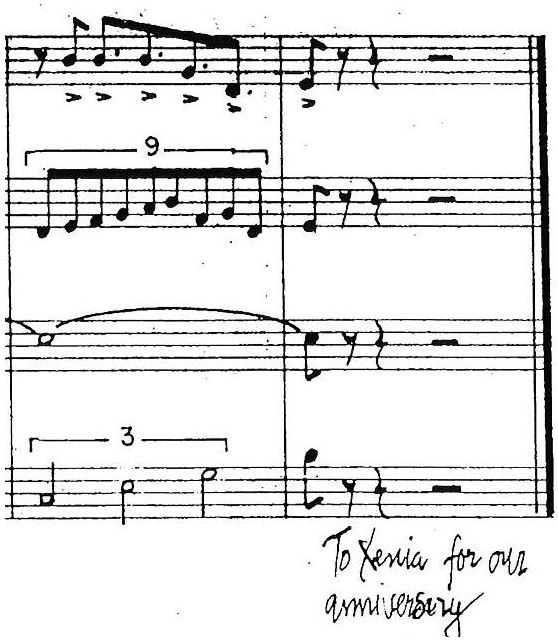


Fig. 3.27 – Last two measures of *Third Construction*. © 1970 Reproduced by permission of C. F. Peters Corporation. All rights reserved.

Uploader	5th (Secs)	4th (Secs)	3rd (Secs)	2nd (Secs)	1st (Secs)
Vic Firth	1.044	0.534	0.786	0.797	0.810
McGill Percussion	0.857	0.841	0.836	0.836	0.824
Aurél Holló	0.836	0.777	0.810	0.783	0.956
Cristobol Gajardo B.	0.865	0.853	0.883	0.882	0.942
Bill Cahn	1.123	1.080	1.097	1.123	1.235
Vic Firth Concert	0.813	0.653	0.689	0.760	0.751
Christopher Salvito	0.704	0.711	0.783	0.704	0.780
Heidelberger Frühling	0.772	0.804	0.818	0.801	0.805
Spec Drum	0.881	0.897	0.888	0.906	0.962
IPCL - Daidalos	0.809	0.784	0.745	0.770	0.845
sideshow097	0.802	0.809	0.722	0.830	0.915
Taylor Yozwiak	0.853	0.923	0.862	0.940	1.007
Sydney Wind Orchestra	0.836	0.770	0.810	0.751	0.941
IPCL - Pulsat	0.785	0.823	0.803	0.856	0.891
Karina Yau	0.819	0.807	0.918	0.888	0.879
PendulumNewMusic	0.881	0.900	0.889	0.774	0.899
Peter Jarvis	0.755	0.764	0.738	0.706	0.758
Daniel Janca	0.927	0.869	0.922	0.834	1.013
HKBU	1.219	0.980	0.987	0.903	1.073
PercaRUS	0.864	0.904	0.894	0.853	1.054

Table 3.9 –Table of durations for the last 5 measures of *Third Construction*

3.12 Conclusions: Visible and Audible Trends

From the examination and analysis of this body of recordings, it appears that there are significant trends that can be seen and heard. Although the decisions to have either individuated or uniform sets of tin cans was evenly split among these 20 quartets, the majority of them (14) chose to take individuated approaches to the selection of their drums. While these decisions can be made individually or collaboratively, they can also be made for musical or logistical reasons—whether it be to distinguish the respective voices within the quartet or due to the equipment available to them. Given Cage's attitude about timbre, instrument selection for *Third Construction* continues to offer modularity to its performers, who can continue to experiment with different combinations of sounds as they wish.

While there are a variety of sounds available to and accepted by percussionists, the realizations of *Third Construction* examined in this corpus study seem to have more established, definitive boundaries regarding their tempi. While it is true that numeric values pertaining to tempo are objective, Cage's use of descriptive words to indicate tempi changes leave us with subjective parameters. From the analysis conducted above, there is a definite shape to the tempi taken in Cage's quartet.

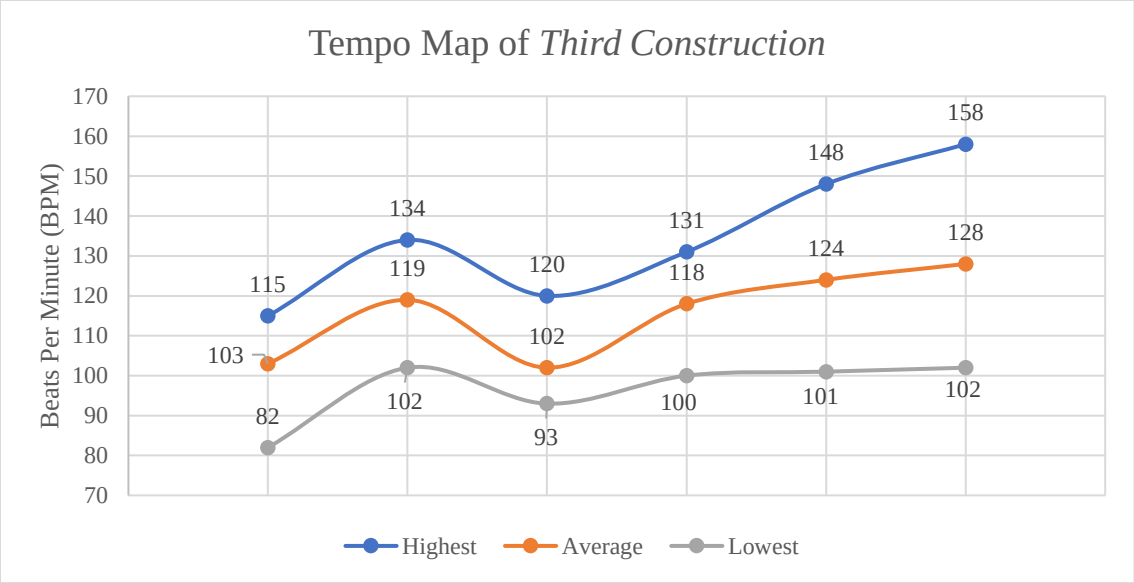


Fig. 3.28 – Tempo Map of *Third Construction*

The above chart illustrates the general directions of tempi within this corpus study of *Third Construction*—the lines between the points do not indicate constant states of acceleration or deceleration of tempo. The points delineate clear sections of the work: 1) the opening until the stringendo; 2) letters "H" and "I"; 3) letter "J" to "O"; 4) letter "O" to "S"; 5) letter "S" to "W" and; 6) letter "W" to the end of the work.

Even within this general contour, the percussionists in these 20 performance videos took their own liberties and deviated from Cage's specified instructions. Some of these decisions were driven by the musical material, be it the immediate texture of a specific section or thinking about what sections were to come after. A number of ensembles saw the thin texture and subdued dynamics between letter "E" and the stringendo (pg. 16 of the score) as an opportunity to slightly drop back the tempo from their original speed at the beginning of the piece; for others, however, the final iteration of Player 2's drum solo at letter "G" (pg. 15 of the score) prompted them to shift the pulse ahead ever so slightly in order to make the stringendo passage less dramatic.

At letter "J," nearly every quartet—17 out of 20—performed under Cage's written instruction of 108 BPM; the sparse texture of the solo teponaxtle (i.e., log drum) passage in Player 1's part seemed to serve as the beginning of a slow wind up, and as more players entered the texture at letters "K," "L," and "M," the tempi of many groups within this corpus study shifted slightly forward as a means of building momentum toward letter "O." The final section (letter "W") instructs the quartet to accelerate all the way until the final attack, but the ensembles in this body of recordings seemed to wait until each member had the consonant, more cohesive rhythms of eighth and quarter notes within their respective parts just five measures from the end.

Percussionists who choose to learn and perform *Third Construction* will have to address a number of points pertaining to timbre and tempi, both of which will elicit technical and musical considerations—individually and collectively. Future generations of percussionists will also have to reckon with more than just the musical score; they will likely have to contend with the numerous recordings available. What if a percussionist encountered a performance video on YouTube *before* they examined the score or began practising/learning their own part? How would undergraduate percussionists who have never performed *Third Construction* evaluate performance videos of the work that exist on YouTube? Would their evaluations change if they viewed the videos with or without the musical score? The next chapter will discuss the findings from the case study that was conducted as part of this research.

Chapter 4

Case Studies on Undergraduate Percussionists Evaluating YouTube Excerpts of *Third Construction*

Introduction

This research also investigated how undergraduate percussion students evaluated performance videos of percussion repertoire on YouTube. I conducted a case study on nine undergraduate percussionists that involved: a five-question survey, and two viewings of five excerpts of *Third Construction* from performance videos on YouTube. To ensure candidness in their responses, the participants in the case study were informed that they would remain anonymous.

I recruited participants by emailing various North American post-secondary percussion instructors[144]. The instructors forwarded this inquiry to their students, who contacted me with their interest in participating. The first ten individuals who made contact were selected to participate the study, and nine of these ten completed the survey and excerpt viewings within the specified time period to submit their materials.

4.1 Precursory Survey: Design

Given the previous research that has been conducted on music students and their uses of YouTube[145], the precursory survey was intentionally designed to be brief (three multiple choice and two open-ended questions).

[144] See Appendix I.
[145] See Dougan (2012), and Lai (2013).

Questionnaire 1 – General survey on your experience using YouTube

1. Do you regularly use YouTube to learn more about percussion repertoire?
    a. Yes
    b. No

1b. If yes, how frequently?

    a. Once a week
    b. Twice a week
    c. Everyday
    d. Other

2. I use YouTube to _____ (Highlight all answers that apply)

    a. Search for recordings to use as references for my own learning process
    b. Search for new repertoire
    c. Connect with performers / composers I do not know personally
    d. Upload videos of my own performances

3. How many videos of the SAME composition do you watch to serve as references during your own learning process?

    a. Only 1
    b. 2–3
    c. 3–4
    d. More than 4

4. What are some CONCERNS you have with percussion performance videos uploaded onto YouTube?

5. What are some BENEFITS you see in using YouTube as a resource for your educational / artistic development?

Fig. 4.1 – Precursory survey from the case study

4.2 Precursory Survey: Data

With YouTube's early years of being a video-sharing social network to the present day—what I consider to be the host to a mass of varying subcultures—gauging how a percussionist can use the site presents interesting perspectives. Eight of the nine participants said that they use the site regularly to learn more about percussion repertoire, with the most frequent response being at least twice per week. All nine participants use YouTube to search for recordings to use as references for their own learning processes, in addition to searching the site for the purpose of finding new repertoire. When asked how many videos of the *same* composition they watch for educational or referential purposes, eight of the nine participants said they only view two or three performance videos.

The two social aspects of YouTube usage for a percussionist—or any musician, for that matter—pertain to networking and uploading content. For the latter, five of the nine participants indicated they upload their own performance videos onto the site, while only three participants expressed that they use YouTube to connect with performers or composers.[146] These varying levels of engagement and usage on YouTube are more or less reflective of the site as a whole. According to the Pew Research Centre, the top 10% of channels provided nearly 70% of YouTube's new content in the first week of 2019[147]; furthermore, almost 90% of all videos uploaded onto the site will never reach 1,000 views.[148]

[146] It is likely that other social media platforms (e.g., Facebook, Instagram) may be more preferrable for networking and corresponding with others in the percussion field.

[147] Van Kessel, Patrick. "10 Facts About Americans and YouTube." 4 December, 2019 <https://www.pewresearch.org/fact-tank/2019/12/04/10-facts-about-americans-and-youtube/>. Accessed April 30, 2021.

[148] Wilde, Damien. "Almost 90% of All Uploaded YouTube Videos Will Never Reach 1,000 Views." 20 August, 2020 <https://9to5google.com/2020/08/10/almost-90-of-all-uploaded-youtube-videos-will-never-reach 1000-views/>. Accessed April 30, 2021.

As a means of eliciting qualitative data, two questions were asked in order for participants to express their concerns with and perceived benefits of viewing percussion performance videos on YouTube. The primary concern expressed by a majority of the participants surrounded the topic of quality: both audiovisual and performance quality. Answers on the topic of audiovisual quality were mostly centred on the ranges of disparity between "good" and "bad" recordings, and how one's reception of the content can be contingent upon the quality of a video. For one participant, their perception of a musical composition's quality is "tied to how well the piece is recorded and presented, though [they] don't consciously try to judge that."[149] The desire to view and listen to optimal recordings on YouTube did, however, concern some participants about its relationships to their own artistic and performance goals. "Note perfect," "pristine" performance videos do have the capacity to negatively influence viewers.

> When percussionists are exposed to YouTube performances for a significant period of time, our perception of the percussion sound world gets distorted, and we may even strive to replicate these edited sounds and set unrealistic goals.[150]

Furthermore, participants expressed that performance videos on YouTube can lead to unhealthy comparisons, which may result in the loss of individual creativity and sense of identity.

Despite their concerns, the participant pool still expressed a number of benefits that YouTube may provide for percussionists, most of which focused on the processes of learning. Viewing performance videos on YouTube may allow one to "conceptualize a piece before approaching their instruments,"[151] and can supplement other areas of the learning process that cannot be offered by the score alone (e.g., audial, visual). Some participants expressed

[149] Participant 8. See Appendix S.
[150] Participant 3. See Appendix N.
[151] Participant 3. See Appendix N.

appreciation for an audiovisual recording's ability to display information on the physical arrangement of one's instruments,[152] and to assist with deciphering musical notation that may be difficult for one to interpret.[153] The participants also expressed gratitude for the ability to remotely access performance videos from percussionists in other parts of the world and to see variances in interpretation from performers at differing levels of artistic and technical skill (e.g., professional, university students).

4.3 Excerpt Viewings

Participants were asked to view five excerpts of *Third* Construction under two differing conditions: 1) simply view them as audience members and; 2) simultaneously following along with the score. The five YouTube uploads of Cage's work that were examined were selected from the larger playlist discussed in the previous chapter (compiled between October and November of 2020).[154] Instead of hyperlinking each video within the word document that contained the case study materials, an embedded hyperlink would route participants to an unlisted YouTube playlist that contained only the five excerpts to be examined.[155]

[152] Participant 7. See Appendix R.
[153] Participant 6. See Appendix Q.
[154] "Third Construction by John Cage," YouTube playlist. <https://www.youtube.com/playlist?list=PLDfuBkNpt41pDREmhR8u8dmFaIn0FTI0>
[155] "Third Construction Case Study Videos," YouTube playlist. <https://www.youtube.com/playlist?list=PLDfuBk-Npt42LEyDnwxy-n99KQslDsGDH>. "Unlisted" is a privacy setting available on YouTube videos & playlists that allow access only to those who have been given its URL link.

Questionnaire 2 – First Excerpt Viewing

Please open your web browser to the following link:

https://www.youtube.com/playlist?list=PLDfuBk-Npt42LEyDnwxy-n99KQslDsGDH

Note: Leave your web browser open until the end of this case study. It will be needed to complete both the second and third questionnaires.

4.4 Selecting the Five Excerpts

The five excerpts examined by the participants were selected from the larger playlist that I began compiling between October and November of 2020.[156] Although it may have been more effective or more appropriate to select the excerpts *after* I had conducted the corpus study discussed in Chapter 3, this was not the case chronologically speaking. One could speculate that this impacted my own analysis of the 20 performance videos, but I will disclose the relationship between the corpus study and the five excerpts chosen for the case study participants.

My primary interests were to investigate the reception of performance videos on YouTube by younger percussionists, and the idea to conduct my own corpus study developed afterward. I would rather disclose the truth about the construction of my research rather than "reverse engineer" my findings in an attempt to further validate them. As a researcher and an aspiring educator, I am more concerned with the "bigger picture," hence the impetus to initially focus on how the case study participants use, interact with, and evaluate percussion performance videos on YouTube. Given that the five excerpts used for the case studies were also analyzed in the corpus study of 20 videos, I will now briefly describe them and explain my rationale for selecting them for this portion of my research.

[156] See Chapter 3, Section 3.2 (Defining a "Living" Corpus on YouTube), pgs. 46–57.

4.4.1 *Amadindapercussion*

Amadinda Percussion is a professional ensemble based in Budapest, Hungary. Formed in 1984, Amadinda has championed the works of many composers, particularly Steve Reich and John Cage. This upload of *Third Construction* is in fact an identical video that was also uploaded by a member of the group, Aurél Holló. The upload on Holló's channel is the third most popular of all the *Third Construction* performance videos available on YouTube, with over 13,000 views. In the meta description of both videos, YouTube indicates that the audio belongs to a copyrighted recording by the group that was released on the 1988 album, *4'33."* Interestingly enough, this same recording of *Third Construction* is also on YouTube but instead of seeing the group members performing, the only visual display is the album's cover art.

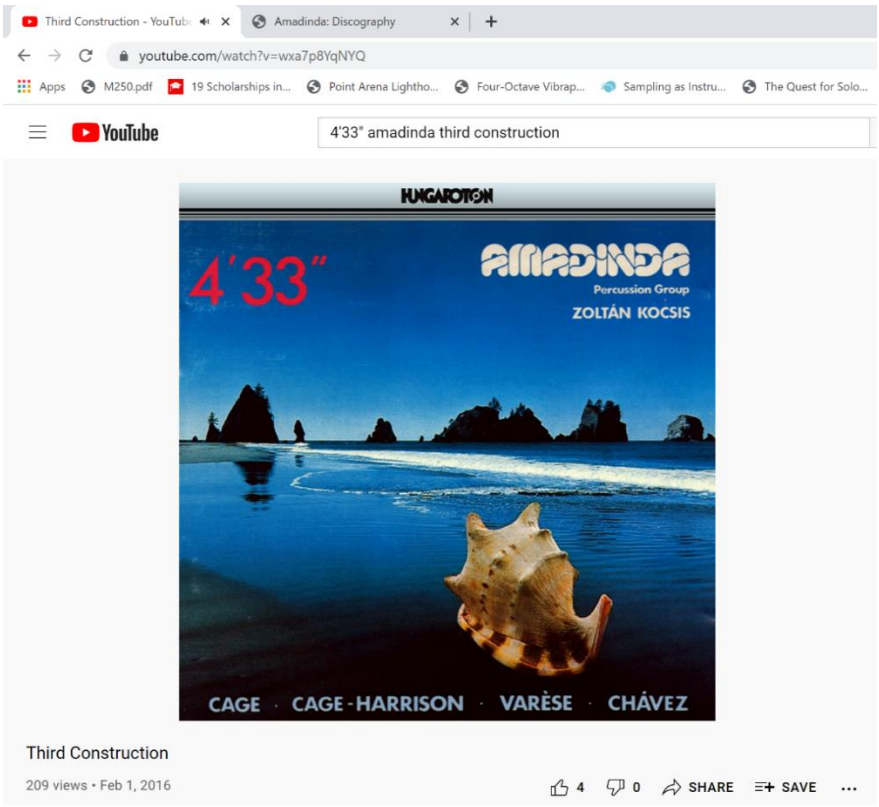


Fig. 4.2 – Screenshot of Amadinda's *Third Construction* recording from the album *4'33"*

When comparing all three audio files from these three videos (*amadindapercussion*, *Aurél Holló*, and the track from the album *4'33"*), they are indeed the same recording. When looking at the video description in the upload on the *amadindapercussion* channel, it is disclosed that the video was recorded in 1992 for a television program. Regardless of how the performance video was constructed (i.e., as a recorded performance, or as a "music video"), there are three main reasons as to why I chose to include it in the case and corpus studies: 1) it offers multiple camera angles; 2) it was captured with audio and visual recording technology from the late 1980s / early 1990s and; 3) its presence on YouTube in the form of duplicate videos could have a subconscious effect on the case study participants—in other words, the participants may receive *amadindapercussion's* upload differently since it has less than 2,000 views when compared to the upload of the *same* video by Aurél Holló, which has over 13,000 views.

4.4.2 *Bill Cahn*

The second excerpt belongs to YouTube user *Bill Cahn*, a member of the Canadian percussion quartet NEXUS. The group formed in 1971, and first garnered attention by presenting full-length concerts consisting of completely improvised music. NEXUS recently celebrated their 50th anniversary, and their lengthy list of accomplishments and contributions to percussion repertoire and performance is evident on a global scale. In addition to the group's close relationship with composer Steve Reich, NEXUS has also championed the works of John Cage. The YouTube video uploaded by member Bill Cahn was of a live concert performance that took place in Seoul, South Korea which was one stop on the group's 1984 world tour. In addition to being one of the earliest percussion groups to revitalize the work, NEXUS is also credited with

the first commercial recording of the work on their 1982 album, *Changes: Cage – Reich – Mather – Cahn*.[157]

The rationale for choosing this video to be used as a case study excerpt was similar to the upload by Amadinda Percussion—both of these videos are quite dated in terms of their chronological age and their audiovisual quality. There is, however, one more interesting aspect of NEXUS' video: the opening tempo of their performance is one of the slowest on YouTube. Would the undergraduate participants be able to detect this when watching and listening to this excerpt? Would the combination of the video's age and the slow tempo make it less favourable in the eyes of the undergraduate participants?

4.4.3 *PendulumNewMusic*

This upload was selected to serve as an example of unclear authority on YouTube—the performers in the video are members of the Grammy award winning ensemble Third Coast Percussion, but the video itself was captured and uploaded to YouTube by *PendulumNewMusic*, an annual festival held at the University of Colorado–Boulder. In addition to the video not being embedded on Third Coast Percussion's YouTube channel, the title of this video is labeled "Construction #3," which likely has affected its circulation on YouTube—the site's default search is based on the relevance of the keywords that one types. I chose this video for two primary reasons: 1) this ensemble is perhaps more recognizable to this younger pool of participants than the previously mentioned ensembles (Amadinda Percussion and NEXUS) and; 2) the context of the instrument selection made by the members of Third Coast Percussion. This

[157] It was confirmed via email correspondence with C.F. Peters that the first licensed recording of *Third Construction* was done by NEXUS. Garry Kvistad, a member of both NEXUS and Blackearth Percussion, confirmed that Blackearth did professionally record Cage's quartet in the late 1970s, but did not commercially release it.

ensemble is based in Chicago, Illinois and their appearance at a music festival in Colorado likely prompted them to use whatever instruments were available to them at the university. Would the case study participants be more or less critical of their instrument choices if they recognized that the group was performing in another state without their own personal equipment?

4.4.4 *Christopher Salvito*

Of all the performance videos previously described, this upload by user *Christopher Salvito* is perhaps the most cinematic. The varying camera angles, lighting, and close-up shots of the percussionists' hands and instruments is akin to the performance videos produced by Evan Chapman and his company, four/ten media.[158] When examining the description of Salvito's upload, he is credited as the post-production editor for the video's visual elements. Considering his intimate knowledge of the score—he and the rest of the ensemble were performing the piece from memory—would his curation be more interesting for the case study participants? Given his knowledge as both a performer and as a video editor, would he be able to communicate more information about the meaning of the musical material to the viewers?

4.4.5 *Karina Yau*

Finally, this video upload by *Karina Yau* was selected for three reasons. First, the video demonstrates the simplest method of capturing its visual elements; in this recording of a live recital performance, there is only one, unchanging camera angle throughout. Second, this upload has a very low number of views on YouTube and thus, one would likely never encounter it unless they either knew of its existence or searched through all of the available YouTube videos

[158] See Chapter 2, pgs. 38–39.

of *Third Construction* as I did. Lastly, I chose this video due to the stature of the performers. Would the participants be more or less responsive to viewing a performance done by student percussionists?

4.5 Excerpt Viewings: Design

Given the capabilities of the Zoom's video-conferencing platform, it would have been possible to administer the excerpt viewing portions of the case study to each participant, individually. There are three reasons, however, as to why I chose to have the participants complete the study on their own: 1) remote accessibility and asynchronous completion; 2) to seek as much raw data as possible from individual participants and; 3) the nature of watching YouTube as a domesticated and consumptive activity of leisure, pleasure, and/or information.

Conducting a controlled case study in a one-on-one context would have a number of implications for both myself as a researcher, and also for the participants. First, maintaining a connection for both sending and receiving audiovisual data through the Zoom platform (i.e., screen sharing) would be contingent upon the Internet connection speed and stability available to both parties. Second, I would have to be more aware of ethical protocols to which I have no certified expertise. Additionally, if the excerpt viewings of the case study were directly proctored, the participants would inherently be removed from the environment which they were asked to make observations within. The participants may have been less comfortable or possibly would have felt a need to "perform" if they knew the researcher was watching them whilst they completed their case study—Susan Tomes writes that the action of recording music generally

makes performers "…hyper-critical of the sound(s) they are producing."[159] The excerpt viewings did prompt participants to answer specific questions and provide their own opinions, but the goal of this research was to elicit as much raw data as possible. Although the primary objects of examination were the performance videos themselves, they only exist within YouTube's environment. Kristin Dougan asserted that a student's distinction between scholarly and non-scholarly resources are often a reflection of how they use electronic devices—their smartphones and laptops can be, and likely are, used for both personal reasons (e.g., communication, online social networking, leisure, etc.) *and* academic information, and they do not necessarily see clear boundaries between the two.[160] This principle is reflective of the YouTube environment as well. Numerous scholars who have studied the YouTube phenomenon in a variety of contexts (e.g., media studies, political science, cultural anthropology, etc.) conclude that the site hosts a wide array of videos ranging from humorous home-videos uploaded by everyday people to mega-media outlets sharing news and information.

In order to allow for asynchronous completion of the case study, and to simultaneously verify the validity of the submissions, the participants were instructed to record their computer screens while they executed the case study. By giving this instruction, I avoided having to proctor the case studies individually, and thus, maintained my goal to have no invasive presence on the participants whilst they completed the case study. In addition to receiving data on the participants' answers to the precursory survey and opinions of the excerpt viewings, their screen recordings presented a secondary layer of data to collect and analyze on individualized levels. Referred to in other fields of research as screencast videography, screen recordings focus solely

[159] Tomes, Susan. "Learning to live with recordings" in *The Cambridge Companion to Recorded Music*. Cook, Nicholas, Erik Clarke, Daniel Leech Wilkinson, and John Rink, eds. Cambridge: Cambridge University Press, 2009, pg. 10.

[160] Dougan, Kirstin. "Music, YouTube, and Academic Libraries." *Notes* Vol. 72, No. 3 (March, 2016), pg. 492.

on digital experiences, be they online or offline.[161] This method of capturing and analyzing a user's actions through a digital interface (e.g., phone, computer), can present information that is not readily available when using more conventional methods.[162] There are ethical considerations when implementing this method of research (e.g., privacy concerns), and all case study participants gave their permission by signing an informed consent letter approved by the University of Toronto's Ethics Review Board.[163]

For the first viewing of the excerpts, participants were prompted to simply view the videos up until a certain point in the music: from the beginning of the work to rehearsal letter "H." Participants were given specific timepoints to stop at the appropriate place:

amandinapercussion – Stop watching @ 3:35
Bill Cahn – Stop watching @ 4:43
PendulumNewMusic – Stop watching @ 3:44
Christopher Salvito – Stop watching @ 3:35
Karina Yau – Stop watching @ 3:45

The impetus for selecting this specific section of *Third Construction* is for three primary reasons: 1) with the performance videos of the work on YouTube lasting for an average duration of eleven minutes and twenty seconds, asking participants to watch 5 full-length performances would be exhaustive; 2) this portion of the score includes the primary instruments used in the work that have the greatest variability in terms of performer choice (e.g., tin cans, drums) and; 3)

[161] Kawaf, Fatema. "Capturing digital experience: The method of screencast videography." *International Journal of Research in Marketing* 36 (February, 2019), pgs. 169–170.
[162] Kawaf, "Capturing digital experience," pg. 170.
[163] See Appendix J. It is important to note that the participants only recorded their computer screens while completing their case studies and were NOT asked to turn on their web cameras to simultaneously record themselves.

the initial tempo taken at the beginning of the piece can have technical implications for the execution of certain material (e.g., clave passages) and musical implications for the indicated tempi in the latter sections of the work, as discussed in Chapter 3. This first viewing instructed participants to simply observe the videos.

For the second viewing of the excerpts, participants were asked to simultaneously follow along with the musical score, which was provided via hyperlink within the case study word document.[164] Instead of providing the entire score of *Third Construction*, only the excerpted portion (the beginning of the music to rehearsal letter "H") was given to the participants. The focus of this second viewing was two-fold: 1) solicit their opinions on the accuracy of the performers' interpretations of the score and; 2) elaborate on their observations with regards to instrument selection, stick/mallet choices, the ensemble's set-up, and performer gestures. In short, the participants were subliminally prompted to act as viewers who were seeking specific information, and how this might inform them of their own approaches to learning and performing the work. Finally, participants were asked to elaborate on these two viewing experiences and how they differed.

4.6 First Viewing of the Excerpts: Data

The goal of the first viewing of the excerpts was to solicit opinions from the participants that pertain to what they view to be of high quality and most interesting on YouTube. After viewing each excerpt, the participants evaluated three criteria: audio quality, visual quality, and

[164] The excerpt of the score was uploaded to a cloud storage folder via GoogleDrive, and only accessible by the participants <https://drive.google.com/drive/folders/1u9zS2hZcmVGCKeSu28lHj2hph6-fW-X->.

performance quality. Participants simply highlighted their answers within a table that contained five scaled ratings for each category.

Audio Quality	Excellent	Very Good	Fair	Not Good	Poor
Video Quality	Excellent	Very Good	Fair	Not Good	Poor
Performance Quality	Excellent	Very Good	Fair	Not Good	Poor

Table 4.1 – Scaled ratings for first viewing of video excerpts

Once all five excerpts were viewed, participants were asked to rank them from most to least favourite. Despite the range of answers concerning the above categories that pertained to quality, the excerpt regarded as the most favourite from six of the nine participants was uploaded by user *Christopher Salvito*.

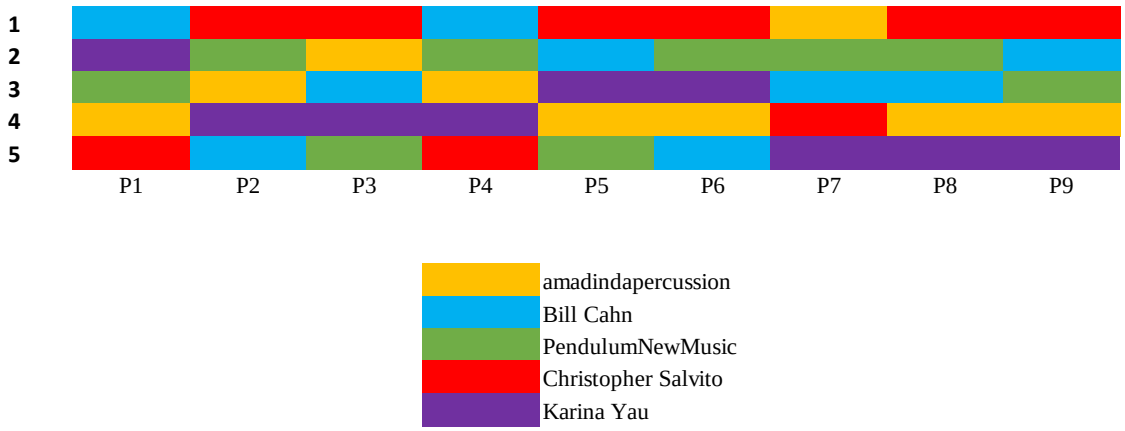


Fig. 4.3 – Most favourite (1) to least favourite (5) rankings from first excerpt viewing

Additionally, the same number of participants expressed that this excerpt had the highest audio and visual quality:

> I think my favourite excerpt was the most enjoyable to watch because it had the best audio and video quality. It was, as a viewer/audience member, the most fun and cleanest to experience.[165]

Given this information, what characteristics does this particular upload have that make it stand out from the others in the eyes of the majority of the participants?

Audiovisual recordings of music performance on YouTube can provide online viewers with new sets of intimacies for one's ears and eyes. Although the intimacies afforded by audio recording technology are evident as early as the 1930s (e.g., Bing Crosby's "crooning"), YouTube videos of music performance allow viewers to be visually stimulated in unparalleled ways when compared to viewing a live, in-person concert performance. Would perhaps the cinematography[166] of Salvito's upload correlate to the majority of participants selecting it as their favourite excerpt to watch?

While viewing these five excerpts with no audio, I counted the number of camera angle changes that occurred within each excerpt's respective duration. I define these camera angle changes as shifts in viewer perspective evidenced by the appearance of new persons or instruments, and not necessarily changes to the scope or depth of field—in other words, camera movement or zooming in or zooming out within an already occurring shot did not count as a change.

[165] Participant 2. See Appendix M.

[166] It would be important for me to clarify my use of the word cinematography. The word typically describes the art and technology of motion-picture photography. Within the context of my dissertation, the word cinematography will simply refer to the way in which a performance video is captured (e.g., number of camera angles, lighting, visual effects), and edited.

Uploader	Number of Camera Angle Changes	Excerpt Duration	Frequency of Camera Angle Changes (Average)
Christopher Salvito	65	3:35	3.30 seconds
Amadindapercussion	47	3:35	4.57 seconds
Bill Cahn	28	4:43	10.1 seconds
PendulumNewMusic	11	3:45	20.45 seconds
Karina Yau	0	3:45	N/A

Table 4.2 – Chart on camera angle changes in case study excerpts

Before the arrival of recording technology, music performance could not have been experienced by spectators without the physical presence of human bodies. YouTube's arrival has brought its viewers the ability to readily access audiovisual recordings of music performance. Philip Auslander believes that the "traditionalist" view of requiring visual elements in order to legitimize or verify a musical performance is an ideological one, at best.[167] There are some forms of music performance where visual elements do not show the cause-and-effect relationship of performer action(s) and the resultant sound(s)—the oral cavities and embouchures of woodwind and brass players, for example, are not visible to an audience. But given the prominent percussive subculture on YouTube discussed in Chapter 2, as well as the visual nature of percussion performance, perhaps the visual stimuli of performance videos can have significant influence on viewer reception.

Many studies have shown that visual information, be it directly or indirectly related to the performer(s) and the resultant sounds, plays a significant role in audience perception and evaluation. Two publications by Noola K. Griffiths present intriguing insights. In 2009, Griffiths conducted a study on how a pool of viewers evaluated classical music performance based on the

[167] Auslander, Philip. "Sound and Vision: The Audio/Visual Economy of Musical Performace" in *The Oxford Handbook of New Audiovisual Aesthetics*. Edited by John Richardson, Claudia Gorbman, and Carol Vernallis (Oxford: Oxford University Press, 2013), pg. 1.

performer's wardrobe; consequently, her findings indicated that those who were the "best dressed" in more formal attire received higher evaluations of technical proficiency, while those wearing jeans or more casual wear were perceived as being less skillful.[168] A later study by Griffiths (2018) featured both a professional and amateur pianist's audiovisual recordings of Debussy's *Clair de lune*, but neither of their fingers were visible to the viewers who participated in the study. Although the video and audio elements from the recordings were used both congruently and incongruently (i.e., amateur video in combination with professional audio, and vice versa), data from the participant pool revealed that the two highest rated performances contained the professional performer's video even when it was paired with the amateur performer's audio.[169]

With this in mind, one can begin to think of the impacts that visual *presentation* may have on those who watch music performance videos on YouTube. As mentioned in the previous chapter, the overwhelming majority of uploads of *Third Construction* are recordings of events that took place in live performance contexts.[170] When examining the metadata (video description) of *Christopher Salvito's* upload, not only is he listed as one of the ensemble performers, but he is credited for the video's visual post-production, as well. Having an intimate knowledge of the score—he and the rest of the ensemble were all playing from memory—Salvito's upload represents a thoughtful curation. With the camera angle changing on an average of every three and a half seconds, viewers are visually directed to see intimate, close-up shots of the ensemble's hands and instruments, which musically coincides with the entrances, exits of,

[168] Griffiths, Noola K. "Posh music should equal posh dress': an investigation into the concert dress and physical appearance of female soloists." *Psychology of Music* Volume 38 No. 2 (2009), pgs. 159-177.
[169] Griffiths, Noola K. & Jonathan L. Reay. "The Relative Importance Of Aural And Visual Information In The Evaluation Of Western Canon Music Performance By Musicians And Nonmusicians." *Music Perception* Vol. 35 No. 3 (2018), pgs. 364–375.
[170] See Chapter 3, pg. 52.

and interactions between the ensemble members' musical material. Did this visual aesthetic coerce the five participants who expressed that Salvito's upload had the best audio quality? It would be beneficial to future researchers to investigate the perception and evaluation of music performance based on its visual *presentation*, especially when one considers the omnipresence of YouTube as well as the significantly large number of online concerts that occurred during COVID-19 pandemic.

The final question associated with this first viewing of the excerpts was designed to pivot the mindset of the participant pool and solicit qualitative data. Participants were asked:

> As a percussionist who is interested in learning this piece, is your favourite excerpt one that you would consider to be the most useful or the most educational? Briefly elaborate on your answer.

Four participants expressed that their favourite excerpt was one that they deemed to be the most useful or most educational. Having the ability to see the selection and arrangement of instruments and observe performance techniques in a very up-close and intimate way led them to their answers. Additionally, some participants expressed that the cinematography, specifically for *Christopher Salvito's* upload, informed them of the musical interactions from player to player and that it was the "easiest [excerpt] to digest."[171] While two participants seemed to not be as definitive in answering this question, three others said that their most favourite was not necessarily the most useful or educational. These participants expressed that every excerpt can offer insights, and presents opportunities for viewers to see variances in instrument selection, as well as observing the differences between how professional and amateur groups have chosen to interpret and perform the work.

[171] Participant 8. See Appendix S.

Earlier, I referred to the participants acting as "audience members" on YouTube while they completed their first viewing of the excerpts. Although the participants functioned in this regard at a fundamental level, that is not to say their perspectives are equivalent to an "average" audience member. Individuals from this participant pool all share a similar performative craft: percussion. Despite their statures within their undergraduate degrees at the time of their participation in this case study (2 first-year students, 3 second and 3 third-year students, and 1 fourth-year student), they likely have a baseline level of knowledge or some shared understanding of their craft from which they base their own opinions. As a requirement to take part in this study, all nine participants confirmed that they have never performed *Third Construction*, but that is not to say that they had no familiarity with the work prior to. Seven of the nine participants either did know about or have heard of the work before they participated in this case study.

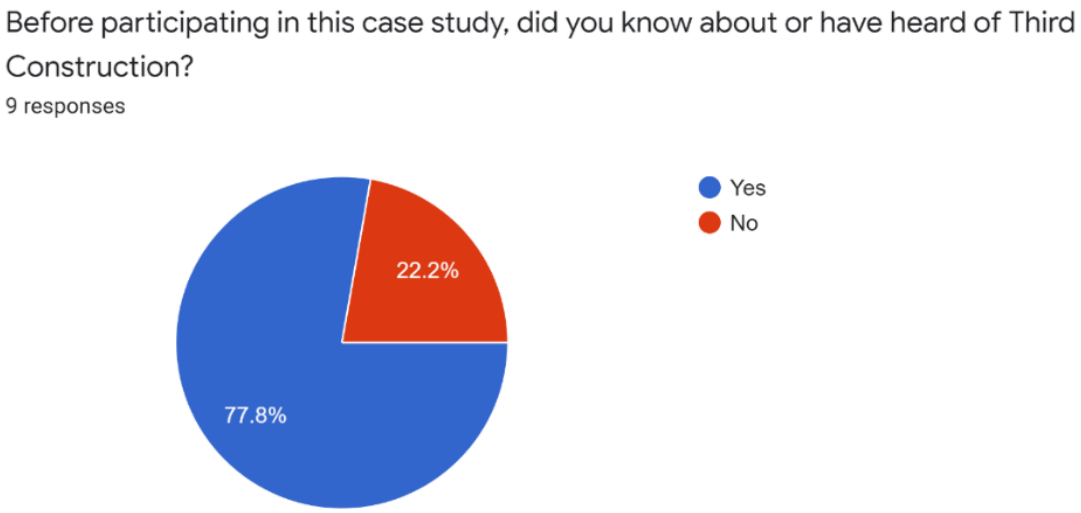


Fig. 4.4 – Chart from Question #3 of the Follow-Up Survey

Discerning the varied levels of familiarity would have required additional follow ups with the seven participants who have had previous exposure to *Third Construction*. The most likely origins of their prior knowledge could include: witnessing a live performance of the work, learning about the work from their percussion instructors or while taking a music history seminar, or simply encountering a recording of the work online. Although this will be discussed later on in this chapter, all nine participants expressed that there were differences, in most cases very significant, when viewing the excerpts both with and without the score. One participant noted:

> While experiencing the piece, I was much less engaged and viewing from a more passive lens. On the rewatch, I was intentionally engaging with the music through the score and I was forced to follow along more intently and with more of a purpose of gaining information rather than simply and solely watching.[172]

4.7 Second Viewing of the Excerpts: Design and Data

For the second viewing of the five excerpts, participants were instructed to simultaneously follow along with the score, which was accessible through an embedded hyperlink in the word document used for the case study. The linked PDF of the score only contained the first sixteen pages of music notation (beginning to rehearsal letter "H") while the precursory performance notes from the composer were omitted. The focus of this second viewing was two-fold: 1) solicit opinions on the accuracy of the performers' interpretations of the score and; 2) elaborate on their observations with regards to instrument selection, stick/mallet choices, the ensemble's set-up, and performer gestures.

Participants were asked the rank the videos again according the five-option Likert scale used in the first viewing (excellent, very good, fair, not good, poor). This second evaluation did not

[172] Participant 2. See Appendix M.

ask the participants to individually rank any subcategories of quality (e.g., audio, video, and performance quality).

Questions on Second Viewing:

1) Please rank the videos again, this time based on your impression of watching *and* following the score, simultaneously. Highlight your answers in the table below.

Amadindapercussion	Excellent	Very Good	Fair	Not Good	Poor
Bill Cahn	Excellent	Very Good	Fair	Not Good	Poor
PendulumNewMusic	Excellent	Very Good	Fair	Not Good	Poor
Christopher Salvito	Excellent	Very Good	Fair	Not Good	Poor
Karina Yau	Excellent	Very Good	Fair	Not Good	Poor

Fig. 4.5 – Question #1 of second viewing and excerpt ranking chart

Based on these rankings, participants were asked which excerpt they believed was the most accurate performance according to the score; contrasting to the majority of participants whose favourite excerpt was uploaded by *Christopher Salvito*, this question yielded a wider array of responses. Three participants selected *PendulumNewMusic's* upload (performed by Third Coast Percussion); two participants selected *amadindapercussion*; two participants selected *Bill Cahn* (performed by NEXUS Percussion) and; the two remaining excerpts, *Christopher Salvito* and *Karina Yau*, each received the support of one participant. In order to answer why the participant pool was more varied in their responses to this question, discussing their screen recordings will provide further insight. After this discussion, I will return to the rest of the data gathered from the second viewing of the excerpts.

4.8 Screen Recordings

Having the participants record their computer screens whilst completing the study not only allowed me to verify that they followed the document's instructions, but also allowed me to collect data on their individual methods and strategies. Through the examination of the screen

recordings, it became evident that there were both consistencies and differences amongst the participants in their approaches to complete their case studies. For both the first and second viewings, participants were encouraged to watch the excerpts in any order of their choosing. All nine participants, however, chose to watch them in the order they were listed within the word document, which reflected their assembly in the playlist on YouTube. As the curator of this playlist, I had the option to display the videos in differing order by using the available filter options: videos within any YouTube playlist can be arranged according to their popularity, publication date, and even by when the curator added them to the playlist.[173] Ultimately, I chose to have the videos within this playlist be arranged by chronological order of when they were uploaded to the site, from oldest to most recent. The participants did have full autonomy to select any video, or could have let the site randomly shuffle the videos within the playlist, but chose not to do so. The most significant differences in execution occurred during the second viewings of the excerpts when the participants were prompted to simultaneously follow along with the musical score. Four participants followed the instructions correctly and had both the musical score *and* the YouTube window each occupying half of their computer screen (i.e., split screen). The other five participants elected to have the score in full view on their screen, leaving them unable to see the performance videos.

[173] See Fig. 3.3 in Chapter 3, pg. 46.

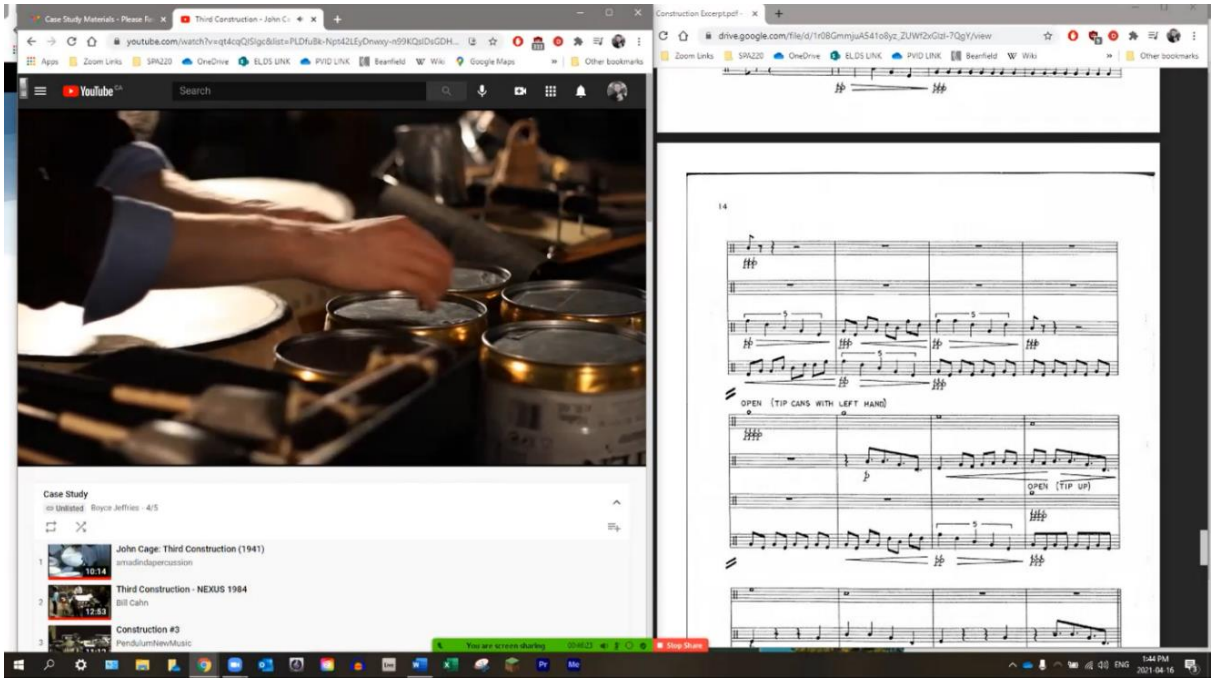


Fig. 4.6 – Screenshot of Participant 8's split screen

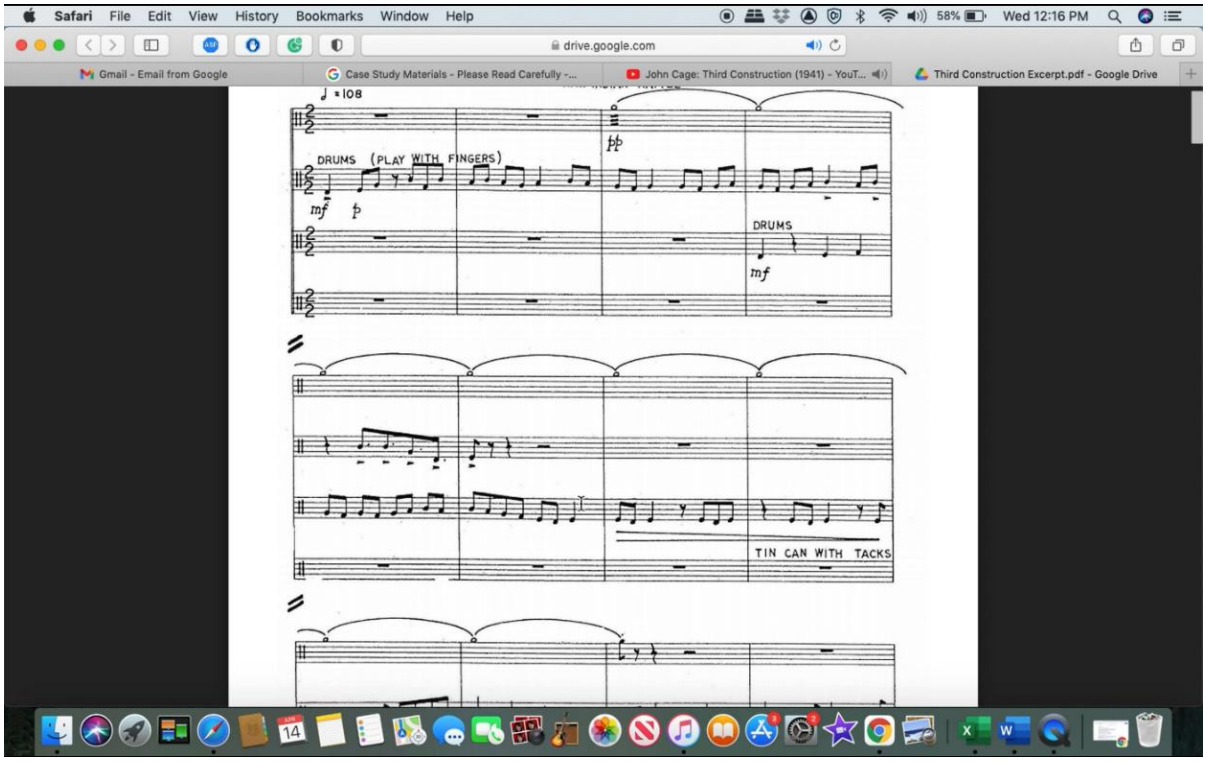


Fig. 4.7 – Screenshot of Participant 4's full screen on the musical score only

Performing music is certainly a multimodal experience, but what about observing it? At a minimum, an individual listening to an audio only recording presents one primary modality, but that is not to say that it is the only one. Witnessing a live performance or an audiovisual recording is at a fundamental level, bimodal—the combination of these two can certainly transform into a multimodal experience for audience members. Research exploring the relationship between the absence of visual components and correctly identifying music performance competition winners presents interesting data for further discussion.

Chia-Jung Tsay asserted that auditory information defines the domain of music performance and its reception—"blind" auditions held for professional orchestra positions allow for the focus to be solely on what most professional musicians describe the at utmost important factor in their craft.[174] Tsay goes on to note that the research investigating visual influence on audience perception and reception of music performance may be at odds with what is supposedly the most valued aspect: sound quality.[175] Tsay's research consisted of both expert and novice musicians attempting to identify performance competition winners by examining audio, visual, and audiovisual excerpts. Although it is important to note that the competition winners of these excerpts were chosen by the subjective opinions of judges who evaluated them, Tsay's findings reiterate that visual information can sway both novices and experts alike from their supposed prioritization of sound.[176] But what could this implicate for listening to recordings of music performance where the only visual information present is that of the work's text—the musical score. Although five participants had their screens and eyes fully on the musical score alone, it cannot be said with certainty that the four participants who had a split screen—a display of both

[174] Tsay, Chia-Jung. "Sight over sound in the judgment of music performance." *Proceedings of the National Academy of Sciences* Vol. 110 No. 36 (September, 2013), pg. 14580.
[175] Tsay, "Sight over sound in the judgement of music performance," pg. 14580.
[176] Ibid., pg. 14583.

the score and the YouTube videos—evenly oscillated their eyes back and forth between the two side-by-side windows. Perhaps the only clear indication of understanding would be to individually examine how the participants followed along with the score and if they "turned" pages at the appropriate times.

4.9 Second Excerpt Viewing: Design and Data (cont.)

Participants were asked to briefly elaborate on instrument selection and sound, choices of materials (sticks / mallets), the set-up of instruments and the ensemble, and performer gestures. Responses from the participants in this section of the case study varied from extremely short, sometimes, one-word responses to more lengthy, detailed thoughts.

Groups	Instruments / Sound	Mallets / Stick Choices	Set-up	Gestures
Amadindapercussion				
Bill Cahn				
PendulumNewMusic				
Christopher Salvito				
Karina Yau				

Table 4.3 – Chart for Question#3 in the second excerpt viewings

In general, the participants seemed to view these four categories as two pairs of co-dependent factors. Decisions on the types of instruments a performer selects (i.e., instruments / sound), particularly for the drums and tin cans in *Third Construction*, can influence or inform what materials a percussionist will use to strike them with (i.e., mallets/stick choices). Much of the participant commentary regarding instrument and stick/mallet choices revolved around issues of clarity, balance, and blend, which can be impacted by a number of factors (e.g., performer interpretation/choices, the positioning of audio capturing devices used in the recording process). The final two categories concerning the set up and gestures of each excerpt also seemed to be

viewed as a co-dependent pair in the eyes of the participants as well; the majority of their commentary discussed the relationship between the ensemble's set up and how this impacted their sight lines and nonverbal communication with one another.

The participants were asked if the excerpt that presented them with the most information was the same as their favourite from the first viewing. For some, following the score reaffirmed their favoritism for *Christopher Salvito's* curated recording, expressing that the high audio quality and visual clarity in his editing reinforced the flow of the musical material from player to player. For others, however, seeing performers more relatable to the participants' own stature as student percussionists provided a more realistic perspective of the challenges that they could encounter in their own experiences with *Third Construction*:

> I would say Karina Yau's [performance] because the small, for lack of a better word, mistakes that they make lead to the improvement of your own [performance] and how you want to go about it. If their sound is … not blending well, you can think aboutways to change and improve that for your own group.[177]

> [T]he Karina Yau recording is the most understandable and the one that gives me the most real world/future performance applicable information.[178]

Perhaps the most unified response from the participants regarded the case study's final question:

> "Is there a different experience between your first and second viewing? Yes / No.
>
> If yes, can you please describe how it is different and if you have a preference?"

All nine participants indicated that there was a difference between the two viewing conditions. Some participants commented on the passivity of the first viewing in which they participated as "audience members."

[177] Participant 1. See Appendix L.
[178] Participant 2. See Appendix M.

> The first time, the viewer can just listen in and really take in the sound. They can listen more in a personal way, which can be a major factor in having [determining] a great performance. When the score was added, then the viewer wasn't really listening to the musicality of the piece, they were listening to correctness and accuracy, which is another big concept when listening to others perform.[179]

Regardless of whether or not the participants had the score in a split or full screen display, the inclusion of the score for the second viewings provided more information for them to make more critical assessments of the performances.

> I can see what they are supposed to play. Before, I could only make assumptions on how the piece should be played by the common traits found in all the performances. With the score, I could follow the music and see what the rhythms are and how the voices mix with each other dynamically. I prefer the second method (using the score) because you can relate the interpretation of the performers to the interpretation of the composer.[180]

> Following along with the music made a lot of things so much clearer. I could follow along with the audio way more easily, and I could start to see why there were some differences in instrument choices for certain parts.[181]

> …having the score and listening for each sound that enters in and each players part. I enjoyed the second viewing more than the first because I had more information not just that the one video quality is better.[182]

For one participant who had the score in full display on their devices, the absence of visual elements changed their perception on the accuracy of performance, itself.

> In the first viewing, I made my decision based off of the content of the video alone. In the second viewing, following the score, my decision was informed solely by the musical quality without the distraction of a video.[183]

[179] Participant 4. See Appendix O.
[180] Participant 6. See Appendix Q.
[181] Participant 7. See Appendix R.
[182] Participant 9. See Appendix T.
[183] Participant 3. See Appendix N.

This is not to say that the participants who had split screen were any less influenced by the inclusion of the score. For two participants, following along with the score allowed them to reconsider the performance quality when it came to excerpts that they felt had poorer visual quality in comparison to the rest of the videos in the case study playlist.

> I was less sure about Bill Cahn's video before the second recording, but it really cemented for me how good the interpretation is. I think I was misled by comparatively poor production quality; not to say there isn't anything worth studying in the Salvito recording, but I think the Nexus one is pretty definitive.[184]

> I think the video quality has a major role in determining what I liked in the first viewing. The first video [*Amadindapercussion*]was kind of boring to watch since they were staring at their music and the quality was so grainy. However, listening back to it with the score, I was able to focus on the music and it sounds fantastic![185]

4.10 Limitations of the Case Study

As previously mentioned, this case study was constructed and disseminated to the participants *before* I developed and executed the corpus study discussed in Chapter 3. Had this not been the case, I could have taken the resultant data from the corpus study (e.g., timbre, tempi) and implemented it into the construction of the case study. Perhaps this would have yielded a stronger correlation between my analyses and the responses from the case study participants, but my intentions were to solicit as much "raw" data about their perceptions of the video excerpts; perhaps if I had asked detailed questions about tempi, then the participants may have become too focused on this aspect of each excerpt. Although the participants recorded their computer screens whilst they completed the case study and I did not individually proctor the excerpts to them, they were never truly embedded within YouTube's environment. Despite using

[184] Participant 8. See Appendix S.
[185] Participant 1. See Appendix L.

the site's interface to start and stop the videos, they were only directed to watch a specific playlist of video content and each participant watched these excerpts in the order of their appearance on both the YouTube playlist and within the case study Word document. Additionally, the case study prompted the participants to execute certain tasks and answer specific questions pertaining to the five excerpts they viewed. Another limitation was the time frame in which I disseminated the case study materials and when I asked the participant pool to submit them by: in the late spring of 2021. I contemplated the idea of conducting exit-interviews and more in-depth follow-ups with each participant, but securing the appropriate amount of time would have not been ideal—the participants were at the cusp of finishing their respective spring semesters, and were likely fatigued from having a large portion of their education through an online medium (e.g., Zoom) due to the COVID-19 pandemic.

4. 11 Conclusions: Mixed Reception, Individual Perception

Upon the completion of this case study, one can observe both the similarities and differences in thought within this participant pool. On a larger scale, all participants expressed both the benefits of and concerns with viewing percussion performance videos on YouTube, and that the two excerpt viewing conditions in the case study created differing experiences. In examining their individual responses, however, one can observe that their reception and perception of the video excerpts quickly becomes diverging streams of opinion.

The participants viewed the first excerpts simply as audience members within the YouTube environment. Although asking the participants which video excerpt was their favourite may have been moot, it can reaffirm how the visual modality can influence their opinions of the video content. Between the two viewing conditions (without and with the musical score),

however, the visual aspects of the video excerpts can be perceived by the viewers in differing contexts. The visual nature of percussion performance lends itself well to a platform such as YouTube, and videos of its repertoire can provide viewers with a wealth of information. But when considering the nature of the first viewing and the resultant data from this case study, an important factor must be addressed: visual presentation.

Visual presentation refers to the manner in which the video's uploader—or those involved in the post-production processes—has curated the visual components of their performance/recording. This curation can manifest into varying layers of intensity; capturing a live concert with one, unchanging camera angle would be the lowest level within the spectrum of performance videos available on YouTube. NEXUS' video (uploaded to YouTube by user *Bill Cahn*) was indeed a live performance from 1984, but the video's multiple camera angles were curated by professionals employed by the concert venue. Going further along this spectrum, viewers on YouTube can encounter highly curated videos of percussion performance. Christopher Salvito not only performed in his upload of *Third Construction* to YouTube, but additionally served as the visual post-production editor. His resultant work illustrates a thoughtful curation as his changing camera angles communicate the flow of musical material from one player to another in Cage's quartet.

As noted in Chapter 2, percussionist Evan Chapman is perhaps the foremost producer of percussion performance videos on YouTube, and has been contracted by large percussion corporations, notable professional ensembles, and well-established composers. He and his company (four/ten media) have curated videos that often incorporate interesting lighting effects, visual enhancements, and numerous camera angles all of which create a more cinematic viewing experience. This high level of curation can perhaps correspond to the concept of motivated

editing, a term rooted in television and film studies.[186] Whether it be for preservation, for the promotion of one's artistic portfolio (e.g., performance CV, audiovisual production resumé), for artistic expression, or for the purposes of reaching a wider, nearly global audience, there are many motivating factors to shoot, edit, curate, and upload videos of music performance onto YouTube.

Referring back to the participants' choices for their favourite excerpt, six chose the upload with the most dynamic visual elements (*Christopher Salvito*).

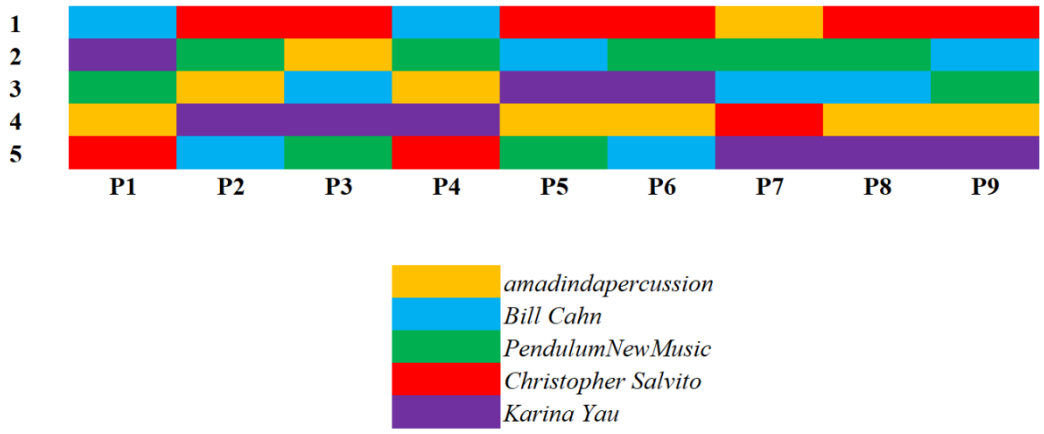


Fig. 4.2 – Most favourite (1) to least favourite (5) rankings from first excerpt viewing

Two of the remaining three participants (P1 and P4) chose the upload by *Bill Cahn* (performed by NEXUS) and one participant (P7) chose *amadindapercussion's* upload as their favourite—both of these videos have multiple camera angles that change throughout the performance. This draw toward the videos with more dynamic visual elements is also supported by evaluations of the excerpt that had only one camera angle throughout: the upload by *Karina Yau*. Six of the nine participants indicated that this excerpt was either their least or second least favourite excerpt,

[186] Fiske, John. *Television Culture* (London: Methuen & Co. Ltd., 1987), pgs. 26–28.

likely due to its unchanging, static view; "It looked like someone just put their camera up in a corner up on stage and just went for it…"[187] This is not to say that videos with more than one camera angle will always be more favored by its viewers. The two oldest excerpts, chronologically speaking, did not always receive high evaluations regarding their video quality; six participants rated the video quality of *amadindapercussion's* upload as "Fair" and five rated *Bill Cahn's* (NEXUS) upload as having "Not Good" video quality. These videos were shot in 1992 and 1984, respectively, but their existence on YouTube places them in competition with videos shot with more modern, and more sophisticated recording technologies.

Given the participants' favourable reception of videos with multiple camera angles, and their opinions on the video quality of the two oldest excerpts, it can be concluded that visual presentation is the combination of two key elements: quality and dynamicity. Quality, in this context, describes a video's visual and audial excellence which is contingent upon: 1) the recording devices used to capture the sights and sounds of a performance and; 2) post-productional processes. Dynamicity is simply defined as the quality of being dynamic, but my use of this term only concerns the visual elements of the performance videos available on YouTube: how one visually captures the actions of the performers (i.e., cinematography) and how one curates and renders these contents (e.g., changes in camera angles, visual effects) in the post-productional stage. The visual presentation of a performance video can also be impacted by the economic resources available—high quality audio and visual recording equipment and editing software needed to produce these performance videos can be quite expensive. In addition to having these necessary tools, one would also have to develop their skills with using them—from my experiences as a teaching assistant for the percussion ensemble during the COVID-19

[187] Participant 7's commentary on *Karina Yau's* YouTube upload of *Third Construction*. See Appendix R.

pandemic, I spent many hours sitting behind my computer learning to synchronize audio recordings with video footage from multiple cameras, and curating them to be as interesting as possible for our online audiences.

Regardless of how the video excerpts were received upon their first viewing, the participants all expressed that their experiences were different when prompted to follow along with the score while viewing the videos a second time. This instruction was designed to: 1) solicit participant opinions on the accuracy of the performers' interpretations of the score and; 2) elaborate on their observations with regards to instrument selection, stick/mallet choices, the ensemble's set-up, and performer gestures. Five participants had the PDF file of the excerpted score in full display on their computer screens; four had both the score and the YouTube excerpts in a split screen display. Whether or not participants had the videos in view or not, their evaluations were based on their perceptions of how the excerpts related *back* to the text of the work (i.e., the score). Does this process of mapping sound back to the musical text usually occur in this direction for today's generation of undergraduate musicians?

Aaron Willamon and Georgia Volioti conducted a study in 2017 that asked both student and professional musicians about their experiences with using recordings of music in order to prepare for performance.[188] One question in their survey asked: "At what stage(s) in your learning/practising are you likely to listen to recordings of that piece?" Willamon and Volioti created five stages, and instructed the participants to answer on a Likert-scale from "Never" to "Always" (1 to 5) based on their own experiences.

[188] Volioti, Georgia and Aaron Willamon. "Recordings as learning and practising resources for performance: Exploring attitudes and behaviours of music students and professionals." *Musicae Scientiae* Vol. 21 No. 4 (2017), pgs. 499–523.

17. **At what stage(s) in your learning/practising are you likely to listen to recordings of that piece?**	Never				Always
Before starting to learn/practise	1	2	3	4	5
Early on during the learning/practising process	1	2	3	4	5
Later in the learning/practising process but before giving a polished performance	1	2	3	4	5
Only after producing a polished performance	1	2	3	4	5

Fig. 4.8 – Question #17 in Willamon and Volioti (2017). Used with permission from the authors.

The average response from the student musicians was well above "3" for the first two stages: "before starting to practise", and "early on during the learning/practising process." Katie Lai's survey indicated that 81 percent of the participant pool (undergraduate musicians at Hong Kong Baptist University) used YouTube as their primary consultant when preparing for lessons or rehearsals.[189] As one participant noted, using YouTube can "…inform[ing] percussionists [on] how to conceptualize a piece before approaching their instruments."[190] If musicians are exposed to audiovisual recordings of music performance *before* they encounter the musical score, to what degree are their perceptions influenced?

The absence of or decreased attention to the visual modality of the video excerpts (i.e., full screen of the score versus split screen between the score and YouTube) had a significant impact on which video the participants believed to be the most accurate interpretation.

[189] Lai, Katie. "How are Undergraduates Using YouTube?: A Survey on Music Students' Use of YouTube." *Music Reference Services Quarterly* Vol.16 (2013), pg. 205.
[190] Participant 3. See Appendix N.

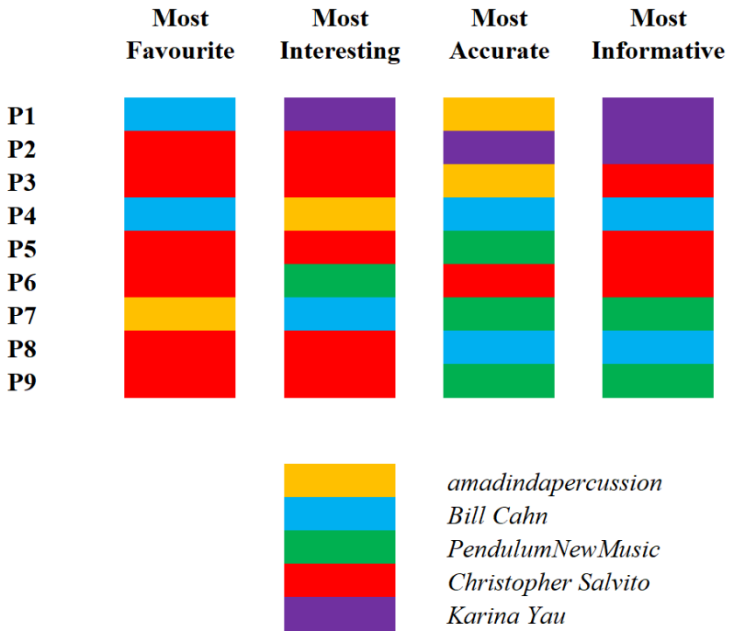


Fig. 4.9 – Chart of most favourite, interesting, accurate, and informative by each participant

From an examination of the above chart, only Participants 4 and 6 indicated that their favourite excerpt was the one they deemed to be the most accurate interpretation. The remaining seven participants chose entirely different excerpts from the ones they initially indicated to be their favourites. Their senses of accuracy also strongly correlated to what they said would provide them with the most information; six of the nine participants indicated that the most informative and the most accurate according to the score were the same excerpt.

With the wealth of information gathered from this case study, and also from my own corpus study of select YouTube videos of *Third Construction*, the focus will now shift to the overarching conclusions resulting from this research. In addition to these remarks, I will also pose further avenues of research regarding music performance and YouTube.

Chapter 5
Here, Now, and What Could Lie Ahead

5.1 Here: Overarching Conclusions from This Research

The impacts of the digitisation of music performance discussed in this dissertation—through the YouTube platform—cannot be overstated: online dissemination allows one's video content to have global reach; videos can not only be shared with others outside the platform, but registered users on YouTube have the ability to be more engaged than ever before (e.g., commenting or "liking/disliking" videos). YouTube is the massive host to a wide array of subcultures presenting material on nearly every topic imaginable; the early days of vlogging still continue on in some capacity, but transitions in societal behaviors and the life cycle of trends—both within digital environments and everyday "real" life—have allowed for numerous video genres to both emerge and fade away. As much as one can see YouTube's enormity in the 21st century, its metamorphosis has become domestically embedded into the minds of its users, perhaps subconsciously. The rapidity of technological changes and advancements far outpace the written word; society is likely to live *through* the experiences of technology rather than reading about or documenting their developments as they occur.

For percussionists, and musicians alike, YouTube offers instant access to what seems like an unending catalogue of music performance recordings. However, not all recordings of music performance are equal to others on YouTube; be it a studio recording, a filmed performance of a student recital, or a highly curated, cinematic experience akin to a "music video," all of the varying levels of production/post-production compete within the same sociocultural economy. There are varying degrees of motivation for uploading music performance videos onto YouTube:

to house one's own artistic portfolio for free, to share something with friends and family abroad, or to receive commentary and feedback on one's performance.

Much of recorded music's history divorced sight from sound until the advent of film, but experiencing music performance through an audiovisual medium did not become as readily available until the arrival of YouTube. While it is true that audiovisual recordings of music performance were produced onto VHS tapes and DVDs, their accessibility pales in comparison to the instantaneous reach that YouTube has. The presence of visual information in percussion performance videos can assist an individual with their own approaches when learning musical works; examining the types and physical arrangement of instruments, taking into consideration the interpretive choices of other percussionists, observing the types of mallets or sticks one has used, and even viewing the various methods and techniques for capturing sound and video. But the visual medium can cloud the perceptions of the quality of music performance—expressive facial or physical gestures,[191] or even one's attire[192] can impact viewer evaluation. So how would one evaluate audiovisual recordings of music performance within an online environment such as YouTube? An environment, mind you, that circulates its content based on algorithms curtailed toward user habits; a website where the "audience" can indicate their favourability of or displeasure for video content by simply clicking a "thumbs up" or "thumbs down" icon, or writing commentary that becomes a paratext of the video itself; a video-sharing giant that knows what you've searched for, what you've watched, and how long you've watched for; a host to a variety of subcultures where information, leisure, and anything in between is just one click away. What then?

[191] See Tsay, Chia-Jung (2013).
[192] See Griffiths, Noola K. (2009)

The participants in the case study discussed in Chapter 4 viewed five excerpts of performance videos of *Third Construction* and did so under differing circumstances: first, simply as "audience members" on YouTube, and; second, following along with the score and seeking specific information. Upon the completion of the first excerpt viewing, one video emerged as a clear favourite within the participant pool: the upload from *Christopher Salvito*. His work as both a performer and the visual post-production editor resulted in a highly polished, curated video: close up intimate shots of hands, sticks, and instruments that changed nearly every 3.5 seconds showing the relationship between the entrances and exits of the musical material among the quartet. His visual presentation consisting of high audiovisual quality and dynamic camera angles won over the eyes of six of the nine participants. But upon the second viewing of the excerpts, however, many minds were changed.

The inclusion of the score provided greater context to the video excerpts that the participants examined. Five participants had the score in full view on their devices, while four split the screen evenly between Cage's notation and the YouTube window. Regardless of these approaches, most of their opinions on the quality of performance—accuracy and interpretation of the score—differed from their initial encounters with the video excerpts.

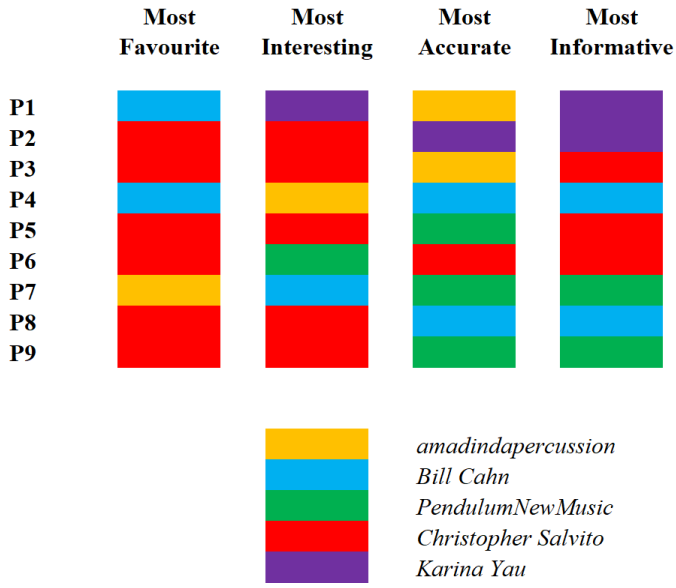


Fig. 4.9 – Chart of most favourite, interesting, accurate, and informative by each participant

Rather than just "make assumptions on how the piece should be played by the common traits found in all the performances,"[193] participants had to map the sounds of the performance back to Cage's musical text (i.e., the score). The archaic process of seeing notation first, performing actions, and then hearing/listening to sound has perhaps become reversed for today's generation of musicians; one percussionist in this case study expressed that being able to conceptualize a composition *before* approaching their instrument(s) was of great benefit to them.[194] Willamon and Volioti's 2017 survey indicated that their pool of student musicians frequently choose to listen to recordings *before* they begin learning or practising their repertoire.

The corpus study discussed in Chapter 3 demonstrated how one could navigate and collect audiovisual recordings of music performance on YouTube. A number of qualitative and empirical trends have emerged from the analysis of these 20 performance videos of *Third*

[193] Participant 6. See Appendix Q.
[194] Participant 3. See Appendix N.

Construction. The dissemination and trajectory of the work's performance practice could be compared to other, more aged styles of music performance (e.g., Baroque). Cage and his Percussion Players were amateurs with no formal percussion training; no recording of the work's 1941 premiere exists, and we can only make inferences about it by consulting written documentation (e.g., books, interviews) and preserved photos that chronicled the composer's life. The piece was "rediscovered" in the mid 1970s by the Blackearth Percussion Group who began touring the work in the U.S. and Europe, but the group disbanded in 1979. The first commercially available recording wasn't made until 1982 by the percussion group NEXUS (Canada), who also toured the world with Cage's quartet in their performance repertoire. Amadinda Percussion (Hungary) also championed the work in the late1980s and early 1990s and other notable ensembles that have formed since (e.g., Sō Percussion, Third Coast Percussion) have also mastered *Third Construction*.

Cage's quartet is securely stapled within the heart of percussion quartet repertoire and is performed all over the world. The ability to choose one's drums and tin cans gives percussionists opportunities to explore and create chameleon-like aesthetics of sound and timbre each time they perform the work. Despite the differences in and variety of instrument selection and sounds within the examined corpus of performance videos, the shaping of the work's tempi all follow a similar contour. I find it very poignant that Cage's instructions to successively play "fast," "faster," and then "accelerate" also depict the developments of recording technology that have occurred within the span of about 150 years: the changes in its mediums (vinyl, cassette, CD, mp3); the changes in its dissemination (physical objects that were one once sold to now being digitally accessible on YouTube) and; its subsequent impacts on music performance.

5.2 Now: Causes for Concern

Although the term "Big Tech" may be used as an American, political buzzword, it does accurately describe the omnipresence of Internet corporations such as YouTube. While perhaps videos of percussion performance are not as high on their radar, these large tech corporations wield immense power when questions regarding the flow of information, censorship, data collection, privacy rights, or freedom of speech/expression come into view. A number of anti-trust lawsuits have been launched against YouTube's parent company—Google is the most visited website worldwide, and its search engine has essentially monopolized the flow of traffic on the Internet. Facebook CEO Mark Zuckerberg has been called to testify in Washington, D.C. about his company's questionable practices pertaining to user data and information security, censorship of free speech, and their acquisitions of Instagram and WhatsApp (2012 and 2014, respectively); Twitter CEO Jack Dorsey and Google CEO Sudar Pichai have also testified at a number of these anti-trust hearings conducted by the Judiciary Committee of the United States Senate.[195] Since 2016, investigations into the spying software program Pegasus have lead to numerous news articles that detail the nefarious uses of this technology which have sounded an even louder alarm on the growing threats to cyber security. Given these concerns—and many others too lengthy to discuss in this concluding chapter—what, if any, relation do they have to the percussion field? What is concerning about the digitisation of music performance?

[195] "CEOs Mark Zuckerberg, Tim Cook, Jeff Bezos & Sudar Pichai testify before House Judiciary Cmte," C-SPAN. Steamed live on 29 July, 2020 <https://www.youtube.com/watch?v=1s1uWo1_bzg>Accessed 1 September, 2021.

See also "Watch Live: Facebook, Google and Twitter CEOs testify on Capitol Hill – 3/25/21," CNBC Television. Streamed live on 25 March, 2021 < https://www.youtube.com/watch?v=UipFasl_nD0> Accessed 1 September, 2021.

If we are indeed living in Thibeault's "postperformance" world, then discussions about our performative craft must continue—even more so now with the lingering effects of the COVID-19 global pandemic. Postperformance doesn't necessarily constitute the absence of live performance altogether, but recognizes the reality that most experiences with listening to music primarily take place within digital environments.[196] Even the notion of recorded music performance has prompted significant considerations and discussions; although recordings of music performance could not exist without human musicians, the context of their manifestation can diverge into a multitude of meanings. Recordings of "live" music refer to the capturing of an event that previously occurred with the presence of human bodies serving in the roles of performers and audiences. But even highly edited, "note perfect" recordings can still be perceived as performances to those who listen to them; the musicians who take part in these processes do indeed perform, but the resultant products serve as a woven quilt comprised of their "best of" moments while in the recording studio. Nicholas Cook describes "musical diegesis" as an act of listening, where experiencing music—whether it is "live," a recorded "live" event, or a pristine artefact of musical perfection—is a continuous unfolding event.[197]

All nine of the case study participants disclosed that they only watch either two or three videos of the *same* composition to use as references in their own experiences with learning percussion repertoire. These experiences can be impressionable on the viewers, and the videos that they will likely encounter are controlled by YouTube's infrastructure: the uses of algorithms that are not disclosed to the public and that are reshaped by viewer activity. In the first chapter of this dissertation, I said that experiences with recordings of music are "all at the control of a

[196] Thibeault, Matthew. "Music Education in the Postperformance World." In *The Oxford Handbook of Music Education*, Vol. 2., edited by Gary McPherson and Graham F. Welch. Oxford: Oxford University Press, 2012.
[197] Cook, Nicholas. *Beyond the Score*, pgs. 366–367.

listener's fingertips." Rather than recant this statement, it would be more fitting to say that there are two simultaneous truths. The first is that listeners do have control over their listening experience (i.e., starting, pausing, rewinding, fast forwarding, skipping, etc.). The second, however, is that the recordings one is led to are indeed shaped and controlled by platforms such as Spotify, Pandora, and YouTube. The use of algorithms on YouTube—and other social media platforms as well—has become a growing concern; while there are certainly more pressing societal matters than videos of music performance, the changes in algorithm designs and their implementations can affect all types of online content. With this in mind, what should we be concerned about as musicians? In my opinion, we must look to address the differing notions of value and how they may impact musical training.

What is valuable to some, may not be valuable to others. Despite their public relations campaigns to encourage content creation and foster a "community", YouTube's bottom line is rather simple: keep people watching and keep accruing advertisement revenue—their $15 billion dollar earnings account for about 10% of Google's revenue.[198] Monetary value aside, however, YouTube ultimately serves as the digital gatekeeper to the largest online collection of video content, including videos of music performance—but our interactions on the site do play a role in reshaping the algorithms that contribute to the circulation of content. What we are essentially left with is a "feedback loop": algorithms lead us to content, our interactions with videos contribute data back to the algorithms, and the cycle begins again.

[198] Statt, Nick. "YouTube is a $15 billion-a-year business, Google reveals for the first time." *The Verge* (3 February, 2020) <https://www.theverge.com/2020/2/3/21121207/youtube-google-alphabet-earnings-revenue-first time-reveal-q4-2019>. Accessed 01 September, 2021.

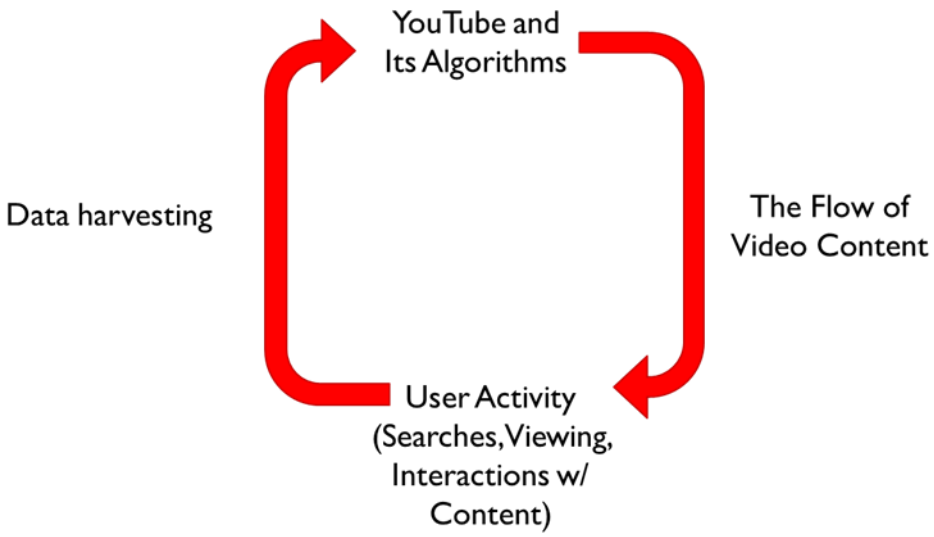


Fig. 5.1 – "Feedback loop" of content on YouTube

In the eyes of the case study participants, videos of percussion performance present varying types of value: some value excellence in audio, visual, or audiovisual quality; others value being able to watch professional performers; some see value in observing the performance experiences of other student percussionists; some simply value the ability to see and hear realizations of repertoire in order to assist them with their own practise. Regardless of these different types of value, YouTube's bottom line as a company and the site's algorithmic processes point toward one value: stimulation. Viewer stimulation (i.e., degrees of engagement, amount of watch time) equals economic stimulation for YouTube.

As I discussed in Chapter 3, both audio and visual recording technologies have offered spectators to witness new sets of intimacies for both their ears and their eyes (e.g., Bing Crosby's "crooning," multiple camera angles). Aspiring performers (i.e., university students), however, are not just "listeners" or "audience members"—the synergetic experiences of observing *and* participating in music performance can assist, shape, and influence them throughout their respective journeys. The digitisation of music performance has been able to offer experiences

that cannot be replicated inside the concert hall—certainly, one could argue the reverse is also true. While these online experiences can be inspirational or highly motivating, we must consider their potential use for one's musical training.

Studying music at the post secondary level is a rigorous endeavour. In addition to the hours spent practising, rehearsing, and performing, music students are also tasked with taking seminars on music history and music theory, as well as other courses pertinent to the specific focus of their degrees (e.g., music performance, music education, music composition.). Aside from these courses, do students have requirements for attending concerts? When I was an undergraduate student, music majors were required to attend ten concerts a semester and submit brief summaries about three of them. In my doctoral studies, I took a graduate seminar entitled "Interpretive Analysis for 20th and 21st Century Music" (MUS4838). One assignment prompted us to compare two audio recordings of a work from our own repertoire—in my case, percussion music. This was my first experience discussing interpretation and performance within a classroom setting; an environment with people from a variety of musical backgrounds and perspectives. Prior to this course, discussions of this nature primarily took place in my private lessons, in percussion ensemble rehearsals, or in masterclass settings. Similar conversations also occurred with my percussion colleagues during my undergraduate studies while we watched performance videos on YouTube, but our discussions were more casual in nature.

University administrators and educators should seek to incorporate the study of YouTube into current music curricula. There are plenty of concerns to be had: the algorithms that control the circulation of content, its less-than-scholarly appeal (e.g., lacking standards of metadata/organization, the search engine's basic construction), its vernacular nature. There are, however, a number of potential benefits as well: its cultural relevance, its instant accessibility, its

"endless" amount of content. Rather than seeking to reconcile these opposing forces, we should encourage that they become a greater part of the discussions held within academic environments. Aside from the possibilities to evaluate or analyze videos of music performance, YouTube can provide opportunities to discuss how our online experiences can be applicable, or not, to one's own craft. Students should be encouraged to contextualise these digital experiences rather than just "simply and solely watching."[199]

5.3 What Lies Ahead: Further Avenues of Research

The combination of visual and audial elements of YouTube videos can present a wealth of information and discussion for a number of disciplines: piano performance, string performance, and conducting are the first that come to mind. This is not to say, however, that other disciplines of music performance could not be researched in this regard. YouTube has nearly 500-plus hours of video content uploaded onto its site every minute[200]—its very likely that a plethora of music performance videos are there now, and are just waiting to be "discovered."

Perhaps researchers within the music education field could conduct a variety of experiments on participants evaluating audiovisual recordings of music performance. One could undertake a similar approach that Noola K. Griffith took in her "*Claire de lune* experiment by interchanging the audial and visual elements of amateur and professional recordings. However, if one were to incorporate the unique aspects of YouTube's environment that are visible to the viewers (e.g., number of views, comments left by viewers), it could yield additional layers of data to unpack and analyze. What if a video of a high quality, professional performance was

[199] Participant 2. See Appendix M.
[200] Hale, James. "More Than 500 hours Of Content Are Now Being Uploaded to YouTube Every Minute." 07 May, 2019 <https://www.tubefilter.com/2019/05/07/number-hours-video-uploaded-to-youtube-per-minute/>. Accessed 01 September, 2021.

riddled with hoards of "dislikes," or negative comments? Would these crowd-sourcing metrics or paratexts of audience reception (i.e., comments) have a significant influence on a viewer's opinion? Another possible experiment would be to interchange the audial and visual elements of a recording of live performance with that of a "pristine" recording that was made in a studio and paired with a highly-curated video; would viewers be aware of the errors made in a live performance (e.g., wrong notes, incorrect tempi, rhythmic discrepancies) if they were watching a visually dynamic and stimulating video?

How has YouTube impacted the performance of younger players? An interesting facet of YouTube is its present capabilities for viewers to playback videos at varying speeds. In the late 2000s a number of tech blogs discussed this possibility (via external, plug-in software programs), but YouTube has since built this capability directly into the site's interface. [201] This feature is located within the "Settings" menu of each video, and allows the contents to be played at various intervals from 25% to 200% of their normal speed.

[201] Moon, Mariella. "YouTube brings playback speed choices to mobile." *Engadget* 10 September, 2017 <https://www.engadget.com/2017-09-09-youtube-playback-speed-mobile-ios-android.html> . Accessed 31 August, 2021.

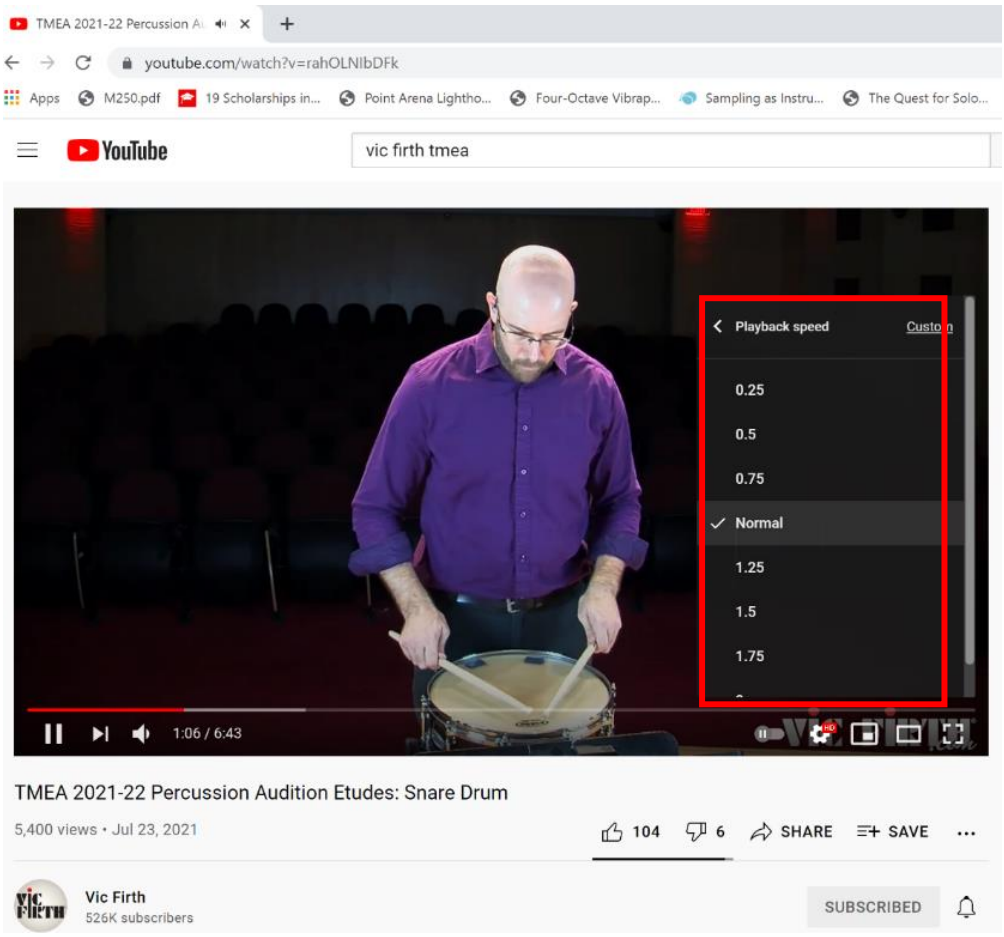


Fig. 5.2 – Screenshot of playback speed options under "Settings" menu on YouTube videos

As a number of case study participants noted, audiovisual recordings of music performance can supplement other areas of the learning process that cannot be offered by the score alone. But have younger musicians become too dependent on YouTube videos to assist them in their own learning process? If so, has this dependence impacted their literacy of reading music notation? The Texas Music Education Association (TMEA) has provided percussion applicants auditioning for its All-State Band or All-State Orchestra with performance videos of audition repertoire, which have been uploaded onto the Vic Firth Company's YouTube channel.[202]

[202] Search conducted on Vic Firth's YouTube channel, <https://www.youtube.com/c/VicFirthCompany/search?query=TMEA>

The reference recordings of the 2021–2022 audition repertoire are quite interesting; in addition to the etudes recorded at their proper tempi, the videos also contain the same footage duplicated at varying speeds: "slow," "medium," and "fast" or "fast with play along track."[203]

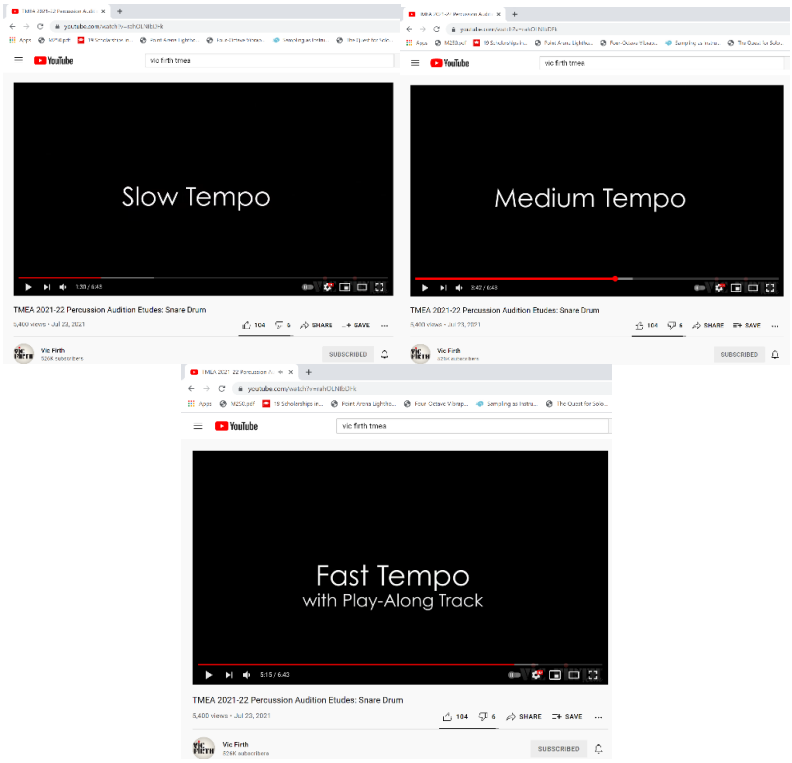


Fig. 5.3 – Screenshots of "slow," "medium," and "fast" versions of TMEA 2021-22 audition etude

Previous studies have discussed the effects of video playback speed on the learning process: two researchers in Japan studied 19 participants who viewed online educational videos; their experiments indicated that the verbal learners within the participant pool spent longer durations of time viewing the video content at twice its normal speed (2.0x).[204] Neta Alexander discusses this approach of "speed watching" video content from a philosophical perspective: one must

[203] Vic Firth, "TMEA 2021-22 Percussion Audition Etudes: Snare Drum." YouTube video, July 23, 2021 <https://www.youtube.com/watch?v=rahOLNIbDFk>. Accessed 31 August, 2021.

[204] Nagahama, Toru and Yusuke Morita. 2017. "An Analysis of Students' Learning Behaviors Using Variable-Speed Playback Functionality on Online Educational Platforms." Paper presented at *HCI International Conference*: Vancouver, British Columbia, July 9–14. https://link.springer.com/chapter/10.1007/978-3319-58753-0_24

consider the effects it may have on the creation and reception of visual art such as film, and also its potential cognitive impacts (e.g., comprehension, retention).[205] It would be interesting to see if this type of research could be adapted for examining videos of music performance and their effects on those who use them as a learning tool.

What about YouTube's role in the dissemination of new repertoire? Do younger composers utilize the site, or other social media platforms, to promote their works more so than the more traditional route of seeking contracts with music publication companies? For performers, has YouTube become the place to "window shop" for new pieces to learn? —one participant in the case study I conducted expressed that they sometimes make assessments about a composition's quality based on its audiovisual presentation.[206] If YouTube users can see exactly how long people are watching their content, would that influence *how* they create and/or present their works of art? Platforms for "streaming" music have had significant impact on the popular music industry: artists say that their involvement with platforms such as Spotify and Apple Music has only earned them pennies on the dollar and does not create a sustainable avenue of income[207]; some pop hits are "reverse-engineered" with the first thirty seconds being the focal point in order to attract and retain a listener's attention.[208] In 2020, YouTube launched a new type of video genre: "Shorts", which was likely developed in order to compete with other social media/video-sharing platforms (e.g., Instagram and Tik Tok).

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[205] Alexander, Neta. "Speed Watching, Efficiency, and the New Temporalities of Digital Spectatorship." In *The Moving Image in the Age of Bit-Sized Media* edited by Pepita Hesselberth and Maria Poulaki. Bloomsbury Academic, 2017. Accessed via academia.edu <https://www.academia.edu/35904657/Speed_Watching_Efficiency_and_the_New_Temporalities_of_Digital_Spectatorship> 28 August, 2021.

[206] Participant 8, See Appendix S.

[207] Sisario, Ben. " Musicians Say Streaming Doesn't Pay. Can the Industry Change?" *New York Times.* < https://www.nytimes.com/2021/05/07/arts/music/streaming-music-payments.html>.

[208] Scherzinger, Martin. "The Political Economy of Streaming," pg. 237–238.

In 2019, it was estimated that about 500-plus hours of new content is uploaded onto YouTube every minute.[209] Oversaturation of video content would certainly be an understatement, but how might this relate to videos of music performance? As I discovered, my YouTube searches for performance videos of *Third Construction* yielded 119 results, but with four instances of duplicated videos and eight performances split between two separate video uploads—ultimately, this results in 107 realizations of the work that have been recorded and posted onto YouTube. If it is not as useful for one to upload their performance videos of canonized repertoire, and composers are utilizing the site to promote and circulate new compositions, it is possible that musical interpretation may become more homogenised? For example, there are only five video uploads of Robert Honstein's six movement vibraphone solo, *An Economy of Means* (2016), in its entirety; the only way to investigate variances in interpretation would be to conduct corpus studies similar to the one discussed in Chapter 3. But if more audiovisual recordings are not uploaded onto the site, then this type of research may not be as readily possible or may not reveal substantial data. Some student percussionists may not want to upload any of their own performances online, perhaps due to their own conscious or subconscious anxieties (e.g., having their work possibly to "note perfect" recordings).

5.4 Final Remarks

I believe that research into how music students consume and interact with digital media related to their own practice is increasingly relevant and necessary. Today's undergraduate student body consists of "digital natives" who have grown up in a technology-saturated

[209] Hale, James. "More Than 500 hours Of Content Are Now Being Uploaded to YouTube Every Minute." 07 May, 2019 <https://www.tubefilter.com/2019/05/07/number-hours-video-uploaded-to-youtube-per-minute/>. Accessed 01 September, 2021.

environment. [210] Their every day uses of electronic devices (e.g., computers, smartphones) serve varying purposes such as communication, entertainment, and accessing information.[211] The continued need of integrating and connecting a student's sociotechnical life to their educational experience has been advocated by numerous scholars (Cain, 2004; Crawford, 2007; Dillon, 2007; Choi & Piro, 2009; Mark & Madura, 2010). The use of YouTube as a resource for audiovisual recordings of music performance can certainly be a contested issue, but advocates and doubters alike must acknowledge its presence in the lives of the current and future generations of students.

I could think of no better way to engage students in further discussions about their musical craft (e.g., performance, composition) than through a medium that has significant relevance to their own lives.

[210] Prensky, Marc. "Digital Natives, Digital Immigrants." *On the Horizon* Vol. 9 No. 5 (October, 2001).
[211] Dougan, Kirstin. "Music, YouTube, and Academic Libraries." *Notes* Vol. 72, No. 3 (March, 2016), pg. 492.

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Appendix A

Third Construction videos available on YouTube
arranged in chronological order (as of September 1st, 2021)

Uploader	Upload Date	Views	Performance Date	Location	Context	Camera Angle(s)	Visual Quality
Alvaro Rodas	12.18.2008	700	10.23.2008	Guatemala	Live	static angle	240p
Alvaro Rodas	12.18.2008	349	10.23.2008	Guatemala	Live	static angle	240p
Sideshow097	4.10.2009	1,381	4.5.2009	Arizona State Uni.	Live	static angle	360p
Thomas Wilson	5.2.2009	655		Umass Amherst	Live	static angle	360p
Thomas Wilson	5.2.2009	328		Umass Amherst	Live	static angle	360p
Mariano Vega	6.15.2009	675	10.2008	Univ. de Lanús	Live	multi-angle	240p
Mariano Vega	6.15.2009	561	10.2008	Univ. de Lanús	Live	multi-angle	240p
Matteo flori	3.17.2010	532			Live	home-video style	240p
Matteo flori	3.17.2010	1,011			Live	home-video style	240p
Jose Abram Lujan	3.21.2010	109			Live	multi-angle	240p
Jon Nathan	4.6.2010	21	Winter 2010	UCSB	Live	static angle	480p
Jon Nathan	4.6.2010	25	Winter 2010	UCSB	Live	static angle	480p
Andrew Furhman	6.1.2010	970	11.18.2008	Eastman School of Music	Live	static angle	480p
Andrew Furhman	6.1.2010	325	11.18.2008	Eastman School of Music	Live	static angle	480p
Orkester Norden	8.9.2010	351	8.7.2010	Kristiansand, Norway	Live	static angle	480p
VNPercussion	11.2.2010	901	2010	Festival Hitzacker	Live	multi-angle	480p
Aurél Holló	11.14.2010	13,699	1992	Budapest, Hungary	Recording	multi-angle	480p
ETLester1	11.26.2010	67			Live	static angle	480p
Vic Firth	3.5.2011	76,597			Recording	multi-angle	480p
Peter Jarvis	8.6.2011	974	1.20.1986	William Patterson College, NJ	Live	home-video style	720p
Mai Tadokoro Hessel	8.11.2011	175		SoPercussion Institute	Live	static angle	480p
Mai Tadokoro Hessel	8.11.2011	137		SoPercussion Institute	Live	static angle	480p
BB7238	11.16.2011	161	Spring 2011	Warner Concert Hall	Live	static angle	480p
amadindapercussion	11.29.2011	1,884	1992	Budapest	Recording	multi-angle	480p
McGillPercussion	12.6.2011	35,837	2011	Halifax, Nova Scotia	Live	static angle	480p
Andrew Neidner	2.4.2012	69			Live	multi-angle	360p
John Korchok	3.6.2012	90	3.5.2012	William Patterson College, NJ	Live	static angle	480p
Candance23	3.14.2012	1,480		Germany	Live	static angle	480p
Architek Percussion	5.17.2012	1,914	4.26.2012	McGill Univ. (Montreal, Quebec)	Live	static angle	480p
NYO Canada	7.13.2012	116			Live	static angle	480p
Liz Soflin	9.5.2012	162		NiefNorf	Live	static-angle	360p
Bill Cahn	10.3.2012	10,430	5.19.1984	Seoul, Korea	Live	multi-angle	360p
PendulumNewMusic	10.31.2012	92	10.10.2012	Univ. of Colorado - Boulder	Live	multi-angle	720p
Sipseywalker	11.24.2012	67	Fall 2012	Furman University	Live	static angle	720p
レドリックちゃんねる	2.3.2013	98			Live	static angle	144p
Michael Silliman	3.5.2013	20			Live	static angle	480p
James Campbell	4.19.2013	45	4.11.2013	Univ. of Kentucky	Live	static angle	360p

Patrick Curry	4.23.2013	37	Fall 2012	Texas A&M	Live	home-video style	480p
Cor Links	5.11.2013	54	6.25.1992	Studiozaal te Tilburg	Live	multi-angle	240p
Taylor Yozwiak	5.18.2013	248	4.13.2013	Umass Amherst	Live	multi-angle	720p
Icreginaelena	6.11.2013	148			Live	static angle	360p
Cristobal Gajardo B.	7.16.2013	11,722	5.1.2012	Yale University	Live	static angle	720p
Mark Sturm	11.15.2013	441		Central Crossing H.S.	Live	static angle	720p
Gabriel Globus-Hoenich	11.26.2013	923		Curtis Institute of Music	Live	multi-angle	480p
Nick Bonaccio	1.13.2014	157	12.10.2013		Live	static angle	480p
Daniel Janca	6.9.2014	795	6.7.2014	Liszt Academy (Budapest)	Live	static angle	720p
Sydney University Wind Orchestra	6.21.2014	113			Live	static angle	720p
Percussion now	11.29.2014	161		Germany	Live	home-video style	480p
Adam Bedell	1.10.2015	43	Spring 2006	Central Mich. Univ.	Live	static angle	480p
IPCL - Daidalos	2.17.2015	2,209	2015	Luxembourg	Live	static angle	720p
IPCL - Ki-Do-Ai-Raku	2.19.2015	1,928	2015	Luxembourg	Live	static angle	720p
IPCL- JJAF Percussion Quartet	2.19.2015	750	2015	Luxembourg	Live	static angle	720p
joeyfox09	2.20.2015	36		Univ. of Akron	Live	static angle	480p
IPCL - Pulast Percussion Group	2.20.2015	485	2015	Luxembourg	Live	static angle	720p
IPCL - Ensemble 1002 Hanji	2.20.2015	1,011	2015	Luxembourg	Live	static angle	720p
Gottardo Paganin	3.9.2015	370	12.9.1983	Italy	Live	static angle	480p
Christopher Salvito	5.15.2015	3,441			Recording	multi-angle	720p
Bobby Fajardo	5.19.2015	27		Univ. of Miami (FL)	Live	static angle	360p
Landon	5.27.2015	81	5.3.2015		Live	static angle	720p
Karina Yau	6.23.2015	123			Live	static angle	720p
Kelly Grill	6.24.2015	40	April.2013	USC	Live	static angle	720p
Chosenvalepercussion	6.26.2015	100	7.6.2013	Chosen Vale Summer Fest.	Live	static angle	720p
Lorena Brabo	8.13.2015	250	6.18.2015	Univ. Federal de Goias	Live	static angle	720p
Spec Drum	9.18.2015	2,570		Toronto, Ontario	Recording	multi-angle	720p
Malloyca	12.1.2015	29	6.2.2015	Ashalnd, OR	Live	static-angle	720p
Nicholas Samuel	12.11.2015	139			Live	static-angle	480p
SOU Percussion	3.16.2016	229		Ashland, OR	Live	static angle	720p
Percussion Ensemble hkbu	3.23.2016	76		HongKong Baptist Univ	Live	multi-angle	720p
Roberto Di Marzo	5.31.2016	142	5.3.2016	Campobasso Fest. Perc	Live	static angle	480p
Vic Firth Concert	9.26.2016	8,288			Recording	multi-angle	720p
Ian McClaflin	12.8.2016	42			Live	static angle	720p
Adam Snow	1.23.2017	125	3.22.2015	Univ. of N. Carolina - Greensboro	Live	static angle	480p
Milton Salazar	5.10.2017	319			Live	static angle	480p
Darren Bastian	9.6.2017	21			Live	static angle	480p
VAN3uard Percussion	9.20.2017	385			Recording	multi-angle	1080p HD
Heidelberger Fruhling	9.29.2017	3,287	4.28.2017	Hedielberger, Germany	Live	multi-angle	1080p HD
Josh Quillen	1.22.2018	19	1.20.2018	Columbia, MD	Live	static angle	720p60
So Percussion	1.30.2018	175	1.20.2018	Columbia, MD	Live	static angle	720p60

Clocks in Motion	2.18.2018		1,045		4.2017	Cleveland St. Univ.	Live		multi-angle	1080p HD
Shane Nickels	3.27.2018		114			Univ. of Kansas	Live		static angle	1080p HD
Eden Porter	4.15.2018		132		4.14.2018	SMU	Live		static angle	360p
Laura Mester	4.17.2018		86		4.16.2018	Pittsburg, PA	Live		static angle	1080p HD
Дмитрий Лукьянов	4.27.2018		372				Live		static angle	1080p HD
Jordan Walsh	5.6.2018		223		4.13.2018		Live		static angle	720p
Kyle Stoker	5.9.2018		31			VCU	Live		multi-angle	1080p HD
Kyle Stoker	5.9.2018		15			VCU	Live		multi-angle	1080p HD
Luke Hildebrandt	5.11.2018		74		4.22.2018	Univ. of British Columbia (Canada)	Live		static angle	720p
GBoydstun Music	7.20.2018		46			Ashland, OR	Live		static angle	720p
Dixit Café by Interpab	7.24.2018		746		7.22.2018	Italy	Live		static angle	720p
John	7.30.2018		44			Round Top Music Festival	Live		multi-angle	1080p HD
Cosimo Lazzarotto	9.11.2018		345		9.1.2018	Italy	Live		static angle	1080p HD
Joshua Weinfeld	9.25.2018		198			Yellow Barn Young Artists Program	Live		static angle	720p
Michigan State University Percussion Ensemble	10.1.2018		19				Live		static angle	360p
Conservatorio "Arriga Boito" Parma	10.5.2018		314		4.7.2018		Live		static angle	720p
WrightStatePerc	1.5.2019		67		12.17.2017		Live		multi-angle	720p
Fernando Chaib	1.25.2019		78		2012		Live		static angle	480p
Leander Percussion	3.3.2019		30		2.8.2019	Leander High School	Live		static angle	1080p HD
Brodie McCash	4.8.2019		30			Univ. of Aberdeen	Live		static angle	1080p50HD
Conservatorio Jesus Guridi Vitoria	4.24.2019		31		2018		Live		multi-angle	1080HD
John Ringor	4.30.2019		111			Northwestern Univ.	Live		static angle	1080pHD
KSU Percussion	5.28.2019		133			Kent State Univ.	Live		multi-angle	1080p60HD
Joseph Murfin	7.2.2019		70		4.13.2014	Chazen Museum of Art (WI)	Live		static angle	1080HD
Seur Percussion	7.31.2019		271				Live		static angle	1080HD
Joseph Murfin	9.7.2019		31		9.21.2013		Live		static angle	1080HD
Tetraktis Percussioni	4.13.2020		276		4.2.2019		Live		multi-angle	1080HD
New Music New College	4.20.2020		58		9.22.2012	New College (Florida)	Live		mult-angle	480p
Colorado State Univ. Center for the Arts	5.1.2020		57			PASIC (Indianapolis, IN)	Live		multi-angle	1080HD
Dustin Patrick	6.29.2020		29		7.6.2013	Chosen Vale 2013	Live		static angle	1080HD
Christian Swofford	6.30.2020		25		Spring 2019	Univ. of TN (Knoxville)	Live		static angle	720p
PercaRUS Group	8.2.2020		51			Russia	Live		multi-angle	720p
Nick Fox	8.24.2020		16			Bowling Green State Univ.	Live		static angle	720p
Boyce Jeffries	10.20.2020		20		4.30.2014	Sacramento, CA	Live		static angle	720p
JJAF Percussion	11.1.2020		50				Live		static angle	720p
RCSM Victoria Eugenia de Granada	12.1.2020		261				Other		multi-angle	1080HD
FOJI Chile	12.24.2020		186				Other		multi-angle	1080HD
Ting Lee	12.29.2020		47				Live		multi-angle	1080HD
Cc Percussion	12.29.2020		73				Live		multi-angle	1080HD
Douglas Perkins	5.4.2021		39			Univ. of Michigan	Recording		multi-angle	1080HD
Tambuco Percussion Ensemble	8.1.2021		72			Mexico	Recording		multi-angle	720p

Appendix B:

Third Construction videos available on YouTube
from most to least viewed (as of September 1st, 2021)

Uploader	Upload Date	Views	Performance Date	Location	Context	Camera Angle(s)	Visual Quality
Vic Firth	3.5.2011	76,597			Recording	multi-angle	480p
McGillPercussion	12.6.2011	35,837	2011	Halifax, Nova Scotia	Live	static angle	480p
Aurél Holló	11.14.2010	13,699	1992	Budapest, Hungary	Recording	multi-angle	480p
Cristobal Gajardo B.	7.16.2013	11,722	5.1.2012	Yale University	Live	static angle	720p
Bill Cahn	10.3.2012	10,430	5.19.1984	Seoul, Korea	Live	multi-angle	360p
Vic Firth Concert	9.26.2016	8,288			Recording	multi-angle	720p
Christopher Salvito	5.15.2015	3,441			Recording	multi-angle	720p
Heidelberger Fruhling	9.29.2017	3,287	4.28.2017	Hedielberger, Germany	Live	multi-angle	1080p HD
Spec Drum	9.18.2015	2,570		Toronto, Ontario	Recording	multi-angle	720p
IPCL - Daidalos	2.17.2015	2,209	2015	Luxembourg	Live	static angle	720p
IPCL - Ki-Do-Ai-Raku	2.19.2015	1,928	2015	Luxembourg	Live	static angle	720p
Architek Percussion	5.17.2012	1,914	4.26.2012	McGill Univ. (Montreal, Quebec)	Live	static angle	480p
amadindapercussion	11.29.2011	1,884	1992	Budapest	Recording	multi-angle	480p
Candance23	3.14.2012	1,480		Germany	Live	static angle	480p
Sideshow097	4.10.2009	1,381	4.5.2009	Arizona State Uni.	Live	static angle	360p
Clocks in Motion	2.18.2018	1,045	4.2017	Cleveland St. Univ.	Live	multi-angle	1080p HD
Matteo flori	3.17.2010	1,011			Live	home-video style	240p
IPCL - Ensemble 1002 Hanji	2.20.2015	1,011	2015	Luxembourg	Live	static angle	720p
Peter Jarvis	8.6.2011	974	1.20.1986	William Patterson College, NJ	Live	home-video style	720p
Andrew Furhman	6.1.2010	970	11.18.2008	Eastman School of Music	Live	static angle	480p
Gabriel Globus-Hoenich	11.26.2013	923		Curtis Institute of Music	Live	multi-angle	480p
VNPercussion	11.2.2010	901	2010	Festival Hitzacker	Live	multi-angle	480p
Daniel Janca	6.9.2014	795	6.7.2014	Liszt Academy (Budapest)	Live	static angle	720p
IPCL- JJAF Percussion Quartet	2.19.2015	750	2015	Luxembourg	Live	static angle	720p
Dixit Café by Interpab	7.24.2018	746	7.22.2018	Italy	Live	static angle	720p
Alvaro Rodas	12.18.2008	700	10.23.2008	Guatemala	Live	static angle	240p
Mariano Vega	6.15.2009	675	10.2008	Univ. de Lanús	Live	multi-angle	240p
Thomas Wilson	5.2.2009	655		Umass Amherst	Live	static angle	360p
Mariano Vega	6.15.2009	561	10.2008	Univ. de Lanús	Live	multi-angle	240p
Matteo flori	3.17.2010	532			Live	home-video style	240p
IPCL - Pulast Percussion Group	2.20.2015	485	2015	Luxembourg	Live	static angle	720p

Mark Sturm	11.15.2013	441		Central Crossing H.S.	Live	static angle	720p
VAN3uard Percussion	9.20.2017	385			Recording	multi-angle	1080p HD
Дмитрий Лукьянов	4.27.2018	372			Live	static angle	1080p HD
Gottardo Paganin	3.9.2015	370	12.9.1983	Italy	Live	static angle	480p
Orkester Norden	8.9.2010	351	8.7.2010	Kristiansand, Norway	Live	static angle	480p
Alvaro Rodas	12.18.2008	349	10.23.2008	Guatemala	Live	static angle	240p
Cosimo Lazzarotto	9.11.2018	345	9.1.2018	Italy	Live	static angle	1080p HD
Thomas Wilson	5.2.2009	328		Umass Amherst	Live	static angle	360p
Andrew Furhman	6.1.2010	325	11.18.2008	Eastman School of Music	Live	static angle	480p
Milton Salazar	5.10.2017	319			Live	static angle	480p
nservatorio "Arriga Boito" Par	10.5.2018	314	4.7.2018		Live	static angle	720p
Tetraktis Percussioni	4.13.2020	276	4.2.2019		Live	multi-angle	1080HD
Seur Percussion	7.31.2019	271			Live	static angle	1080HD
CSM Victoria Eugenia de Grana	12.1.2020	261			Other	multi-angle	1080HD
Lorena Brabo	8.13.2015	250	6.18.2015	Univ. Federal de Goias	Live	static angle	720p
Taylor Yozwiak	5.18.2013	248	4.13.2013	Umass Amherst	Live	multi-angle	720p
SOU Percussion	3.16.2016	229		Ashland, OR	Live	static angle	720p
Jordan Walsh	5.6.2018	223	4.13.2018		Live	static angle	720p
Joshua Weinfeld	9.25.2018	198		Yellow Barn Young Artists Program	Live	static angle	720p
FOJI Chile	12.24.2020	186			Other	multi-angle	1080HD
Mai Tadokoro Hessel	8.11.2011	175		SoPercussion Institute	Live	static angle	480p
So Percussion	1.30.2018	175	1.20.2018	Columbia, MD	Live	static angle	720p60
Liz Soflin	9.5.2012	162		NiefNorf	Live	static-angle	360p
BB7238	11.16.2011	161	Spring 2011	Warner Concert Hall	Live	static angle	480p
Percussion now	11.29.2014	161		Germany	Live	home-video style	480p
Nick Bonaccio	1.13.2014	157	12.10.2013		Live	static angle	480p
Icreginaelena	6.11.2013	148			Live	static angle	360p
Roberto Di Marzo	5.31.2016	142	5.3.2016	Campobasso Fest. Perc	Live	static angle	480p
Nicholas Samuel	12.11.2015	139			Live	static-angle	480p
Mai Tadokoro Hessel	8.11.2011	137		SoPercussion Institute	Live	static angle	480p
KSU Percussion	5.28.2019	133		Kent State Univ.	Live	multi-angle	1080p60HD
Eden Porter	4.15.2018	132	4.14.2018	SMU	Live	static angle	360p
Adam Snow	1.23.2017	125	3.22.2015	Univ. of N. Carolina - Greensboro	Live	static angle	480p
Karina Yau	6.23.2015	123			Live	static angle	720p
NYO Canada	7.13.2012	116			Live	static angle	480p

Shane Nickels	3.27.2018	114		Univ. of Kansas	Live	static angle	1080p HD
ydney University Wind Orchestr	6.21.2014	113			Live	static angle	720p
John Ringor	4.30.2019	111		Northwestern Univ.	Live	static angle	1080pHD
Jose Abram Lujan	3.21.2010	109			Live	multi-angle	240p
Chosenvalepercussion	6.26.2015	100	7.6.2013	Chosen Vale Summer Fest.	Live	static angle	720p
レドリックちゃんねる	2.3.2013	98			Live	static angle	144p
PendulumNewMusic	10.31.2012	92	10.10.2012	Univ. of Colorado - Boulder	Live	multi-angle	720p
John Korchok	3.6.2012	90	3.5.2012	William Patterson College, NJ	Live	static angle	480p
Laura Mester	4.17.2018	86	4.16.2018	Pittsburg, PA	Live	static angle	1080p HD
Landon	5.27.2015	81	5.3.2015		Live	static angle	720p
Fernando Chaib	1.25.2019	78	2012		Live	static angle	480p
Percussion Ensemble hkbu	3.23.2016	76		HongKong Baptist Univ	Live	multi-angle	720p
Luke Hildebrandt	5.11.2018	74	4.22.2018	Univ. of British Columbia (Canada)	Live	static angle	720p
Cc Percussion	12.29.2020	73			Live	multi-angle	1080HD
Tambuco Percussion Ensemble	8.1.2021	72		Mexico	Recording	multi-angle	720p
Joseph Murfin	7.2.2019	70	4.13.2014	Chazen Museum of Art (WI)	Live	static angle	1080HD
Andrew Neidner	2.4.2012	69			Live	multi-angle	360p
ETLester1	11.26.2010	67			Live	static angle	480p
Sipseywalker	11.24.2012	67	Fall 2012	Furman University	Live	static angle	720p
WrightStatePerc	1.5.2019	67	12.17.2017		Live	multi-angle	720p
New Music New College	4.20.2020	58	9.22.2012	New College (Florida)	Live	mult-angle	480p
rado State Univ. Center for the	5.1.2020	57		PASIC (Indianapolis, IN)	Live	multi-angle	1080HD
Cor Links	5.11.2013	54	6.25.1992	Studiozaal te Tilburg	Live	multi-angle	240p
PercaRUS Group	8.2.2020	51		Russia	Live	multi-angle	720p
JJAF Percussion	11.1.2020	50			Live	static angle	720p
Ting Lee	12.29.2020	47			Live	multi-angle	1080HD
GBoydstun Music	7.20.2018	46		Ashland, OR	Live	static angle	720p
James Campbell	4.19.2013	45	4.11.2013	Univ. of Kentucky	Live	static angle	360p
John	7.30.2018	44		Round Top Music Festival	Live	multi-angle	1080p HD
Adam Bedell	1.10.2015	43	Spring 2006	Central Mich. Univ.	Live	static angle	480p
Ian McClaflin	12.8.2016	42			Live	static angle	720p
Kelly Grill	6.24.2015	40	April.2013	USC	Live	static angle	720p
Douglas Perkins	5.4.2021	39		Univ. of Michigan	Recording	multi-angle	1080HD
Patrick Curry	4.23.2013	37	Fall 2012	Texas A&M	Live	home-video style	480p
joeyfox09	2.20.2015	36		Univ. of Akron	Live	static angle	480p

Kyle Stoker	5.9.2018	31			VCU	Live	multi-angle	1080p HD
onservatorio Jesus Guridi Vitori	4.24.2019	31	2018			Live	multi-angle	1080HD
Joseph Murfin	9.7.2019	31	9.21.2013			Live	static angle	1080HD
Leander Percussion	3.3.2019	30	2.8.2019	Leander High School		Live	static angle	1080p HD
Brodie McCash	4.8.2019	30		Univ. of Aberdeen		Live	static angle	1080p50HD
Malloyca	12.1.2015	29	6.2.2015	Ashalnd, OR		Live	static-angle	720p
Dustin Patrick	6.29.2020	29	7.6.2013	Chosen Vale 2013		Live	static angle	1080HD
Bobby Fajardo	5.19.2015	27		Univ. of Miami (FL)		Live	static angle	360p
Jon Nathan	4.6.2010	25	Winter 2010	UCSB		Live	static angle	480p
Christian Swofford	6.30.2020	25	Spring 2019	Univ. of TN (Knoxville)		Live	static angle	720p
Jon Nathan	4.6.2010	21	Winter 2010	UCSB		Live	static angle	480p
Darren Bastian	9.6.2017	21				Live	static angle	480p
Michael Silliman	3.5.2013	20				Live	static angle	480p
Boyce Jeffries	10.20.2020	20	4.30.2014	Sacramento, CA		Live	static angle	720p
Josh Quillen	1.22.2018	19	1.20.2018	Columbia, MD		Live	static angle	720p60
gan State University Percussion Ens	10.1.2018	19				Live	static angle	360p
Nick Fox	8.24.2020	16		Bowling Green State Univ.		Live	static angle	720p
Kyle Stoker	5.9.2018	15			VCU	Live	multi-angle	1080p HD

Appendix C:

Tin can selection in *Third Construction* corpus study videos

Uploader	Player 1	Player 2	Player 3	Player 4	Ensemble
Vic Firth	Lrg. Soup Cans	Mini-beer kegs	Soup Cans	Paint Cans	Individuated
McGill Percussion	Lrg. Soup Cans	Lrg. Soup Cans	Lrg. Soup Cans	Lrg. Soup Cans	Uniform
Aurell Hollo	Med. Soup Cans	Mini-beer kegs	Mini-beer kegs	Oil Barrels	Individuated
Cristobol Gajardo B.	Mini-beer kegs	Mini-beer kegs	Mini-beer kegs	Mini-beer kegs	Uniform
Bill Cahn	Lrg. Paint Cans	Lrg. Paint Cans	Lrg. Paint Cans	Lrg. Paint Cans	Uniform
Vic Firth Concert	Med. Soup Cans	Mini-beer kegs	Lrg. Soup Cans	Lrg. Soup Cans	Individuated
Christopher Salvito	Mini-beer kegs	Mini-beer kegs	Mini-beer kegs	Mini-beer kegs	Uniform
Heidelberger Frühling	Pots/ Kitchen Items	Pots/ Kitchen Items	Pots/ Kitchen Items	Oil Barrels/Large Cans	Individuated
Spec Drum	Med. Paint Cans	Med. Paint Cans	Med. Paint Cans	Med. Paint Cans	Uniform
Daidalos	Graduated Soup Cans	Lrg. Soup Cans	Mini-beer kegs	Lrg. Soup Cans	Individuated
sideshow097	Lrg. Soup Cans	Lrg. Soup Cans	Lrg. Soup Cans	Lrg. Soup Cans	Uniform
Taylor Yozwiak	Lrg. Soup Cans	Lrg. Soup Cans	Lrg. Soup Cans	Lrg. Soup Cans	Uniform
Sydney Wind Orch	Small Soup Cans	Small Soup Cans	Pots/ Kitchen Items	Small Soup Cans	Individuated
Pulsat Perc. Group	Small Soup Cans	Small Soup Cans	Small Paint Cans	Small Soup Cans	Individuated
Karina Yau	Small Soup Cans	Graduated Variety	Small Soup Cans	Graduated Soup Cans	Individuated
PendulumNewMusic	Lrg. Soup Cans	Pots/ Kitchen Items	Large Soup Cans	Kitchen Items / Cans	Individuated
Peter Jarvis	Lrg. Paint Cans	Lrg. Paint Cans	Lrg. Paint Cans	Lrg. Paint Cans	Uniform
Daniel Janka	Mini-beer kegs	Mini-beer kegs	Mini-beer kegs	Mini-beer kegs	Uniform
HKBU	Graduated Variety	Graduated Variety	Graduated Variety	Graduated Variety	Uniform
PercaRUS	Mini-beer kegs	Lrg. Soup Cans	Mini-beer kegs	Lrg. Soup Cans	Individuated

Appendix D:

Drum selection in *Third Construction* corpus study videos

Uploader	Player 1	Player 2	Player 3	Player 4	Ensemble
Vic Firth	Tom-toms	Tom-toms	Congas	Bongos	Individiated
McGill Percussion	Bongos + Conga	Bongos + Conga	Bongos + Conga	Bongos + Conga	Uniform
Aurél Holló	Chinese	Chinese	Chinese	Chinese	Uniform
Cristobol Gajardo B.	Chinese	Chinese	Chinese	Chinese	Uniform
Bill Cahn	Timbales + Tom-tom	Chinese	Timbales	Chinese	Individiated
Vic Firth Concert	Chinese	Tom-toms	Congas + Djembe	Bongos + Conga	Individiated
Christopher Salvito	Chinese	Chinese	Congas	Bongos	Individiated
Heidelberger Frühling	Tom-toms	Tom-toms	Congas	Bongos	Individiated
Spec Drum	Bongos + Conga	Bongos + Conga	Timbales + S.D.	Tom-toms	Individiated
IPCL - Daidalos	Djembes	Unknown	Bongos	Congas	Individiated
sideshow097	Tom-toms	Tom-toms	Tom-toms	Tom-toms	Uniform
Taylor Yozwiak	Tom-toms	Congas	Bongos + Conga	Bongos	Individiated
Sydney Wind Orchestra	Timbales + S.D.	Tom-toms	Congas	Bongos	Individiated
IPCL - Pulsat	Bongos	Congas	Tom-toms	Congas	Individiated
Karina Yau	Tom-toms	Tom-toms	Djembes	Bongos + Conga	Individiated
PendulumNewMusic	Bongos + tom-tom	Tom-toms	Tom-toms	Congas + Bongo	Individiated
Peter Jarvis	Tom-toms	Tom-toms	Tom-toms	Tom-toms	Uniform
Daniel Janca	Chinese	Chinese	Chinese	Chinese	Uniform
HKBU	Congas + Chinese	Djembes	Chinese	Chinese	Individiated
PercaRUS	Tom-toms	Tom-toms	Congas	Bongos	Individiated

Appendix E:

"Tempo Checks" in *Third Construction* corpus study videos

Uploader	TimeB (secs)	TimeA (secs)	Difference	Avg. Time (secs) (per measure)	Avg. Time (secs) (per pulse)	Avg. BPM
Vic Firth						
m. 1 - 3	13.904	10.374	3.530	1.177	0.588	102.040
Letter A (3 mm.)	41.995	38.382	3.613	1.204	0.602	99.668
Letter B (5 mm.)	71.438	65.701	5.737	1.147	0.574	104.529
Letter C (3 mm.)	96.256	92.949	3.307	1.102	0.551	108.893
11 after D (3 mm.)	134.206	130.770	3.436	1.145	0.573	104.712
4th Bar After E (5 mm.)	155.166	149.460	5.706	1.141	0.571	105.079
5th Bar After F (5 mm.)	186.036	180.253	5.783	1.157	0.578	103.806
Letter G (3 mm.)	205.155	201.664	3.491	1.164	0.582	103.092
Letter H (5 mm.)	233.498	228.823	4.675	0.935	0.467	128.480
Letter I (5 mm.)	260.307	255.598	4.709	0.942	0.471	127.389
Letter J (4 mm.)	284.000	278.929	5.071	1.268	0.634	94.637
Letter K (5 mm.)	313.985	308.278	5.707	1.141	0.571	105.079
Letter L (5 mm.)	340.770	335.349	5.421	1.084	0.542	110.701
3rd Bar After M (3 mm.)	367.554	364.228	3.326	1.109	0.554	108.303
Letter N (5 mm.)	394.900	389.274	5.626	1.125	0.563	106.572
Letter O (8 mm.)	421.712	414.020	7.692	0.962	0.481	124.740
Letter P (10 mm.)	446.345	436.906	9.439	0.944	0.472	127.118
Letter Q (4 mm.)	463.368	459.580	3.788	0.947	0.474	126.582
6th Bar After R (3 mm.)	490.150	487.259	2.891	0.964	0.482	124.481
3rd Bar After S (4 mm.)	512.905	509.521	3.384	0.846	0.423	141.844
Letter U (2 mm.)	550.548	548.771	1.777	0.889	0.444	135.135
11th Bar After V (4 mm.)	582.181	578.379	3.802	0.951	0.475	126.316
Letter W (10 mm.)	599.154	590.875	8.279	0.828	0.414	144.928
McGill Percussion						
m. 1 - 3	42.935	39.248	3.687	1.229	0.615	97.561
Letter A (3 mm.)	72.576	68.904	3.672	1.224	0.612	98.039
Letter B (5 mm.)	104.993	98.521	6.472	1.294	0.647	92.737
Letter C (3 mm.)	132.805	128.998	3.807	1.269	0.635	94.488
11 after D (3 mm.)	174.997	171.037	3.960	1.320	0.660	90.909
4th Bar After E (5 mm.)	199.066	192.469	6.597	1.319	0.660	90.909
5th Bar After F (5 mm.)	232.968	226.681	6.287	1.257	0.629	98.390
Letter G (3 mm.)	253.663	249.970	3.693	1.231	0.616	97.403
Letter H (5 mm.)	285.126	280.154	4.972	0.994	0.497	120.724
Letter I (5 mm.)	313.089	307.970	5.119	1.024	0.512	117.188
Letter J (4 mm.)	338.314	332.967	5.347	1.337	0.668	89.820
Letter K (5 mm.)	371.162	364.689	6.473	1.295	0.647	92.736
Letter L (5 mm.)	401.560	395.441	6.119	1.224	0.612	98.039
3rd Bar After M (3 mm.)	436.256	432.416	3.840	1.280	0.640	93.750
Letter N (5 mm.)	472.832	466.569	6.263	1.253	0.626	95.847
Letter O (8 mm.)	496.108	488.493	7.615	0.952	0.476	126.050
Letter P (10 mm.)	521.657	511.695	9.962	0.996	0.498	120.482
Letter Q (4 mm.)	540.395	536.137	4.258	1.065	0.532	112.782
6th Bar After R (3 mm.)	569.946	566.716	3.230	1.077	0.538	111.524
3rd Bar After S (4 mm.)	593.982	590.171	3.811	0.953	0.476	126.050
Letter U (2 mm.)	636.917	634.919	1.998	0.999	0.500	120.000
11th Bar After V (4 mm.)	673.599	669.583	4.016	1.004	0.502	119.522
Letter W (10 mm.)	693.214	683.456	9.758	0.976	0.488	122.951

Aurél Holló (amadindapercussion)						
m. 1 - 3	9.808	6.560	3.248	1.082	0.541	110.837
Letter A (3 mm.)	35.729	32.536	3.193	1.064	0.532	112.746
Letter B (5 mm.)	63.989	58.311	5.678	1.117	0.559	107.392
Letter C (3 mm.)	88.121	84.826	3.295	1.098	0.549	109.256
11 after D (3 mm.)	125.258	121.931	3.327	1.109	0.555	108.205
4th Bar After E (5 mm.)	146.236	140.741	5.495	1.099	0.550	109.256
5th Bar After F (5 mm.)	174.312	168.811	5.501	1.100	0.550	109.071
Letter G (3 mm.)	193.175	189.848	3.327	1.109	0.555	108.205
Letter H (5 mm.)	221.573	216.307	5.266	1.053	0.527	113.852
Letter I (5 mm.)	247.263	242.215	5.048	1.010	0.505	118.812
Letter J (4 mm.)	270.741	266.316	4.425	1.106	0.553	108.500
Letter K (5 mm.)	297.772	292.468	5.304	1.061	0.530	113.208
Letter L (5 mm.)	323.217	317.947	5.270	1.054	0.527	113.852
3rd Bar After M (3 mm.)	349.053	345.617	3.436	1.145	0.573	104.712
Letter N (5 mm.)	377.155	371.528	5.627	1.125	0.563	106.572
Letter O (8 mm.)	406.185	399.070	7.115	0.889	0.445	134.831
Letter P (10 mm.)	432.916	422.630	10.286	1.029	0.514	116.732
Letter Q (4 mm.)	451.232	447.222	4.010	1.003	0.501	119.760
6th Bar After R (3 mm.)	479.800	476.770	3.030	1.010	0.505	118.812
3rd Bar After S (4 mm.)	502.770	498.770	4.000	1.000	0.500	120.000
Letter U (2 mm.)	544.809	542.981	1.828	0.914	0.457	131.291
11th Bar After V (4 mm.)	579.075	575.248	3.827	0.957	0.478	125.523
Letter W (10 mm.)	598.247	588.675	9.572	0.957	0.479	125.261
Cristóbal Gajardo B.						
m.1 - 3	40.772	37.594	3.178	1.059	0.530	113.279
Letter A (3 mm.)	66.695	63.404	3.291	1.097	0.548	109.389
Letter B (5 mm.)	95.088	89.355	5.733	1.147	0.573	104.657
Letter C (3 mm.)	119.887	116.617	3.270	1.090	0.545	110.092
11 after D (3 mm.)	157.337	153.837	3.500	1.167	0.583	102.857
4th Bar After E (5 mm.)	179.102	172.884	6.218	1.244	0.622	96.494
5th Bar After F (5 mm.)	211.006	204.854	6.152	1.230	0.615	97.529
Letter G (3 mm.)	230.537	226.897	3.640	1.213	0.607	98.901
Letter H (5 mm.)	259.768	254.852	4.916	0.983	0.492	122.050
Letter I (5 mm.)	289.732	284.386	5.346	1.069	0.535	112.233
Letter J (4 mm.)	315.493	310.325	5.168	1.292	0.646	92.879
Letter K (5 mm.)	346.655	340.582	6.073	1.215	0.607	98.798
Letter L (5 mm.)	374.467	368.766	5.701	1.140	0.570	105.245
3rd Bar After M (3 mm.)	402.292	398.646	3.646	1.215	0.608	98.738
Letter N (5 mm.)	430.937	425.124	5.813	1.163	0.581	103.217
Letter O (8 mm.)	459.240	450.886	8.354	1.044	0.522	114.915
Letter P (10 mm.)	486.469	475.997	10.472	1.047	0.524	114.591
Letter Q (4 mm.)	504.689	500.587	4.102	1.026	0.513	117.016
6th Bar After R (3 mm.)	533.870	530.666	3.204	1.912	0.956	62.751
3rd Bar After S (4 mm.)	557.629	553.684	3.945	0.986	0.493	121.673
Letter U (2 mm.)	601.706	599.702	2.004	1.002	0.501	119.760
11th Bar After V (4 mm.)	638.308	634.379	3.929	0.982	0.491	122.168
Letter W (10 mm.)	657.097	648.062	9.035	0.903	0.452	132.817

Bill Cahn						
m. 1 - 3	17.226	13.088	4.138	1.379	0.690	87.020
Letter A (3 mm.)	50.238	46.084	4.154	1.384	0.692	86.705
Letter B (5 mm.)	85.414	78.427	6.987	1.395	0.698	86.022
Letter C (3 mm.)	116.368	111.883	4.485	1.495	0.748	80.268
11 after D (3 mm.)	164.290	159.986	4.304	1.434	0.717	83.682
4 after E (5 mm.)	190.569	183.555	7.014	1.402	0.701	85.592
5 after F (5 mm.)	228.055	221.035	7.020	1.404	0.702	85.470
Letter G (3 mm.)	251.931	247.582	4.349	1.464	0.732	81.967
Letter H (5 mm.)	290.320	284.571	5.749	1.150	0.575	104.366
Letter I (5 mm.)	320.922	315.160	5.762	1.152	0.576	104.131
Letter J (4 mm.)	349.733	344.346	5.387	1.347	0.673	89.103
Letter K (5 mm.)	382.367	376.045	6.322	1.264	0.632	94.907
Letter L (5 mm.)	412.336	406.204	6.132	1.226	0.613	97.847
3rd Bar After M (3 mm.)	441.613	437.884	3.729	1.243	0.621	96.541
Letter N (5 mm.)	471.502	465.291	6.211	1.242	0.621	96.603
Letter O (8 mm.)	504.025	494.706	9.319	1.165	0.582	103.015
Letter P (10 mm.)	534.117	522.533	11.584	1.158	0.579	103.591
Letter Q (4 mm.)	554.671	550.122	4.549	1.137	0.569	105.518
6th Bar After R (3 mm.)	587.486	583.735	3.751	1.250	0.625	95.974
3rd Bar After S (4 mm.)	617.912	613.166	4.746	1.187	0.593	101.138
Letter U (2 mm.)	669.590	667.152	2.438	1.219	0.609	98.441
11th Bar After V (4 mm.)	712.235	707.577	4.658	1.165	0.582	103.049
Letter W (10 mm.)	735.695	723.948	11.747	1.175	0.587	102.154
Vic Firth Concert						
m. 1 - 3	32.613	29.278	3.335	1.112	0.556	107.946
Letter A (3 mm.)	59.311	56.002	3.309	1.103	0.552	108.794
Letter B (5 mm.)	88.165	82.653	5.512	1.102	0.551	108.853
Letter C (3 mm.)	112.661	109.328	3.333	1.111	0.556	108.011
11 after D (3 mm.)	150.403	147.056	3.347	1.116	0.558	107.559
4 after E (5 mm.)	171.455	165.888	5.567	1.113	0.557	107.778
5 after F (5 mm.)	200.346	194.820	5.526	1.105	0.553	108.578
Letter G (3 mm.)	219.272	215.980	3.292	1.097	0.549	109.356
Letter H (5 mm.)	249.454	244.506	4.948	0.990	0.495	121.261
Letter I (5 mm.)	278.524	273.531	4.993	0.999	0.499	120.168
Letter J (4 mm.)	302.706	297.846	4.860	1.215	0.608	98.765
Letter K (5 mm.)	332.704	326.675	6.029	1.206	0.603	99.519
Letter L (5 mm.)	361.447	355.536	5.911	1.182	0.591	101.506
3rd Bar After M (3 mm.)	390.236	386.700	3.536	1.179	0.589	101.810
Letter N (5 mm.)	419.049	413.031	6.018	1.204	0.602	99.701
Letter O (8 mm.)	449.031	440.715	8.316	1.040	0.520	115.440
Letter P (10 mm.)	475.902	465.528	10.374	1.037	0.519	115.674
Letter Q (4 mm.)	494.452	490.249	4.203	1.051	0.525	114.204
6th Bar After R (3 mm.)	523.225	520.107	3.118	1.039	0.520	115.459
3rd Bar After S (4 mm.)	547.896	544.045	3.851	0.963	0.481	124.643
Letter U (2 mm.)	590.193	587.911	2.282	1.141	0.571	105.171
11th Bar After V (4 mm.)	624.721	620.908	3.813	0.953	0.477	125.885
Letter W (10 mm.)	643.395	634.351	9.044	0.904	0.452	132.685

Christopher Salvito												
m. 1 - 3	5.635		2.252		3.383		1.127		0.564		106.477	
Letter A (3 mm.)	32.635		29.276		3.359		1.125		0.563		106.667	
Letter B (5 mm.)	61.760		56.111		5.649		1.129		0.565		106.289	
Letter C (3 mm.)	86.222		82.898		3.324		1.108		0.554		108.303	
11 after D (3 mm.)	123.448		120.884		2.564		0.854		0.427		140.515	
4 after E (5 mm.)	144.600		138.819		5.781		1.156		0.578		103.806	
5 after F (5 mm.)	174.140		168.502		5.638		1.127		0.564		106.477	
Letter G (3 mm.)	193.066		189.795		3.271		1.090		0.545		110.092	
Letter H (5 mm.)	220.992		216.081		4.911		0.982		0.491		122.175	
Letter I (5 mm.)	248.189		243.297		4.892		0.978		0.489		122.649	
Letter J (4 mm.)	273.068		268.065		5.003		1.251		0.625		95.942	
Letter K (5 mm.)	304.355		298.145		6.210		1.242		0.621		96.618	
Letter L (5 mm.)	333.998		327.937		6.061		1.212		0.606		98.994	
3rd Bar After M (3 mm.)	363.539		359.653		3.886		1.295		0.648		92.640	
Letter N (5 mm.)	394.945		388.501		6.444		1.289		0.644		93.110	
Letter O (8 mm.)	422.728		415.085		7.643		0.955		0.478		125.605	
Letter P (10 mm.)	446.799		437.540		9.259		0.926		0.463		129.604	
Letter Q (4 mm.)	463.894		460.045		3.849		0.962		0.481		124.708	
6th Bar After R (3 mm.)	491.728		488.414		3.314		1.105		0.552		108.630	
3rd Bar After S (4 mm.)	516.410		512.357		4.053		1.013		0.507		118.431	
Letter U (2 mm.)	557.609		555.833		1.776		0.888		0.444		135.135	
11th Bar After V (4 mm.)	592.468		588.794		3.674		0.918		0.459		130.648	
Letter W (10 mm.)	611.143		602.024		9.119		0.912		0.456		131.593	
Heidelberger Frühling												
m. 1 - 3	6.697		2.462		4.235		1.412		0.706		85.006	
Letter A (3 mm.)	40.849		36.571		4.278		1.426		0.713		84.151	
Letter B (5 mm.)	78.344		71.014		7.330		1.466		0.733		81.855	
Letter C (3 mm.)	110.481		106.168		4.313		1.438		0.719		83.469	
11 after D (3 mm.)	159.156		154.529		4.627		1.542		0.771		77.804	
4 after E (5 mm.)	186.770		179.026		7.744		1.549		0.774		77.479	
5 after F (5 mm.)	225.533		218.223		7.310		1.462		0.731		82.079	
Letter G (3 mm.)	250.006		245.635		4.371		1.457		0.729		82.361	
Letter H (5 mm.)	285.168		280.058		5.110		1.022		0.511		117.417	
Letter I (5 mm.)	313.140		307.804		5.336		1.067		0.534		112.444	
Letter J (4 mm.)	339.893		334.676		5.217		1.304		0.652		92.007	
Letter K (5 mm.)	372.002		365.673		6.329		1.266		0.633		94.802	
Letter L (5 mm.)	402.210		395.861		6.349		1.270		0.635		94.503	
3rd Bar After M (3 mm.)	432.303		428.361		3.942		1.314		0.657		91.324	
Letter N (5 mm.)	463.876		457.398		6.478		1.296		0.648		92.621	
Letter O (8 mm.)	493.830		485.910		7.920		0.990		0.495		121.212	
Letter P (10 mm.)	519.668		509.695		9.973		0.997		0.499		120.325	
Letter Q (4 mm.)	537.071		533.170		3.901		0.975		0.488		123.045	
6th Bar After R (3 mm.)	565.165		562.062		3.103		1.034		0.517		116.017	
3rd Bar After S (4 mm.)	588.408		584.965		3.443		0.861		0.430		139.413	
Letter U (2 mm.)	626.768		625.000		1.768		0.884		0.442		135.747	
11th Bar After V (4 mm.)	658.737		655.172		3.565		0.891		0.446		134.642	
Letter W (10 mm.)	676.088		667.459		8.629		0.863		0.431		139.066	

Spec Drum											
m. 1 - 3	70.907		67.324		3.583		1.194		0.597		100.474
Letter A (3 mm.)	98.459		95.130		3.329		1.110		0.555		108.141
Letter B (5 mm.)	127.536		122.015		5.521		1.104		0.552		108.676
Letter C (3 mm.)	151.774		148.452		3.322		1.107		0.554		108.368
11 after D (3 mm.)	189.233		185.867		3.366		1.122		0.561		106.952
4 after E (5 mm.)	210.738		204.875		5.863		1.173		0.586		102.337
5 after F (5 mm.)	240.994		235.389		5.605		1.121		0.560		107.047
Letter G (3 mm.)	260.577		257.082		3.495		1.165		0.583		103.004
Letter H (5 mm.)	291.911		287.310		4.601		0.920		0.460		130.406
Letter I (5 mm.)	320.626		315.599		5.027		1.005		0.503		119.355
Letter J (4 mm.)	345.687		340.485		5.202		1.301		0.650		92.272
Letter K (5 mm.)	377.881		371.537		6.344		1.269		0.634		94.578
Letter L (5 mm.)	407.696		401.502		6.194		1.239		0.619		96.868
3rd Bar After M (3 mm.)	436.288		432.413		3.875		1.292		0.646		92.903
Letter N (5 mm.)	467.450		461.126		6.324		1.265		0.632		94.877
Letter O (8 mm.)	496.950		489.067		7.883		0.985		0.493		121.781
Letter P (10 mm.)	520.894		511.486		9.408		0.941		0.470		127.551
Letter Q (4 mm.)	537.567		533.851		3.716		0.929		0.465		129.171
6th Bar After R (3 mm.)	564.535		561.567		2.968		0.742		0.371		161.725
3rd Bar After S (4 mm.)	587.637		583.795		3.842		0.960		0.480		124.935
Letter U (2 mm.)	629.648		627.747		1.901		0.951		0.475		126.249
11th Bar After V (4 mm.)	665.626		661.585		4.041		1.010		0.505		118.782
Letter W (10 mm.)	685.116		675.375		9.741		0.974		0.487		123.191
IPCL - Daidalos											
m.1 - 3	11.054		7.296		3.758		1.253		0.626		95.796
Letter A (3 mm.)	40.472		36.839		3.633		1.211		0.606		99.092
Letter B (5 mm.)	71.762		65.687		6.075		1.215		0.608		98.765
Letter C (3 mm.)	98.250		94.791		3.459		1.153		0.577		104.076
11 after D (3 mm.)	138.614		135.126		3.488		1.163		0.581		103.211
4 after E (5 mm.)	160.744		154.758		5.986		1.197		0.599		100.234
5 after F (5 mm.)	190.733		185.134		5.599		1.120		0.560		107.162
Letter G (3 mm.)	209.258		205.901		3.357		1.119		0.560		107.239
Letter H (5 mm.)	237.387		232.689		4.698		0.940		0.470		127.714
Letter I (5 mm.)	263.689		258.790		4.899		0.980		0.490		122.474
Letter J (4 mm.)	286.724		282.522		4.202		1.051		0.525		114.231
Letter K (5 mm.)	312.797		307.513		5.284		1.057		0.528		113.550
Letter L (5 mm.)	337.752		332.331		5.421		1.084		0.542		110.681
3rd Bar After M (3 mm.)	363.154		359.974		3.180		1.060		0.530		113.208
Letter N (5 mm.)	388.527		383.390		5.137		1.027		0.514		116.800
Letter O (8 mm.)	415.059		407.662		7.397		0.925		0.462		129.782
Letter P (10 mm.)	439.858		430.356		9.502		0.950		0.475		126.289
Letter Q (4 mm.)	456.841		453.199		3.642		0.910		0.455		131.796
6th Bar After R (3 mm.)	484.273		481.310		2.963		0.988		0.494		121.498
3rd Bar After S (4 mm.)	507.358		503.677		3.681		0.920		0.460		130.399
Letter U (2 mm.)	549.803		547.953		1.850		0.925		0.463		129.730
11th Bar After V (4 mm.)	584.581		580.758		3.823		0.956		0.478		125.556
Letter W (10 mm.)	603.110		594.054		9.056		0.906		0.453		132.509

Uploader	TimeB (secs)	TimeA (secs)	Difference	Avg. Time (secs) (per measure)	Avg. Time (secs) (per pulse)	Avg. BPM
Taylor Yozwiak						
m. 1 - 3	27.196	23.662	3.534	1.178	0.589	101.868
Letter A (3 mm.)	54.599	51.236	3.363	1.121	0.561	107.047
Letter B (5 mm.)	83.545	77.844	5.701	1.140	0.570	105.245
Letter C (3 mm.)	108.271	104.990	3.281	1.094	0.547	109.723
11 after D (3 mm.)	146.163	142.760	3.403	1.134	0.567	105.789
4th Bar After E (5 mm.)	167.840	161.975	5.865	1.173	0.587	102.302
5th Bar After F (5 mm.)	199.485	193.381	6.104	1.221	0.610	98.296
Letter G (3 mm.)	219.419	215.756	3.663	1.221	0.611	98.280
Letter H (5 mm.)	249.701	244.828	4.873	0.975	0.487	123.127
Letter I (5 mm.)	275.121	270.080	5.041	1.008	0.504	119.024
Letter J (4 mm.)	300.274	295.203	5.071	1.268	0.634	94.656
Letter K (5 mm.)	329.859	324.051	5.808	1.162	0.581	103.306
Letter L (5 mm.)	356.263	350.638	5.625	1.125	0.563	106.667
3rd Bar After M (3 mm.)	383.245	380.000	3.245	1.082	0.541	110.940
Letter N (5 mm.)	416.002	410.363	5.639	1.128	0.564	106.402
Letter O (8 mm.)	439.408	431.026	8.382	1.048	0.524	114.531
Letter P (10 mm.)	466.631	456.245	10.386	1.039	0.519	115.540
Letter Q (4 mm.)	485.302	481.111	4.191	1.048	0.524	114.531
6th Bar After R (3 mm.)	514.374	511.079	3.295	1.098	0.549	109.256
3rd Bar After S (4 mm.)	537.975	534.215	3.760	0.940	0.470	127.660
Letter U (2 mm.)	579.629	577.754	1.875	0.938	0.469	128.000
11th Bar After V (4 mm.)	612.744	609.023	3.721	0.930	0.465	128.998
Letter W (10 mm.)	630.984	622.191	8.793	0.879	0.440	136.472
sideshow097						
m. 1 - 3	7.608	4.455	3.153	1.051	0.526	114.177
Letter A (3 mm.)	32.453	29.463	2.990	0.997	0.498	120.401
Letter B (5 mm.)	59.131	53.899	5.232	1.046	0.523	114.679
Letter C (3 mm.)	82.122	78.998	3.124	1.041	0.521	115.237
11 after D (3 mm.)	118.374	115.185	3.189	1.063	0.531	112.888
4th Bar After E (5 mm.)	137.793	132.400	5.393	1.079	0.539	111.255
5th Bar After F (5 mm.)	165.489	160.243	5.246	1.049	0.525	114.373
Letter G (3 mm.)	182.675	179.530	3.145	1.048	0.524	114.467
Letter H (5 mm.)	209.579	205.040	4.539	0.908	0.454	132.188
Letter I (5 mm.)	234.826	230.355	4.471	0.894	0.447	134.198
Letter J (4 mm.)	257.397	252.643	4.754	1.189	0.594	100.968
Letter K (5 mm.)	286.151	280.535	5.616	1.123	0.562	106.838
Letter L (5 mm.)	313.306	307.715	5.591	1.118	0.559	107.315
3rd Bar After M (3 mm.)	340.040	336.602	3.438	1.146	0.573	104.712
Letter N (5 mm.)	368.172	362.531	5.641	1.128	0.564	106.364
Letter O (8 mm.)	395.412	387.660	7.752	0.969	0.484	123.839
Letter P (10 mm.)	419.693	410.733	8.960	0.896	0.448	133.929
Letter Q (4 mm.)	437.231	433.580	3.651	0.913	0.456	131.471
6th Bar After R (3 mm.)	463.412	460.662	2.750	0.917	0.458	130.909
3rd Bar After S (4 mm.)	487.219	483.513	3.706	0.927	0.463	129.520
Letter U (2 mm.)	527.523	525.635	1.888	0.944	0.472	127.119
11th Bar After V (4 mm.)	560.241	556.724	3.517	0.879	0.440	136.480
Letter W (10 mm.)	578.626	569.570	9.056	0.906	0.453	132.509

PercaRUS Group														
m. 1 - 3		6.548		3.111		3.437		1.146		0.573		104.743		
Letter A (3 mm.)		34.504		31.022		3.482		1.161		0.580		103.389		
Letter B (5 mm.)		65.060		59.058		6.002		1.200		0.600		99.967		
Letter C (3 mm.)		90.618		87.114		3.504		1.168		0.584		102.740		
11 after D (3 mm.)		130.131		126.506		3.625		1.208		0.604		99.310		
4th Bar After E (5 mm.)		152.478		146.588		5.890		1.178		0.589		101.868		
5th Bar After F (5 mm.)		182.593		176.979		5.614		1.123		0.561		106.876		
Letter G (3 mm.)		201.456		198.036		3.420		1.140		0.570		105.263		
Letter H (5 mm.)		231.301		226.499		4.802		0.960		0.480		124.948		
Letter I (5 mm.)		258.248		253.477		4.771		0.954		0.477		125.760		
Letter J (4 mm.)		281.138		276.327		4.811		1.203		0.601		99.771		
Letter K (5 mm.)		311.275		305.469		5.806		1.161		0.581		103.341		
Letter L (5 mm.)		338.581		332.967		5.614		1.123		0.561		106.876		
3rd Bar After M (3 mm.)		365.827		362.292		3.535		1.178		0.589		101.839		
Letter N (5 mm.)		393.210		387.624		5.586		1.117		0.559		107.411		
Letter O (8 mm.)		421.302		413.250		8.052		1.007		0.503		119.225		
Letter P (10 mm.)		446.837		437.059		9.778		0.978		0.489		122.724		
Letter Q (4 mm.)		464.491		460.576		3.915		0.979		0.489		122.605		
6th Bar After R (3 mm.)		491.152		488.513		2.639		0.880		0.440		136.415		
3rd Bar After S (4 mm.)		505.491		501.512		3.979		0.995		0.497		120.633		
Letter U (2 mm.)		559.164		557.174		1.990		0.995		0.498		120.603		
11th Bar After V (4 mm.)		593.980		590.093		3.887		0.972		0.486		123.489		
Letter W (10 mm.)		613.302		603.628		9.674		0.967		0.484		124.044		
Karina Yau														
m. 1 - 3		4.818		1.298		3.520		1.173		0.587		102.273		
Letter A (3 mm.)		32.272		28.963		3.309		1.103		0.552		108.794		
Letter B (5 mm.)		62.048		56.116		5.932		1.186		0.593		101.146		
Letter C (3 mm.)		88.422		85.034		3.388		1.129		0.565		106.257		
11 after D (3 mm.)		127.552		123.921		3.631		1.210		0.605		99.146		
4th Bar After E (5 mm.)		149.779		143.764		6.015		1.203		0.601		99.751		
5th Bar After F (5 mm.)		181.605		175.579		6.026		1.205		0.603		99.569		
Letter G (3 mm.)		201.654		197.946		3.708		1.236		0.618		97.087		
Letter H (5 mm.)		231.686		226.674		5.012		1.002		0.501		119.713		
Letter I (5 mm.)		259.722		254.566		5.156		1.031		0.516		116.369		
Letter J (4 mm.)		284.884		279.993		4.891		1.223		0.611		98.139		
Letter K (5 mm.)		315.937		309.844		6.093		1.219		0.609		98.474		
Letter L (5 mm.)		344.766		338.996		5.770		1.154		0.577		103.986		
3rd Bar After M (3 mm.)		372.277		368.803		3.474		1.158		0.579		103.627		
Letter N (5 mm.)		399.582		393.867		5.715		1.143		0.571		104.987		
Letter O (8 mm.)		429.159		420.718		8.441		1.055		0.528		113.731		
Letter P (10 mm.)		456.365		445.968		10.397		1.040		0.520		115.418		
Letter Q (4 mm.)		476.267		471.832		4.435		1.109		0.554		108.230		
6th Bar After R (3 mm.)		507.395		504.039		3.356		1.119		0.559		107.271		
3rd Bar After S (4 mm.)		531.875		527.928		3.947		0.987		0.493		121.611		
Letter U (2 mm.)		575.538		573.500		2.038		1.019		0.510		117.763		
11th Bar After V (4 mm.)		612.205		608.010		4.195		1.049		0.524		114.422		
Letter W (10 mm.)		632.614		622.435		10.179		1.018		0.509		117.890		

Sydney Univ. Wind Orch.											
m. 1 - 3	9.124		5.431		3.693		1.231		0.616		97.482
Letter A (3 mm.)	36.352		33.000		3.352		1.117		0.559		107.399
Letter B (5 mm.)	65.988		60.292		5.696		1.139		0.570		105.337
Letter C (3 mm.)	90.049		86.835		3.214		1.071		0.536		112.010
11 after D (3 mm.)	127.767		123.406		4.361		1.454		0.727		82.550
4th Bar After E (5 mm.)	148.339		141.590		6.749		1.350		0.675		88.902
5th Bar After F (5 mm.)	179.192		173.482		5.710		1.142		0.571		105.079
Letter G (3 mm.)	197.892		194.661		3.231		1.077		0.538		111.421
Letter H (5 mm.)	229.748		224.594		5.154		1.031		0.515		116.414
Letter I (5 mm.)	257.268		251.939		5.329		1.066		0.533		112.591
Letter J (4 mm.)	282.309		277.151		5.158		1.290		0.645		93.059
Letter K (5 mm.)	314.063		307.864		6.199		1.240		0.620		96.790
Letter L (5 mm.)	342.973		337.168		5.805		1.161		0.581		103.359
3rd Bar After M (3 mm.)	371.321		366.684		4.637		1.546		0.773		77.636
Letter N (5 mm.)	397.805		392.274		5.531		1.106		0.553		108.479
Letter O (8 mm.)	428.810		418.295		10.515		1.314		0.657		91.298
Letter P (10 mm.)	453.109		442.935		10.174		1.017		0.509		117.948
Letter Q (4 mm.)	472.380		468.134		4.246		1.062		0.531		113.048
6th Bar After R (3 mm.)	501.267		498.189		3.078		1.026		0.513		116.959
3rd Bar After S (4 mm.)	526.576		522.657		3.919		0.980		0.490		122.480
Letter U (2 mm.)	569.193		567.253		1.940		0.970		0.485		123.711
11th Bar After V (4 mm.)	X		X		X		X		X		X
Letter W (10 mm.)	622.521		612.784		9.737		0.974		0.487		123.241
PendulumNewMusic											
m. 1 - 3	20.883		17.418		3.465		1.155		0.578		103.896
Letter A (3 mm.)	47.408		44.185		3.223		1.074		0.537		111.697
Letter B (5 mm.)	76.094		70.400		5.694		1.139		0.569		105.374
Letter C (3 mm.)	100.127		96.848		3.279		1.093		0.546		109.790
11 after D (3 mm.)	136.554		133.294		3.260		1.087		0.543		110.429
4th Bar After E (5 mm.)	156.826		151.366		5.460		1.092		0.546		109.890
5th Bar After F (5 mm.)	185.377		180.101		5.276		1.055		0.528		113.723
Letter G (3 mm.)	203.189		199.905		3.284		1.095		0.547		109.622
Letter H (5 mm.)	230.746		225.745		5.001		1.000		0.500		119.976
Letter I (5 mm.)	260.087		255.067		5.020		1.004		0.502		119.522
Letter J (4 mm.)	285.304		279.675		5.629		1.407		0.704		85.273
Letter K (5 mm.)	319.799		313.064		6.735		1.347		0.673		89.087
Letter L (5 mm.)	351.137		344.874		6.263		1.253		0.626		95.801
3rd Bar After M (3 mm.)	379.728		376.385		3.343		1.114		0.557		107.688
Letter N (5 mm.)	406.674		401.110		5.564		1.113		0.556		107.836
Letter O (8 mm.)	433.459		425.474		7.985		0.998		0.499		120.225
Letter P (10 mm.)	459.958		449.848		10.110		1.011		0.506		118.694
Letter Q (4 mm.)	478.426		474.282		4.144		1.036		0.518		115.830
6th Bar After R (3 mm.)	508.490		505.206		3.284		1.095		0.547		109.622
3rd Bar After S (4 mm.)	532.210		528.309		3.901		0.975		0.488		123.045
Letter U (2 mm.)	575.420		573.445		1.975		0.987		0.494		121.519
11th Bar After V (4 mm.)	610.943		607.126		3.817		0.954		0.477		125.753
Letter W (10 mm.)	629.991		620.591		9.400		0.940		0.470		127.660

Peter Jarvis							
m. 1 - 3	19.423	16.081	3.342	1.114	0.557	107.720	
Letter A (3 mm.)	48.568	44.911	3.657	1.219	0.609	98.441	
Letter B (5 mm.)	81.219	74.839	6.380	1.276	0.638	94.044	
Letter C (3 mm.)	109.236	105.569	3.667	1.222	0.611	98.173	
11 after D (3 mm.)	152.645	148.500	4.145	1.382	0.691	86.852	
4th Bar After E (5 mm.)	175.316	169.488	5.828	1.166	0.583	102.951	
5th Bar After F (5 mm.)	202.057	197.008	5.049	1.010	0.505	118.835	
Letter G (3 mm.)	219.451	216.409	3.042	1.014	0.507	118.343	
Letter H (5 mm.)	247.203	241.992	5.211	1.042	0.521	115.141	
Letter I (5 mm.)	275.758	270.265	5.493	1.099	0.549	109.230	
Letter J (4 mm.)	300.945	297.084	3.861	0.965	0.483	124.320	
Letter K (5 mm.)	326.037	321.182	4.855	0.971	0.485	123.584	
Letter L (5 mm.)	349.721	344.881	4.840	0.968	0.484	123.967	
3rd Bar After M (3 mm.)	372.963	369.494	3.469	1.156	0.578	103.776	
Letter N (5 mm.)	397.518	392.547	4.971	0.994	0.497	120.700	
Letter O (8 mm.)	421.638	414.751	6.887	0.861	0.430	139.393	
Letter P (10 mm.)	444.517	435.200	9.317	0.932	0.466	128.797	
Letter Q (4 mm.)	461.685	458.013	3.672	0.918	0.459	130.719	
6th Bar After R (3 mm.)	487.684	484.767	2.917	0.972	0.486	123.414	
3rd Bar After S (4 mm.)	508.749	505.556	3.193	0.798	0.399	150.329	
Letter U (2 mm.)	544.137	542.512	1.625	0.813	0.406	147.692	
11th Bar After V (4 mm.)	573.990	570.724	3.266	0.816	0.408	146.969	
Letter W (10 mm.)	590.640	582.120	8.520	0.852	0.426	140.845	
Daniel Janca							
m. 1 - 3	12.499	9.214	3.285	1.095	0.548	109.589	
Letter A (3 mm.)	39.219	35.842	3.377	1.126	0.563	106.603	
Letter B (5 mm.)	69.043	63.379	5.664	1.133	0.566	105.932	
Letter C (3 mm.)	94.026	90.666	3.360	1.120	0.560	107.143	
11 after D (3 mm.)	132.451	128.986	3.465	1.155	0.578	103.896	
4th Bar After E (5 mm.)	154.354	148.447	5.907	1.181	0.591	101.574	
5th Bar After F (5 mm.)	183.920	178.195	5.725	1.145	0.572	104.803	
Letter G (3 mm.)	203.214	199.902	3.312	1.104	0.552	108.696	
Letter H (5 mm.)	232.707	227.653	5.054	1.011	0.505	118.718	
Letter I (5 mm.)	261.564	256.176	5.388	1.078	0.539	111.359	
Letter J (4 mm.)	287.742	282.848	4.894	1.224	0.612	98.079	
Letter K (5 mm.)	318.586	312.421	6.165	1.233	0.617	97.324	
Letter L (5 mm.)	347.777	341.962	5.815	1.163	0.582	103.181	
3rd Bar After M (3 mm.)	375.392	371.931	3.461	1.154	0.577	104.016	
Letter N (5 mm.)	403.577	397.688	5.889	1.178	0.589	101.885	
Letter O (8 mm.)	433.298	424.504	8.794	1.099	0.550	109.165	
Letter P (10 mm.)	462.760	451.525	11.235	1.124	0.562	106.809	
Letter Q (4 mm.)	482.824	478.405	4.419	1.105	0.552	108.622	
6th Bar After R (3 mm.)	514.006	510.638	3.368	1.123	0.561	106.888	
3rd Bar After S (4 mm.)	538.692	534.790	3.902	0.976	0.488	123.014	
Letter U (2 mm.)	582.280	580.310	1.970	0.985	0.493	121.827	
11th Bar After V (4 mm.)	619.389	615.225	4.164	1.041	0.520	115.274	
Letter W (10 mm.)	640.398	629.916	10.482	1.048	0.524	114.482	

percussion ensemble												
hkbu												
m. 1 - 3	16.779		12.887		3.892		1.297		0.649		92.497	
Letter A (3 mm.)	47.174		43.354		3.820		1.273		0.637		94.241	
Letter B (5 mm.)	79.556		73.245		6.311		1.262		0.631		95.072	
Letter C (3 mm.)	106.510		102.777		3.733		1.244		0.622		96.437	
11 after D (3 mm.)	148.676		144.968		3.708		1.236		0.618		97.087	
4th Bar After E (5 mm.)	172.749		166.592		6.157		1.231		0.616		97.450	
5th Bar After F (5 mm.)	204.894		198.686		6.208		1.242		0.621		96.649	
Letter G (3 mm.)	225.498		221.692		3.806		1.269		0.634		94.587	
Letter H (5 mm.)	258.786		252.952		5.834		1.167		0.583		102.845	
Letter I (5 mm.)	288.928		282.978		5.950		1.190		0.595		100.840	
Letter J (4 mm.)	316.834		312.163		4.671		1.168		0.584		102.762	
Letter K (5 mm.)	345.559		339.742		5.817		1.163		0.582		103.146	
Letter L (5 mm.)	373.667		363.629		10.038		2.008		1.004		59.773	
3rd Bar After M (3 mm.)	402.008		398.337		3.671		1.224		0.612		98.066	
Letter N (5 mm.)	436.886		430.985		5.901		1.180		0.590		101.678	
Letter O (8 mm.)	463.532		452.703		10.829		1.354		0.677		88.651	
Letter P (10 mm.)	491.012		479.201		11.811		1.181		0.591		101.600	
Letter Q (4 mm.)	512.314		507.621		4.693		1.173		0.587		102.280	
6th Bar After R (3 mm.)	544.985		541.287		3.698		1.233		0.616		97.350	
3rd Bar After S (4 mm.)	575.309		570.737		4.572		1.143		0.572		104.987	
Letter U (2 mm.)	626.519		624.162		2.357		1.178		0.589		101.824	
11th Bar After V (4 mm.)	670.496		665.975		4.521		1.130		0.565		106.171	
Letter W (10 mm.)	693.048		681.681		11.367		1.137		0.568		105.569	
Pulsat Perc. Group												
m. 1 - 3	10.089		6.894		3.195		1.065		0.533		112.676	
Letter A (3 mm.)	35.408		32.32		3.088		1.029		0.515		116.580	
Letter B (5 mm.)	62.987		57.567		5.42		1.084		0.542		110.701	
Letter C (3 mm.)	86.400		83.118		3.282		1.094		0.547		109.689	
11 after D (3 mm.)	121.439		118.467		2.972		0.991		0.495		121.131	
4th Bar After E (5 mm.)	141.812		136.261		5.551		1.110		0.555		108.089	
5th Bar After F (5 mm.)	168.458		163.563		4.895		0.979		0.490		122.574	
Letter G (3 mm.)	185.380		182.354		3.026		1.009		0.504		118.969	
Letter H (5 mm.)	211.608		207.262		4.346		0.869		0.435		138.058	
Letter I (5 mm.)	236.509		231.924		4.585		0.917		0.458		130.862	
Letter J (4 mm.)	259.222		254.569		4.653		1.163		0.582		103.159	
Letter K (5 mm.)	287.324		281.839		5.485		1.097		0.549		109.389	
Letter L (5 mm.)	313.924		308.597		5.327		1.065		0.533		112.634	
3rd Bar After M (3 mm.)	339.013		335.892		3.121		1.040		0.520		115.348	
Letter N (5 mm.)	364.029		358.746		5.283		1.057		0.528		113.572	
Letter O (8 mm.)	390.850		382.961		7.889		0.986		0.493		121.688	
Letter P (10 mm.)	416.770		406.796		9.974		0.997		0.499		120.313	
Letter Q (4 mm.)	454.790		450.784		4.006		1.002		0.501		119.820	
6th Bar After R (3 mm.)	X		X		X		X		X		X	
3rd Bar After S (4 mm.)	X		X		X		X		X		X	
Letter U (2 mm.)	X		X		X		X		X		X	
11th Bar After V (4 mm.)	481.654		477.532		4.122		1.031		0.515		116.448	
Letter W (10 mm.)	498.387		490.793		7.594		0.759		0.380		158.019	

Appendix F:

Overall Average BPM of opening section of *Third Construction* corpus study videos (Beginning to stringendo on pg. 16 of the score)

Uploader	Overall Average BPM	Rounded
Vic Firth	103.977	104
McGill Percussion	95.045	95
Aurél Holló	109.371	109
Cristobol Gajardo B.	104.150	104
Bill Cahn	84.490	84
Vic Firth Concert	108.359	108
Christopher Salvito	111.078	111
Heidelberger Frühling	81.776	82
Spec Drum	105.625	106
IPCL - Daidalos	101.947	102
sideshow097	114.685	115
Taylor Yozwiak	103.569	104
Sydney Wind Orchestra	101.273	101
IPCL - Pulsat	115.051	115
Karina Yau	101.753	102
PendulumNewMusic	109.303	109
Peter Jarvis	103.170	103
Daniel Janca	106.030	106
HKBU	95.503	96
PercaRUS	103.109	103

Appendix G:

Stringendo Pacing in *Third Construction* corpus study videos

Uploader	Stringendo Total Time	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th (Fermata)	
Vic Firth	12.149	1.037	1.021	0.986	0.961	0.923	0.991	0.894	0.895	0.843	0.921	0.872	1.805	Break
McGill Percussion	14.074	0.993	1.161	1.080	1.184	1.117	0.961	1.138	1.065	1.059	1.031	1.096	2.002	Break
Aurél Holló	12.847	1.020	1.084	0.975	0.967	0.984	0.867	0.907	0.876	0.932	0.882	0.909	2.444	Break
Cristobol Gajardo B.	12.974	1.180	1.156	1.086	0.988	0.949	0.954	0.899	0.953	0.893	0.923	0.908	2.085	Break
Bill Cahn	18.939	1.385	1.391	1.332	1.267	1.306	1.228	1.214	1.320	1.260	1.528	1.914	3.794	No Break
Vic Firth Concert	15.136	1.137	1.130	1.060	1.001	1.081	0.878	0.835	0.943	0.864	0.805	0.856	4.646	No Break
Christopher Salvito	12.394	1.087	1.029	0.999	0.998	0.952	1.045	0.903	0.964	0.966	1.002	0.937	1.512	Break (Audio Edit)
Heidelberger Frühling	15.576	1.358	1.317	1.354	1.358	1.278	1.234	1.211	1.243	1.171	1.119	1.130	1.803	Break
Spec Drum	15.566	1.153	1.105	1.129	1.057	1.112	1.050	1.093	1.023	1.097	1.067	0.943	3.737	Break
IPCL - Daidalos	12.199	1.021	1.010	1.047	1.001	1.029	0.862	0.899	0.918	0.917	0.859	0.809	1.827	Break
sideshow097	12.582	0.944	0.932	0.816	0.899	0.909	0.879	0.942	0.919	0.940	0.805	0.884	2.713	Break
Taylor Yozwiak	14.077	1.115	1.143	1.126	1.025	1.123	1.019	0.987	1.045	0.946	0.998	0.904	2.656	Break
Sydney Wind Orch.	15.106	1.138	1.097	1.097	1.158	1.138	1.067	1.107	1.097	1.077	1.056	1.098	2.976	Break
IPCL - Pulsat	12.414	1.038	0.960	0.966	0.876	0.953	0.869	0.855	0.875	0.882	0.790	0.823	2.527	Break
Karina Yau	13.887	1.071	1.132	1.080	1.071	1.010	1.150	1.010	1.088	1.027	1.019	1.073	2.156	Break
PendulumNewMusic	12.237	1.030	1.001	0.940	0.932	0.893	0.878	0.994	0.842	0.834	0.865	0.891	2.137	Break
Peter Jarvis	12.418	0.975	0.934	0.987	0.952	1.021	0.894	0.987	1.057	0.894	0.905	0.999	1.783	No Break
Daniel Janca	13.689	0.991	1.109	0.969	1.001	0.984	1.005	1.028	0.937	0.972	0.907	0.969	3.007	Break
HKBU	14.150	X	X	1.152	1.284	1.234	1.204	1.205	1.176	1.175	1.176	1.262	3.309	Break
PercaRUS	13.734	1.125	1.061	1.025	0.874	1.030	0.884	0.975	0.870	0.982	0.899	0.867	3.041	Break

Appendix H:

Letter “W” and 2nd Accelerando Marking in *Third Construction* corpus study videos

Uploader	"W" to 2nd Accel.	Avg. Time Per Measure	2nd. Accel to 5 Before End	Avg. Time Per Measure	Time Differential
Vic Firth	8.279	0.828	7.330	0.814	0.949
McGill Percussion	9.758	0.976	7.712	0.857	2.046
Aurél Holló	9.572	0.957	7.663	0.851	1.909
Cristobol Gajardo B.	9.035	0.904	7.893	0.877	1.142
Bill Cahn	11.747	1.175	9.979	1.109	1.768
Vic Firth Concert	9.044	0.904	7.213	0.801	1.831
Christopher Salvito	9.119	0.912	7.255	0.806	1.864
Heidelberger Frühling	8.629	0.863	7.693	0.855	0.936
Spec Drum	9.741	0.974	8.276	0.920	1.465
IPCL - Daidalos	9.056	0.906	7.489	0.832	1.567
sideshow097	9.056	0.906	7.931	0.881	1.125
Taylor Yozwiak	8.793	0.879	7.971	0.886	0.822
Sydney Wind Orchestra	9.793	0.974	7.748	0.861	1.989
IPCL - Pulsat	7.594	0.759	9.549	1.061	-1.955
Karina Yau	10.174	1.017	8.491	0.943	1.683
PendulumNewMusic	9.400	0.940	8.437	0.937	0.963
Peter Jarvis	8.520	0.852	7.285	0.809	1.235
Daniel Janca	10.482	1.048	8.392	0.932	2.090
HKBU	11.367	1.137	9.609	1.068	1.758
PercaRUS	9.674	0.967	8.310	0.923	1.364

Appendix I:

Durations of the last five measures *Third Construction* corpus study videos

Uploader	5th (Secs)	4th (Secs)	3rd (Secs)	2nd (Secs)	1st (Secs)
Vic Firth	1.044	0.534	0.786	0.797	0.810
McGill Percussion	0.857	0.841	0.836	0.836	0.824
Aurél Holló	0.836	0.777	0.810	0.783	0.956
Cristobol Gajardo B.	0.865	0.853	0.883	0.882	0.942
Bill Cahn	1.123	1.080	1.097	1.123	1.235
Vic Firth Concert	0.813	0.653	0.689	0.760	0.751
Christopher Salvito	0.704	0.711	0.783	0.704	0.780
Heidelberger Frühling	0.772	0.804	0.818	0.801	0.805
Spec Drum	0.881	0.897	0.888	0.906	0.962
IPCL - Daidalos	0.809	0.784	0.745	0.770	0.845
sideshow097	0.802	0.809	0.722	0.830	0.915
Taylor Yozwiak	0.853	0.923	0.862	0.940	1.007
Sydney Wind Orchestra	0.836	0.770	0.810	0.751	0.941
IPCL - Pulsat	0.785	0.823	0.803	0.856	0.891
Karina Yau	0.819	0.807	0.918	0.888	0.879
PendulumNewMusic	0.881	0.900	0.889	0.774	0.899
Peter Jarvis	0.755	0.764	0.738	0.706	0.758
Daniel Janca	0.927	0.869	0.922	0.834	1.013
HKBU	1.219	0.980	0.987	0.903	1.073
PercaRUS	0.864	0.904	0.894	0.853	1.054

Appendix J:

Sample email to university percussion professors for case study recruitment

Gmail

Boyce Jeffries <boycejeffries@gmail.com>

Case Study Participants Needed
3 messages

Boyce Jeffries Jr. <boyce.jeffries@mail.utoronto.ca> Sat, Mar 13, 2021 at 2:17 PM
To: Boyce Jeffries <boycejeffries@gmail.com>
Cc: Boyce Jeffries <boycejeffries@gmail.com>

Dear all,

I am writing to you to seek volunteer participants from your respective percussion studios for a case study on the perception and reception of percussion performance videos on YouTube.

My dissertation research examines the question; How are undergraduate percussionists evaluating percussion performance videos on YouTube? Two subsidiary questions are: 1) How does an undergraduate's use of YouTube affect their percussion training; 2) How can viewing percussion performance videos on YouTube be used most productively to enhance undergraduate percussion training?

In order to answer the above questions, I am seeking to conduct a case study on 10 persons to gather qualitative data on their interactions with and perceptions of percussion performance videos on YouTube. Participants will view excerpts of selected performance videos of John Cage's *Third Construction*. I have created a playlist of 5 excerpts from specific performance videos that participants are to watch and to answer questions / elaborate on. Participants will be compensated $25 for their time and energy, which should be no more than one hour of their time.

- Students *must* be:
  - Undergraduate percussionists (performance or education majors) who have not performed Third Construction yet but are interested in learning the piece.

The goal of this research is to elicit and analyze qualitative information about what the current generation of university percussionists are observing in audiovisual recordings of percussion repertoire (specifically within the YouTube environment).

Please forward this information along to your students who are eligible to participate in this study. Participants are encouraged to contact me (boyce.jeffries@mail.utoronto.ca) to receive materials for this case study.

Thank you very much for your time and consideration,

Boyce Jeffries

DMA candidate
Faculty of Music
University of Toronto

Appendix K:

Sample of Informed Consent Letter for case study participants

Informed Consent Letter

Researcher
Boyce Jeffries, Jr., DMA Candidate, Faculty of Music
209-625-7826
boyce.jeffries@mail.utoronto.ca

Supervisor

Aiyun Huang
aiyun.huang@utoronto.ca

Title of Study
"Case Study on Percussion Performance Videos on YouTube: Perception, Reception & Evaluation"

This dissertation research aims to study how are undergraduate percussionists evaluating percussion performance videos on YouTube.

This consent form outlines the purpose and scope of the study, the conditions of participation, the potential risks and benefits of participation, and how information gathered in the study will be accessed. Further, it asks for signed consent for participation and acknowledges each participant's right to withdraw at any point in time from the study. Participants should keep a copy of this letter for their own reference. Should you have any further questions about this study, you are encouraged to contact the researcher, Boyce Jeffries (boyce.jeffries@mail.utoronto.ca). Questions about your rights as a participant in this study may also be directed to:

Research Oversight and Compliance Office
Human Research Ethics Program
ethics.review@utoronto.ca or (416)-946-3273

Purpose and Scope of the Study

This research will investigate how undergraduate percussionists are currently evaluating percussion performance videos on YouTube. Some subsidiary questions include:

1) How does an undergraduate's use of YouTube affect their percussion training?

2) How can viewing percussion performance videos on YouTube be used most productively to enhance undergraduate percussion training?

In order to accrue information on the primary and secondary questions, participants in this case study will watch excerpts of John Cage's *Third Construction*, respond to questionnaires, and give written thoughts on the subject material. Participants will be asked to 'screen-record' their devices while they execute this study. These recordings will be used only for the purpose of analysis by the researcher. Follow up interviews may be conducted to clarify and elaborate on any participant's submitted materials from the case study.

Conditions of Participation

The analysis of data from the case study and its subsequent findings will be presented in the DMA thesis of the researcher (Boyce Jeffries, Jr.). In order to solicit more candid responses in this case study, the researcher will not publish the names, identities, or private information (e.g. email address) belonging to the participants. This information within the written responses and questionnaires will be redacted in the final publication in the document, and will be known only by the researcher, and therefore, confidential.

An honorary compensation of $25.00 will be offered for participation in this study. Participants should only expect to take one hour to complete the case study, and the researcher would like to appropriately compensate them for their time and energy.

Potential Risks and Benefits

There is no social risk involved with this research. The intention of this case study is to elicit the opinions and insights of undergraduate students through anonymous questionnaires. In the final publication of this research, the materials submitted will be published, but names and information with be redacted and hidden from public eye.

The benefit of this research is to collect, highlight and analyze the expressed opinions of the participants' perception and reception of percussion performance videos on YouTube. The topic of YouTube in academic research is relatively a new one, so to discuss its prominence and relationship with current percussionists in their undergraduate study can present important information for future generations of pedagogues, educators, and performers.

Access to Information

The data gathered from this study will be analyzed by the researcher and the findings will be presented in his DMA thesis paper. No one other than the researcher will have access to the data collected during the case study process. The data will be stored in encrypted files (password-protected) on a personal, external hard-drive of the researcher. If, after consenting to the study, a participant decides that they no longer wish to participate, they can inform the researcher at any time, before the study is published. All data belonging to those who chose to withdraw will then be deleted and a confirmation e-mail will be sent to the participants.

Consent

I, _____, consent to the above terms outlined in this informed consent letter, and will participate in this case study conducted by the researcher (Boyce Jeffries, Jr.)

Signed: _____ Date: _____

Appendix L:

Participant 1: Case Study Answers

Case Study on Reception and Perception of Audiovisual Recordings of Percussion Performance Videos on YouTube

Thank you for joining this study. This will take about one hour of your time. There are three sets of questionnaires. All of your answers will be given / typed directly into this document.

Before beginning, please take this time to begin screen recording on your device. If you do not know how to screen-record on your device, please watch this video that explains how to do so (via the Zoom platform).

Questionnaire 1 – General survey on your experience using YouTube

1. Do you regularly use YouTube to learn more about percussion repertoire?
   a. Yes
   b. No

1b. If yes, how frequent?

   a. Once a week
   b. Twice a week
   c. Everyday
   d. Other

2. I use YouTube to _____ (Highlight all answers that apply)

   a. Search for recordings to use as references for my own learning process
   b. Search for new repertoire
   c. Connect with performers / composers I do not know personally
   d. Upload videos of my own performances

3. How many videos of the SAME composition do you watch to serve as references during your own learning process?

   a. Only 1
   b. 2–3
   c. 3–4
   d. More than 4

4. What are some CONCERNS you have with percussion performance videos uploaded onto YouTube?

   It can take away some of the creativity for the watcher. If you hear the artistic liberties someone else is taking with a piece, you might not be able to come up with your own.

5. What are some BENEFITS you see in using YouTube as a resource for your educational / artistic development?
   It is nice if you're struggling to get something in a piece or want to hear what it sounds like in general to have that aid. It also gives you an idea of things you can try/do.

Questionnaire 2 – First Excerpt Viewing

Please open your web browser to the following link:

https://www.youtube.com/playlist?list=PLDfuBk-Npt42LEyDnwxy-n99KQslDsGDH

Note: Leave your web browser open until the end of this case study. It will be needed to complete both the second and third questionnaires.

Watch the video excerpts in any order you choose. This will be your first viewing.

amandinapercussion – Stop watching @ 3:35

Bill Cahn – Stop watching @ 4:43

PendulumNewMusic – Stop watching @ 3:44

Christopher Salvito – Stop watching @ 3:35

Karina Yau – Stop watching @ 3:45

Questions on First Viewing:

1) Rating: Rate each excerpt by completing the charts below. Please do this immediately after you watch each excerpt. Give your assessments on the quality of the audio (sound), video (clarity, visual presentation), and performance. Highlight your selections in the tables below.

Amadindapercussion

Audio Quality	Excellent	Very Good	Fair	Not Good	Poor
Video Quality	Excellent	Very Good	Fair	Not Good	Poor
Performance Quality	Excellent	Very Good	Fair	Not Good	Poor

Bill Cahn

Audio Quality	Excellent	Very Good	Fair	Not Good	Poor
Video Quality	Excellent	Very Good	Fair	Not Good	Poor
Performance Quality	Excellent	Very Good	Fair	Not Good	Poor

PendulumNewMusic

Audio Quality	Excellent	Very Good	Fair	Not Good	Poor
Video Quality	Excellent	Very Good	Fair	Not Good	Poor
Performance Quality	Excellent	Very Good	Fair	Not Good	Poor

Christopher Salvito

Audio Quality	Excellent	Very Good	Fair	Not Good	Poor
Video Quality	Excellent	Very Good	Fair	Not Good	Poor
Performance Quality	Excellent	Very Good	Fair	Not Good	Poor

Karina Yau

Audio Quality	Excellent	Very Good	Fair	Not Good	Poor
Video Quality	Excellent	Very Good	Fair	Not Good	Poor

Performance Quality	Excellent	Very Good	Fair	Not Good	Poor

2) Rank the videos from most favorite (1) to least favorite (5). Type your responses next to the name of the video uploader.

Amadindapercussion _4_

Bill Cahn _1_

PendulumNewMusic _3_

Christopher Salvito _5_

Karina Yau _2_

3) How many views does your favorite excerpt have at the present moment?

Answer: __10,082 views__

4) In your opinion, which excerpt had the best audio quality?

a. Amadindapercussion
b. Bill Cahn
c. PendulumNewMusic
d. Christopher Salvito
e. Karina Yau

5) In your opinion, which excerpt was the most interesting to watch as an audience member?

a. Amadindapercussion
b. Bill Cahn
c. PendulumNewMusic
d. Christopher Salvito
e. Karina Yau

6) As a percussionist who is interested in learning this piece, is your favorite excerpt one that you would consider to be the most useful or the most educational? Briefly elaborate on your answer.

I would say yes because they play it, what sounds to be, correctly and give lots of shaping and dynamics which would be very useful and a good example for any percussionist. They also got very good sounds and tone from their instruments and were entertaining to watch which was the icing on the cake.

Questionnaire 3 - Second Viewing:

Now you will watch the same excerpts again, but this time, simultaneously follow along with the score. You may choose the order in which you watch these excerpts. Click here to be directed to the score. Stop the videos once you reach the end of the sheet music provided.

Questions on Second Viewing:

1) Please rank the videos again, this time based on your impression of watching *and* following the score, simultaneously. Highlight your answers in the table below.

Amadindapercussion	Excellent	Very Good	Fair	Not Good	Poor
Bill Cahn	Excellent	Very Good	Fair	Not Good	Poor
PendulumNewMusic	Excellent	Very Good	Fair	Not Good	Poor
Christopher Salvito	Excellent	Very Good	Fair	Not Good	Poor
Karina Yau	Excellent	Very Good	Fair	Not Good	Poor

2) Which excerpt do you think is the most accurate performance according to the written score?

   a. Amadindapercussion
   b. Bill Cahn
   c. PendulumNewMusic
   d. Christopher Salvito
   e. Karina Yau

3) Briefly discuss each excerpt based on the following criteria:

Groups	Instruments / Sound	Mallets / Stick Choices	Set-up	Gestures
Amadindapercussion	You can hear hear instrument and how they fit together	Everything sounds balanced and nice, so I would say good choices	They look like they are mostly reading off their music but when they do look up, they seem to be in a good set up	Not much in the room for gestures. I would say they were listening more than looking, and it worked for them.
Bill Cahn	You can hear everything but sometimes feels like parts do not fit together	Everything sounds nice so good choices in mallets/sticks.	They set up looking at each other which is a great choice for this piece. Opens up for a line of nonverbal communication	Did not see much in the term of gestures but their nonverbal communication in eye contact and other ways is very good
PendulumNewMusic	Missing some of the instruments. Too covered up	Maybe softer mallets on drums so that the softer instrumentation has a chance to shine through a bit	Facing each other which is good however one of the performers seems to be tucked away further than the rest. He cannot make eye contact with the performer diagonal from him at all which will make it hard to be together	Did not see anything gesture wise and they could use a lot more eye contact together to get their parts lined up.
Christopher Salvito	Missing some of the instruments even though they are played.	Again, softer mallets on the drums and bring out the softer parts	Facing each other which is probably the best set up. They seem to be using that	Didn’t see much gesture wise but again, good eye contact and nonverbal

	You can seem them but can't hear them in the blend	that are getting buried	to their advantage to be connected and together with one another.	communicatio n that way. Just need to balance out their sounds.
Karina Yau	Missing some of the instruments here too. They are getting buried in the louder sounds	Softer mallets on the drums so that the quitter instruments can come through more. When playing with hands, play a little quitter.	Facing each other, which like the other bands, is the best idea, in my eyes. They seem to groove and make eye contact consistently which is good.	Again, no gestures that I can see, but eye contact and moving their bodies to the beat is very prominent and useful. Helps keep them together.

4) In your opinion, which excerpt offers you the most information on how you might learn this piece? Why?

I would say Karina Yau's piece because the small, for lack of a better word, mistakes that they make lead to the improvement of your own piece and how you want to go about it. If their sound is getting covered up and not blending well, you can think about ways to change and improve that for your own group.

5) With regard to the question above, is this excerpt you chose as having the most information for you the same as your favorite recording from the first viewing?

i. Yes
ii. No

6) If you answered NO in the question above, please elaborate further. Why is your favorite excerpt from the first viewing different than the one you chose that has the most information for you as someone who wants to learn this piece? What are the significant differences between these two excerpts?

There isn't always something to learn from the best sounding and "perfect" recordings. Hearing how it's supposed to sound is beneficial but hearing the conflicts that could happen with the piece can help you prepare and adjust your own group. The one I liked the most just

had it put together a bit more and had fun with it. The group I learned the most from made some mistakes but also still had fun with it. There is more to it than being perfect, but if you're looking to improve, it's nice to be able to hear what problems might arise.

7) Is there a different experience between your first viewing and second viewing following the score? Yes / No

7a) If your answer is YES, can you please describe how it is different and if you have a preference?

I think the video quality has a major role in determining what I liked in the first viewing. The first video was kind of boring to watch since they were staring at their music and the quality was so grainy. However, listening back to it with the score, I was able to focus on the music itself and it sounds fantastic! People who have fun and move with the music are more entertaining to watch but might not be the most accurate recording and vice versa.

Appendix M:

Participant 2: Case Study Answers

Case Study on Reception and Perception of Audiovisual Recordings of Percussion Performance Videos on YouTube

Thank you for joining this study. This will take about one hour of your time. There are three sets of questionnaires. All of your answers will be given / typed directly into this document.

Before beginning, please take this time to begin screen recording on your device. If you do not know how to screen-record on your device, please watch this video that explains how to do so (via the Zoom platform).

Questionnaire 1 – General survey on your experience using YouTube

1. Do you regularly use YouTube to learn more about percussion repertoire?
   a. Yes
   b. No

1b. If yes, how frequent?

   a. Once a week
   b. Twice a week
   c. Everyday
   d. Other

2. I use YouTube to _____ (Highlight all answers that apply)

   a. Search for recordings to use as references for my own learning process
   b. Search for new repertoire
   c. Connect with performers / composers I do not know personally
   d. Upload videos of my own performances

3. How many videos of the SAME composition do you watch to serve as references during your own learning process?

   a. Only 1
   b. 2–3
   c. 3–4
   d. More than 4

4. What are some CONCERNS you have with percussion performance videos uploaded onto YouTube?

Usually, the audio/video quality of the performances aren't too clear.

5. What are some BENEFITS you see in using YouTube as a resource for your educational / artistic development?
   There is a range of skill levels that are available to view.

Questionnaire 2 – First Excerpt Viewing

Please open your web browser to the following link:

https://www.youtube.com/playlist?list=PLDfuBk-Npt42LEyDnwxy-n99KQslDsGDH

Note: Leave your web browser open until the end of this case study. It will be needed to complete both the second and third questionnaires.

Watch the video excerpts in any order you choose. This will be your first viewing.

amandinapercussion – Stop watching @ 3:35

Bill Cahn – Stop watching @ 4:43

PendulumNewMusic – Stop watching @ 3:44

Christopher Salvito – Stop watching @ 3:35

Karina Yau – Stop watching @ 3:45

Questions on First Viewing:

1) Rating: Rate each excerpt by completing the charts below. Please do this immediately after you watch each excerpt. Give your assessments on the quality of the audio (sound), video (clarity, visual presentation), and performance. Highlight your selections in the tables below.

Amadindapercussion

Audio Quality	Excellent	Very Good	Fair	Not Good	Poor
Video Quality	Excellent	Very Good	Fair	Not Good	Poor
Performance Quality	Excellent	Very Good	Fair	Not Good	Poor

Bill Cahn

Audio Quality	Excellent	Very Good	Fair	Not Good	Poor
Video Quality	Excellent	Very Good	Fair	Not Good	Poor
Performance Quality	Excellent	Very Good	Fair	Not Good	Poor

PendulumNewMusic

Audio Quality	Excellent	Very Good	Fair	Not Good	Poor
Video Quality	Excellent	Very Good	Fair	Not Good	Poor
Performance Quality	Excellent	Very Good	Fair	Not Good	Poor

Christopher Salvito

Audio Quality	Excellent	Very Good	Fair	Not Good	Poor
Video Quality	Excellent	Very Good	Fair	Not Good	Poor
Performance Quality	Excellent	Very Good	Fair	Not Good	Poor

Karina Yau

Audio Quality	Excellent	Very Good	Fair	Not Good	Poor

Video Quality	Excellent	Very Good	Fair	Not Good	Poor
Performance Quality	Excellent	Very Good	Fair	Not Good	Poor

2) Rank the videos from most favorite (1) to least favorite (5). Type your responses next to the name of the video uploader.

Amadindapercussion 3

Bill Cahn 5

PendulumNewMusic 2

Christopher Salvito 1

Karina Yau 4

3) How many views does your favorite excerpt have at the present moment?

Answer: 3371

4) In your opinion, which excerpt had the best audio quality?

a. Amadindapercussion
b. Bill Cahn
c. PendulumNewMusic
d. Christopher Salvito
e. Karina Yau

5) In your opinion, which excerpt was the most interesting to watch as an audience member?

a. Amadindapercussion
b. Bill Cahn
c. PendulumNewMusic
d. Christopher Salvito
e. Karina Yau

6) As a percussionist who is interested in learning this piece, is your favorite excerpt one that you would consider to be the most useful or the most educational? Briefly elaborate on your answer.

I think that my favorite excerpt had the best camera quality and audio quality, which allowed for me to enjoy the timbre and colors of the instruments much more, but would not necessarily be the most educational or useful. I do think that it was fun and interesting to listen to and watch, but it didn't give me the most information on setup or style of playing compared to some of the other performances.

Questionnaire 3 - Second Viewing:

Now you will watch the same excerpts again, but this time, simultaneously follow along with the score. You may choose the order in which you watch these excerpts. Click here to be directed to the score. Stop the videos once you reach the end of the sheet music provided.

Questions on Second Viewing:

1) Please rank the videos again, this time based on your impression of watching *and* following the score, simultaneously. Highlight your answers in the table below.

Amadindapercussion	Excellent	Very Good	Fair	Not Good	Poor
Bill Cahn	Excellent	Very Good	Fair	Not Good	Poor
PendulumNewMusic	Excellent	Very Good	Fair	Not Good	Poor
Christopher Salvito	Excellent	Very Good	Fair	Not Good	Poor
Karina Yau	Excellent	Very Good	Fair	Not Good	Poor

2) Which excerpt do you think is the most accurate performance according to the written score?

   a. Amadindapercussion
   b. Bill Cahn
   c. PendulumNewMusic
   d. Christopher Salvito

e. Karina Yau

3) Briefly discuss each excerpt based on the following criteria:

Groups	Instruments / Sound	Mallets / Stick Choices	Set-up	Gestures
Amadindapercussion	The drums are pretty boomy so they kind of get lost in the audio, but I did like the tone of the lower drums. The bright metal cut through the audio very well so they sound super crisp and bright.	The mallets and stick choices didn't stick out to me too much, especially since the audio quality isn't super clear. I did like the sticks used on all metal percussion.	Unable to see the full set up due to camera angles, but it looks pretty condensed and chaotic.	They seem to be communicating effectively and using gestures only when needed.
Bill Cahn	The metal drums sound very tinny. I liked the clave and the hand drums. The hand drums sound very warm which offset the bright metals and clave.	I didn't super love the mallets used in their performance. None of them stood out to me a ton. The mallets on the metal drum don't help with the tinny-ness of the drum.	The setup is somewhat like a boxed set up. Each percussionist has their own area to work with while still seeing each other. The music of the person facing away from the camera may get in the way of communicati on with the	They don't look at each other too much. They kind of stay in their own world for the majority of the piece and don't do too many extra gestures or movements to add to the performance. This may be because of the camera angles changing so often and mostly showing their

			other people in the ensembles.	hands/instruments.
PendulumNewMusic	I really liked the drum tones in this one. I think they were careful in what instruments they chose and it allowed for the different timbres and colors to really shine through when speaking to one another.	I thought the sticks they use for the brighter instruments were great. I liked how they interacted with each instrument and didn't force each percussion instrument to do too much work. I felt like they got the necessary and desired sound from each hit.	Very spacious set up. One of the bigger setups compared to the rest of the performances. This setup might be a tad too far away from each other which may make it difficult to communicate with the other percussionists in the ensemble.	This ensemble definitely was pretty confident and started to enjoy the performance. They were often nodding their heads or getting into the piece with body dynamics. They felt like they were pretty connected to the piece and each other despite their distance on the stage.
Christopher Salvito	Maybe it was the improved sound quality or video quality, but I think this performance had my favorite instrument and sound production. All the hand drums were very bassy and boomy/spaciou	The sticks and mallets, especially the timpani mallets used on the drum, were great. I do think the sound quality has something to do with my positive reviews, but I really liked how the	This setup was similar to the second setup (Bill Cahan's video) and the last one (Karina Yau's video). They are spaced out but facing each other. I do think they	This ensemble also enjoyed their performance. The video shooting did focus more on the instruments and their hands more than the performers' faces/bodies but it did usually zoom out for bigger ensemble moments which

	s and all the cans had great and differing tones. The accessory instruments sounded full and characteristic of the style and desired effects for the piece.	mallets sounded on all the instruments.	have enough space for each person but they're close enough to interact with one another. I felt like the setup was really ergonomic and flowed into each others' setup well.	allowed the viewer to see how they looked to one another and interacted when needed. I do think each player was a bit in their own world for the majority of the piece, though.
Karina Yau	Probably one of my favorite choices of instrumentation. I think they used a lot more found objects than the other performances. The claves were not my favorite, but that was my only note for their performance. I really liked the bowl thing they used for the tin bowl. I wish the "lion's roar" was more audible. I liked their tambourine	I think their choice of mallets were good. No notable comments, good or bad. I did like the metal sticks used on cans and things.	One of the bigger of the setups. I think they are pretty well spread out, but not too far away. I think, especially with the amount of instruments needed for this piece, this level of distance is reasonable. These performers interacted a lot, which made up for the distance between	This ensemble interacted the most out of all the videos. They were constantly nodding/bobbing their heads together in sync and looking at one another. I think although the audio and video quality is one of the worse ones, I could see the interaction and gestures the clearest.

	sound, although it did throw the audio off a bit.		them. This setup is more of a circular setup as opposed to the more square setup from the Bill Cahon video.	

4) In your opinion, which excerpt offers you the most information on how you might learn this piece? Why?

I think the last excerpt, the Karina Yau gave me the most information about this piece. Although the audio/video is worse off, it had the most character from each individual player and as an ensemble as a whole.

5) With regard to the question above, is this excerpt you chose as having the most information for you the same as your favorite recording from the first viewing?
   i. Yes
   ii. No

6) If you answered NO in the question above, please elaborate further. Why is your favorite excerpt from the first viewing different than the one you chose that has the most information for you as someone who wants to learn this piece? What are the significant differences between these two excerpts?

I think my favorite excerpt was the most enjoyable to watch because it had the best audio and video quality. It was, as a viewer/audience member, the most fun and cleanest to experience. However, as a music student and as someone trying to analyze the piece, the interpretation, and the interaction between each of the performers, I think the Karina Yau recording is the most understandable and the one that gives me the most real world/future performance applicable information.

7) Is there a different experience between your first viewing and second viewing following the score? Yes / No

7a) If your answer is YES, can you please describe how it is different and if you have a preference?

I think on first impressions and first viewing, I was experiencing the piece of music differently than when I was following along and trying to analyze and look for different things. While experiencing the piece, I was much less engaged and viewing from a more passive lens. On the rewatch, I was intentionally engaging with the music through the score and I was forced to follow along more intently and with more of a purpose of gaining information rather than simply and solely watching.

Appendix N:

Participant 3: Case Study Answers

Case Study on Reception and Perception of Audiovisual Recordings of Percussion Performance Videos on YouTube

Thank you for joining this study. This will take about one hour of your time. There are three sets of questionnaires. All of your answers will be given / typed directly into this document.

Before beginning, please take this time to begin screen recording on your device. If you do not know how to screen-record on your device, please watch this video that explains how to do so (via the Zoom platform).

Questionnaire 1 – General survey on your experience using YouTube

1. Do you regularly use YouTube to learn more about percussion repertoire?
   a. Yes
   b. No

   1b. If yes, how frequent?

   a. Once a week
   b. Twice a week
   c. Everyday
   d. Other

2. I use YouTube to _____ (Highlight all answers that apply)

   a. Search for recordings to use as references for my own learning process
   b. Search for new repertoire
   c. Connect with performers / composers I do not know personally
   d. Upload videos of my own performances

3. How many videos of the SAME composition do you watch to serve as references during your own learning process?

   a. Only 1
   b. 2–3
   c. 3–4
   d. More than 4

4. What are some CONCERNS you have with percussion performance videos uploaded onto YouTube?

The audio quality produced on YouTube/electronically cannot replicate the organic sound of percussion instruments. Many YouTubers also alter the sounds by adding reverb and other audio mastering tools. When percussionists are exposed to YouTube performances for a significant period of time, our perception of the percussion sound world gets distorted, and we may even strive to replicate these edited sounds and set unrealistic goals.

5. What are some BENEFITS you see in using YouTube as a resource for your educational / artistic development?
   In many cultures, music is taught through rote learning and without using a notation system. I believe that YouTube allows musicians to use their ears as part of the learning process, and I find that it is a useful tool. YouTube can be beneficial for score-studying and informing percussionists on how to conceptualize a piece before approaching their instruments.

Questionnaire 2 – First Excerpt Viewing

Please open your web browser to the following link:

https://www.youtube.com/playlist?list=PLDfuBk-Npt42LEyDnwxy-n99KQslDsGDH

Note: Leave your web browser open until the end of this case study. It will be needed to complete both the second and third questionnaires.

Watch the video excerpts in any order you choose. This will be your first viewing.

amandinapercussion – Stop watching @ 3:35

Bill Cahn – Stop watching @ 4:43

PendulumNewMusic – Stop watching @ 3:44

Christopher Salvito – Stop watching @ 3:35

Karina Yau – Stop watching @ 3:45

Questions on First Viewing:

1) Rating: Rate each excerpt by completing the charts below. Please do this immediately after you watch each excerpt. Give your assessments on the quality of the audio (sound), video (clarity, visual presentation), and performance. Highlight your selections in the tables below.

Amadindapercussion

Audio Quality	Excellent	Very Good	Fair	Not Good	Poor
Video Quality	Excellent	Very Good	Fair	Not Good	Poor
Performance Quality	Excellent	Very Good	Fair	Not Good	Poor

Bill Cahn

Audio Quality	Excellent	Very Good	Fair	Not Good	Poor
Video Quality	Excellent	Very Good	Fair	Not Good	Poor
Performance Quality	Excellent	Very Good	Fair	Not Good	Poor

PendulumNewMusic

Audio Quality	Excellent	Very Good	Fair	Not Good	Poor
Video Quality	Excellent	Very Good	Fair	Not Good	Poor
Performance Quality	Excellent	Very Good	Fair	Not Good	Poor

Christopher Salvito

Audio Quality	Excellent	Very Good	Fair	Not Good	Poor
Video Quality	Excellent	Very Good	Fair	Not Good	Poor
Performance Quality	Excellent	Very Good	Fair	Not Good	Poor

Karina Yau

Audio Quality	Excellent	Very Good	Fair	Not Good	Poor
Video Quality	Excellent	Very Good	Fair	Not Good	Poor
Performance Quality	Excellent	Very Good	Fair	Not Good	Poor

2) Rank the videos from most favorite (1) to least favorite (5). Type your responses next to the name of the video uploader.

Amadindapercussion __2_

Bill Cahn _3__

PendulumNewMusic _5__

Christopher Salvito _1__

Karina Yau _4__

3) How many views does your favorite excerpt have at the present moment?

Answer: __3,348__

4) In your opinion, which excerpt had the best audio quality?

a. Amadindapercussion
b. Bill Cahn
c. PendulumNewMusic
d. Christopher Salvito
e. Karina Yau

5) In your opinion, which excerpt was the most interesting to watch as an audience member?

a. Amadindapercussion
b. Bill Cahn
c. PendulumNewMusic
d. Christopher Salvito
e. Karina Yau

6) As a percussionist who is interested in learning this piece, is your favorite excerpt one that you would consider to be the most useful or the most educational? Briefly elaborate on your answer.
   - My favorite excerpt has excellent audio and video quality, which would be useful and informative when learning the piece. The audio allows me to hear the different instruments clearly, and the video allows me to view the setup, stick/mallet choices, and other logistics.

Questionnaire 3 - Second Viewing:

Now you will watch the same excerpts again, but this time, simultaneously follow along with the score. You may choose the order in which you watch these excerpts. Click here to be directed to the score. Stop the videos once you reach the end of the sheet music provided.

Questions on Second Viewing:

1) Please rank the videos again, this time based on your impression of watching *and* following the score, simultaneously. Highlight your answers in the table below.

Amadindapercussion	Excellent	Very Good	Fair	Not Good	Poor
Bill Cahn	Excellent	Very Good	Fair	Not Good	Poor
PendulumNewMusic	Excellent	Very Good	Fair	Not Good	Poor
Christopher Salvito	Excellent	Very Good	Fair	Not Good	Poor
Karina Yau	Excellent	Very Good	Fair	Not Good	Poor

2) Which excerpt do you think is the most accurate performance according to the written score?

   a. Amadindapercussion
   b. Bill Cahn
   c. PendulumNewMusic
   d. Christopher Salvito
   e. Karina Yau

3) Briefly discuss each excerpt based on the following criteria:

Groups	Instruments / Sound	Mallets / Stick Choices	Set-up	Gestures
Amadindapercussion	Excellent	Excellent	Excellent	Excellent
Bill Cahn	Excellent	Excellent	Excellent	Excellent
PendulumNewMusic	Good	Good	Excellent	Good
Christopher Salvito	Excellent	Excellent	Excellent	Excellent
Karina Yau	Good	Good	Excellent	Excellent

4) In your opinion, which excerpt offers you the most information on how you might learn this piece? Why?
   - Christopher Salvito
     - This excerpt has excellent quality and is also accurate to the score. For those reasons, I find it the most informative.

5) With regard to the question above, is this excerpt you chose as having the most information for you the same as your favorite recording from the first viewing?
   i. Yes
   ii. No

6) If you answered NO in the question above, please elaborate further. Why is your favorite excerpt from the first viewing different than the one you chose that has the most information for you as someone who wants to learn this piece? What are the significant differences between these two excerpts?

7) Is there a different experience between your first viewing and second viewing following the score? Yes / No

7a) If your answer is YES, can you please describe how it is different and if you have a preference?

- In the first viewing, I made my decision based off of the content of the video alone. In the second viewing, following the score, my decision was informed solely by the musical quality without the distraction of a video. Similar to playing a CD or an old record, the focus is solely on the sound. This allows the mind to internalize the music imagine its own interpretation.

Appendix O:

Participant 4: Case Study Answers

Case Study on Reception and Perception of Audiovisual Recordings of Percussion Performance Videos on YouTube

Thank you for joining this study. This will take about one hour of your time. There are three sets of questionnaires. All of your answers will be given / typed directly into this document.

Before beginning, please take this time to begin screen recording on your device. If you do not know how to screen-record on your device, please watch this video that explains how to do so (via the Zoom platform).

Questionnaire 1 – General survey on your experience using YouTube

1) Do you regularly use YouTube to learn more about percussion repertoire?
   a. Yes
   b. No

1b. If yes, how frequent?

   e. Once a week
      a. Twice a week
   b. Everyday
   c. Other

2) I use YouTube to _____ (Highlight all answers that apply)

   a. Search for recordings to use as references for my own learning process
   b. Search for new repertoire
   c. Connect with performers / composers I do not know personally
   d. Upload videos of my own performances

3) How many videos of the SAME composition do you watch to serve as references during your own learning process?

   a. Only 1
   b. 2–3
   c. 3–4
   d. More than 4

4) What are some CONCERNS you have with percussion performance videos uploaded onto YouTube?

   Some of the concerns I have is how credible a performer is when playing a piece that is uploaded to YouTube. Sometimes someone can be hitting the right notes, but their technique is terrible and it's because they are still in high school. There can also be the issue that maybe there is too much background sound that is interfering with the performance. I ran into that issue when I was researching *Little Windows* by Keiko Abe that certain recordings of it were just muffled out by the background noise so much that it took away from the learning experience of it.

5) What are some BENEFITS you see in using YouTube as a resource for your educational / artistic development?

   Some of the benefits that I see using YouTube as a resource for educational and artistic development is that YouTube is a gateway for individuals to be able to see and experience others play without having to be there. Taking how someone else styled a piece can be influential in one's playing, especially when there is a section that is confusing me as a performer.

Questionnaire 2 – First Excerpt Viewing

Please open your web browser to the following link:

https://www.youtube.com/playlist?list=PLDfuBk-Npt42LEyDnwxy-n99KQslDsGDH

Note: Leave your web browser open until the end of this case study. It will be needed to complete both the second and third questionnaires.

Watch the video excerpts in any order you choose. This will be your first viewing.

amandinapercussion – Stop watching @ 3:35

Bill Cahn – Stop watching @ 4:43

PendulumNewMusic – Stop watching @ 3:44

Christopher Salvito – Stop watching @ 3:35

Karina Yau – Stop watching @ 3:45

Questions on First Viewing:

1) Rating: Rate each excerpt by completing the charts below. Please do this immediately after you watch each excerpt. Give your assessments on the quality of the audio (sound), video (clarity, visual presentation), and performance. Highlight your selections in the tables below.

Amadindapercussion

Audio Quality	Excellent	Very Good	Fair	Not Good	Poor
Video Quality	Excellent	Very Good	Fair	Not Good	Poor
Performance Quality	Excellent	Very Good	Fair	Not Good	Poor

Bill Cahn

Audio Quality	Excellent	Very Good	Fair	Not Good	Poor
Video Quality	Excellent	Very Good	Fair	Not Good	Poor
Performance Quality	Excellent	Very Good	Fair	Not Good	Poor

PendulumNewMusic

Audio Quality	Excellent	Very Good	Fair	Not Good	Poor
Video Quality	Excellent	Very Good	Fair	Not Good	Poor
Performance Quality	Excellent	Very Good	Fair	Not Good	Poor

Christopher Salvito

Audio Quality	Excellent	Very Good	Fair	Not Good	Poor
Video Quality	Excellent	Very Good	Fair	Not Good	Poor
Performance Quality	Excellent	Very Good	Fair	Not Good	Poor

Karina Yau

Audio Quality	Excellent	Very Good	Fair	Not Good	Poor
Video Quality	Excellent	Very Good	Fair	Not Good	Poor
Performance Quality	Excellent	Very Good	Fair	Not Good	Poor

2) Rank the videos from most favorite (1) to least favorite (5). Type your responses next to the name of the video uploader.

Amadindapercussion 3

Bill Cahn 1

PendulumNewMusic 2

Christopher Salvito 5

Karina Yau 4

3) How many views does your favorite excerpt have at the present moment?

Answer: 10, 108

4) In your opinion, which excerpt had the best audio quality?

a. Amadindapercussion
b. Bill Cahn
c. PendulumNewMusic
d. Christopher Salvito
e. Karina Yau

5) In your opinion, which excerpt was the most interesting to watch as an audience member?

f. Amadindapercussion
g. Bill Cahn
h. PendulumNewMusic
i. Christopher Salvito
j. Karina Yau

6) As a percussionist who is interested in learning this piece, is your favorite excerpt one that you would consider to be the most useful or the most educational? Briefly elaborate on your answer.

   I think they all are very useful excerpts to listen to. My favorite excerpt is one that I would consider to be useful, but maybe not the most educational. Firstly, this video is older, so the quality of the video is not the greatest, but it has a lot of emotion and a lot of clarity to it. This video also uses some very hard-to-obtain instruments, such as the bean shaker, that make it difficult to replicate nowadays in the United States.

Questionnaire 3 - Second Viewing:

Now you will watch the same excerpts again, but this time, simultaneously follow along with the score. You may choose the order in which you watch these excerpts. Click here to be directed to the score. Stop the videos once you reach the end of the sheet music provided.

Questions on Second Viewing:

1) Please rank the videos again, this time based on your impression of watching *and* following the score, simultaneously. Highlight your answers in the table below.

Amadindapercussion	Excellent	Very Good	Fair	Not Good	Poor
Bill Cahn	Excellent	Very Good	Fair	Not Good	Poor
PendulumNewMusic	Excellent	Very Good	Fair	Not Good	Poor
Christopher Salvito	Excellent	Very Good	Fair	Not Good	Poor
Karina Yau	Excellent	Very Good	Fair	Not Good	Poor

2) Which excerpt do you think is the most accurate performance according to the written score?

   k. Amadindapercussion
   l. Bill Cahn
   m. PendulumNewMusic
   n. Christopher Salvito
   o. Karina Yau

3) Briefly discuss each excerpt based on the following criteria:

Groups	Instruments / Sound	Mallets / Stick Choices	Set-up	Gestures
Amadindapercussion	Great sounding drums lower pitched cowbells, and softer shakers.	Had sticks with just moleskin on the end for the drums.	Tight, but there were some gaps here and there	Groove between individuals.
Bill Cahn	Clear and precise.	Had softer sticks for certain aspects.	Tight, condensed, organized	Large and cohesive
PendulumNewMusic	Clear and precise. Had louder sounding instruments.	Sticks were harder and claves and cowbells were able to pierce through.	Organized, everyone was able to be seen.	Grooving here and there, looked up at one another.
Christopher Salvito	Clear and precise; shakers and other high pitched instruments overpowered the drums at moments.	Mallet choice for claves and cans were harder, and allowed for the sound to be brought out. On the drums it was a bit softer.	Tight, but there were some gaps.	They really didn't connect as much with each other, but they were in a groove amongst themselves.
Karina Yau	Drums were muffled, but shakers were loud and cut through the sound.	Softer choice of mallets and sticks.	Very spread out; some instruments could have been closer to each other.	Not a lot of movement between individuals. They didn't connect as much as they should of in my personal opinion.

4) In your opinion, which excerpt offers you the most information on how you might learn this piece? Why?

I think the second excerpt offers the most information because it follows the score very well, it is very clear, and it shows viewers how to really groove in terms of playing. The players all work together and connect with each other, making the piece very cohesive and very together.

5) With regard to the question above, is this excerpt you chose as having the most information for you the same as your favorite recording from the first viewing?
   i. Yes
   ii. No

6) If you answered NO in the question above, please elaborate further. Why is your favorite excerpt from the first viewing different than the one you chose that has the most information for you as someone who wants to learn this piece? What are the significant differences between these two excerpts? N/A

7) Is there a different experience between your first viewing and second viewing following the score? Yes / No

7a) If your answer is YES, can you please describe how it is different and if you have a preference?

The first time, the viewer can just listen in and really take in the sound. They can listen more in a personal way, which can be a major factor in having a great performance. When the score was added, then the viewer wasn't really listening to the musicality of the piece, they were listening to correctness and accuracy, which is another big concept when listening to others perform.

Appendix P:

Participant 5: Case Study Answers

Case Study on Reception and Perception of Audiovisual Recordings of Percussion Performance Videos on YouTube

Thank you for joining this study. This will take about one hour of your time. There are three sets of questionnaires. All of your answers will be given / typed directly into this document.

Before beginning, please take this time to begin screen recording on your device. If you do not know how to screen-record on your device, please watch this video that explains how to do so (via the Zoom platform).

Questionnaire 1 – General survey on your experience using YouTube

1) Do you regularly use YouTube to learn more about percussion repertoire?
   a. Yes
   b. No

1b. If yes, how frequent?

   a. Once a week
   b. Twice a week
   c. Everyday
   d. Other

2) I use YouTube to _____ (Highlight all answers that apply)

   a. Search for recordings to use as references for my own learning process
   b. Search for new repertoire
   c. Connect with performers / composers I do not know personally
   d. Upload videos of my own performances

3) How many videos of the SAME composition do you watch to serve as references during your own learning process?

   a. Only 1
   b. 2–3
   c. 3–4
   d. More than 4

4) What are some CONCERNS you have with percussion performance videos uploaded onto YouTube?

My biggest concern with percussion performance uploads, are the quality of sound. Many times, the audio is not of a high enough quality to really hear how parts are fitting together especially in percussion ensemble settings. Solo repertoire usually has better quality.

5) What are some BENEFITS you see in using YouTube as a resource for your educational / artistic development?

Even if the quality of sound is not the best, being able to hear the overall idea of another person's performance is always beneficial. Being able to hear another interpretation of the piece can be eye opening to your own performance goals.

Questionnaire 2 – First Excerpt Viewing

Please open your web browser to the following link:

https://www.youtube.com/playlist?list=PLDfuBk-Npt42LEyDnwxy-n99KQslDsGDH

Note: Leave your web browser open until the end of this case study. It will be needed to complete both the second and third questionnaires.

Watch the video excerpts in any order you choose. This will be your first viewing.

amandinapercussion – Stop watching @ 3:35

Bill Cahn – Stop watching @ 4:43

PendulumNewMusic – Stop watching @ 3:44

Christopher Salvito – Stop watching @ 3:35

Karina Yau – Stop watching @ 3:45

Questions on First Viewing:

1) Rating: Rate each excerpt by completing the charts below. Please do this immediately after you watch each excerpt. Give your assessments on the quality of the audio (sound), video (clarity, visual presentation), and performance. Highlight your selections in the tables below.

Amadindapercussion

Audio Quality	Excellent	Very Good	Fair	Not Good	Poor
Video Quality	Excellent	Very Good	Fair	Not Good	Poor
Performance Quality	Excellent	Very Good	Fair	Not Good	Poor

Bill Cahn

Audio Quality	Excellent	Very Good	Fair	Not Good	Poor
Video Quality	Excellent	Very Good	Fair	Not Good	Poor
Performance Quality	Excellent	Very Good	Fair	Not Good	Poor

PendulumNewMusic

Audio Quality	Excellent	Very Good	Fair	Not Good	Poor
Video Quality	Excellent	Very Good	Fair	Not Good	Poor
Performance Quality	Excellent	Very Good	Fair	Not Good	Poor

Christopher Salvito

Audio Quality	Excellent	Very Good	Fair	Not Good	Poor
Video Quality	Excellent	Very Good	Fair	Not Good	Poor

Performance Quality	Excellent	Very Good	Fair	Not Good	Poor

Karina Yau

Audio Quality	Excellent	Very Good	Fair	Not Good	Poor
Video Quality	Excellent	Very Good	Fair	Not Good	Poor
Performance Quality	Excellent	Very Good	Fair	Not Good	Poor

2) Rank the videos from most favorite (1) to least favorite (5). Type your responses next to the name of the video uploader.

Amadindapercussion ___4

Bill Cahn ___2

PendulumNewMusic ___5

Christopher Salvito ___1

Karina Yau ___3

3) How many views does your favorite excerpt have at the present moment?

Answer: ____3351

4) In your opinion, which excerpt had the best audio quality?

a. Amadindapercussion
b. Bill Cahn
c. PendulumNewMusic
d. Christopher Salvito
e. Karina Yau

5) In your opinion, which excerpt was the most interesting to watch as an audience member?

a. Amadindapercussion
b. Bill Cahn

c. PendulumNewMusic
d. Christopher Salvito
e. Karina Yau

6) As a percussionist who is interested in learning this piece, is your favorite excerpt one that you would consider to be the most useful or the most educational? Briefly elaborate on your answer.
I thought that the Salvito one had not only the best sound and video quality, but also the best overall performance. The consistency from player to player seemed really impressive and they were really vibing with each other to create one sound. From an educational standpoint, I would love to watch this video as the camera work showed exactly what they were doing and how, and I felt that I could tell what was going through their mind as they played it; almost like I was physically there.

Questionnaire 3 - Second Viewing:

Now you will watch the same excerpts again, but this time, simultaneously follow along with the score. You may choose the order in which you watch these excerpts. Click here to be directed to the score. Stop the videos once you reach the end of the sheet music provided.

Questions on Second Viewing:

1) Please rank the videos again, this time based on your impression of watching *and* following the score, simultaneously. Highlight your answers in the table below.

Amadindapercussion	Excellent	Very Good	Fair	Not Good	Poor
Bill Cahn	Excellent	Very Good	Fair	Not Good	Poor
PendulumNewMusic	Excellent	Very Good	Fair	Not Good	Poor
Christopher Salvito	Excellent	Very Good	Fair	Not Good	Poor
Karina Yau	Excellent	Very Good	Fair	Not Good	Poor

2) Which excerpt do you think is the most accurate performance according to the written score?

a. Amadindapercussion

b. Bill Cahn
c. PendulumNewMusic
d. Christopher Salvito
e. Karina Yau (close 2nd)

3) Briefly discuss each excerpt based on the following criteria:

Groups	Instruments / Sound	Mallets / Stick Choices	Set-up	Gestures
Amadindapercussion	Had a more deep resonate sound on the toms, and a more pingy tin can sound.	Maybe a bit towards the softer side. I think the triangle beaters(?) were maybe a bit smaller than other groups?	Square all facing each other	Lots of body movements, pulses for time
Bill Cahn	A more deep resonate sound, especially when playing with the fingers, it seemed to be low. The claves had a nice balance.	More articulate, but not to punchy.	Square all facing each other, a bit bigger square, more spaced out.	Less body movements, more independency
PendulumNewMusic	The toms here seemed a bit higher pitched, also used seemingly different toms than the other groups (?)Shakers seemed a bit less articulate.	More articulate	An open square, more of 2 direct sides facing out.	Energetic, pulses.
Christopher Salvito	Toms had the same deep sound as other groups,	A good balance of volume and articulation, I thought these	Square all facing each other, also	Lots of body movements, moving with the sounds,

	had a nice, pitched clave sound, and the tin cans came out of the texture very balanced.	were the best mallets.	seemed a bit compressed	specifically the shaker
Karina Yau	Toms were a bit overpowered at times, though the tin can sections spoke really well. The shakers seemed a bit to articulate and some of the rolls seemed disconnected.	Definitely louder and in your face, could have maybe gone less articulate/hard?	Square facing each other, maybe a bit more compressed	Easy to tell the time, all moving and breathing together

4) In your opinion, which excerpt offers you the most information on how you might learn this piece? Why? Although I think that the Pendulum followed the score most accurately, the Salvito version makes up for it by providing excellent video and sound quality. Being able to watch the hands, seeing exactly how they move and play the instruments gives more educational content than the video of the Pendulum group. I also think the video was a bit more balanced volume wise, easier to pick out certain parts in the score compared to the other versions.

5) With regard to the question above, is this excerpt you chose as having the most information for you the same as your favorite recording from the first viewing?
   i. Yes
   ii. No

6) If you answered NO in the question above, please elaborate further. Why is your favorite excerpt from the first viewing different than the one you chose that has the most

information for you as someone who wants to learn this piece? What are the significant differences between these two excerpts?

7) Is there a different experience between your first viewing and second viewing following the score? Yes / No

7a) If your answer is YES, can you please describe how it is different and if you have a preference?

I think that listening to the piece without the score provides more of an audience experience where I am focused on HOW they play the piece. Things like drum size, mallet choice, body movements, all mentioned above, is more evident this way. I love being able to hear their decisions as an ensemble in terms of those criteria and how you can hear those decisions in the piece. When listening to the audio and following along with the score, I was much more critical of any rhythmic errors and balancing. I would say I listened to it more musically than the first time. For me, I prefer to take things off the page and add a little personal touch. This means that following along with the score and being judgemental in the more musical way I just mentioned is something I try to avoid doing. I don't always think that playing exactly by the score and book is the way to go.

Appendix Q:

Participant 6: Case Study Answers

Case Study on Reception and Perception of Audiovisual Recordings of Percussion Performance Videos on YouTube

Thank you for joining this study. This will take about one hour of your time. There are three sets of questionnaires. All of your answers will be given / typed directly into this document.

Before beginning, please take this time to begin screen recording on your device. If you do not know how to screen-record on your device, please watch this video that explains how to do so (via the Zoom platform).

Questionnaire 1 – General survey on your experience using YouTube

1) Do you regularly use YouTube to learn more about percussion repertoire?
   a. Yes
   b. No

1b. If yes, how frequent?

   e. Once a week
      a. Twice a week
   b. Everyday
   c. Other

2) I use YouTube to _____ (Highlight all answers that apply)

   a. Search for recordings to use as references for my own learning process
   b. Search for new repertoire
   c. Connect with performers / composers I do not know personally
   d. Upload videos of my own performances

3) How many videos of the SAME composition do you watch to serve as references during your own learning process?

   a. Only 1
   b. 2–3
   c. 3–4
   d. More than 4

4) What are some CONCERNS you have with percussion performance videos uploaded onto YouTube?

The performers may not have the "correct" interpretation of the score

5) What are some BENEFITS you see in using YouTube as a resource for your educational / artistic development?

Seeing different ways to play the same piece allows me to see what sound I like for sections of the music. If I'm struggling with reading a part, the video can help aid in learning the rhythm/part by ear.

Questionnaire 2 – First Excerpt Viewing

Please open your web browser to the following link:

https://www.youtube.com/playlist?list=PLDfuBk-Npt42LEyDnwxy-n99KQslDsGDH

Note: Leave your web browser open until the end of this case study. It will be needed to complete both the second and third questionnaires.

Watch the video excerpts in any order you choose. This will be your first viewing.

amandinapercussion – Stop watching @ 3:35

Bill Cahn – Stop watching @ 4:43

PendulumNewMusic – Stop watching @ 3:44

Christopher Salvito – Stop watching @ 3:35

Karina Yau – Stop watching @ 3:45

Questions on First Viewing:

1) Rating: Rate each excerpt by completing the charts below. Please do this immediately after you watch each excerpt. Give your assessments on the quality of the audio (sound), video (clarity, visual presentation), and performance. Highlight your selections in the tables below.

Amadindapercussion

Audio Quality	Excellent	Very Good	Fair	Not Good	Poor
Video Quality	Excellent	Very Good	Fair	Not Good	Poor
Performance Quality	Excellent	Very Good	Fair	Not Good	Poor

Bill Cahn

Audio Quality	Excellent	Very Good	Fair	Not Good	Poor
Video Quality	Excellent	Very Good	Fair	Not Good	Poor
Performance Quality	Excellent	Very Good	Fair	Not Good	Poor

PendulumNewMusic

Audio Quality	Excellent	Very Good	Fair	Not Good	Poor
Video Quality	Excellent	Very Good	Fair	Not Good	Poor
Performance Quality	Excellent	Very Good	Fair	Not Good	Poor

Christopher Salvito

Audio Quality	Excellent	Very Good	Fair	Not Good	Poor
Video Quality	Excellent	Very Good	Fair	Not Good	Poor
Performance Quality	Excellent	Very Good	Fair	Not Good	Poor

Karina Yau

Audio Quality	Excellent	Very Good	Fair	Not Good	Poor
Video Quality	Excellent	Very Good	Fair	Not Good	Poor

Performance Quality	Excellent	Very Good	Fair	Not Good	Poor

2) Rank the videos from most favorite (1) to least favorite (5). Type your responses next to the name of the video uploader.

Amadindapercussion __4_

Bill Cahn _5__

PendulumNewMusic _2__

Christopher Salvito _1__

Karina Yau _3__

3) How many views does your favorite excerpt have at the present moment?

Answer: __3,360__

4) In your opinion, which excerpt had the best audio quality?

f. Amadindapercussion
g. Bill Cahn
a. PendulumNewMusic
b. Christopher Salvito
c. Karina Yau

5) In your opinion, which excerpt was the most interesting to watch as an audience member?

a. Amadindapercussion
b. Bill Cahn
c. PendulumNewMusic
d. Christopher Salvito
e. Karina Yau

6) As a percussionist who is interested in learning this piece, is your favorite excerpt one that you would consider to be the most useful or the most educational? Briefly elaborate on your answer.

I have two answers for this question. If you can afford all the specific instruments, I would recommend the PendulumNewMusic video by Third Coast Percussion. The video shows all four performers for a majority of the time, but focuses on different performers in specific sections where they may be leading the ensemble. If you cannot afford each specific instrument, I would recommend the Karina Yau video. The video shows two of the ensemble at a static angle and gives you a great perspective on two of the performers. The video also shows the performers using tambourines and cans filled with things like rice to replace the shakers seen in the other four videos. This substitution is likely to happen if you can't afford to buy those special types of shakers, which makes this video great for educating the "PlanB" groups.

Questionnaire 3 - Second Viewing:

Now you will watch the same excerpts again, but this time, simultaneously follow along with the score. You may choose the order in which you watch these excerpts. Click here to be directed to the score. Stop the videos once you reach the end of the sheet music provided.

Questions on Second Viewing:

1) Please rank the videos again, this time based on your impression of watching *and* following the score, simultaneously. Highlight your answers in the table below.

Amadindapercussion	Excellent	Very Good	Fair	Not Good	Poor
Bill Cahn	Excellent	Very Good	Fair	Not Good	Poor
PendulumNewMusic	Excellent	Very Good	Fair	Not Good	Poor
Christopher Salvito	Excellent	Very Good	Fair	Not Good	Poor
Karina Yau	Excellent	Very Good	Fair	Not Good	Poor

2) Which excerpt do you think is the most accurate performance according to the written score?

   a. Amadindapercussion
   b. Bill Cahn
   c. PendulumNewMusic
   d. Christopher Salvito
   e. Karina Yau

3) Briefly discuss each excerpt based on the following criteria:

Groups	Instruments / Sound	Mallets / Stick Choices	Set-up	Gestures
Amadindapercussion	The piece sounds pretty good. There were small discrepancies, but overall a good performance	I think the mallets on the tin cans could be harder in order to project more. The ensemble overcompens-ated for the different timbres of the instruments, making the metals too soft in comparison with the drums	The set up is fine for the environment they're in. It looks a little cramped, but that is most likely due to the room they are in.	You can't tell by the video that any gestures or communication was occuring.
Bill Cahn	The piece is performed too loud, the softs are too loud, and it causes the differences between them and forte to be hidden. The rhythms weren't exact or even close or correct at some points. Quintuplet patterns were severely inconsistent	I think that the sticks and mallets chosen were correct in balancing the voicing of the ensemble.	The setup looks fine EXCEPT I would rotate the setup to have a point of the square face the audience instead of the side. This prevents the audience from having to stare at someone's back. It also allows all the performers to be seen	The performers aren't necessarily gesturing to one another. They are relying on what they hear to adjust and stay together, but no gesturing or body language is occurring to communicate between the individuals.

	and incorrect.			
PendulumNewMusic	This performance gets the soft nature of the piece correct. They're only main issues I heard were entrances not aligning at times	The performers had a similar problem tot he first ensemble, just less extremely. The drums were louder that the other voices: possibly due to either the hall or the softness of the mallets/sticks on the metals	This setup worked well, but I did not necessarily like it. I would prefer the diamond shape for a quartet for the small change in listening environment. In my opinion, it is easier to balance better in the diamond than you can in the two lines	They are communicating through using their bodies to gesture to one another; however, the placement of one individual means he can't gesture to another. They're setup lets them communicate across, but not to the left or right for this individual, which is a problem.
Christopher Salvito	The performance started a bit too loud in comparison to what the score says, but quickly adjusted and became a great performance	The balance was great! each voice was heard and wasn't overpowering the other	I like the square/diamond setup. I especially like the placement of the cans, creating small windows to gesture to one another and communicate.	The ensemble is looking at each other and gesturing. Their setup allows for the easiest communication and they really use this to have a great performance.
Karina Yau	The piece was played well. The performers began too loud, but quieted down around "C" and had a good	The mallets were most likely good. While I could hear everything clearly, the placement of the recording device made	The microphone placement was entirely wrong for this performance. While I like the diamond setup, the placement of	The ensemble was great at communicating and gesturing to each other. They moved at the same time and you could tell they were

	performance afterwards.	half the ensemble sound entirely too loud. I can only assume there was a good mallet choice that blended well with the group.	the microphone made the closer side of the ensemble overpower the rest in almost all sections of the piece.	communicating and staying in sync.

4) In your opinion, which excerpt offers you the most information on how you might learn this piece? Why?

The Christian Saltivo piece gives the most consistent performance of the score and the clean setup allows for students to easily see the communication between the performers. The balance in the ensemble is ideal, allowing for this to be a great performance to use as a reference.

5) With regard to the question above, is this excerpt you chose as having the most information for you the same as your favorite recording from the first viewing?
   i. Yes
   ii. No

6) If you answered NO in the question above, please elaborate further. Why is your favorite excerpt from the first viewing different than the one you chose that has the most information for you as someone who wants to learn this piece? What are the significant differences between these two excerpts?

7) Is there a different experience between your first viewing and second viewing following the score? Yes / No

7a) If your answer is YES, can you please describe how it is different and if you have a preference?

I can see what they are supposed to play. Before, I could only make assumptions on how the piece should be played by the common traits found in all the performances. With the score, I could follow the music and see what the rhythms are and how the voices mix with each other dynamically. I prefer the second method (using the score) because you can relate the interpretation of the performers to the interpretation of the composer.

Appendix R:

Participant 7: Case Study Answers

Case Study on Reception and Perception of Audiovisual Recordings of Percussion Performance Videos on YouTube

Thank you for joining this study. This will take about one hour of your time. There are three sets of questionnaires. All of your answers will be given / typed directly into this document.

Before beginning, please take this time to begin screen recording on your device. If you do not know how to screen-record on your device, please watch this video that explains how to do so (via the Zoom platform).

Questionnaire 1 – General survey on your experience using YouTube

1) Do you regularly use YouTube to learn more about percussion repertoire?
    a. Yes
    b. No

1b. If yes, how frequent?

a. Once a week
b. Twice a week
c. Everyday
d. Other

2) I use YouTube to _____ (Highlight all answers that apply)

a. Search for recordings to use as references for my own learning process
b. Search for new repertoire
c. Connect with performers / composers I do not know personally
d. Upload videos of my own performances

3) How many videos of the SAME composition do you watch to serve as references during your own learning process?

a. Only 1
b. 2–3
c. 3–4
d. More than 4

4) What are some CONCERNS you have with percussion performance videos uploaded onto YouTube?

Depending on the song, the amount of good or professional recordings can either be really high or very low. In a lot of cases, it's usually the latter.

5) What are some BENEFITS you see in using YouTube as a resource for your educational / artistic development?
When I can find a good video, it can give me an idea of how a piece/my part in a piece is generally supposed to sound. It can also help give me a good idea of how to set up my instruments if more than one is involved.

Questionnaire 2 – First Excerpt Viewing

Please open your web browser to the following link:

https://www.youtube.com/playlist?list=PLDfuBk-Npt42LEyDnwxy-n99KQslDsGDH

Note: Leave your web browser open until the end of this case study. It will be needed to complete both the second and third questionnaires.

Watch the video excerpts in any order you choose. This will be your first viewing.

amandinapercussion – Stop watching @ 3:35

Bill Cahn – Stop watching @ 4:43

PendulumNewMusic – Stop watching @ 3:44

Christopher Salvito – Stop watching @ 3:35

Karina Yau – Stop watching @ 3:45

Questions on First Viewing:

1) Rating: Rate each excerpt by completing the charts below. Please do this immediately after you watch each excerpt. Give your assessments on the quality of the audio (sound), video (clarity, visual presentation), and performance. Highlight your selections in the tables below.

Amadindapercussion

Audio Quality	Excellent	Very Good	Fair	Not Good	Poor
Video Quality	Excellent	Very Good	Fair	Not Good	Poor
Performance Quality	Excellent	Very Good	Fair	Not Good	Poor

Bill Cahn

Audio Quality	Excellent	Very Good	Fair	Not Good	Poor
Video Quality	Excellent	Very Good	Fair	Not Good	Poor
Performance Quality	Excellent	Very Good	Fair	Not Good	Poor

PendulumNewMusic

Audio Quality	Excellent	Very Good	Fair	Not Good	Poor
Video Quality	Excellent	Very Good	Fair	Not Good	Poor
Performance Quality	Excellent	Very Good	Fair	Not Good	Poor

Christopher Salvito

Audio Quality	Excellent	Very Good	Fair	Not Good	Poor
Video Quality	Excellent	Very Good	Fair	Not Good	Poor
Performance Quality	Excellent	Very Good	Fair	Not Good	Poor

Karina Yau

Audio Quality	Excellent	Very Good	Fair	Not Good	Poor

Video Quality	Excellent	Very Good	Fair	Not Good	Poor
Performance Quality	Excellent	Very Good	Fair	Not Good	Poor

2) Rank the videos from most favorite (1) to least favorite (5). Type your responses next to the name of the video uploader.

Amadindapercussion _1_ It seemed like this video was probably the closest to what the song was supposed to sound like so I just put it at the top.

Bill Cahn _3_ It was fine. Video was a little on the old side (I think this was the one that looked like it was taken from a VHS tape) but not much to say other than that.

PendulumNewMusic _2_ Honestly this is pretty much only above the Bill Cahn video because I recognize Third Coast more than Nexus. Both videos were ok.

Christopher Salvito _4_ I didn't like how dark the video was. It made things a little hard to see.

Karina Yau _5_ It looked like someone just put their camera up in a corner up on stage and just went for it, so not only could I never really see much of the 2 players in the back but the audio quality was also lower than the other videos.

3) How many views does your favorite excerpt have at the present moment?

Answer: 1,697

4) In your opinion, which excerpt had the best audio quality?

a. Amadindapercussion
b. Bill Cahn
c. PendulumNewMusic
d. Christopher Salvito
e. Karina Yau

5) In your opinion, which excerpt was the most interesting to watch as an audience member?

a. Amadindapercussion
b. Bill Cahn
c. PendulumNewMusic
d. Christopher Salvito
e. Karina Yau

6) As a percussionist who is interested in learning this piece, is your favorite excerpt one that you would consider to be the most useful or the most educational? Briefly elaborate on your answer.
Probably the amadindapercussion video. Seeing the differences between how they got those specific sounds back then would motivate me to try and find a way to get as close to those same sounds as possible.

Questionnaire 3 - Second Viewing:

Now you will watch the same excerpts again, but this time, simultaneously follow along with the score. You may choose the order in which you watch these excerpts. Click here to be directed to the score. Stop the videos once you reach the end of the sheet music provided.

Questions on Second Viewing:

1) Please rank the videos again, this time based on your impression of watching *and* following the score, simultaneously. Highlight your answers in the table below.

Amadindapercussion	Excellent	Very Good	Fair	Not Good	Poor
Bill Cahn	Excellent	Very Good	Fair	Not Good	Poor
PendulumNewMusic	Excellent	Very Good	Fair	Not Good	Poor
Christopher Salvito	Excellent	Very Good	Fair	Not Good	Poor
Karina Yau	Excellent	Very Good	Fair	Not Good	Poor

2) Which excerpt do you think is the most accurate performance according to the written score?

a. Amadindapercussion
b. Bill Cahn

c. PendulumNewMusic
d. Christopher Salvito
e. Karina Yau

3) Briefly discuss each excerpt based on the following criteria:

Groups	Instruments / Sound	Mallets / Stick Choices	Set-up	Gestures
Amadindapercussion	loud	fine	fine	Didn't see much
Bill Cahn	Also loud	Fine/a bit washy at times	Also fine	There was plenty
PendulumNewMusic	Pretty accurate	good	ok	Same as bill cahn
Christopher Salvito	accurate	Ok-ish, could be more clear	Needs more lighting	Same as first one
Karina Yau	Too quiet	Probably fine live; not clear enough in recording	ok	I sae a little bit here and there

4) In your opinion, which excerpt offers you the most information on how you might learn this piece? Why?

The Pendulum New Music video. Since it was the most accurate to the score, I would trust how they played it as well as how they set things up a little more than the others.

5) With regard to the question above, is this excerpt you chose as having the most information for you the same as your favorite recording from the first viewing?
   i. Yes
   ii. No

6) If you answered NO in the question above, please elaborate further. Why is your favorite excerpt from the first viewing different than the one you chose that has the most information for you as someone who wants to learn this piece? What are the significant differences between these two excerpts?

The main difference was the accuracy. My first pick was fine for just learning how the piece works, but if I want to learn how to play the music a little more faithfully, I would have to go with my second pick.

7) Is there a different experience between your first viewing and second viewing following the score? Yes / No

7a) If your answer is YES, can you please describe how it is different and if you have a preference?

Following along with the music made a lot of things so much clearer. I could follow along with the audio way more easily, and I could start to see why there were some differences in instrument choices for certain parts. I prefer viewing with the score over viewing without one.

Appendix S:

Participant 8: Case Study Answers

Case Study on Reception and Perception of Audiovisual Recordings of Percussion Performance Videos on YouTube

Thank you for joining this study. This will take about one hour of your time. There are three sets of questionnaires. All of your answers will be given / typed directly into this document.

Before beginning, please take this time to begin screen recording on your device. If you do not know how to screen-record on your device, please watch this video that explains how to do so (via the Zoom platform).

Questionnaire 1 – General survey on your experience using YouTube

1. Do you regularly use YouTube to learn more about percussion repertoire?
    a. Yes
    b. No

1b. If yes, how frequent?

a. Once a week
b. Twice a week
c. Everyday
d. Other

2. I use YouTube to _____ (Highlight all answers that apply)

a. Search for recordings to use as references for my own learning process
b. Search for new repertoire
c. Connect with performers / composers I do not know personally
d. Upload videos of my own performances

3. How many videos of the SAME composition do you watch to serve as references during your own learning process?

a. Only 1
b. 2–3
c. 3–4
d. More than 4

4. What are some CONCERNS you have with percussion performance videos uploaded onto YouTube?

Primary limitations would probably be recording quality for me; my perception about the quality of a piece is often tied to how well the piece is recorded and presented, though I don't consciously try to judge that, it absolutely informs my opinion of a piece

5. What are some BENEFITS you see in using YouTube as a resource for your educational / artistic development?

It is a great way to check out alternative interpretations to shape your own, as well as check out how other artists present the same material in different ways.

Questionnaire 2 – First Excerpt Viewing

Please open your web browser to the following link:

https://www.youtube.com/playlist?list=PLDfuBk-Npt42LEyDnwxy-n99KQslDsGDH

Note: Leave your web browser open until the end of this case study. It will be needed to complete both the second and third questionnaires.

Watch the video excerpts in any order you choose. This will be your first viewing.

amandinapercussion – Stop watching @ 3:35

Bill Cahn – Stop watching @ 4:43

PendulumNewMusic – Stop watching @ 3:44

Christopher Salvito – Stop watching @ 3:35

Karina Yau – Stop watching @ 3:45

Questions on First Viewing:

1) Rating: Rate each excerpt by completing the charts below. Please do this immediately after you watch each excerpt. Give your assessments on the quality of the audio (sound), video (clarity, visual presentation), and performance. Highlight your selections in the tables below.

Amadindapercussion

Audio Quality	Excellent	Very Good	Fair	Not Good	Poor
Video Quality	Excellent	Very Good	Fair	Not Good	Poor
Performance Quality	Excellent	Very Good	Fair	Not Good	Poor

Bill Cahn

Audio Quality	Excellent	Very Good	Fair	Not Good	Poor
Video Quality	Excellent	Very Good	Fair	Not Good	Poor
Performance Quality	Excellent	Very Good	Fair	Not Good	Poor

PendulumNewMusic

Audio Quality	Excellent	Very Good	Fair	Not Good	Poor
Video Quality	Excellent	Very Good	Fair	Not Good	Poor
Performance Quality	Excellent	Very Good	Fair	Not Good	Poor

Christopher Salvito

Audio Quality	Excellent	Very Good	Fair	Not Good	Poor
Video Quality	Excellent	Very Good	Fair	Not Good	Poor
Performance Quality	Excellent	Very Good	Fair	Not Good	Poor

Karina Yau

Audio Quality	Excellent	Very Good	Fair	Not Good	Poor
Video Quality	Excellent	Very Good	Fair	Not Good	Poor
Performance Quality	Excellent	Very Good	Fair	Not Good	Poor

2) Rank the videos from most favorite (1) to least favorite (5). Type your responses next to the name of the video uploader.

Amadindapercussion 4 ___

Bill Cahn 3 ___

PendulumNewMusic 2___

Christopher Salvito 1___

Karina Yau 5___

3) How many views does your favorite excerpt have at the present moment?

   Answer: 3,360 ____

4) In your opinion, which excerpt had the best audio quality?

   a. Amadindapercussion
   b. Bill Cahn
   c. PendulumNewMusic
   d. Christopher Salvito
   e. Karina Yau

5) In your opinion, which excerpt was the most interesting to watch as an audience member?

   a. Amadindapercussion
   b. Bill Cahn
   c. PendulumNewMusic
   d. Christopher Salvito
   e. Karina Yau

6) As a percussionist who is interested in learning this piece, is your favorite excerpt one that you would consider to be the most useful or the most educational? Briefly elaborate on your answer.

Not necessarily. I think Chris Salvito's is the easiest to digest because of the good production quality, but I think there's tons to be learned from any of them, especially NEXUS even though the recording quality is comparatively poor.

Questionnaire 3 - Second Viewing:

Now you will watch the same excerpts again, but this time, simultaneously follow along with the score. You may choose the order in which you watch these excerpts. Click here to be directed to the score. Stop the videos once you reach the end of the sheet music provided.

Questions on Second Viewing:

1) Please rank the videos again, this time based on your impression of watching *and* following the score, simultaneously. Highlight your answers in the table below.

Amadindapercussion	Excellent	Very Good	Fair	Not Good	Poor
Bill Cahn	Excellent	Very Good	Fair	Not Good	Poor
PendulumNewMusic	Excellent	Very Good	Fair	Not Good	Poor
Christopher Salvito	Excellent	Very Good	Fair	Not Good	Poor
Karina Yau	Excellent	Very Good	Fair	Not Good	Poor

2) Which excerpt do you think is the most accurate performance according to the written score?

   a. Amadindapercussion
   b. Bill Cahn
   c. PendulumNewMusic
   d. Christopher Salvito
   e. Karina Yau

3) Briefly discuss each excerpt based on the following criteria:

Groups	Instruments / Sound	Mallets / Stick Choices	Set-up	Gestures
Amadindapercussion	Particularly liked sound here, good drums	No complaints	No complaints	No complaints, though some gestures were a little distracting
Bill Cahn	The best sound palette of all the	Same as before, great sounds	No complaints, everything	Very concise and easy to follow gestures

	excerpt in my mind		seemed economical and well thought out	
PendulumNewMusic	Things were a little quiet, though instruments sounded great	Same as before, quiet but good	No complaints	Good gestures, maybe a little flashy
Christopher Salvito	Excellent production quality and instruments	Same as before	No complaints	Great movement, felt the most 'chamber music-y' of them all
Karina Yau	I really liked the sounds, but it suffered from having some instruments so close to the mic; tamb and cans were too loud	Good choices, interesting techniques used	No complaints, apart from previous mic comment	Great movement and communication

4) In your opinion, which excerpt offers you the most information on how you might learn this piece? Why?

The Bill Cahn and Nexus recording offered so much information, tons to digest that could inform an interpretation

5) With regard to the question above, is this excerpt you chose as having the most information for you the same as your favorite recording from the first viewing?
   i. Yes
   ii. No

6) If you answered NO in the question above, please elaborate further. Why is your favorite excerpt from the first viewing different than the one you chose that has the most information for you as someone who wants to learn this piece? What are the significant differences between these two excerpts?

I was less sure about Bill Cahn's video before the second recording, but it really cemented for me how good the interpretation is. I think I was misled by comparatively poor production quality; not to say there isn't anything worth studying in the Salvito recording, but I think the Nexus one is pretty definitive

7) Is there a different experience between your first viewing and second viewing following the score? Yes / No

7a) If your answer is YES, can you please describe how it is different and if you have a preference?

I don't really have a preference between the two but having a score in front of you absolutely lays bare interpretation choices and how closely groups follow the score. Musically, I thought all of the groups did an excellent job of conveying the phrasing and musicality of the piece, but I thought only the Nexus recording really captured the vibe of the score properly.

Appendix T:

Participant 9: Case Study Answers

Case Study on Reception and Perception of Audiovisual Recordings of Percussion Performance Videos on YouTube

Thank you for joining this study. This will take about one hour of your time. There are three sets of questionnaires. All of your answers will be given / typed directly into this document.

Before beginning, please take this time to begin screen recording on your device. If you do not know how to screen-record on your device, please watch this video that explains how to do so (via the Zoom platform).

Questionnaire 1 – General survey on your experience using YouTube

1. Do you regularly use YouTube to learn more about percussion repertoire?
   a. Yes
   b. No

1b. If yes, how frequent?

   a. Once a week
   b. Twice a week
   c. Everyday
   d. Other

2. I use YouTube to _____ (Highlight all answers that apply)

   a. Search for recordings to use as references for my own learning process
   b. Search for new repertoire
   c. Connect with performers / composers I do not know personally
   d. Upload videos of my own performances

3. How many videos of the SAME composition do you watch to serve as references during your own learning process?

   a. Only 1
   b. 2–3
   c. 3–4
   d. More than 4

4. What are some CONCERNS you have with percussion performance videos uploaded onto YouTube?

Sometimes I use youtube performances too seriously when comparing to my own playing, set up, and instrumentation. Therefore I forget that as musicians we need to have our own opinions and musicality.

5. What are some BENEFITS you see in using YouTube as a resource for your educational / artistic development?

   Helping understand a piece better by listening to how others have chosen to perform the piece as well as gaining knowledge on new pieces to learn and see new percussionists.

Questionnaire 2 – First Excerpt Viewing

Please open your web browser to the following link:

https://www.youtube.com/playlist?list=PLDfuBk-Npt42LEyDnwxy-n99KQslDsGDH

Note: Leave your web browser open until the end of this case study. It will be needed to complete both the second and third questionnaires.

Watch the video excerpts in any order you choose. This will be your first viewing.

amandinapercussion – Stop watching @ 3:35

Bill Cahn – Stop watching @ 4:43

PendulumNewMusic – Stop watching @ 3:44

Christopher Salvito – Stop watching @ 3:35

Karina Yau – Stop watching @ 3:45

Questions on First Viewing:

1) Rating: Rate each excerpt by completing the charts below. Please do this immediately after you watch each excerpt. Give your assessments on the quality of the audio (sound), video (clarity, visual presentation), and performance. Highlight your selections in the tables below.

Amadindapercussion

Audio Quality	Excellent	Very Good	Fair	Not Good	Poor
Video Quality	Excellent	Very Good	Fair	Not Good	Poor
Performance Quality	Excellent	Very Good	Fair	Not Good	Poor

Bill Cahn

Audio Quality	Excellent	Very Good	Fair	Not Good	Poor
Video Quality	Excellent	Very Good	Fair	Not Good	Poor
Performance Quality	Excellent	Very Good	Fair	Not Good	Poor

PendulumNewMusic

Audio Quality	Excellent	Very Good	Fair	Not Good	Poor
Video Quality	Excellent	Very Good	Fair	Not Good	Poor
Performance Quality	Excellent	Very Good	Fair	Not Good	Poor

Christopher Salvito

Audio Quality	Excellent	Very Good	Fair	Not Good	Poor
Video Quality	Excellent	Very Good	Fair	Not Good	Poor
Performance Quality	Excellent	Very Good	Fair	Not Good	Poor

Karina Yau

Audio Quality	Excellent	Very Good	Fair	Not Good	Poor

Video Quality	Excellent	Very Good	Fair	Not Good	Poor
Performance Quality	Excellent	Very Good	Fair	Not Good	Poor

2) Rank the videos from most favorite (1) to least favorite (5). Type your responses next to the name of the video uploader.

Amadindapercussion _4__

Bill Cahn _2__

PendulumNewMusic _3__

Christopher Salvito _1__

Karina Yau _5__

3) How many views does your favorite excerpt have at the present moment?

Answer: _3,357___

4) In your opinion, which excerpt had the best audio quality?

a. Amadindapercussion
b. Bill Cahn
c. PendulumNewMusic
d. Christopher Salvito
e. Karina Yau

5) In your opinion, which excerpt was the most interesting to watch as an audience member?

a. Amadindapercussion
b. Bill Cahn
c. PendulumNewMusic
d. Christopher Salvito
e. Karina Yau

6) As a percussionist who is interested in learning this piece, is your favorite excerpt one that you would consider to be the most useful or the most educational? Briefly elaborate on your answer.

Yes because the sound quality captures every part is the piece and the video shows multiple angles to show each players part.

Questionnaire 3 - Second Viewing:

Now you will watch the same excerpts again, but this time, simultaneously follow along with the score. You may choose the order in which you watch these excerpts. Click here to be directed to the score. Stop the videos once you reach the end of the sheet music provided.

Questions on Second Viewing:

1) Please rank the videos again, this time based on your impression of watching *and* following the score, simultaneously. Highlight your answers in the table below.

Amadindapercussion	Excellent	Very Good	Fair	Not Good	Poor
Bill Cahn	Excellent	Very Good	Fair	Not Good	Poor
PendulumNewMusic	Excellent	Very Good	Fair	Not Good	Poor
Christopher Salvito	Excellent	Very Good	Fair	Not Good	Poor
Karina Yau	Excellent	Very Good	Fair	Not Good	Poor

2) Which excerpt do you think is the most accurate performance according to the written score?

   a. Amadindapercussion
   b. Bill Cahn
   c. PendulumNewMusic
   d. Christopher Salvito
   e. Karina Yau

3) Briefly discuss each excerpt based on the following criteria:

Groups	Instruments / Sound	Mallets / Stick Choices	Set-up	Gestures

Amadindapercussion	Good. Some of the intruments I felt didn't really go with what the score said. At one point in the beginning claves were supposed to play and they didn't sound like the claves I'm used to hearing but again, interpterion takes place there.	Great	Great from what I can see	Good I couldn't really tell but perhaps they could've used a bit more to engage with each other
Bill Cahn	Great. The audio doesn't do it justice but from what I could hear and see the instruments were good	Great	Great. They could all see each other well	Great. They were engaged with each other
PendulumNewMusic	Great	Great	Good. They could've set it up more like a circle. At some points one performer (David Skidmore) had to turn his whole body to see the other performer behind him	Great. They were all engaged with each other very well
Christopher Salvito	Great. This video had the greatest sound quality and	Great	Great. It was similar to how most of the videos were set up	Good. The video focused a lot of their hands so it

	captured each sound			was a little hard to tell
Karina Yau	Good	Good. couldn't really tell from the angle of the camera and the sound	Good (besides mic area you can't really hear the other players that are further away)	They seemed to be watching each other well but maybe could've had more gestures to not get off

4) In your opinion, which excerpt offers you the most information on how you might learn this piece? Why?

Pendulum music because when looking at the score and listening to their performance they had little to no mess ups and were all very engaged with each other and with the music. It is a great model to listen to and watch.

5) With regard to the question above, is this excerpt you chose as having the most information for you the same as your favorite recording from the first viewing?
   i. Yes
   ii. No

6) If you answered NO in the question above, please elaborate further. Why is your favorite excerpt from the first viewing different than the one you chose that has the most information for you as someone who wants to learn this piece? What are the significant differences between these two excerpts?

I think without having the score I enjoyed my first favorite because of the video and audio quality but once I knew and could use the written music, I realized how the other was better. The Christopher one clearly spent more time on the audio and video aspect and it was clearly meant for youtube but pendulum was an actual live performance that they recorded.

7) Is there a different experience between your first viewing and second viewing following the score? Yes / No

7a) If your answer is YES, can you please describe how it is different and if you have a preference?

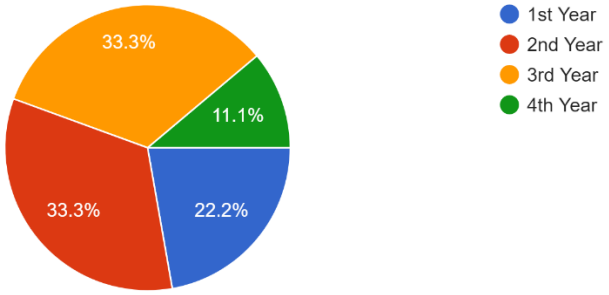
It is different because of having the score and listening for each sound that enters in and each players part. I enjoyed the second viewing more than the first because I had more information not just that the one video quality is better.

Appendix U:

Data from follow-up survey via Google Forms

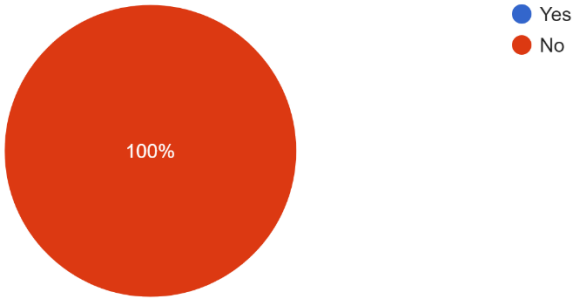
When you participated in this case study, what year of your undergraduate were you in?

9 responses



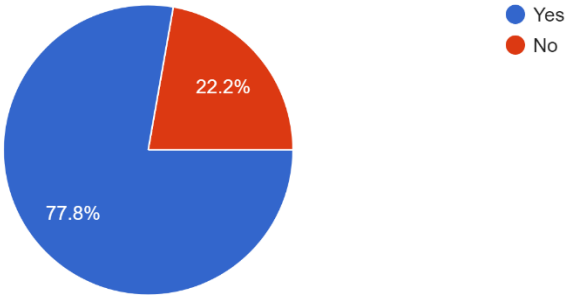
Have you ever performed Third Construction by John Cage?

9 responses



Before participating in this case study, did you know about or have heard of Third Construction?

9 responses



Appendix V:

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To Whom It May Concern,

This letter grants Boyce Jeffries, DMA Candidate, the right to reproduce excerpts from **Third Construction** by John Cage as part of the requirements for their degree at the University of Toronto.

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Best wishes for your studies,

Sincerely,

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