Exploring Communication Between Skilled Musicians and Novices During Casual Jam Sessions

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ABSTRACT
This paper explores the use of communication between skilled musicians and novices during casual jam sessions within a community of practice in order to gain insight into how design might be used to augment this communication and assist novice musicians during the process of playing collaboratively. After observation, color coded stickers were introduced as place-markers, which aided in the communication of instruction. The learning that took place and the roles of skilled musicians and novices are considered, and design implications of these considerations are discussed.

Keywords
Collaborative music-making, Jamming, Community of practice

1. INTRODUCTION
Collaborative improvisational music-making, which is casually referred to as 'jamming' [1], is typically thought to require a high level of musical knowledge and skill. Music improvisation requires the ability to respond musically by listening, playing, acting and reacting [2]. The more control a person feels that they have over the outcome of the music, the more satisfaction they get from it, and the more they feel that they are a part of the collaborative process [3]. In order for the experience to be satisfying, the group also has to share the feeling of being “in the groove” [1]. Though, when jamming is thought of as an entertaining social activity rather than a means of expression for expert musicians, people without any musical training can participate and enjoy being a part of the music-making process [3].

At least several musical interfaces have been designed for the purpose of including those without any musical training in collaborative music-making. Examples include *Polymetros* [3], the *Beatbug Network* [4], and the *Jam-O-Drum Interactive Music System* [5]. Blaine and Fels argue that musical interfaces designed to aid novice musicians with collaborative musical experiences should be kept relatively simple in order to make it easier for novice musicians to communicate both with the instrument and with each other [6]. Though, there is a trade-off between an instrument's ease for beginners and its long-term engagement [8]. Many interfaces designed for novices begin to feel "toy-like" after a short time, and then do not encourage further musical growth and exploration [6]. Instructors and mentors often promote learning and motivation by teaching what is "just within reach" [7], thus by ignoring what is out of reach, the learning process itself simplifies the instrument as needed.

At a certain level of proficiency with an instrument, the instrument and musician become one [7]. When an instrument becomes an extension of the musician's body, the physical motions necessary to play notes and chords requires less concentration. Skilled musicians can also feel the music and are able to respond with harmonious notes instinctively. Unlike an experienced musician, a beginner who is in the early stages of learning to play an instrument does not have this kind of embodied connection to their instrument or posses the same deep understanding of the language of music. When skilled musicians and novices play together, the skilled musicians can share some of their musical knowledge and experience in order to help guide novices throughout their collaboration, creating a community practice.

The process of becoming a member of a community of practice, which involves developing an identity within a community in addition to acquiring knowledge and skills, is a form of situated learning [8]. Lave argues that, "learning, thinking, and knowing are relations among people engaged in activity in, with, and arising from the socially and culturally structured world," and that there is not a clear boundary between what happens inside and outside of a person's own mind [8]. Through the research presented in this paper, I investigate how communication is used to share musical understanding in such a community and how this communication helps bridge the gap between skilled musicians and novices during collaborative music-making. Rather than focusing on the design of musical interfaces for novice musicians, the aim of this research is to explore design opportunities for the augmentation of communication between musicians and novices.

2. MATERIALS & METHODS
A group of musicians and their friends had been frequently gathering at an apartment in Sønderborg, Denmark and playing collaborative, improvised music. At this self-proclaimed community of practice, these jams sessions were often spontaneous and unplanned, and musicians and non-musicians alike were encouraged to join in. After experiencing this phenomenon first hand, I conducted an ethnomethodological [9] field study around this communal activity, incorporating aspects of action research through the modification of methods upon reflection and by intermediating with a designed intervention [10]. I filmed three jam sessions in which both skilled musicians and novices participated. While I was present only as an observer during the first session, I actively participated in the second and

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third sessions. In between the second and third sessions, one of the participants and I reflected on our involvement in the music-making process, and as a result, I intervened by introducing colored stickers as a low-fidelity prototype during the third session, leaving their exact use up for negotiation between participants. I then analyzed the video material using Interaction Analysis methods: writing content logs and interviewing one of the participants during a video review session [11].

Participants were between the ages of 20 and 29, and were friends and acquaintances of one another. Participants whom I refer to as *musicians* were proficient with at least one musical instrument, were knowledgable about music theory, and jammed regularly. Participants whom I refer to as *novices* had little skill or experience with musical instruments and had a limited knowledge of music. A total of four musicians and four novices participated, not including myself (figure 1). *Novice A* had participated in a jam session once prior to the recording, during which she played the bass guitar, and had not played any musical instrument previous to that. *Novice B* had participated a few times before, playing the drums, and though she had owned a guitar at one point, she had only played it twice. *Novice C* had participated in a couple of jam sessions in short bursts, playing the piano, and *Novice D* had played the drums a handful of times and started experimenting with the bass guitar two days before participating in a recorded session.

All sessions took place in the living room of a shared apartment, where *Musician A* and *Musician B* lived with one other roommate. There were several musical instruments around the room: a guitar, a bass guitar, a drum set, an electric piano, a keytar, a theremin, and a laptop computer with synthesizer software. Small round stickers (in the colors red, yellow, blue, green, and white) were used as place-markers during the third session.

	Session 1	Session 2	Session 3
Musician A	x	x	x
Musician B	x	x	x
Musician C	x		x
Musician D		x	
Novice A	x	x	
Novice B		x	x
Novice C		x	
Novice D			x
Myself		x	x

Figure 1: List of participates, indicating which of the three sessions they participated in

3. RESEARCH RESULTS

Upon reflection, *Novice A* and I recalled that the first time we participated in a jam session, the musicians initially tried to guide us by telling us which musical key they would be playing in. When we didn't understand, they tried telling us which notes we should use and explained how to find them on the instruments. But as beginners, that was difficult for us, so the musicians began physically pointing out combinations of notes and giving us specific patterns to play, which they continued to do during the recorded sessions.

The original intention behind the designed intervention was to use the colored stickers to mark notes as belonging to various keys (for instance, marking all of the notes in one key with red and all of the notes in another key with blue, allowing individual notes to be marked with multiple colors). I proposed this system in order to enable the musicians to tell novices which notes they should limit themselves to by naming the color associated a musical key, but when discussing the concept with participants, they felt that they should try something simpler and preferred to use the color-coding for individual notes.

3.1 Preparation

Before starting a new song, the musicians usually gave the novices a set or pattern of notes to play. Prior to the introduction of the colored stickers, this was primarily done through pointing and demonstration. When the colored stickers were introduced, the participants first had to decide where to place the stickers. *Musician B* placed four stickers (one green, one red, one blue and one yellow) on different frets of the bass (figure 2). Once the stickers were in place, *Novice B*, who had never played the bass before, spent a few minutes teaching herself how to play the notes marked by the stickers, confirming with *Musician B* that when she played the frets with the red and green stickers, she had to pluck the top string, and when she played the frets with blue and yellow stickers, she had to pluck the second string down. Next, *Musician B* gave her a pattern of colors to play, at first using all four marked notes, but them simplifying it down to two notes, since it was confusing for *Novice* B at first. Later on in the session, stickers were added to the piano as well. The colored stickers were placed in correlation with the stickers of matching colors on the bass guitar, and *Musician C* explained how to turn the notes into simple chords (figure 3).

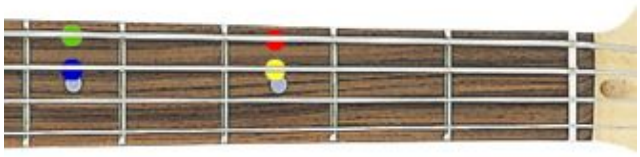

Figure 2: Placement of the colored stickers on the bass guitar

Figure 3: Placement of the colored stickers on the electric piano

3.2 Exploration and Experimentation

Novice musicians explored different melodies and experimented with new ways of playing, both with and without the use of the place-markers. For example, *Novice B* began to experiment with different ways of using the drum sticks, since she felt that the quality of sound was not as good when she played as it was when *Musician D* played. Another example of exploration occurred after *Novice A* had been playing a pattern given to her by *Musician A* for an extended period time. She began to experiment by playing the same set of notes in a different pattern. After the third new pattern she tried, she began alternating between the new variation and the original pattern.

Novice B became bored with playing the simple two note pattern that she was given on the bass marked with stickers, and began to search for a new pattern. Even though she was unable to find one before a musician stepped in to help her, she was able to experiment with the original pattern by choosing the rhythm and speed. When she had two patterns to alternative between, she also experimented with the number of times to repeat each before changing.

3.3 Guidance and Feedback

In the midst of jamming, musicians often provided the novices with guidance. After *Novice A* began alternating between two patterns, *Musician A* stopped playing and told her to "use four." He then started singing one of the patterns that *Novice A* had been playing, which prompted her to start playing it again. When she played one pattern three times and then switched to the alternate for the fourth, *Musician A* stopped her again. When she restarted, he counted the repetitions out loud and told her when to change. After she confirmed that it would be four of each, they resumed playing.

While playing the bass marked by stickers, at one point, *Novice B* was struggling to find a new pattern or rhythm of notes. Continuing to play, *Musician C* told her to play "red twice and green twice." When *Novice B* mistakingly played blue instead of green, *Musician* C repeated "green green" and *Novice D* helped correct her by pointing out the green sticker. After *Novice B* repeated this pattern several times, she paused, looking to *Musician C* for the next step, and *Musician C* told her that she could do "the same thing on the string below," which used the yellow and blue stickers. She easily adapted and was able to alternative between the two.

Musician C frequently provided positive feedback by nodding his head reassuringly and interjecting with phrases such as "yeah" and "nice" when a novice discovered something new or was playing along well. *Musician D* also gave positive feedback when *Novice B* was feeling the beat and moving to the music while playing the drums, telling her, "you're not just hearing it," which implied that she was "in the groove" and feeling the music. Conversely, *Musician A* tended to give negative feedback. For example, whenever *Novice A* played a wrong note in a pattern he gave her, *Musician A* would say, "no" until she found the right one.

3.5 Acting, Reacting and Flow

When everyone was confident in what they were playing and followed the rhythm, the jamming flowed smoothly. While reviewing the videos, *Novice B* noticed that at times she was moving her entire body along with the music. She explained that this occurred when she was "feeling" the music. She also pointed out that when she played with *Musician D*, she was less afraid to experiment because she trusted him and felt that he could adapt to anything she did. In many instances, the musicians reacted seamlessly to changes, whether initiated by fellow musicians or by novices. For example, when I began playing different patterns of chords while playing the piano, *Musician B* and *Musician C* adjusted what they were playing. In some cases, novices were also able to react to changes initiated by musicians. When *Musician D* started playing in a way that made the music seem as if it was coming to an end, *Novice B* reacted by slowing down, and then starting to play drum rolls.

Though, sometimes mistakes and experimentation by novices, or a novice's inability to react to a change promptly, disrupted the flow. One instance of this happening was when *Novice B* wanted to return to playing a previous pattern, but while attempting to play it, found that she had forgotten how. When she asked the others, this caused them to stop what they were doing. Another example occurred while I was playing the bass and *Musician A* drastically slowed down his drumming. I was locked into a pattern and was not prepared to react, which caused the others to stop playing.

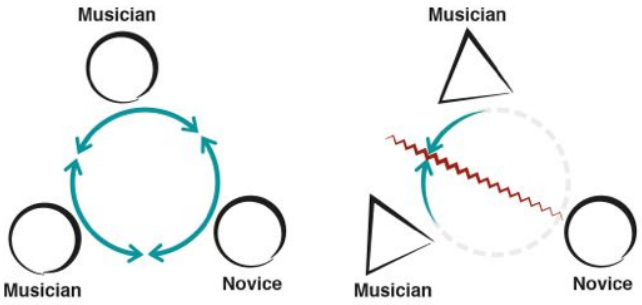

Figure 4: Visualization of the flow of the music being disrupted by a novice failing to follow a change

4. DISCUSSION

The musicians used a lot of pointing, counting and demonstrating, which helped the novices play along. The musicians also provided feedback, which let the novices know whether what they were doing worked well or not. When the stickers were added, some of this communication was replaced with using color names as code for different notes, which made it easier for the musicians to communicate with novices while still continuing to play. Using color names rather than explaining through demonstration, while still limiting the novices as necessary, also provided them with a little more freedom, allowing them to come up with the speed and rhythm as they saw fit. The color-coded place-markers acted as means of distributed cognition, sharing a role in the representation and processing of information and outsourcing some of the participants' cognitive load [12]. Since the use of the stickers externalized some of the information that was needed to participate in jamming, it softened some of the blow of the initial struggle, but also created a degree of dependence [7]. This suggests that one might learn more without using the stickers by internalizing more knowledge, but the stickers are useful when the primary goal is simply to get started and enjoy jamming.

There were also many subtler forms of communication that the participants seemed to inherently understand. If one of the musicians changed the feeling of the music in a particular way,

others could sense that the song was coming to an end and reacted appropriately. Another example was when *Musician A* starting singing the pattern that *Novice A* had been playing in order to signal her to start playing it, rather than using words to convey this. And though sometimes it went unnoticed, when *Musician C* did realize that *Novice B* was looking at him, he knew that she was hoping for advice. The connection the participants felt when playing together was another important factor. *Novice B* felt more comfortable experimenting when playing with *Musician D*, since she felt connected to him when they were playing together. I felt similarly when jamming with *Musician C*, and *Novice A* and *Musician A* also appeared to have a strong connection. These kinds of connections are important, since music in a jam session evolves through the changing of patterns and the reactions of others. When somebody takes the lead to make a change, either the others follow, or the collaborative factor and flow is lost. It also became apparent that when someone was moving their entire body with the music while they played, they were "in the groove."

5. DESIGN IMPLICATIONS

A problem with the place-markers as they were used in this experiment was that they were not modified in order to create a greater challenge as an individual's skills improved. If another iteration were to be done, it might involve making adjustments with progressively more difficult steps. For example, new combinations of notes and chords could be introduced, and eventually new techniques and skills (such as using both hands when playing the piano and performing slides, hammer-ons and pull-offs on the bass), sticking to what is “just in reach” to keep the participants engaged [7]. Taking such steps would also increase learning, and likely make the experience more interesting for the skilled musicians as well, further bridging the gap between the musicians and novices. Technology could be used to semiautomate this process, lessening the burden that novices have on the musicians they play with.

The addition of technology could also take the concept further, adding a layer of responsiveness. The idea of the place-markers could be enhanced, turning them into something more dynamic through the use of traces [12]. Traces of the notes and rhythms that others play could be conveyed using networked smart instruments. These traces could be filtered and controlled by skilled musicians taking part in a jam session, enabling them to communicate with novices musically by selecting from where the rhythm and notes would be extracted. Perhaps they may choose to relay the rhythm produced by a certain drum or combination of drums, and the notes from a particular instrument or section of an instrument (e.g. only the upper or lower end of a piano). The rhythmic traces might be transmitted through tactile means, such as pulsation or vibration, and the traces of notes might be transmitted visually through light, for instance. The level of complexity of the information represented could be tailored to the skill level of the individuals, acting as feedforward to provide novices with continuous cues and hints of what to play. Feedback could also be provided, warning novices when they fall out of sync. The occurrence of major changes in the music was another matter where there was much room for improvement in communication during the jam sessions, since it was problematic if novice musicians were not ready to react. Before the initiation of the change, perhaps something (a spot light triggered by a foot pedal for example) could draw attention to the initiator, indicating that they are about to make a change. In order to be more informative, there could be different ways to indicate different types of changes (such as different colored lights or different projections).

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