# On the Making and Breaking of Social Music Improvisation during the COVID-19 Pandemic

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## ABSTRACT

Music improvisation has traditionally been a real-time, collocated group activity where individuals listen and react to one another as they organically create music together. The severe restrictions of COVID-19 provide an extreme case study of how remote work is affecting music improvisation practices, and how technology might co-evolve to better support those creative needs. We report results from interviews of six professional music improvisation artists during the pandemic. We found that, despite modern remote communication technologies, remote work has had a detrimental impact on musicians' livelihood and practice. The inability to make music with others in real-time has erected barriers to creative music production, and made it challenging to create "safe spaces" for the creative process. In response, new forms of social practices have begun to emerge, including increased use of elongated spaces and silences to facilitate remote music making sessions, new types of large-scale distributed music-making, and global, societal dialogues about music.

## Author Keywords

Creativity; Music; Remote Collaboration; Remote Work

## INTRODUCTION

This paper examines the practice of live music improvisation ("improv") by groups, and how this community has employed technology to adapt its practices to the global pandemic.

Music improv is practiced by novices and experts in informal settings, educational contexts, and live performances. This form of music is characterized by collocated individuals collectively creating music that organically evolves (i.e., there is no predetermined song that the musicians play). To create the music, individuals listen and react to one another, employing non-verbal cues (e.g., gestures, body language) and verbal communication to develop the music. Improv also serves important social roles, enabling musicians to connect with one another and grow a community. Thus, music improv is more than simply performance—it is a social activity where individuals can learn from one another, make new connections, and enrich the larger community.

Music improv has traditionally been a real-time, collocated activity since timing, real-time feedback, and lightweight, nuanced communications are all critical to successfully and spontaneously creating music with others. These requirements make it difficult to use existing communication technologies to remotely improvise music in real-time. For example, when latency is introduced, participants are limited in their ability to quickly react to the actions of others. Instead, they must change how they listen to and interpret the music, explicitly calculating how much delay there is to understand where the music is "now" and how their contributions will be perceived by others after latency is added. Remote communication technologies also reduce the ability to fluidly communicate with one another through verbal and non-verbal means. In short, music improv is not an activity that is supported well by current remote communication technologies. Yet, music improv is a critical part of many professional musicians' livelihoods, and a key part of maintaining a community. As such, there is a need to understand how this practice and technology can co-evolve to exist during the pandemic.

This paper reports results from an interview study of six professional music improvisation artists. Our goal was to understand how the pandemic is affecting their practices, and, further, how they have adapted to maintain a practice. Our findings reveal the following themes:

- **Adapting the medium to the practice**: Attempts to maintain existing practices using current remote communication technologies do not fare well, due to latency and current technologies being optimized for other uses (e.g., meetings). This has made it nearly impossible to conduct real-time improv online.

- **Adapting the practice to the medium**: Participants are evolving their practice and their music to the capabilities of current technologies. For example, latency in the communication medium has shifted musicians' practices towards more asynchronous social activities (e.g. round-robin improv over recordings), and encouraged the development of musical skills that would be less imperative in a collocated setting (e.g., listening even more attentively to each other).

- **New forms of social, distributed music-making**: While certain musical practices are nearly impossible to recreate in an online setting, musicians are seeking ways to address the *social* aspect of music improv through novel social configurations (e.g. large-scale virtual orchestras). In coping with latency effects, musicians are also discovering new social coordination strategies that have in turn spurred emergent

new forms of music, such as the explicit use of space and silence as an enabling communication medium.

- **Time for personal reflection:** Cancelled gigs and performances have taken a substantial toll on musicians' livelihood and motivation. Some musicians have taken this time to revisit longer-term projects, or reflect on how to approach their work with more intentionality if and when gigs and performances return.

- **Increasing and strengthening connections in the community of practice**: The need to take the practice online has also lowered barriers to accessing and interacting with highly sought-after individuals in the community. As a result, there are also more opportunities for different members of the community to interact with and learn from one another.

## RELATED WORK

In their seminal work comparing collocated and remote work, Olson & Olson [9] note that collocation affords communication via multiple channels, with rapid feedback and nuanced communications. Collocated individuals also share a common local context to help ground and coordinate their work. These characteristics aptly describe key features musicians rely on to effectively create music together in an improv setting: real-time, rapid feedback are essential for musicians to be able to react to, and further develop, the music others are playing.

In the music domain, network music systems have been designed for both real-time and non-real-time collaborative music making, ranging from LAN systems for local collaboration (JAMSpace [5]), to the World Wide Web for remote music-making (e.g. SoundWIRE [3], FMOL [6]). In most remote music-making settings, latency has been a key challenge to real-time collaboration.

Research such as WebDrum [2] and Metatone [7] has investigated design requirements for facilitating collaboration and coordination during group musical improvisation. These design criteria include aspects such as localization (ability to indicate which aspect of the artifact one is referring to), mutual awareness (knowing who is contributing to what), mutual modifiability (ability to modify each others' contributions), and a shared and consistent representation (everyone sees what everyone else sees). Researchers have also explored design interventions for facilitating social coordination during ensemble improvisation, such as signaling group configurations to other players [4], sound visualizations to show who did what [8], or encouraging more spontaneity through novel representations of music [1].

In the wake of the COVID-19 global pandemic, the need to work and collaborate remotely has provided new urgency to these research themes. Our work contributes to this overall research area by describing how professional musicians are actively adapting tools-at-hand to maintain their livelihood and practice.

## METHOD

Between April and June 2020, we conducted 45-minute interviews with 6 professional music improvisation artists to understand how the pandemic has affected their practices. Because this was an early-stage study and because professionals in this field are rare, participants were recruited primarily through word-of-mouth. Participants had between 16-40 years of professional experience, ranging from jazz, funk, and blues, to experimental, contemporary, and new age music. Their instruments of specialty ranged from piano, keyboard, oboe, clarinet, and guitar, to percussion, drums, bass, and vocals, with most having experience on multiple instruments. Aside from their own practice, all participants also taught music improvisation, in settings such as elementary school, university, graduate school, non-profit organizations, music therapy, and private lessons.

## CHALLENGES RESULTING FROM REMOTE WORK

### Latency precludes real-time social improvisation
All participants stated that the most significant challenge for them has been internet latency, which has made it nearly impossible to conduct any form of real-time social improvisation online: *"It's so frustrating. We don't have an online platform where people can hear each other without latency delays."* (P2) Participants had tried and failed to use common video chat online platforms, citing an inability to synchronize between players as a key barrier to real-time collaborative music creation. Many emphasized that although latency is more tolerable in other domains, it is a show-stopper in music: *"Zoom, Skype...they're not meant to be duplex. They're ok for things that involve turn-taking, and ok for things that don't require a rhythmic pulse."* (P2), *"Dance is a little bit less offensive if the timing's off...but for musicians they really want to hear 20 people playing a note at once."* (P1)

As a result, participants indicated that they have had to stop playing (and performing) real-time improv altogether: *"I've never gone this long without improvising with someone else."* (P3) *"Social distancing kills any possibility of ensemble music making."* (P2) Instead, many have reverted to asynchronous formats, such as passing each other recordings and playing improv over them: *"People would record a track, give it to someone else, they would add something, they would send it to someone else. It becomes making music in a very different way than making it in real-time."* (P5)

A few who had prior experience songwriting with others shifted from social improv towards doing more collaborative composition: *"We've done songwriting on the phone before. How do we both feel about this chord next? This progression? And then mutual agreement until something is done."* (P4) However, this tended to be primarily feasible with collaborators who had already worked closely together before: *"Because he and I work together so much, we are able to adapt."* (P4)

### Barriers to creativity
The practical barriers of being remote have led to fundamental creative barriers when making music together. First, adjusting and reacting to one another in real-time is fundamental to the creative pursuit itself: *"Let's say the drummer is playing his part, and you're joining in as a pianist. What can you play that complements his groove?...What's a missing accent that*

*you can fill in?"* (P6) The back-and-forth dialogue that yields in-the-moment creativity is much more difficult to replicate asynchronously. Because players cannot react to each other in real-time, some only recognize new changes they would like to make after the entire piece is finished: *"We get to the end, we all listen together, then person number 2 goes 'now that I hear the whole beautiful structure, I wanna revise my part.'"* (P6)

Others also pointed to critical dimensions of creativity that are typically enabled by in-person live performance. For example, in some communities, dynamically varying the group size during improvisation is one way of encouraging musical contrast within a single piece: *"Group size is one of the contrasting elements. From quiet to middling to high energy and back to quiet."* (P2) Remote work has made it difficult to leverage this dynamic, real-time manipulation of group size.

### De-humanizing the collective experience
Participants pointed to the in-person nature of their profession as what makes music improvisation fundamentally human: *"We're like blood sweat and tears. We like to be in the same room together. It's a real organic form of music. What keeps my heart and my soul pumping is communicating with other musicians."* (P3) As a result of remote work, many have tried asynchronous approaches, such as sending each other music and adding to them. However, most felt this is a far cry from the human experience of improvising with others in the same room: *"It's not human enough for me. I like to be in a room with musicians playing."* (P3) For most, it is that give-and-take of responding to others that makes them come alive: *"So much is about what the bass and drummer have given me, how we respond to each other. So much is about responding."* (P6)

### Lack of a psychological "safe space"
Others discussed the challenge of providing creative "safe spaces," especially in improvisation where music expression is deeply organic and personal. Creative risk-taking can be hindered by a lack of shared, physical safe space: *"You really have to be there as a group. It has to feel like a safe environment."* (P2) A shift to other mediums (e.g. online communication channels, recording mediums) may involve the loss of certain characteristics of safe creative spaces, such as the highly ephemeral nature of playing without any recording mediums, or the ease in creating a shared local context.

The loss of a safe creative space can be particularly problematic for novices, whom experts described as being particularly prone to self-criticism or over-intellectualizing of improvisation. As one participant put it, *"The number one barrier to people improvising is often self-consciousness, self-criticism, and judgment, fear of making a wrong note or embarrassing themselves, and difficulty of achieving an attitude of playfulness."* (P2) To address this, improvisation educators typically engage novices in group exercises to disarm the inner critic, such as *"exercises with your voice to prove to them that there are no wrong notes"* (P1), or *"just play your name on the drums...something that is so 100 percent who they are, that there's no way they're gonna think they can't do it."* (P3) Some

also referenced teaching philosophies (e.g. Music for People[1]) that encourage playfulness from the start, such as drumming on one's lap or walking together in place. These shared safe spaces may be more challenging to create in a remote setting.

## OPPORTUNITIES ENABLED BY REMOTE WORK

### New forms of distributed creativity
While participants mentioned a number of challenges in working in this new reality of remote music-making, they have also discovered that they can explicitly leverage space and silence as creative devices for social coordination. For example, one group tried to improvise together in real-time and line up the individual recordings afterward. They discovered that their music sounded better when players left more space: *"Leaving space leaves room for people to come forward. With latency, it's like the artistic product has to change to reflect the fact that you're in a different sonic space."* (P5) Despite the immense frustration of internet lag, those pauses occasionally fostered new ideas: *"It inserts an extra level of pause. That's kind of interesting. It's making me come up with new activities, more taking turns playing solos rather than all of us playing together."* (P1)

Temporal lags also created new opportunities to embrace the unexpected. For example, one participant described how laggy music can give rise to newfound creative experiences: *"How can it be different from what we (individually) actually heard, but still sound like a beautiful coherent piece of music? Maybe it still sounds cool, what pitches people are playing."* (P5)

For some, these extreme circumstances have forced them to listen more attentively to each other while playing together, a skill that is fundamental to social improvisation. Even under normal circumstances, instructors may ask students to practice listening to others by leaving more silence: *"What if you only play 25 percent of the time? The listening level goes up, it enhances their listening."* (P1) Now, with the additional internet latency, players are forced to leave more space in their music to accommodate the time lag. This has resulted not only in more careful listening, but also in more active adjustments of one's own playing to others: *"With people leaving more space, the pieces they were coming up with started to become more interesting. They're playing in a much more thoughtful way. They're actually having to listen to it and refine their own ways of playing to make it work better. Learning to play together in a new way."* (P5) In effect, the medium of communication is directly influencing the *type* of music that is being produced.

### Time for personal reflection
Cancelled gigs and performances have taken a substantial toll on musicians' livelihood and motivation: *"It's been hard without performance opportunities. Being able to perform music is such an important part of my mental health."* (P6).

Some have taken this time to develop longer-term skills or revisit longer-term projects that they had put off: *"A lot of us are reviving projects we haven't done in a while."* (P1), *"I've been re-acquainted with the iterative nature of composition."*

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[1]https://www.musicforpeople.org/wp/

(P4) A temporary pause from gig culture has allowed some to reflect on an increasingly fragmented lifestyle: *"Jump from one gig to the next, different city every night, you're in and out"* (P6). This has prompted a re-consideration of how one might retain more intentionality and control as an artist, if and when gigs and performances return: *"How to...have more intentional projects, more creative control, more sustained time and place devoted to them?"* (P6)

**New ways of humanizing the collective experience**
The pandemic has also given rise to new forms of collective human experience. Whereas music-improv communities have traditionally formed through physically gathering and jamming together, new communities are now emerging through global forums and projects for a greater cause. For example, a new common phenomenon is to have people across the country play the same composition individually in their own homes, then have a central person creatively edit them together. Reflecting on this experience, one participant remarked that, even though she was merely *"playing by myself to a metronome in my ear,"* she felt an increased sense of belonging in a vibrant, global community: *"It was a community builder. We were rooting for each other. It brought us all down to earth in a way, we are all in this together. I'm reaching out to people beyond the walls of my house."* (P3)

The pandemic has also spurred many professionals to offer pro bono performances, or serve on expert panels freely broadcasted worldwide. Some felt that, by increasing access, the pandemic may also be bringing music back to its humanistic, community-based roots: *"It's driving home this concept that music, and especially jazz, is a community-based music. Music has become so commercial that it's easy to forget that it's actually just human community, 'let's be together' type of music."* (P3) One participant hoped that these new platforms could broaden artists' professional scope beyond performance, even after the pandemic: *"To talk and teach and lecture, to lead societal dialogues about this stuff, not just perform."* (P6) Such global platforms could spur and enrich societal dialogues around music, *beyond* the playing of music itself.

**DISCUSSION**
The severe restrictions of COVID-19 provide an extreme case study of how music improvisation communities adapt to a new normal of remote work, in a domain where real-time, social coordination is fundamental. We acknowledge that this work does not capture the potential economic hardships faced by musicians during the pandemic. Rather, it begins to shed light on how the pandemic is affecting their improvisational practices, and how technology might co-evolve to better support those creative needs.

Interestingly, the severe restrictions of COVID-19 have had a dual impact of both making and breaking social music improvisation: while it has severed the temporal synchrony necessary for real-time collaboration, and hindered the formation of physical safe spaces necessary for creative risk-taking, these constraints simultaneously motivated new coordination strategies, with emergent new forms of social creativity. The pandemic has also redefined what it has meant to be human during social

music creation; notably, it has shifted a community of practice from that of jamming together in the same room, to participating in distributed activities and broader-reaching global movements.

These early findings bring to light significant implications regarding the new future of work. First, we have learned that remote work can be detrimental in domains where temporal synchrony is at the heart of the collective experience. There continues to be an opportunity and need to explore how time-based activities can be fruitfully supported given persistent conditions of latency. Second, as seen in our interviews, temporal and physical constraints can also inspire new forms of creativity. Hence, in addition to addressing immediate latency concerns, the next generation of remote technologies could also enable users to explicitly *control*, manipulate, and increase or decrease temporal and spatial constraints, to inspire and support new forms of distributed creativity.

The pandemic has also pushed the boundaries on what it means to create music together: how can improvisation still unfold spontaneously and ephemerally, if social coordination is now more deliberate and less organic? For example, could technology introduce new ways of supporting the raw ephemerality of social improv, for example through creatively leveraging elongated spaces and silences, or through real-time coordination of people in ways that feel spontaneous? In our study, some participants explicitly took advantage of remote constraints to explore new musical forms. How might we leverage new constraints such as home-based environments, social distancing, and increased time spent in a single setting, to ignite new forms of raw, human expression that are not just creative, but also socially spontaneous?

Ultimately, lessons learned during the pandemic could inform not only the future of remote work, but also the future of in-person real-time music improvisation, if and when it returns. As one participant put it, *"I have a feeling that some of the lessons we've learned this year will go back into a live performance. It is one useful tool."* (P5)

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