Suggestions for Ensemble Directors at Liberal Arts Institutions During COVID-19:

A Document of the Associated Colleges of the South (ACS) Working Group for Ensemble Directors

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About this document

While many educators are facing the realities of teaching during COVID-19, music educators and ensemble directors specifically have had to "think outside the box" in terms of curriculum and the technological needs required by this moment. This document aims to sketch the current landscape and provide helpful suggestions of what is **possible** rather than focusing on the well-documented hindrances facing our community. We hope you will draw inspiration and find useful information to help traverse your own path in the coming months.

This document focuses foremost on suggestions for hybrid pedagogies and technology that may assist liberal arts college ensemble directors in their decision-making. We aim to utilize the specific opportunities for meaningful, interdisciplinary, and interconnected teaching as you

prepare students for lives and careers beyond our ensembles. Furthermore, this document summarizes relevant research and factors that may have an impact on any such decisions. While this is an evolving landscape, the suggestions listed here are based on an understanding of matters as they exist at the end of July 2020. Some sections may focus more specifically on choral ensembles, but most of the suggestions in this document are relevant to both choral and instrumental ensembles.

We welcome questions, suggestions, and feedback from ensemble directors. Please feel free to contact the facilitator at johann.vanniekerk@centre.edu or any of the contributors listed above.

With gratitude,

ACS Working Group for Ensemble Directors

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* Applicable suggestions suitable for choral and instrumental ensembles

1. Curricular design: towards a "hybrid" model

a. Introduction

Purpose

This section is intended as a guide for collegiate music ensemble directors to help curricular design of a semester-long ensemble experience.

Background/Considerations

Every ensemble director will be dealing with multiple factors that certainly may differ from program to program and between ensembles within the same school. These include, but may not be limited to, the following broad categories:

- **Medical**: Situational details of the COVID-19 virus spread in a given area will affect the trajectory of *any* ensemble work, as will the progression of scientific research related to spread of the virus and a vaccine timeline. Such details will be driven in part by factors like geographical location, urban proximity, and policies at the local governmental level and campus administration.
- **Logistical**: Within this broad category we include ensemble directors' capabilities regarding space availability, basic equipment (stands, chairs, music, stand lights, page clips, masks), scheduling structures, and personnel availability. The restructuring of the academic calendar is also a significant logistical impact.
- **Technical**: The technical infrastructure capabilities of any given school, a music department/school's ability to support additional infrastructure as needed (e.g. latency-reducing solutions, mics for sound recording quality, tech support personnel), and the director and students' ability to work with any technological structure will substantially affect the success rate of *any* virtual solution. This includes considerations for internet-restricted students studying remotely and requiring asynchronous options.
- **Musical**: We want to create experiences that have the potential for musical satisfaction.
- **Pedagogical**: Different student demographics have vastly divergent goals driving their ensemble participation. Pre-professional training ensembles will have an entire cadre of skills to develop in their musicians (sectional coordination, group problem-solving, responsiveness and listening skills). Ensembles which deal primarily with non-majors are more likely to face issues of retention as their students join largely for the communal experience that occurs in each gathering.
- **Departmental**: The makeup of ensembles within a music school/department, interaction between the ensemble director and applied faculty, and the availability/fluidity of other programs within the school/department can (and should) play a role in shaping an ensemble directors' response. Options that may serve to alleviate some of the time drain and tedium that come from leading virtual sessions include cross-ensemble collaborations, introductions, or lecture exchanges; the usage of applied faculty to generate recordings or run remote sectionals; or the coordination of projects in conjunction with certain academic courses that are offered in the music school/ department. Other factors such as the pre-existence of a chamber music

program will impact large ensembles' ability to pivot to the "small group" format that has gained traction in recent weeks.

In order to design a trajectory that serves the students' needs, we advise that in the categories listed above every ensemble director define his or her situation within the realm of possibilities to guide curricular decision-making.

Assumptions

We take the following as baseline assumptions for suggestions:

- COVID-19 will severely impact day-to-day operations of a campus and music school, thus requiring extremely restrictive standard operating procedures for large ensembles and making normal rehearsal/concert cycles impossible, particularly for vocal artists and woodwind/brass musicians.
- A university/campus elects to incorporate in-person instruction for at least part of the fall 2020 semester in some timeline, and at the same time asks that its instructors have contingency plans for a full-virtual scenario.
- Instructors are attempting to create a "hybrid" model that balances safety with risk-management and pedagogical needs/goals, incorporating aspects of both remote-learning and in-person ensemble rehearsal.
- We will assume that the ensemble director's aim is not just to rehearse pieces with as many members of the ensemble at once as possible, but to use the hybrid model to enhance and amplify the reduced number of in-person learning that we are able to execute.
- This document does not discuss structural possibilities for fully-remote students who wish to participate in ensembles while some or most of their classmates take part in the live activities. A critical proportion of such students will obviously pull the balance of activities in the virtual direction.

Criteria

In light of the above considerations, we recommend that ensemble directors create a curriculum that prioritizes the following:

- Protects the safety of the director and students
- Spotlights the educational *goals* of the students
- Deepens the understanding/problem-solving skills using the act of playing their instrument in conjunction with others
- Looks to contextualize the study of music ensembles within a larger framework and does not merely aspire to be a placeholder until normal rehearsals resume

Format

As the goal is to create a "hybrid" curriculum, we take the straightforward format:

I. Live element of collegiate ensemble
II. Virtual element of collegiate ensembles
III. "Hybridization" process and structure

Each of these sections begins with overarching suggestions and recommendations about how to approach each of these components, followed by some possible scenarios that might be employed.

b. Live elements

Suggestions

- Scheduling live elements should be done with great care to maximize the value of in-person meetings and their productivity while considering the necessity to reduce health risks. Simply put, the stakes are higher.
- As much background information as possible should be given in a distanced format so that live meetings are dedicated to making music.
- in-person meetings should be more heavily accentuated at the start of the fall semester since climate/weather/temperature will play a role insofar as outdoor activities are included.
- Live projects should generally focus on a shorter total duration of music that might be suitable for "performance" on a shorter-than-typical concert cycle. This offers the freedom of not being bound to a typical concert schedule, allows for reduced rehearsal lengths, (30 minutes of live followed by 20 minutes break), and reduces the loss of prior work in the event of unpredictable pivot to full-virtual instruction.
- All projects should integrate the production of a video/audio recording element suitable for broadcast/sharing remotely with audiences that do not have access to the live performance.

Possibilities

- Focus on two or three group pieces of repertoire, highlighting a variety in genre. In response to the global climate and antiracist education, we strongly encourage including non-idiomatic compositions by Black composers (see list **here**). This involves sectional rehearsals for 15-20 per group OR in groups of 4, 6 or 8. We recommend that practice tracks are available for all students to work with independently before rehearsals. Alternatively, distanced sectionals can be run for individual instruments or ensemble sections by faculty, ringers, or able students. A distanced/virtual scenario for sectionals/small group rehearsing is outlined in the Virtual Elements section.
- Consider using a student-chosen repertoire (one or two pieces). Students will collaborate to find repertoire they wish to perform. The instructor will guide the groups in shaping the repertoire based on style, performance practice, and other considerations. Each group may record its piece using free phone-based software such as Smule. The instructor may choose to host a socially distant viewing of these videos in lieu of a final concert.

c. Virtual Elements

Suggestions

- As much as possible, virtual content should be designed in support of the live projects, not as mere stopgap measures
- The "Virtual Ensemble" format has a specific workflow and technological requirements for which Section 2 of this document has specific guidelines.
- *In addition to Virtual Ensemble*, directors should employ a healthy mix of formats for their online sessions, synchronous/asynchronous, viewing/listening, discussions, performance, and Q&As.
- Ensemble directors should carefully design parameters for their synchronous video sessions: length (not more than 75-90 minutes and built-in breaks), structure/variety (guest speakers, Q&A, listening/watch parties, "breakout room" discussions), and guidelines for student engagement (use of chat/hand-raising, requesting interface by computer rather than mobile phone if possible, advising students not to multitask).
- Zoom/Skype/Google Classroom video conference software presents challenges to the "human connection" (aspects of live interaction that are not duplicable in the virtual context). While there is no way to predict connection difficulties or ameliorate the problem of eye contact or "constant gaze" fatigue, these difficulties should be acknowledged and addressed regularly. and some basic coaching for all ensemble members about orientation, lighting, and background may be enjoyable and ice-breaking to explore. Some basic positioning advice appears in this article.

Possibilities

- Introductions or coached practice sessions on the repertoire chosen for live rehearsal. Utilize opportunities to provide historical, analytical, and musical background on the repertoire, perhaps interpolated with coached practice using host-shared audio of a recording of the work. Work through a piece in segments, playing a recording to which students would sing or play along. This also serves as an ideal opportunity to highlight the duty of each ensemble member to practice. Emphasize that without strides made in isolation the act of gathering as a group is not only less productive, but also less likely to justify the inherent risk that individuals take to meet in person.
- Virtual Ensemble/Virtual Choir - execution guidelines detailed in Section 2
- Focus groups or individual sessions helping students set up their professional portfolio as an artist - discussing materials, websites, recordings, interview best practices, or email etiquette
- Mock audition modules sourcing outside experts or faculty to serve as adjudicators and provide feedback. This requires pre-engagement of adjudicators for each instrument/category, and a clear set of guidelines for repertoire, length, and recording/submission methods
- Group viewing of concerts with live annotation/commenting or "flipped classroom" style asynchronous viewing. Follow-up activities could include synchronous discussion in small groups, the collaborative compilation of a Google Doc, participation in a collaborative whiteboard, or polls based on guided-listening questions posited prior to the group activity. Most of these activities can be synchronous OR asynchronous.
- Small-group video production projects that parallel live meetings of trios, quartets, etc.
- Online conversations that focus on the wider social and artistic context of music-making. These may easily be held in conjunction or exchange with faculty from other schools and

feature guest speakers from a variety of distanced locations and fields. Discussion opens the possibility of insight into topics that might otherwise never be accessed. Small group discussions using breakout rooms also offer rich possibilities. Suggested topics include:

- The medical landscape: Conversations and Q & A with relevant medical professionals about COVID-19, its impact on the arts, opportunities and limitations, and the considerations of physical safety measures.
- The creative spirit: Conversations and Q & A with artists and educators about the creative mindset, balance and importance of creative outlets, and ways in which to connect to our own creativity while physically distanced or isolated.
- Mental health: Conversations and Q & A with mental health experts and educators about the importance of mental health and finding balance between consumption of knowledge and output of creative endeavors. How may music aid in finding this balance in an often overwhelming psychological landscape?
- Improvising and collaborating: Strategies, central concepts and suggestions for student-led exploration and performance of printed and improvised work with focus on group dynamics, collaboration and healthy interactions

- Informal coffee hours with members of the ensemble. Introductions, sharing about joys and challenges, "Meet my pet/plant/roommate" ice-breaker, etc. This could be combined with online introduction profiles on social media, particularly for incoming first year students.

d. Hybridization Structures

Suggestions

- In order to maximize planning time, we suggest that a "hybrid" plan might look like a project-based, segmented semester in which each project carries virtual as well as live components supporting each other and allowing directors to shift in a graduated way in either direction as restrictions permit.
- Directors should approach the semester as a cogent whole with learning goals in mind that will perhaps be addressed in different ways by each project or segment of the semester. Practically, we also suggest that the weather and climate be taken into account in designing the trajectory of the semester if outdoor events are included (and additional contingency plans to account for rain and other unpredictabilities).

Possibilities

- Shortened concert/project cycles interpolating phases of virtual preparation and live rehearsal with the following scheduling possibilities:
  - Beginning with virtual introduction/coached "practice" as outlined, then moving to a live mode after some preset schedule
  - Beginning with live group or reduced mixed group practice, then moving to virtual coached sectionals, then coming back together for the live performance/livestream/recording
  - Beginning with live "onboarding" then moving to virtual sectionals and individual recordings to use for a "virtual choir" video production project

- Alternating live concert/project cycles with weeks of virtual activities (e.g. 2-3 week rehearsal cycle followed by 1-2 weeks of unrelated virtual activities)
- Front-loading 100% live projects at the beginning of the semester with a plan to accomplish as much live as possible before the eventual migration to all-virtual instruction, then taking up virtual activities outlined above or using the all-virtual phase to process, edit, and produce recorded material from the live activities.

2. Logistics for a Virtual Ensemble/Choir Model

a. Technological suggestions (please see section 3 for more thorough information and suggestions)

Should you choose to run your ensemble as a virtual one this semester, the good news is that you can save your students money by using technology they already have. Most students have a smartphone, laptop, and headphones with a built-in microphone. While the headphone with built-in microphone might not be the ideal equipment for capturing sound, it will work perfectly for this application since this is not a live music-making session. Also, the video quality captured by most cell phones is usually very high. For music majors or minors, you might be able to talk them into purchasing a better microphone and an audio interface. These will dramatically improve the audio quality of what they capture. There are several relatively inexpensive options for the microphone and audio interface.

- We recommend a Shure SM-57 for the microphone ($169.00) or Shure SM-58 ($99 for mic only)
  https://www.sweetwater.com/store/detail/SM57GtrPack--shure-sm57-instrument-microphone-pack-with-short-stand-and-cable

  https://www.sweetwater.com/store/detail/SM58--shure-sm58-cardioid-dynamic-vocal-microphone

  (SM-57 is mostly suitable for instrumental, but could be used for vocal, whereas SM-58 would be used primarily for vocal, or under extreme financial circumstances for instrumental). While this is not the preferred technology, it could be helpful and suitable as the most cost-effective.)

- The Focusrite Scarlett Solo 3rd Gen USB Audio Interface ($109.99)
  https://www.sweetwater.com/store/detail/ScarSG3--focusrite-scarlett-solo-3rd-gen-usb-audio-interface There is one other option where a student could get all of the items in one bundle for ($219.99)
  https://www.sweetwater.com/store/detail/ScarlettSoloSG3--focusrite-scarlett-solo-studio-3rd-gen-recording-bundle but would still need to purchase a microphone stand.

- For the average student, however, it might be cost prohibitive to purchase a microphone and audio interface because they may never use them outside of your course. So for most cases, the technology students have will suffice.

A mock-up or backing track (conductor track is optional) with which he or she can perform is needed. There are several approaches to consider when creating a backing track, and what you end up using will depend on the abilities of your students. I have created mock-ups of songs using Logic Pro X (this could also be done in GarageBand or any DAW), and sent students mp3s of the song minus their part so they can practice along with it, or sent them an mp3 of only

their part so they can learn and then perform it. When they are comfortable playing or singing their part, they then record themselves on video.

b. Possible language to use in virtual ensemble recording assignments

1. Dress presentably and find a quiet, well-lighted place in which to record. Make sure you are seen singing or playing your instrument. You'll most likely want to record in landscape view (sideways) versus portrait view (up and down).

2. Play the track on the 1st device with headphones and record yourself singing or playing your instrument along with it on the second device. You don't want any sound from the recorded track in the video of you singing or playing. Any app that captures video will work. One good take of you performing the song all the way through is needed.

3. Send the finished video back to me. You will want to make sure that the file extension of the video is (.mov or .mp4). I've sent you an additional email with a link to a Google drive folder where you can upload your videos.

c. Editing

Once you receive the videos from the students, editing is the next step. This is possibly the hardest part of the process until you get the hang of it. It will require you to know your way around a DAW and video editing software. The good news here is that if you are a Mac user you already have a free DAW (GarageBand) and video editing software (iMovie) on your computer. If you are not a MAC user, there are free options for both of these software applications that you can use as well as video editing programs like Final Cut Pro, Adobe Premiere, and Davinci Resolve that will do the job as well. Creating the mock-up can be time-consuming for the instructor, but this is the road map that the student needs to navigate the piece you've chosen. We recommend smaller works and smaller ensembles, as well as fewer pieces per program if you choose to use this approach for a semester.

3. Online Pedagogical Tools: A summary of technological possibilities for learning including relevant hardware and software

a. Synchronous learning

It must be understood that there is no conferencing software currently available that allows for remote rehearsals of full ensembles. There are several hardware and software issues that currently preclude its feasibility including bottlenecking, connection stability, and bandwidth. Synchronous music-making applications such as JamKazam, Jamulus, and Jack Trip designed for small groups work best when limiting the distance of the ensemble, and they only support audio. These softwares also require a high quality audio source provided by an audio interface and studio grade microphone, or a high quality USB microphone. While the initial financial outlay for audio equipment might not be feasible for all ensemble members, music majors, students who receive individual instruction, and students who hope to continue to create recorded content would benefit from possessing the basics.

i. Audio hardware - interfaces, mics, headphones, etc.

The most affordable way to capture high quality sound is with a USB microphone. These microphones couple a studio grade capsule with a single channel interface in a microphone shaped package. We highly recommend using a USB microphone that also offers a headphone output. This allows for latency free direct monitoring for the user, and microphones that provide a headphone output have controls for balancing mic monitoring and source audio, thus allowing the user to decide how much of which party to hear. This is a feature that is not typical on lower priced single channel interfaces. Audio Technica's AT-2020 USB is a prime example of a well made, studio quality, USB microphone that offers all of the features required by a discerning student musician.

https://www.sweetwater.com/store/detail/AT2020USBP--audio-technica-at2020usb-cardioid-condenser-usb-microphone

Interfaces offer more options in regard to microphone selection. With an interface, any microphone can be used to capture audio whether it is passive or requires 48 volt phantom power. Interfaces also accept line audio sources, allowing for direct recording of electric instruments. Focusrite's line of Scarlett products offer high quality preamps, and they are very easy to use. They do not offer the ability to balance direct and source audio, which is an important level of control in the context of virtual meetings. The Focusrite Scarlett Solo is an excellent choice for those seeking the added flexibility an interface provides. For vocal students, we would suggest using a cardioid condenser microphone, such as the Audio Technica AT-2020, the non-USB sibling of the previously mentioned microphone. Cardioid condensers offer sensitive capture, while rejecting a significant amount of room noise. Instrumentalists might consider a versatile dynamic microphone such the Shure SM57.

https://www.sweetwater.com/store/detail/ScarSG3--focusrite-scarlett-solo-3rd-gen-usb-audio-interface

https://www.sweetwater.com/store/detail/AT2020--audio-technica-at2020-cardioid-condenser-microphone

https://www.sweetwater.com/store/detail/SM57--shure-sm57-cardioid-dynamic-instrument-microphone

The last piece of necessary audio equipment is headphones. Full-sized over the ear headphones are preferred to in-ear headphones because of their isolation ability. Headphones that offer transparent sound are also preferable to those that provide artificial isolation, or noise cancelling. Audio Technica offers a line of affordable reference headphones in their ATH series. The ATH M20X, their entry level model, has proven to be reliable in recording studio use for years.

https://www.sweetwater.com/store/detail/ATHM20x--audio-technica-ath-m20x-closed-back-monitoring-headphones

It should also be mentioned that all of these devices are suitable for use with most laptops, desktops, tablets, and mobile devices because each user is able to acquire the proper adapter, more commonly known as a dongle. All of these devices have also been tested with several video calling/conferencing programs including Zoom, Teams, and FaceTime.

ii. Video conferencing software (Zoom, WebEx, Teams, Skype, FaceTime)

Video conferencing software provides a minimal buffer for latency causing synchronous music-making to be impossible. However, studio instructors have found success teaching remotely, especially when conferencing software has been paired with quality audio equipment. Sound quality can be further enhanced by coupling third party audio processing software with the video conferencing program.

Cleanfeed allows for a higher quality audio signal when coupled with video conferencing software and is capable of multitrack, multi-party live audio and recording using only a browser.

https://cleanfeed.net

iii. Applications for small group rehearsals

There are several applications that allow simultaneous rehearsal or jamming. These programs only support audio and use proprietary protocols to minimize or account for the latency of each user's internet connection. The minimum requirements for this family of applications are audio input via a USB mic or interface, and an internet connection capable of 1MBPS upload and download. Devices must also be connected directly to a modem via an ethernet cable to avoid the added latency and intermittent wireless connections. Each of these programs requires the optimization of the user's computer and provides detailed instructions for device setup. Because the effectiveness of latency reduction is dependent upon distance, the closer a group is to one another, the faster the connection. Therefore, if an ensemble is present on campus but unable to rehearse in person, the campus's local area network may be able to facilitate synchronous small group rehearsals.

The Jamulus software enables musicians to perform real-time jam sessions over the internet. There is one server running the Jamulus software which collects the audio data from each Jamulus client, mixes the audio data, and sends the mix back to each client. It is a free open source application and is supported by an active group of amateur users.

http://llcon.sourceforge.net

JamKazam offers synchronous music-making as well as a backing track application and a team of online instructors. JamKazam also offers an interface for use with their server that negates the need for a computer. It appears that JamKazam ceased maintenance of their servers in 2016 but recently began offering software updates. Connections speeds limit participants to 4 - 5 in a session, more if the group is in close proximity.

https://www.jamkazam.com

Soundjack is a realtime communication system providing any quality and latency relevant parameter to the user. Depending on the physical distance, network capacities, the actual network conditions, and the actual routing, even musical interaction or at least compromised musical interaction is possible. Soundjack is in its beta phase and is still a developing product.

https://www.soundjack.eu

b. Asynchronous learning

Applications for Asynchronous Learning

Applications, especially ones that are easily accessible on mobile devices, that supplement any facet of music learning could be particularly useful in hybrid and fully remote models. This is by no means an exhaustive list, but the apps included here are well designed and can aid in individual learning, part preparation, and skill maintenance during periods apart.[1]

Choral Preparation

Choral Line is a UK based company that has been producing supplemental rehearsal materials designed to support the participants of community choirs. They have begun populating an app with these materials and offer a flexible tool for the part learning of large works.
https://www.choralineapp.com

My Choral Coach is a simple guided practice and choral management system. It provides access to the entire GIA Publishing catalog and allows for uploading other repertoire. My Choral Coach is available on your desktop, laptop or mobile device and integrates Zoom video conferencing. The app is inexpensive and will remain free for ensemble members for the foreseeable future.
https://acda.org/my-choral-coach/

Carus Music, the choir app, is another part learning tool that grants access to the majority of Carus Verlag's choral catalog. It offers high quality recording along with digital scores, as well as a coach mode. When the coach is activated, the chosen choral part is played by a piano within the overall sound of choir and instruments. The coach is also available at a slow mode, so that fast or difficult passages can be practiced more easily.
https://www.carus-verlag.com/en/digital-media/carus-music-the-choir-app/

[1] Online learning software such as SmartMusic and Aurelia furthermore provide exciting opportunities for ear-training, instrum

c. Quasi Remote Learning

If a situation arises where students return to campus but face to face rehearsals remain unsafe, it is feasible to create a closed, latency free system that could facilitate the rehearsal of small ensembles with each member contained in a practice room or other isolated space. Recording studios are commonly wired to facilitate musicians separated into individual spaces connected via a headphone distribution system. The following devices are readily available, and in some cases institutions will already possess them. To create a system for local video rehearsal, 4 lanes of signal travel must be considered: Video Send, Video Return, Audio Send, Audio Return. Several common systems could be made to work synchronously to address all of these.

Video Send

HD Closed Circuit Television System or similar

These systems are commonly used for residential video surveillance and arrive prepackaged with the majority of the necessary accessories for installation.

Video Return

HDMI Splitter to HD Monitor in rooms

An HDMI splitter allows for a single HDMI source to be sent to several receiving devices, in this case the CCTV output to HD monitors. Any HD monitor with an HDMI input can be used for this. Industrious IT departments may maintain a surplus of monitors that would be suitable.

Audio Send

Microphones placed in rooms

Microphone suggestions were made in the audio hardware section (p. 12), but for this application passive dynamic microphones would offer the most convenience.

Analog Audio Mixing Board

A conventional sound mixing board receives audio from the room microphones. The size of the board is dependent upon the number of rooms to be wired.

Audio Return

Headphone distribution amplifier

Headphone amps function in the same way as an HDMI splitter, sending a single source to multiple outputs - the output of the mixer is sent back to the rooms.

Passive Stereo Volume Control Box

This receives the signal from the mixer and provides a stereo headphone jack and a volume control in each room.

Connections

Each room would require four separate cables, making for a rather involved installation process. The underlying principles are that the individual components are simple to operate, all of these technologies are proven, and video and audio are being processed separately. More complex and therefore more expensive options such as a digital mixer and accompanying digital snake are available that would lower the number of connections. However, more versatility often makes for a less user friendly experience.

Hardware Examples:

HD CCTV System
https://www.amazon.com/Tonton-Surveillance-Waterproof-Detection-Protection/dp/B079HSG4NF?ref_=fsclp_pl_dp_3

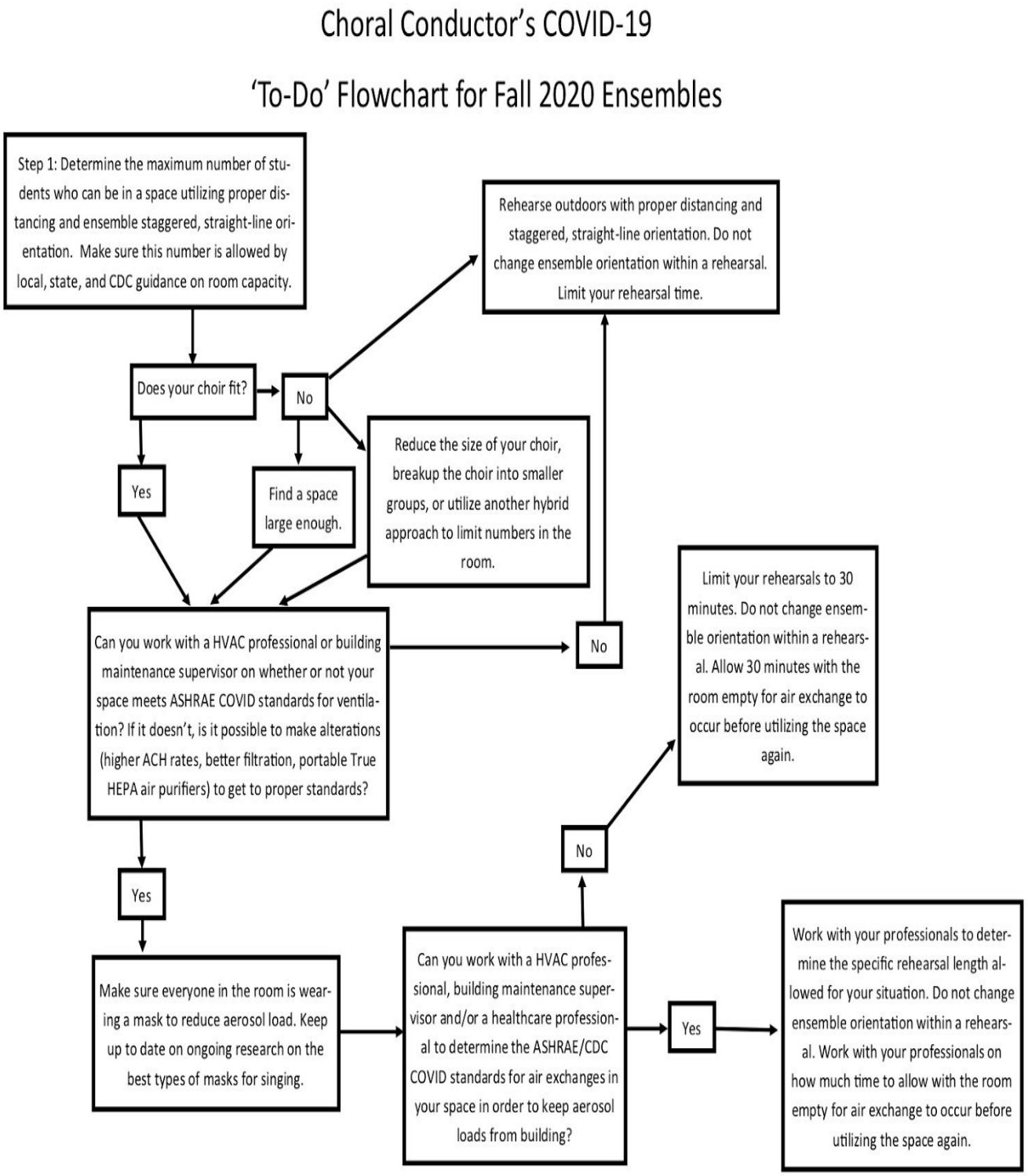
HDMI Splitter
https://www.amazon.com/Portta-Splitter-support-1080p-Display/dp/B002M6LC5W

Analog Audio Mixer
https://www.sweetwater.com/store/detail/EPM8--soundcraft-epm8-mixer

Headphone Distribution Amplifier
https://www.sweetwater.com/store/detail/HA8000V2--behringer-ha8000-v2-8-ch-headphone-mixing-distribution-amplifier

Passive Volume Control
https://www.amazon.com/Volbox-inline-audio-control-attenuator/dp/B00XDKKQ9E/ref=sr_1_1?dchild=1&keywords=volbox&qid=1596089968&sr=8-1

4. Flowchart for Live Fall 2020 Ensemble Rehearsals



5. Relevant Data

a. Main considerations as suggested by medical and HVAC specialists

The Covid-19 virus has severely altered the traditional methodology of choral singing for both faculty and students. Because singing creates more aerosol and droplets than simply speaking, practicing one's art is a potentially dangerous activity for both the singer and the conductor.

There are numerous studies that speak to the science driving the production and the distance that aerosol can travel, thus identifying the dangers and issues that need addressing. Through multiple discussions with practicing physicians and nurses who are well versed in current Covid-19 research, several issues not as often discussed have emerged. These precautions are extremely important to consider when making decisions as to how, where, and when to rehearse musical ensembles.

The well-publicized mandates include regular and thorough hand washing; avoiding touching the nose, mouth or eyes with hands; wearing face masks around other people; and practicing social distancing.

While these are imperative actions, other areas deserve further investigation as they pertain to live rehearsals for conductors.

b. Suggested Conductor Guidance for Live Rehearsals

Utilizing current available research[1], here is a suggested conductor's "to-do" list for live choral ensemble rehearsals (also available in flow-chart form):

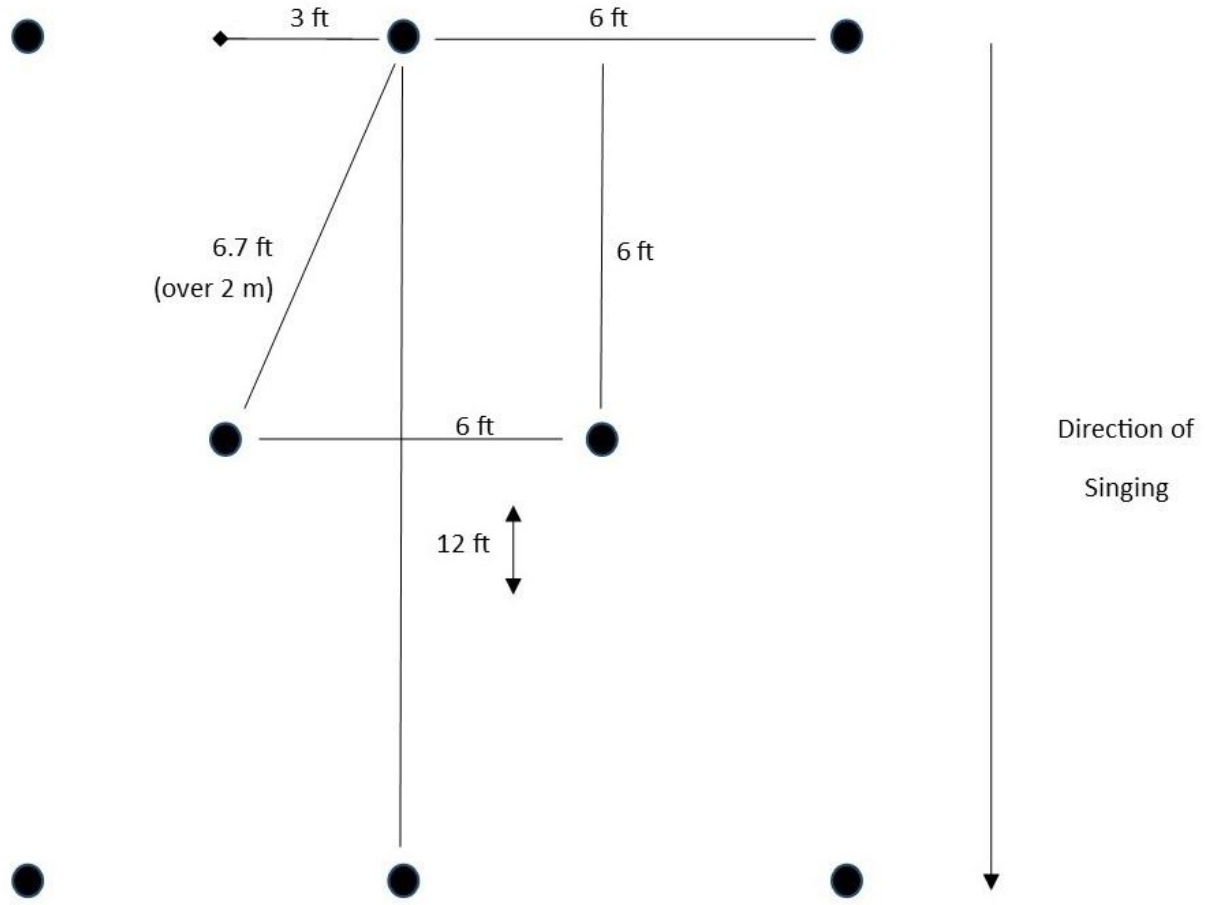
There are four main considerations beyond general public health concerns such as proper hand hygiene:

1. Proper spacing/orientation/direction of singers
2. Proper ventilation
3. Rehearsal length and air turnover in a space (coupled with ventilation and masks)
4. Masks

Here is a step-by-step plan of action to consider:

Spacing:

- Utilizing a straight line organization (no curves with projection in different directions) with staggered seating is ideal as it creates a 6 ft minimum horizontally, over 2 m of spacing on the diagonal, and 12 ft of spacing in the direction of projection.[2] [3] [4]



- Therefore, Step 1 makes sure any space you use has enough square footage to allow for this arrangement with the number of singers in your group. Room capacity is also determined by local, state, and CDC guidelines.

Ventilation:

- Ventilation is a huge concern for any indoor space. All three singing studies, (CU-Boulder, Munich-1, and Bavaria), note the importance of ventilation. If it is not possible to confirm that your indoor space meets the following considerations, rehearse outdoors.

- Ideally, work through the details with an HVAC specialist who understands the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) guidance[5] for COVID-19 ventilation and the ventilation system in the building. Some key points from this guidance to consider are:
    - Air flow from room input to output. As noted in the CU-Boulder study, linear air flow from a low input/high output or high input/low output is better than both input and output being in the ceiling, a common arrangement for commercial buildings that creates more circling of the air in the space.[6]
    - Air input directly from outside is better than recycled air. Increasing outdoor input air to its maximum for the system is ideal.
    - Recycled air needs to be filtered to at least MERV-13 standards; MERV-14 or greater is better. (see section c.i for further explanation)
    - The Air Change Rate/Hour (ACH) needs to be sufficient to clear the room on a regular basis per CDC and ASHRAE. Increasing the ACH rate in the system, which is often set low for energy efficiency, is recommended. The ACH rates to 'flush' a room are listed in the following table:

Table B.1. Air changes/hour (ACH) and time required for airborne-contaminant removal by efficiency *		
ACH § ¶	Time (mins.) required for removal 99% efficiency	Time (mins.) required for removal 99.9% efficiency
2	138	207
4	69	104
6+	46	69
8	35	52
10+	28	41
12+	23	35
15+	18	28
20	14	21
50	6	8

    - The ACH rate in rooms with large ceiling height—a concert hall, for example--can be calculated with 10' ceiling height according to ASHRAE COVID guidance, which may be different/higher than the overall rating for the HVAC system for that room. This typically shortens the necessary time required.
    - In-room True HEPA air purifiers can be used to augment any HVAC system, especially those that cannot be upgraded due to system limitations, following the ASHRAE guidance.
        - Properly size the units to the space. Slightly oversized is better if an exact match is not possible. Do not undersize the units.

Rehearsal length:

- Aerosols build up in any occupied indoor area over time. The exact details for any space are dependent on the ACH rate, air source/filtration levels, and air flow path.
    - If you are unable to work with an HVAC engineer knowledgeable of the ASHRAE COVID guidelines to calculate the details for your space, keep rehearsals to 30 minutes or shorter with 30 minutes of empty time in the space, (no one in the room), so the air can exchange any build-up that occurs.
- Singers should be stationary within any rehearsal to keep build-up localized.
- Singers should not change choral orientation within rehearsals (i.e. if they start the rehearsal standing in sections, they should not move to standing in mixed quartets in that same rehearsal. Be in sections for one rehearsal and then quartets for the next rehearsal)

Masks:

- The three singing-specific studies done to this point have focused on unmasked singing and general aerosol/droplet production from singing, and attempt to address concerns raised by early choir "super-spreader" events.[7]
- CU-Boulder and Bavaria did look at some masked singing and found that masks reduce aerosol and droplet spread, depending on the type of mask used. Even basic surgical masks reduce the spread and the build-up in the area. [8]
- The main results for the best options with masked singing are part of forthcoming research [9]
- It is unknown whether COVID-19 spreads via aerosols and is one of the largest current debates.[10]
    - Because it is not known if COVID-19 spreads via aerosols, singers should proceed under the assumption that it does, even if this is proven to be wrong with further study. This means singing with masks to reduce aerosols spread and build-up in an area.[11]
- Masks help limit the aerosol build up in a space, but do not eliminate it.

c. Considerations and definitions regarding HVAC

HVAC Systems. An HVAC system provides heating, ventilation, and an air-conditioning, as well as controlling air filtration and cleaning elements. The following are points to discuss with an institution's HVAC experts:

i. What is the MERV factor of the filters being used. (MERV is an acronym for Minimum Efficiency Reporting Value.) The higher the MERV number, the higher the filtration

capabilities. Since HVAC systems vary, there is not a standard answer, but this is an important issue that must be considered.

ii. Air exchange refers to how many times the air within a defined space is replaced. The CDC has guidelines to address this issue. The more often the air is replaced and cleaned, the more likely the virus is removed from a space. Often, HVAC systems can be adjusted to speed up the air exchange.

iii. Air flow is simply the movement of air. The importance is not only the speed, but also how the air circulates in any given space. Knowledge is important about where the duct location is in relation to where the filtered air enters and, perhaps even more importantly, where the air exits. For example, standing in front of an air return duct could expose an individual to more aerosol.

The practical implication for ensemble directors is that knowledge of HVAC issues can help in determining where ensemble members and conductors should stand in a particular room and how much time is needed between sessions to effectively allow the air to be filtered.

d. Considerations and definitions regarding PPE

PPE (Personal Protection Equipment) Placing a barrier between the music-makers and the virus.

i. Face masks. While the N-95 masks used by healthcare professionals provide the best protection, this may not be a possibility and especially if it would keep them from the medical individuals on the front line. KN95 masks may be a viable option in place of N95 masks. A high-quality mask is preferable, but any mask covering the mouth and nose is better than none.

ii. Face shields. The CDC does not recommend the use of face shields for normal everyday activities or as a substitute for cloth face coverings. If face shields are used without a mask, they should wrap around the sides of the wearer's face and extend to below the chin. Disposable face shields should only be worn for a single use. Reusable face shields should be cleaned and disinfected after each use.

iii. Eye protection. It is important to remember that the eyes are also a mucus membrane and can be susceptible to viruses. The CDC recommends eye protection for individuals who could be at risk of infectious diseases through ocular exposure. Face shields, goggles, or other covering could be used to protect the eyes from absorbing the virus.

iv. Barriers and shields. Often referred to as sneeze guards, coronavirus shields provide another level of protection for all concerned. These are only effective if large enough or placed appropriately to keep aerosols contained, diffused, or redirected.

v. Distancing. Consensus is still being reached within the research community. While acknowledging the risk factor, it is essential at minimum to adhere to CDC guidelines, while awaiting further relevant scientific data. The more space one can place between each musician, the safer. While not optimum in music-making, wearing a mask can serve as a mitigating factor in the spacing of ensemble members.

e. Considerations and discussions

- Outdoor rehearsals and performances could be a safer option. The sun's ultraviolet rays will kill the virus, and the distancing of the outdoor space can diffuse it. The direction of the wind could be an issue in boosting aerosol spread, but outdoors is still believed to be safer than inside.
- Administrative intervention. Group control issues such as determining how ensemble members enter and exit the room, how they arrive at their assigned seats, etc., help maintain distancing. The basic flow of all participants can diminish the exposure of one person to another.
- Blue light technology. While it is not safe to be exposed continually to UV rays, a new technology of blue light is an option to consider for enclosed spaces.

f. Rehearsal protocol

- As far as possible, no water bottles in any ensemble rehearsal space.
- No shared materials (music, folders, pencils, anything). Everyone must have his or her own materials.
- No coming and going during a rehearsal time (i.e. no bathroom trips and such), which should be easier with the shorter rehearsals, to keep movement to a minimum through potential areas with aerosol load.
- Standing for the entire rehearsal makes spacing easier without chairs and reduces the surfaces that have to be regularly cleaned (again, this should be easier with shorter rehearsals).

g. Practice room use protocol

Practice Room Use Protocol (Sample Template)

1. Do not use a practice room if you are experiencing any symptoms of any illness.
2. Practice rooms must be reserved. The maximum time block for a single reservation is sixty (60) minutes. Contact Appropriate Departmental Contact to make your reservations.
3. By entering this room, you are pledging on your honor that you will follow every procedure on this list.[1]
4. Use hand sanitizer prior to entering the room.
5. Upon entering the room, use a disposable sanitized cloth to wipe down the piano keyboard and the music stand. Do not allow the liquid to run down between the piano keys. Leave the fallboard, (the cover over the piano keys), in its open position at all times. Leave the piano lid closed at all times.
6. Make sure the air purifier is running.[2]
7. Wear a face covering for the entirety of your practice session unless you are a wind instrument player. Brass players must use bell covers. Spit valves must be emptied onto the medical pads provided by the Music Office. Singers must wear either a face shield or singers' mask during their practice session. Singers and wind players must face away from the piano while rehearsing.
8. If you cough or sneeze, do so into your mask and/or your elbow. Doing both simultaneously is prefered.
9. If you leave the room for any reason, you must wear a face mask and you must use hand sanitizer before re-entering the room.
10. Only one student may occupy this room at a time unless you are rehearsing with an accompanist. The accompanist must wear a face covering at all times. A minimum 6-ft distance must be maintained at all times. Do not meet with accompanists in the small practice rooms (list any rooms that apply). Those rooms cannot accommodate more than one person at a time.
11. Students rehearsing with an accompanist must take a break after 20 minutes of rehearsal in order to exit the room and allow the air to clear. After a minimum 10-minute break, the rehearsal may resume for another 20 minutes at which time, the rehearsal must end and the room must be vacated.
12. Upon completion of your practice session, use a sanitized disposable cloth to wipe down the piano keyboard, piano music rack, and any other furniture or equipment you have used while in the room.
13. Make sure you have everything you brought in; do not leave personal items in the room.
14. Prop the door open as you leave the room. Leave the light on; it will go off automatically. Make sure the air purifier is running.
15. After leaving the room, use hand sanitizer again or wash your hands for at least 20 seconds.

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[1] Most colleges have a COVID code of conduct for all campus members—reaffirming that here is helpful.

[2] Utilizing a True HEPA air purifier for spaces that cannot meet ASHRAE/CDC HVAC guidance—most practice rooms will fall under this category—is necessary. Make sure the units are properly sized for the space, with a little oversize being better. Do not undersize the units for the space.

Notes

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[1] An excellent synopsis of singing-related issues through first ~2.5 months of pandemic, with hyperlinks to a vast amount of early research is available at https://www.publichealthontario.ca/-/media/documents/ncov/covid-wwksf/2020/07/what-we-know-transmission-risks-singing-wind-instruments.pdf?la=en

[2] Three studies (CU-Boulder https://www.nfhs.org/articles/unprecedented-international-coalition-led-by-performing-arts-organizations-to-commission-covid-19-study/, Munich-1 https://www.unibw.de/lrt7-en/making_music_during_the_sars-cov-2_pandemic.pdf, and Bavaria https://healthcare-in-europe.com/en/news/singing-in-times-of-covid-19.html) form the basis for the recommendations.

[3] The CU-Boulder study notes the need for straight line, staggered formations.

[4] The Bavarian study noted that aerosol projection was greater in front than to the sides.

[5] Interactive PDF available at: https://www.ashrae.org/file%20library/technical%20resources/covid-19/ashrae-covid19-infographic-.pdf

[6] The ASHRAE guidance for patient rooms, which provides visualizations of various air flow possibilities, can be found here: https://www.ashrae.org/file%20library/technical%20resources/covid-19/2016june_016-027_khankari.pdf

[7] Studies and news reports about these early events are included in the Public Health Ontario synopsis.

[8] The Bavarian study noted that singing with surgical masks produces jets from the sides and top of the surgical mask, but overall spread was still lower than unmasked singing.

[9] Forthcoming research on masked singing is expected from CU-Boulder, Public Health England, Colorado State University, and the University of Alberta.

[10] The varying current views on this debate can be researched here https://www.who.int/publications/i/item/modes-of-transmission-of-virus-causing-covid-19-implications-for-ipc-precaution-recommendations and here https://academic.oup.com/cid/article/doi/10.1093/cid/ciaa939/5867798?searchresult=1

[11] The Munich-1 study looked at the possibility of popscreens to limit droplet spread, which might be an option for live performances.