"Contact Tracing" the Chaconne Theme in the Brahms Symphony No. 4 Finale
Summary of a research, analysis and performance project of the Carlton College Orchestra
Dr. Stephen Radcliffe, Visiting Assistant Professor and Director of the Carleton Orchestra

PROJECT OVERVIEW

Carleton College is an undergraduate liberal arts college with an enrollment of approximately 2,000 students located in Northfield Minnesota. Like most institutions of higher education in America, the college was shuttered in March of 2020 as a result of the Covid-19 pandemic and all instruction was delivered online for the remainder of the academic year. This document is a description of how the college's orchestra program grappled with the disruption of the normal teaching and learning environment and created a meaningful orchestral education experience that was challenging and engaging for the students

The Carleton College Orchestra project for the spring 2020 trimester focused on the Finale of Johannes Brahms's Symphony No. 4. The project included aspects of historical research, structural and formal analysis, and performance in a "virtual concert" setting. Students engaged in synchronous activities (Zoom sectionals, video recorded practice sessions and video lectures) and asynchronous activities (reading, analysis and personal practice).

The Brahms Finale, *Allegro energico e passionato*, is cast as an orchestral Chaconne, with a simple eight-bar theme serving as the foundation for 32 variations. Students were engaged in historical research (through the reading of articles about the work's form and history), analysis (through the identification of the Chaconne theme as it is deployed through each of the variations), and performance (through sectional rehearsals and the submission of audio and video segments).

The goals of the project were to:
- Continue motivating active student engagement in instrumental music growth through goal-driven practice and performance regimens,
- broaden student understanding of the intersection of scholarship, analysis and performance, and thus enrich their approach to works they may study in the future,
- instill in students an understanding of the historical context of the work and its location within the broader compositional trends in fashion at the time of its creation,
- engage students in a process of analyzing the work's structure and form,
- foster a deeper understanding of Brahms's compositional process and of the orchestral compositional process in general, and
- involve students in the creation of a "virtual" performance of sections of the composition.

BACKGROUND

Description of Carleton Orchestra Program:

Orchestra is an official, one-credit academic course at Carleton College. The College's academic calendar is divided into three 10-week trimesters. The orchestra program meets three evenings per week for 90-minute rehearsals. The general schedule consists of two sectional rehearsals and one full orchestra rehearsal. Monday evenings are string sectionals, Tuesday evenings are wind/brass and percussion sectionals and Thursday evenings are full orchestra. The orchestra consists of undergraduate musicians with some community members brought in for the final rehearsals to fill instrumentation vacancies (generally low brass and horns) The repertoire generally performed consists of works from the 17th through 21st centuries. Repertoire examples for the 2019-20 season included Dvorak's *Symphonies No. 8*, Mussorgsky's *Pictures at an Exhibition*, Beethoven's *Egmont Overture* Bach's *Violin Concerto in A minor*, Wagner's *Overture to Rienzi* and Ravel's *Mother Goose Suite*.

While the vast majority of orchestra members are non-majors, the orchestra draws from a pool of exceptionally talented young musicians who have participated in strong school orchestra and youth symphony programs in their home localities. The College is rated highly competitive with a 20% admissions ratio and is ranked #7 in private liberal arts colleges by USNews.

Timeline for School Closure:

For the Spring 2020 trimester classes were to have begun on March 30, 2020 after a one-week spring break. In response to the outbreak of the Covid-19 pandemic, the administration extended the spring break by one week and closed campus to returning students. Courses were to be taught remotely and a tentative plan to return to campus in early May for in-person instruction was proposed. In late April, that plan was abandoned, and all classes were to be taught remotely for the remainder of the trimester.

Project Design and Execution:

Following best-practice guidance from college administration and faculty teaching resources, the project designed for the orchestra program consisted of both synchronous and asynchronous activities. In addition, unlike most performance-only oriented programs, the project included aspects of student analysis and research in addition to performance requirements.

Challenges:

As could be expected there were numerous design and execution challenges faced by the prospect of remote teaching a traditionally performance-based orchestra program. Among these challenges were:

- Access to instruments. (Many students were unable to bring their instruments home with them before the campus closed, and large instruments such as tuba, timpani were unavailable to rent or borrow.)

- Limitation of technology. Not all students had access to high-bandwidth internet or adequate computers at home.
- Apathy. With the dramatic disruption of the college experience and the fracturing of social, intellectual, and emotional norms, students were working under significant stress. This stress was manifested in numerous ways, one of which was the inability to harness the positive "habits of mind" such as intellectual inquisitiveness, resilience, self-reliance, and teamwork that are cultivated in a traditional academic environment.

Course Delivery Platforms:

Course material was delivered through the Carleton College open structure learning platform, Moodle, as well as through emails, Zoom meetings and shared Google Drives. Student audio and video submissions were provided in .mp3, .mp4, and mov files on these platforms.

COURSE COMPONENTS AND PROJECT IMPLEMENTATION

The content of the curriculum was spread over a nine-week period.

- **WEEK ONE**
  - **Performance:** As students settled into their off-campus residences they were asked to provide an evaluation of their access to an instrument (owned, rented, or borrowed), their technology assets, their access to internet service, and their access to an appropriate and functional workspace. The results of these student surveys helped to inform course content and delivery.
  - **Performance:** String students were provided with bowed string parts to the Brahms Symphony Finale. Wind/Brass and Percussion students were provided links to parts from IMSLP. All students were provided a link to download the entire orchestral score.
  - **Research/Reflection:** As a first week assignment students were required to listen to recordings while reading the orchestral score and to provide commentary of their listening experience.
- **WEEK TWO**
  - **Research**: Students were given an online lecture about the origins of the Brahms *Chaconne* movement. The lecture served as an introduction to the creative background and genesis of the work and provided insight into its compositional structure and form.
  - **Analysis**: Students were given the assignment to begin analyzing the orchestration of the Chaconne theme as it is passes through the orchestra. An Excel spreadsheet with the measure numbers of each of the variations was provided to students who were assigned the task of filling in the spreadsheet with the instruments carrying the theme in each

of the variations. Specific passages for private practice were assigned in advance of interactive sectional rehearsals in the following week.

- **WEEK THREE**
    - o **Performance**: Interactive sectional rehearsals took place over the ZOOM platform. String faculty members assisted the conductor by demonstrating selected passages and suggesting bowings and fingerings.
    - o **Research/Refection:** During the sectional some time was allotted for student reflection on their listening assignment from week-one and for discussion.
    - o **Research**: A reading assignment was provided that included an excerpt from the article by musicologist Raymond Knapp about the various theories of the origin of the Brahms Chaconne theme.

- **WEEK FOUR**
    - o **Analysis:** Students began submitting their completed "Chaconne Theme Charts" from week-two.
    - o **Performance:** Students submitted short videos of private-practice sessions of specific passages assigned in the previous week's sectionals. The conductor provided commentary and encouragement. Helpful practice techniques such as those pertaining to shifting, string crossing, technical challenges, intonation, tone quality were provided as part of an overall assessment to enrich and expand the "arsenal" of student practice skills.
    - o **Research:** Students were assigned a reading by musicologist Jacquelyn Sholes about the "tragic" aspects of the Brahms Finale and its theme's connections with other movements in the Symphony. In addition, students were provided a link to an online lecture by Leonard Bernstein that reinforced that material provided in the Sholes article.

- **WEEK FIVE**
    - o **Research/Refection:** Students participated in individual video conference sessions in which issues addressed in the readings were discussed. The conferences also provided the opportunity to assess individual student learning and encourage continued student engagement.
    - o **Performance:** Utilizing the "Chaconne Theme Charts" that students themselves had submitted in previous weeks, students were asked to begin uploading short video or audio "performances" of the individual 8-bar variations in which their instrument group was carrying the theme. The completed and annotated spreadsheet indicated which instruments have the Chaconne theme in which variations. It both guided student audio/video upload assignments and provided the conductor with a template for stitching together the foundation of the piece. As was discussed in the ZOOM sectional, the plan was to record the Chaconne theme in each variation, stitch the segments together and then fill-in the melodies, harmonies and counter-melodies over that. The object was to "deconstruct" the piece to its bones and then put it back together as

Brahms himself may have imagined it in the moment of composition. Specific metronome marking for each variation were added to the chart. Students were to listen to a metronome "click-track" on headphones while recording the excerpts on a computer or other such device. For the final section of the movement, all students, regardless of their instrument's association with the Chaconne theme, were requested to submit audio or video recordings.

- **WEEKS SIX AND SEVEN**
  - **Performance:** During this period students began submitting the assigned audio and video excerpts. An audio "Chaconne Theme Template" was created by mixing down the various submissions and stitching them together in one continuous stream. This audio template was to be used as a "click-track" for the layering of countermelodies and harmonies that would serve as the final, fully orchestrated virtual performance.
  - **Research/Reflection:** As the Covid-19 pandemic progressed and students became more engaged in aspects of medical research, pandemic response and current events, a number of student commented on the relationship between their work "musically tracing" the theme of the Brahms Chaconne and the practice of "contact tracing" the virus's spread. This relationship served to make their work more relevant and topical and provided direction for the project moving forward

- **WEEKS EIGHT AND NINE**
  - **Performance**: In the semester's final weeks, the Carleton College Music Department faculty voted to create a department-wide live-streamed presentation highlighting the work of all the department's large and small ensembles. This served to accelerate the Brahms Chaconne project significantly. The initial plan was to have the audio "Chaconne Theme Template" serve as the "click-track" for the "fleshing out" of the piece by way of student submissions of the counter-melodies, supporting voices and harmonies that surround the Chaconne theme. With the accelerated schedule for the Department-wide live-streamed virtual performance, this was no longer possible for the entire movement. Students were thus assigned the project of submitting the fullest orchestration possible for three specific sections of the work that were subsequently mixed down for the creation of a final "performance" that was presented in the department's live-streamed event.

RESOURCES
Research/Reflection
- Lecture Summaries and Discussion Topics

- o [Historical Context: "Brahms Looks Back"](#)
- o [Sources, Origins and Influences of Brahms Chaconne](#)
- o [Is Brahms a "Tragic Antiquarian?"](#)
- o Readings/Resources
  - o [The Finale of Brahms's Fourth Symphony: A Tale of the Subject](#)
  - o [A Later Example: Tragic Antiquarianism in Brahms's Fourth Symphony](#)
  - o [Leonard Bernstein: Video Lecture on Brahms Symphony No. 4 Finale](#)

Analysis
- o [Theme Finding Assignment and Score Study Overview](#)
- o [Blank "Chaconne Theme Chart"](#)
- o [Sample Student Submission – "Chaconne Theme Chart"](#)

Performance
- o ["Chaconne Theme Chart" for Audio-Video Submissions](#)
- o [Student Directions for Audio-Video Submissions](#)
- o [Virtual Performance: "Contract Tracing" Brahms's Chaconne Theme in a Time of Covid-19](#)

NOTES ON VIRTUAL PERFORMANCE CREATION

Programs Utilized – Benefits and Limitations

ZOOM: As most all conductors and music educators have come to realize, it is virtually impossible to provide meaningful synchronous performance experiences utilizing the ZOOM platform. The disparity of internet speeds available to participants in a virtual meeting-space creates time-lags that, while manageable for speech, leads to chaos for musical ensemble and cohesion. Even with a conductor-cam broadcasting a regular pulse, the time delay issues are insurmountable. Student musicians are additionally burdened with the challenge of looking at the conductor (or their colleagues' bow-strokes) to try to keep together while, at the same time, trying to read the music, often on the same device. Furthermore, students cannot hear one another as the platform prioritizes only one single contributing voice at a time.

The ZOOM platform was highly effective in sectional rehearsals when one player, a section-leader, teacher or the conductor demonstrated a passage and then observed student participants' execution of that passage. The platform was also highly effective for the efficient transmission of bowings, fingerings, and expressive recommendations to large groups of students.

Adobe Audition: The Adobe Audition program was the primary tool for audio editing and mix-down. The vast majority of students submitted audio files and, unlike Adobe Premiere Pro, Audition is an audio-only program and does not have a video component. It is relatively easy to learn with multiple online tutorials and

resources. While students were listening to a metronomic "click-track" during recording, slight variations in tempi were occasionally observed. The ability to use visual wave-forms to align pulses by cutting or stretching mitigated most of the ensemble issues. Audition has multiple capabilities that include pitch correction (particularly helpful for students that submitted excerpts with wrong notes or faulty pitch on specific notes!), amplitude balancing (helpful for students who had their microphones too close to or too far from their instrument), something called "modulation" (which takes a single instrument and overdubs the sound to create a synthesized "chorus" or full section of multiple voices), and reverb (which imitates the acoustic environment of a large concert hall).

Adobe Premiere Pro
Adobe Premiere Pro incorporated the Audition capabilities into its audio-video platform. The program is thus necessarily more complex than Audition. The desktop screen arrangement prioritizes video components but can be scaled down when working on audio files. Individual video files are dragged onto the desktop file management pane and then onto a workplace that contains both video and audio components. Therefore the workspace is significantly more cluttered when working with multiple files at a time.

For the Carleton Orchestra project I created the audio mixdown and edit on Adobe Audition, then imported the completed file of large sections (consisting of multiple variation segments stitched together) into Premiere Pro. For the video component it was impossible to use the very few video submissions of individual variation segments provided by students for the Music Department's live-streamed virtual performance. In order to have some student representation in video format, I sent the audio file of the three large segments to students and asked them to play along while being videoed. These video submissions were then incorporated into the final product.

File management
Creating a "virtual orchestra" project raises challenges not found in the creation of an SATB "virtual chorus" or a small ensemble project. For example, the Brahms *Symphony No. 4 Finale* movement consists of 23 individual voices - pairs of woodwinds, four horns, two trumpets, three trombones, timpani and five string parts, some of which divided into upper and lower divisi parts. It is thus extremely important when dealing with such a multitude of independent lines that each student audio file submission be consistently labeled. For the Carleton Orchestra project I insisted that students submit files in the following format:
instrumentvoice-variationnumber-studentname.mp3
thus:
horn2-variation21-smith.mp3

clarinet1-variation4-mcdonnel.mp3

and for divisi string parts:

violin2top-variation16-reid.mp3

For the purposes of file management it was very important that the same format be followed for every file submitted, including attention to all lower-case letters, dashes (not underlines) separating criteria, and order of information. This format made finding all the files for a given instrument and variation easier.

Mixing, Aligning and Balancing

As files were received and uploaded I placed each file into a folder specific to the instrument to which it corresponded. The woodwind folders (flute, oboe, clarinet, bassoon) were then placed into a woodwind folder, the brass instruments into a brass folder and the violin 1, violin 2, viola, cello, and bass folders into a string section folder. This arrangement, while perhaps overly organized, made it much faster to locate files for the mixdown process. The alphabetical layout of files within folders grouped all instruments and variations together. This was particularly helpful when dealing with submissions from large string sections. A similarly rigorous file management protocol was used for mixed down files. For example, once all the violin 1 files had been combined in Adobe Audition, that file was labeled violin1all-variation23.mp3. When this was combined with the other mixed-down string groups, that file was labeled strings-variation23.mp3. The same process applied to individual woodwind and brass parts. Thus, in the final mixdown, I was only working with a maximum of three lines; woodwinds, brass and strings.

Working with small batches of files on the Adobe Audition platform was critical to an efficient editing process. The mixdown file window in the program gets cluttered with more than six voices to align. Mixing, correcting and aligning the two clarinet voices to create a "clarinets" file was relatively easy. Mixing and aligning the resulting clarinets file with the combined and corrected oboes, flutes and bassoon files to create a combined "all woodwinds" file was also relatively hassle-free.

My process for large string section submissions relied on selecting a single submission, usually from the section-leader, and using that file as the "master" to which all the other submissions from the section aligned and balanced. The resulting "celloall" file was then combined with other string section files to create an "all strings" file that was, in the final mixdown combined and balance with the all woodwinds and all brass files to make a full orchestra file.

Repertoire and Replicability

Central to the project's success was the ease at which individual audio or video submissions could be created by students, sent over conventional email

platforms and digitally edited. Students were able to work at their own pace. Some submitted recordings daily, some would submit a few each week and others, regrettably waited until the final deadlines to submit all the required recordings. The 8-bar excerpts were manageable "chunks" that could be practiced and recorded/performed in less than an hour. In addition, they were easily recorded in .mp3, .mp4 or .mov formats which, because of their brevity, were of a small enough file size to be emailed or uploaded to the school's Moodle site. Furthermore the audio editing process was facilitated by providing the conductor with small excerpts that could be corrected, balanced and mixed down individually *before* assembling the entire movement.

The Theme and Variation form lends itself to this process perhaps better than works of a more through-composed formal design. Conductors, particularly ones with little experience in the digital workspace, might be wise to favor works that have a relatively steady pulse and a formal structure with multiple periodic phrases and regular points of closure, cadential or otherwise, and to avoid repertoire with a great deal of rubato and lengthy passages void of temporal reference points. Other musical forms that might be appropriate for this type of treatment include scherzo and minuet-trio movements, rondo form movements, and works with multiple short movements such as orchestral suites.

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