

**THE INSPIRATION IN IMPROVISATION:
IDENTIFYING AND CLASSIFYING APPROACHES TO EMOTION-
BASED MUSICAL IMPROVISATION**

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Master's Thesis
Music, Mind, and Technology
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25 May 2016
University of Jyväskylä

JYVÄSKYLÄN YLIOPISTO

Tiedekunta – Faculty Humanities	Laitos – Department Music Department
Tekijä – Author Aaro Keipi	
Työn nimi – Title THE INSPIRATION IN IMPROVISATION: IDENTIFYING AND CLASSIFYING THE APPROACHES TO EMOTION-BASED MUSICAL IMPROVISATION	
Oppiaine – Subject Music, Mind & Technology	Työn laji – Level Master’s Thesis
Aika – Month and year APRIL 2016	Sivumäärä – Number of pages 55
<p>Tiivistelmä – Abstract</p> <p>The purpose of this study was to identify the naturally occurring approaches that musicians use to improvise and to analyse the relationships between the approach used, the improviser’s musical experience, and the quality of the resulting improvisation. 16 participants took part in three group improvisation and discussion sessions, and the improvisations of the final session (80 in total) were recorded and rated by experts on emotions- and quality-related aspects. The approaches mentioned by participants in the final session were organised into five distinct categories: technical, musical inspiration, nuanced emotion, visualized scene, and personal experience. Significant negative correlations were found between the technical approach and two distinct ratings for the quality of the resulting improvisation. No significant correlations were found between musical experience and the tendency to use a particular approach. Finally, two methods of organizing the approaches were proposed: (1) a scale of that places all five approaches to improvisation on a single continuum with cognitive and intuitive extremes and (2) a multi-layer categorization to use with multiple complementary approaches.</p>	
Asiasanat – Keywords Music, improvisation, pedagogy, teaching methods, creativity, emotion	
Säilytyspaikka – Depository	
Muita tietoja – Additional information	

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1 INTRODUCTION

Traditionally, the task of communicating emotional meaning belongs in varied measure to the composer and the performer, with the composer being responsible for creating the musical composition and the performer being responsible for interpreting it in a performance. The roles of composer and performer are blurred, however, when discussing musical improvisation, which includes elements of both composition and performance (Nettl, 2014; Alperson, 1984). During a musical improvisation by a skilled performer, possible inconsistencies between the composer's and performer's intentions are minimized, and the improviser is able to determine both the musical and emotional content of a performed piece.

Musical improvisation is featured in many musical genres, each of which has its own set of norms and rules. These sets of norms and rules are often referred to by researchers as improvisational models (Huovinen, 2015; Nettl, 1974). For improvisation within a particular genre, a successful performance depends on the performer being familiar with the appropriate improvisation model (for example, improvisation in jazz music often requires studying specific chord sequences and melodic modes that provide guidelines for improvisation). A type of improvisation also exists outside of the traditional models, however. This type of music making is called "free improvisation" and focuses on building a performer's musical individuality and creativity (see Cahn, 2005) and eschews traditional technical guidelines in favour of an exploratory approach to improvisation that is not constrained by set models.

The term "free improvisation" may not, however, be entirely accurate, as explained by well by Huovinen & Kuusinen in their 2006 study:

Strictly speaking, improvisation is perhaps never absolutely "free" but always happens in relation to some (implicit or explicit) organisational principles or ideas. In music, these points of departure are often consciously chosen to the extent that they might allow us a view to the processes of improvisation without a detailed analysis of the improvised products. (p. 19)

These "points of departure," then, are an important part of the improvisation process. They can include theoretical characteristics, familiar musical cues, specific visualized scenes, feelings, or anything else that serves as inspiration for an improvisation. These points of departure, when viewed as the conscious or subconscious ideas that influence the content of

an improvisation, are later in this text referred to improvisational “referents” (see Section 2.2).

The aim of this study is to identify and categorize the different approaches that musicians use in improvisation and to determine whether the specific method a performer uses has any relation with the quality of the resulting improvisation. These approaches are likely to include metaphorical aspects, which in turn may provide insight into the understanding of music as a type of language. This research project hopes to address the following questions:

- What are the main approaches to improvisation that musicians use?
- Are some approaches to improvisation more effective at communicating specific emotions than others?
- Are some approaches to improvisation more effective at creating compelling improvisations?
- Does the degree of improvisation experience play a role in the approach an improviser uses to improvise?

2 LITERATURE REVIEW

This section will review research from three areas related to this study: improvisation, referents, and music and emotion.

2.1 Improvisation research

Improvisation-related research has generally focused on three main areas: improvisation pedagogy, music therapy, and ethnomusicology. Since this study is focused on the creative process of improvisation among musicians, this literature review will focus on research in the area of improvisation pedagogy.

Musical improvisation lessons have been found to increase children’s musical creativity (Koutsoupidou & Hargreaves, 2009). Many methods of teaching musical improvisation exist, and a variety of these methods have been studied in order to assess their respective effects on

students (see e.g. Huovinen, Tenkanen, & Kuusinen, 2011; Schlicht 2007; Cahn, 2005). In terms of research, these improvisation teaching methods are often simplified into a dichotomy, with a theory-based method being pitted against a more creative method. A theory-based method involves the use of scales, chords, or other technical aspects to guide improvisations, whereas more creative methods may include the use of metaphors and musical games. Examples of these types of dichotomies in improvisation studies include the “music-theoretical” vs. “dramaturgical” approaches of Huovinen et al. (2011), and the “didactic” vs. “creative” approaches used by Koutsoupidou (2008).

Improvisation teachers agree that providing students with “rules” or guiding factors generally result in more effective, focused improvisations (Junttu, 2015; Cahn, 2005). Traditionally, a method that focuses on the technical/theoretical rules is the most common used in music pedagogy (Huovinen et al., 2011). However, this method has been criticized for not properly addressing a student’s creative needs (Cahn, 2005). In part as a response to this criticism, other methods of teaching improvisation have been studied. These include the use of games—e.g. having two students play a “musical conversation” (see Agrell, 2008; Riveire, 2006) or having students play just two notes in different ways and expanding into specific genres, such as blues, ska, reggae, and so on (Bitz, 1998). These alternate methods of teaching improvisation are often based on the concepts of free improvisation, which (as discussed in Section 1) involves improvising without traditional theoretical or stylistic constraints.

A key feature distinguishing free improvisation from more traditional forms of improvisation is its focus on process (method) rather than product (outcome). While some researchers such as Kratus (1996) see the improvisation process as a continuum—with improvisers moving from a process to a product view of improvisation as they gain experience (a sentiment echoed by Koutsoupidou, 2008)—proponents of free improvisation like Huovinen & Kuusinen (2006) argue that students’ improvisations in general should be judged not on a product basis but on a process basis, with the ultimate goal of developing a student creatively rather than technically (see also Cahn, 2005).

Huovinen et al., in their 2011 study, aimed to gain insight into the effects of two different teaching methods (a technical vs. a more conceptual approach) on students’ improvisations.

They found that students taught using a technical approach created improvisations that were more interesting harmonically but not rhythmically, whereas the approach that emphasized concepts such as variation and tension (labeled a “dramaturgical” approach) resulted in improvisations that were more rhythmically varied but less harmonically interesting. Koutsoupidou (2008) also explored two primary methods of teaching music in a series of interviews with music teachers. These two methods were labeled “didactic” and “creative.” It was found that a creative approach to music teaching—one that uses improvisation and emphasizes flexibility and individuality—was most in line with most music teachers’ goals, which included increasing students’ confidence, creativity, and originality. It was stated, however, that a minimum level of technical skill should be necessary before using the more creative methods; therefore, a teaching style that utilizes elements of both didactic and creative teaching was labeled as favorable (a thought echoed by Alperson in his 1984 overview of musical improvisation).

Tafari (2006), meanwhile, had an expanded view of the two methods of teaching improvisation. In this study, 132 primary school students with no improvisational or compositional experience were asked to create pieces based on specific things: a semantic basis (e.g. improvise a piece called “an old man and a child”); a rules basis (e.g. “invent a piece based on the rule of repetition”); and a materials basis (e.g. “invent a piece using three different sounds on the tambourine”). In this study, there was no improvisation training involved; participants were simply asked to improvise based on these specific ideas. The differences between the methods were found to be largely inconsequential, but Tafari gained some insight into the creative processes of different-aged children, finding a marked decrease in exploration and an increase in compositional organization among older participants, which seemed to indicate a correlation between age (or life experience) and an ability to think organizationally.

Finally, the dichotomy between free and technically constrained improvisation methods is echoed in Sawyer’s (2011) overview of two types of general teaching methods: a traditional approach (called “instructionism”) and a newer approach.

In instructionism, creativity is opposed to learning, because learning is equated with mastery of what is already known. Learning is simple internalization and convergent thinking. But in the newer

understanding of learning that's emerging from the learning sciences, the conceptual understanding that underlies creative behavior emerges from learning environments in which students build their own knowledge...

In music pedagogy, proponents of free improvisation may argue that “instructionism” stifles creativity, while a more process-based teaching method is better able to positively impact a student’s musical identity (see e.g. Cahn, 2005).

In spite of the tendency to pit one teaching method against another, many researchers agree on the following aspects: a combination of both a technical and non-technical approach may be best (Koutsoupidou, 2008; Alperson, 1984), the best approach is situation- and student-dependent (Burnard, 1995), and finally, the question of *which* method to use may not be as important as simply *choosing* a method to use (Huovinen et al., 2011)

2.2 Musical referents and associations

Music is often referred to as a type of language (Sawyer, 2011; Meyer, 1956). Indeed, the idea that music is a language of emotions has been popular among music researchers since the mid-20th century (Meyer, 1956; Pratt, 1954). Music differs in its sign typology, however, from literal language, and while the meanings of literal words and phrases can be more or less objectively defined, musical meanings are often assumed and intuitive. Though there is no clear consensus on the meaning of music, many accounts point to meaning being derived from the emotional impact of music (see Juslin, 2001). Meyer (1956), for example, argued that musical symbols used by a composer or performer (i.e. specific compositional and performance aspects of a musical piece) either knowingly or unknowingly refer to specific emotions, which are then communicated to listeners. The effective communication of these emotions is dependent on the composer, performer, and the listener all being sufficiently familiar with a specific musical culture and its norms. Sloboda (1985) found that listeners use similar cognitive processes while listening to music and parsing speech, and Berkowitz (2010) found that musical improvisation and spontaneous speech resulted in similar brain activity.

A common feature in all languages is their use of a system of symbols (e.g. the sounds or letters that make up words) to indicate things and concepts; the same is true for music as well. However, the system of symbols used in literal language is much more adept at communicating specific meanings compared to music (Tagg, 2013) and the things music “refers” to tend to be more vaguely communicated through music than through literal language. Leonard Meyer (1956) explained this significant difference between music and linguistic language:

Not only does music use no linguistic signs but, on one level at least, it operates as a closed system, that is, it employs no signs or symbols referring to the non-musical world of objects, concepts, and human desires.... Unlike a closed, non-referential system, music is said to communicate emotional and aesthetic meanings as well as purely intellectual ones. (p. vii)

Perhaps the best way to explain this concept of a “referential system” is by using a metaphor: In the English language, the word “dog” refers to an extraverbal thing: a physical being with which the reader is assumed to be familiar. Similarly, in the musical language, performed music often refers to extramusical things—which can include, for example, visualized scenes, personal memories, colors, or fictional characters (Junttu, 2015). These things and concepts that linguistic symbols refer to are called referents. Pressing (1984) explains referents—specifically as relates to improvisation—as follows:

The referent is an underlying formal scheme or guiding image specific to a given piece, used by the improviser to facilitate the generation and editing of improvised behavior on an intermediate scale [...] For example, the referent may be a musical theme, a motive, a mood, a picture, an emotion, a structure in space or time, a guiding visual image, a physical process, a story, an attribute, a movement quality, a poem, a social situation, an animal—virtually any coherent image which allows the improviser a sense of engagement and continuity. (p. 346)

According to Pressing, then, a referent can be thought of as the inspiration used when improvising a piece (similar to the “point of departure” mentioned in Section 1). A referent is what the piece of music *refers to* in the performer’s mind. In addition, referents can be used by composers as part of the compositional process. Igor Stravinsky provided the following narrative for the inspiration for one of his pieces:

More than a decade before composing *Jeu de Cartes*, I was aware of an idea for a ballet with playing-card costumes and a green-baize gaming-table backdrop. The origins of the ballet, in the sense of the attraction of the subject, go back to a childhood holiday with my parents at a German spa, and my first impressions of a casino there...In fact the trombone theme with which each of the ballet's three 'Deals'

begins imitates the voice of the master of ceremonies at that first casino ... and the timbre, character, and pomposity of the announcement are echoed, or caricatured, in my music. (Quoted in Mountain, 2001, p. 10-11)

In this case, a vivid childhood memory—which includes visual, auditory, and other related effects—served as the referent for Stravinsky’s work.

2.2.1 Referent categorization

Several researchers have attempted to create categories for musical referents. According to Mountain (2001), referents (which he refers to as “imagery”) can fall into five distinct categories:

- Auditory imagery, e.g. a familiar segment of a melody
- Visual imagery, e.g. a squiggle or graphic representation of a melodic contour
- Kinesthetic imagery (i.e. movement and gestures)
- Sound effects (i.e. nonmusical sounds)
- Metaphors and analogies, which included the following subcategories:
 - Animate beings
 - Inanimate objects, processes, or concepts

Mountain states that the imagery a composer uses are task- and personality-specific, and that composers often use more than one approach per composition, indicating that referents can be multidimensional and non-exclusive.

Whereas Mountain studied the compositional process, Persson (2001) studied the primary methods that performers use to conceptualize the emotional content of music prior to and during a performance. In interviews with pianists, Persson found that performers tend to use two primary types of references in conceptualizing music for a performance: visual imagery (i.e. recalling an emotional memory) and memory of an emotion (i.e. recalling a particular emotion). Interestingly, Persson found that “all participants made use of imagery in one way or another in order to construe understanding and meaning.” (p. 281.)

While composers and performers make use of referents in the composition or performance of a piece of music, a similar phenomenon exists while listening to music. Many studies have sought to identify and categorize these “extramusical associations” on the part of the listener (see e.g. Huovinen & Kaila, 2014; Tagg, 2013; Shevy, 2008). The most thorough, perhaps, is Tagg’s 2013 taxonomy of verbal and visual associations to musical themes. By analyzing listeners’ written verbal-visual responses to soundtrack music, Tagg sought to organize listener-recognized associations into intuitive multi-layer categories. The main categories listed by Tagg are:

- **General attributive effects:** including issues of emotional content, balance, density, and sparseness
- **Beings, props, and gatherings:** including visualizations of characters, clothing, and social activity
- **Location, scene, and setting:** including buildings, scenery, and geography
- **Explicit space-time relations, movements, and actions:** including speed, velocity, and movement descriptors
- **Media immanence:** including genre features, instruments, and target groups
- **Evaluative and judgmental factors:** Subjectively positive or negative evaluations

In the course of his research, Tagg found that the associations participants made were quite individualized and depended on a person’s experiences, personality, and state of mind. However, clear correlative elements existed among the visualizations provided by participants.

Finally, although Tagg sought to analyze musical associations using visual-verbal representations, he argues that verbal language is incapable of fully describing music: “If, as I’ve argued several times, music could be described in words, it would be unnecessary” (Tagg, 2013, p. 78). In contrast with Meyer (1956), however, Tagg argues that words in the form of metaphors are better at describing music than emotions words:

Given the restrictive problems of ‘emotion words’ and of music’s holistic combination of simultaneous modes of expression and perception in specific cultural contexts, it would be logical to talk about the meaning of musical sound in ways that recognise its intrinsic multimodality. This entails considering the synaesthetic and metaphorical characterisation of music... (2013, p. 78)

Though researchers still debate the specifics of extra-musical meaning—in the form of referents, imagery, visualizations or other associations—its existence is generally acknowledged (Juslin, 2001), excepting some cases when considering music as a therapeutic tool (see e.g. Smeijsters, 2005).

2.2.2 Referent-related improvisation research

Some research exists on the effects of improvisers being asked to perform using specific referents. Huovinen & Kuusinen (2006), for example, created a study where improvisers were provided with one of nine referents that consisted of either soundscape recordings or written descriptions of soundscape recordings in order to assess the possibilities of using this type of free improvisation training in music pedagogy. These referents for improvisation were further categorized as belonging to one of two groups: “in time” (meaning there was some sort of rhythmic element present or implied, e.g. “grandfather clock”) or “out of time” (meaning a referent with no clear rhythmic content, such as “French café”). Referents were organized based on the categories provided by Pressing (1984). The resulting improvisations were analyzed for compositional structure and the participants were asked to share their improvisation experiences. As a result, researchers found that improvisations based on out-of-time referents had more room for personal interpretation, whereas improvisations on in-time referents were more mimetic in nature and more approachable for beginning improvisers.

It can be argued, however, that if we were to analyze the situation on a deeper semantic level, the recordings and verbal descriptions in this study did not function as pure referents, but rather served as a kind of concrete idea for which the improvisers could provide their own referents. For example, the following is a description of a discussion with a cellist after performing over a recording of a grandfather clock:

Afterwards, she related on her experience at her parents' home with two different grandfather clocks whose ticking had not quite been temporally synchronised. This she recalled as irritating while trying to sleep, but the personal memory of unsynchronised [sic] clocks apparently inspired her to an improvisatory performance that she was quite happy with. (Huovinen & Kuusinen, 2006, 24-25)

In this case, the improviser used the recording of the grandfather clock as a jumping-off point for her own referent, which was a specific childhood memory of spending the night at her grandparents' home, quite possibly with all of the related feelings and nostalgia that may be inherent in memories such as these. This distinction may seem unnecessary, but it is important to note that this participant was clearly impacted by the personal inspiration for the improvisation, possibly resulting in an improvisation vastly different from other participants' improvisations over the same audio recording.

2.3 Music and Emotion

Pratt (1954, p. 296) stated: "Music sounds the way emotions feel." Music has been shown to evoke emotional responses in listeners, and emotion has been found to play an important role in the reason why people listen to and perform music (see e.g. Juslin & Laukka, 2004; Sloboda & O'Neill, 2001; Meyer, 1956).

Eerola & Vuoskoski (2013) reviewed 251 emotion- and music-related studies from 1988 to 2009 with the purpose of comparing methodologies and findings. In this study, they identified four main types of emotion models used:

1. **Discrete:** Models derived from the theory of basic emotions—the idea that all emotions can be derived from a set of four or five emotions (which generally include happiness, sadness, fear, and anger).
2. **Dimensional:** Models that measure emotions based on two or more distinct dimensions, such as valence and arousal.
3. **Miscellaneous:** Include other models based on concepts such as intensity, preference, similarity, etc.
4. **Music-specific:** Models that use specific music features to identify emotions.

Music studies using a discrete model of emotion generally include five emotions that appear in a majority of studies: happiness (or joy), sadness, anger, fear, and love (or tenderness). These emotions provide "a natural point of departure" for music studies (Juslin, 2001, p. 314-

315) since they are seen as normal emotions by lay people (see e.g. Shaver, Schwartz, Kirson, & O'Connor, 1987) and they have been labeled as “basic emotions” by researchers (e.g. Plutchik, 1994, p. 58).

The emotional content of a musical performance is influenced by both compositional aspects of the performed piece as well as the performer's individual expressivity, and, in Western music, these compositional aspects include tempo, loudness, pitch, and harmony (Gabrielsson & Lindström, 2001). For example, sad music is often characterized by a slower tempo, legato playing style, and use of minor modes. Dalla Bella, Peretz, Rousseau, & Gosselin (2001) found that adults as well as 6-8 year old children were consistently able to identify happiness and sadness in music based on variations in tempo and mode. Younger children were much less consistent, however, perhaps indicating that the identification of emotions in music is—at least in part—a learned cognitive skill.

In addition to compositional aspects, a performer's expressive intentions affect the emotional content of a musical performance. The emotional content is made apparent through performance cues that are familiar to both performers and listeners (Juslin, 2001). The importance of the performer's role in communicating the emotional content of a piece depends on the performance situation and repertoire. Sometimes, the performer's role is simply to realize the composer's intent (Sloboda, 2000). In other traditions the performer has more freedom and can be led by their own personal intuition (Juslin, 2001). This intuition has been shown to result in different interpretations of a similar piece. Repp (1998) analyzed performances of a single Chopin piece by 115 different performers with the goal of identifying individual expressive differences. He found that the differences in performances were not in the performers' perceptions of the musical structure, but in the “expressive shape” of the structure. In other words, performers agreed on the main technical aspects of the composition, but each communicated it in a unique way. It should also be noted that experienced musicians are generally able to communicate particular emotions more accurately than amateurs, though amateurs were able to improve their accuracy through appropriate feedback (Juslin & Laukka, 2000).

Although the musical communication process can be effective in communicating basic emotions, listeners are still left to provide their own more specific musical meanings. In addition, a listener's background, personality, musical culture, and mood effects can affect how they interpret the emotional content of a piece (Meyer, 1956).

Finally, different emotions tend to impact listeners differently. Juslin (1997) found that ratings for sadness/tenderness in music were more highly correlated with expressiveness than other emotions. This is in line with the findings of Eerola and Vuoskoski (2011), who found that sad music tended to be rated higher in terms of beauty than happy music. Vuoskoski and Eerola (2012) also found that sad music provoked some sort of visual imagery in nearly a quarter of the cases during a listening exercise, concluding that sad music can trigger sadness-related effects on memory and judgment.

2.4 Hypotheses

We have so far found that referents have been studied from the perspective of the composer (Mountain, 2001) and the performer (Persson, 2001), and that listeners' extramusical associations have also been categorized (Tagg, 2013). In addition, many methods of teaching improvisation have been studied (Huovinen et al., 2011; Koutsoupidou, 2008; Tafuri, 2006), as well as the effect of different referents on improvisations (Huovinen & Kuusinen, 2006). Finally, researchers agree that music and emotions are very closely linked (Juslin & Laukka, 2004; Sloboda & O'Neill, 2001; Meyer, 1956; Pratt, 1954).

One important gap in research remains, however, concerning improvisation: what are the approaches that musicians naturally tend to use when faced with an improvisation task? The answers to this question have the potential to provide useful insight into the existence of additional improvisational referents, the improvisational process as a whole, and improvisation pedagogy. Related questions include: Do improvisers, like composers and performers, use visualizations to conceptualize a performance? Do novice and experienced improvisers use similar approaches to improvisation? And could it be that a certain approach

results in improvisations of a higher quality than others? These are some of the questions this study is interested in. Consequently, the two main hypotheses of this study are as follows:

1. Improvisations using a more technical approach will receive lower ratings on compositional quality compared with improvisations using other approaches
2. Less experienced improvisers will tend to use a more technical approach

3 METHODOLOGY

In order to gain insight into the different approaches to improvisation, a study was developed in which participants would be asked to improvise without being given specific technical or methodological instructions. However, in order to provide helpful constraints for less-experienced improvisers (à la Junttu, 2015; Cahn, 2005) and in order to establish a basis for comparing and evaluating the participants' improvisations in later stages of the study, participants were asked to focus on specific elements during their improvisations. The elements chosen were emotion words.

The purpose of using emotion words as a basis for improvisation was threefold: (1) they would allow the participants the freedom to use any method they chose to improvise without any additional guidelines or suggestions from the facilitator which might influence the approach; (2) all participants were already familiar with the concept and differences between emotions, which makes them a more appropriate improvisation source than, say, specific genres or styles of music or specific visual or metaphorical cues; and (3) considering the close link between music and emotion (see Section 2.3), it would seem natural to use emotions as a basis for making music.

This was a two-stage study. The first stage of the study involved participants taking part in three improvisation group sessions. The improvisations performed during the third session were recorded and used in the second stage of the study. Stage 2 involved University-level professors of music rating the recordings on various musical and emotional measures, which were then correlated with participants' musical/improvisation experience. Finally, the

discussions on musical approaches that took place during the final group improvisation session were coded for themes in order to identify specific improvisation approaches, and these were then also correlated to the professors' ratings.

3.1 Stage 1: Improvisation sessions

16 participants were split into four groups and took part in three sessions of 90 minutes each. The sessions took place on consecutive weeks. It was determined that, due to the potential difficulty in comparing improvisations from different instruments (especially instruments not typically considered solo instruments, such as drums and bass guitar), all participants would perform improvisations on the piano, with which all had participants at least some experience. The sessions occurred in the University of Jyväskylä's recording studio's main recording room. The instrument used for improvisation was a Yamaha C7 acoustic grand piano. The primary language of all discussions during the sessions was Finnish, and all sessions were recorded using video and audio recording devices for subsequent transcription and analysis.

3.1.1 Participants

The participants in this first stage of the study were students from Jyväskylä University of Applied Sciences and the University of Jyväskylä. Of the 16 participants, six were males and ten were females. The ages ranged from 20 to 31 (mean: 24.2; standard deviation: 3.7). All of the participants were music students studying instrumental performance, musicology, pedagogy, or similar fields, and the participants had between 6 and 20 years experience playing their primary instrument (M : 14.7; SD : 4). Ten of the participants listed piano as their primary instrument and the remaining participants listed voice (two participants), guitar, violin, drums, and bass (one participant for each) as a main instrument. Of those who did not list piano as a primary instrument, four participants listed piano as a secondary or tertiary instrument with an average of 9.25 years playing experience, leaving two participants who did not list piano as a primary, secondary, or tertiary instrument. These two participants had

some experience playing the piano, however, and were concurrently enrolled in a pop/jazz piano course at the Jyväskylä University of Applied Sciences.

All participants except one had previous improvisation experience (pop, jazz, free improvisation, or classical), resulting in an average of 5.4 years of improvisation experience among these participants (*SD*: 4.95). Thirteen out of sixteen participants had actively studied improvisation, with an average of 4.3 years among these participants (*SD*: 3.4). The participants received course credit for participation.

3.1.2 Procedure

Participants were organized into groups of four. Group sessions were chosen over individual sessions in order to facilitate natural discussions surrounding the methods of improvisation, and to work within time constraints that would have made organizing three individual sessions for 16 improvisers prohibitive. The participants were assigned into groups based on their own availability. One group consisted of four females, one group of four males, and two groups with one male each. At least two of the participants in each group had piano as a primary instrument. The mean musical experience per group on each participant's primary instrument ranged from 12.5 to 18 years (overall *M*: 14.7 years), and the mean improvisation experience per group ranged from 3.5 to 8.3 years (overall *M*: 5.4 years).

The sessions were facilitated by a professor of the University of Jyväskylä. The facilitator was instructed not to provide musical instruction or direct feedback on the quality of improvisations to the students, and was asked to work mainly as a discussion guide following each improvisation, asking open-ended questions that would encourage discussion among all participants.

The goal of the first two sessions was to familiarize students with the improvisation tasks and allow an open, positive group dynamic to form in order to minimize performance anxiety and encourage discussion. During each of the three group sessions, each participant performed five improvisations on the piano, one at a time. In the first two sessions, a discussion immediately followed each improvisation, while the discussion occurred after every round of

four improvisations in the last session (this was done in order to minimize possible effects of one participant's discussions on the subsequent performances).

The participants were seated in a semicircle with their backs to the piano in order to eliminate the influence of the performer's visual cues on the listeners (see Figure 1).

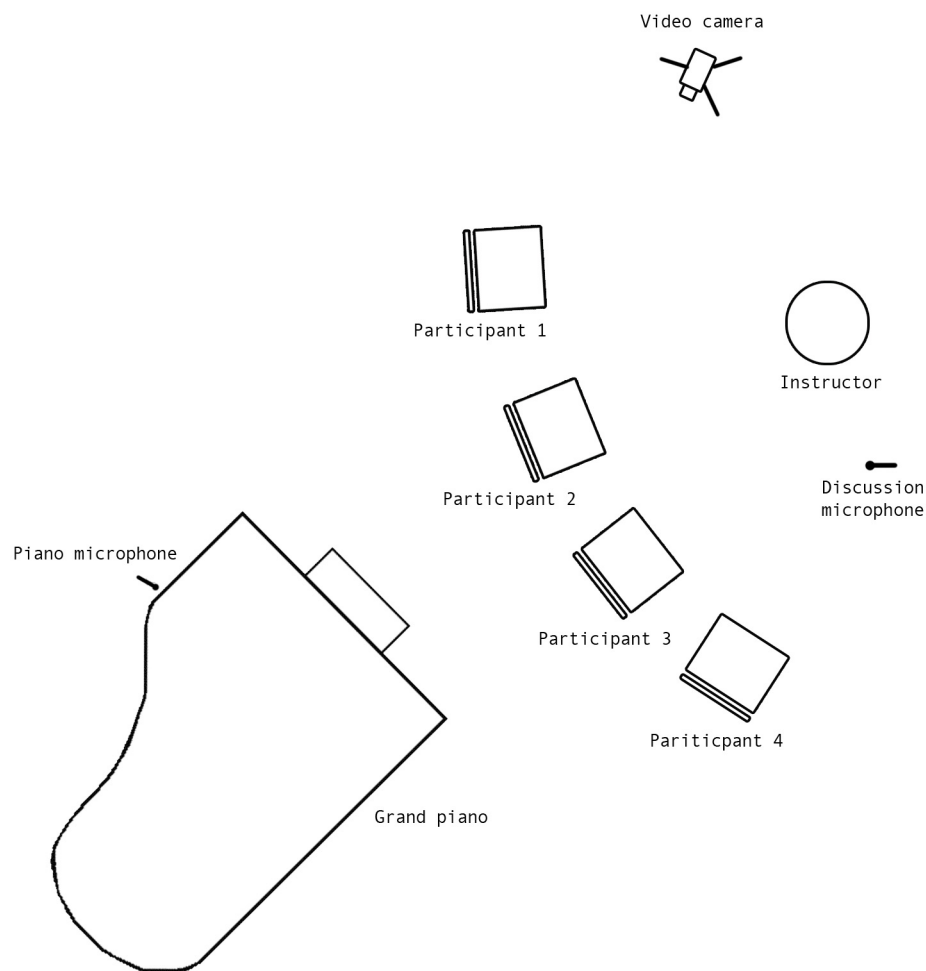


FIGURE 1: Diagram of improvisation session room layout

3.1.3 First Session

The first session began with a brief introduction to the study during which the facilitator introduced the study's concept to the four participants—however, participants were not made aware of the true focus of the study; rather, they were informed that our aim was to analyse the effectiveness of communicating specific emotions through improvised music. The

participants were informed that their improvisations would not be judged based on any traditional standards of musical quality and that they would be free to improvise using any methods familiar to them, or to create new ways of improvising that they considered most natural.

In the first session, the participants were introduced to a list of five emotion words: joy, sadness, love, fear, and anger. These emotions are generally considered primary—or basic—emotions (Shaver et al., 1987), and these emotion words have also been used in numerous music-emotion studies (note that in some studies, joy is replaced with happiness, and love with tenderness) (see e.g. Vuoskoski & Eerola, 2012; Juslin & Laukka, 2004).

The participants took turns improvising in order. In each of the five rounds of improvisations, each participant performed an improvisation based on one of the five emotion words. The participants were instructed to choose an emotion word from the list and—without telling the other participants what word was chosen—improvised a piece based on it on the piano. While listening to the improvisation, the other participants attempted to correctly identify the emotion and wrote down brief explanations on why they thought the performance correlated with that particular emotion (they were given handouts for this task). When the participants were done writing notes on the improvisation, there was a short discussion (generally 1 to 2 minutes) during which the instructor asked each listener which emotion he/she believed the performer was improvising and why. Finally, the performer was asked how he or she had approached the improvisation and the methods he/she used to communicate the chosen emotion.

3.1.4 Second Session

The second session was identical to the first, with the exception that participants in this session were asked to improvise using 10 new emotion words. As with the five primary emotion words used in the first session, these ten words were chosen from the emotion categorization list by Shaver et al. (1987). They were selected specifically for their relation to each primary emotion—two sub-emotions were chosen for each primary emotion: one more mild emotion (e.g. contentment) and one stronger emotion (e.g. triumph, when referring to joy). We refer to these more specific types of emotions used in the second section as

“nuanced emotions.” Table 1 shows the list of emotions words used in each improvisation session.

TABLE 1. List of emotions used in improvisation sessions

Sessions 1 and 3	Session 2	
	Nuanced emotion (mild)	Nuanced emotion (strong)
Joy	Contentment	Triumph
Sadness	Melancholy	Anguish
Love	Longing	Lust
Anger	Irritability	Rage
Fear	Nervousness	Horror

The purpose of using nuanced emotions in the second session was to familiarize participants with the possibly unclear boundaries between emotions categories and to encourage them to explore more creative/less stereotypical ways to communicate these emotions.

As in the first session, each participant performed five times, and each performance was followed by a short discussion on the listeners’ identified emotions and the performer’s method of improvisation. This resulted in each of the participants improvising based on half of the available nuanced emotion words of their choice.

3.1.5 Third Session

While the first two sessions were designed to introduce and familiarize the participants with improvising based on emotions, the purpose of the third session was to collect the data that would be used in stage 2 of the study. In this third session, participants were once again asked to perform the primary emotions utilized in the first session (joy, sadness, love, anger, and fear); however, the “guessing game” aspect of the previous sessions was removed; instead, one emotion word at a time was selected, and each of the performers took turns improvising based on that emotion (this was done so that participants could focus fully on their own performances). The improvisations in this session were recorded using two microphones placed near the soundboard of the piano. The participants were encouraged to perform in a *personal* way and to keep in mind the potential complexity of the emotions as discussed in the second session.

After all the participants has performed an emotion, there was a brief discussion period during which brief sections of the recordings of the improvisations were listened to (in order to refresh each listener's memory), and each performer was asked to share the approach or approaches they used for improvising. The discussions were done in this order to minimize possible group effects of participants being influenced by others' approaches. The participants were also encouraged to comment on the other performers' improvisations, to identify emotional nuances and provide the performer with feedback.

The playing order of emotions and the order of performances were randomized to minimize order effects.

3.2 Stage 2: Expert evaluation of improvisation recordings

In the second stage of the study, the recordings from the third improvisation session were listened to by four expert reviewers and rated on various emotional and musical dimensions. These expert reviewers were music professors and researchers at the University level who had each earned a PhD in a music-related field.

Improvisation recordings from the third improvisation session were used as stimuli in this stage of the study. Each participant in the first stage of the study had recorded one improvisation for each of the primary emotions (joy, sadness, love, fear, and anger), for a total of 80 improvisations performed by 16 participants. The recordings varied in length from 21 seconds to 2 minutes 46 seconds, with a mean length of 1 minute 10.5 seconds.

A questionnaire was given to the expert reviewers that would allow them to assess the perceived emotional content and performance/musical quality of the improvisations. The questionnaire consisted of a 5-point scale for each of the following dimensions (see Appendix 1 for the full questionnaire):

1. How well do the following emotion words, in your opinion, describe this piece of music?
 - 1.1 Joy
 - 1.2 Sadness

1.3 Love

1.4 Fear

1.5 Anger

2. How personal did the performance sound, in your opinion?
3. Improviser's musical originality
4. How well did the improvisation work as a compositional whole?

Questions 2 and 3 were further verbally clarified for the expert reviewers, in that the second question (“How personal did the performance sound, in your opinion?”) was related to performance aspects (i.e. expressiveness) of the improvisation, whereas question 3 (“Improviser's musical originality”) was related to compositional originality.

The listening sessions took place in a classroom at the University of Jyväskylä. The listening samples were played through studio monitor speakers. The sessions were held with two participants at a time, with the second pair of participants listening to the randomly ordered stimuli in reverse order from the first pair. The complete evaluation process took approximately two hours for each set of participants.

4 RESULTS

4.1 Improvisation session results

Each 90-minute improvisation session contained approximately 45 minutes of discussion. Since the improvisations from the third session were the ones evaluated in Stage 2 of the study, this study focused on identifying the improvisation approaches mentioned during this session.

4.1.1 Categorizing the improvisation methods

As mentioned in Section 3.1.5, the third session began with each participant in the group performing an improvisation based on a certain emotion (e.g. sadness), which was then

followed by a discussion period during which the performers were asked to describe how they approached their own improvisation. A categorization system was necessary for comparing the improvisation approaches to the experts' perceived quality of the improvisations. This categorization system was made according to the pattern coding method of Miles & Huberman (1994) based on a single level of abstraction.

We identified five main approaches to improvisation from the discussions, while taking into consideration the categorizations mentioned in Vuoskoski & Eerola (2012) and Juslin & Västfjäll (2008). The five approaches were the following:

Technical/Theoretical approach

The participant improvised using specific compositional or performance techniques such as chords, musical modes, tempo, or dynamics. One participant, for example, mentioned thinking "of black keys and glissandos" before improvising on love. Another "thought of a minor seventh chord" while improvising on sadness.

Interestingly, participants in several different groups mentioned similar technical aspects being related to specific emotions. For example, major seventh chords were seen as indicating love while a minor second interval signified fear. These were relationships that had apparently been discussed in many participants' prior improvisation and theory classes. This knowledge had an impact on the session's improvisations, as explained by a participant:

It would have been more interesting if I didn't know that, for example, a major 7 chord would result in a certain emotion. I would have had to improvise more, in that case. Well, you don't really do it on purpose, but when you know that a major 7 chord results in a certain emotion, you can use that theory to help you out a lot.

Many participants had knowledge of these agreed-upon conventions, which may have influenced their choice of a technical approach to express certain emotions

Musical inspiration approach

This approach occurred when a participant utilized familiar musical themes or excerpts in their improvisations. The improvisation could contain vaguely recognizable melodic or rhythmic motives or could be a direct quotation from a certain piece. One participant (who

had relatively little improvisation experience), for example, performed a shortened version of a familiar composition. Another student borrowed a chord progression from a familiar piece while improvising on anger:

This time I had a musical starting point. Stravinsky's Rite of Spring came to mind, the chord progression...it is a fantastic composition and in my mind represents pure rage.

The musical inspiration approach was used least often of all the approaches (see Figure 2 in Section 4.1.2).

Emotional nuance approach

The emotional nuance approach involved using another, related emotion while improvising; generally, it involved using a descriptive adjective before the actual emotion word (e.g. “triumphant joy” or “melancholy sadness”), though standalone emotion words were also mentioned (e.g. “terror” and “depression”). One participant, performing anger, said the following: “I tried to make it a kind of Finnish “Perkele!” feeling. Yeah, pretty furious...it was a kind of fury and serious anger.”

It could be argued that the emotional nuance approach may not be an independent approach at all, so much as a slightly more involved description of the emotional content of the improvisation. As such, a participant could use it in conjunction with another approach—indeed, the emotional nuance approach was the approach most likely to be combined with another approach (see the upcoming section on multiple and missing approaches). A participant could also mention an emotional nuance if they were not able to easily describe a more involved approach, or if they were not willing to share a more personal approach in a group setting (see Section 5.5.3 for more discussion on this topic).

Visualized scene approach

This approach involved the participant using an imagined visualization or situation while improvising. The scenes described by participants varied from generic (“I thought of a fear of loss, or something, or maybe that of a loved one getting sick”) to specific (“A kind of Russian 18th century composer who is incredibly depressed and contemplating suicide, who

is deeply sad and hopeless.”). One participant explained how he used the visualized scene approach to focus his improvisations:

[I approach improvisation] pretty intuitively. I usually have a strong idea in mind; a visualized thought of what is happening. It becomes like a story that’s always in my mind. Then, the feelings come through that.

In addition, using a visualized scene approach may have helped to provide clearer focus for the improvisation compared with some of the other approaches. This was explained by one participant as follows: “If you choose a specific situation, or if it just comes strongly to mind, then the improvisation easily stays in it and doesn’t go anywhere else.”

Participants also mentioned visualizing scenes while listening to others’ improvisations. These scenes were often influenced by specific technical/theoretical factors. One participant, for example, upon hearing a specific chord progression that reminded them of the James Bond theme, visualized a car chase. Another participant heard a melody that reminded her of one used in a popular Finnish TV cartoon (Moomin) and visualized images from that series.

Personal experience approach

The personal experience approach involved one or more elements associated with a personal experience, such as feelings, visualizations, or other characters. It was the most complex of the approaches mentioned, due to the broad range of experiences that could be mentioned. Although they share common factors, the personal experience approach is in a distinct category from the visualized scene approach due to its use of memory rather than imagination. Take this improvisation on anger, for example:

I broke my computer's hard drive yesterday. I shouted a lot, so I somehow tried to play that. I got so angry, that I just shouted and cursed, and I was really clumsy...since the bass line was so clumsy, when I messed up, so that's how it was. I somehow expressed how I moved, and how I felt.

This approach is clearly distinct from a visualized scene approach, since the situation mentioned—along with all the remembered emotions—had already been experienced by the performer. Here is another example, on an improvisation based on sadness:

This was very familiar, this feeling for me. My grandfather died last Saturday. [Facilitator: ‘Was he close?’] Yes, quite. [‘Did it affect your playing somehow...was it on your mind?’] Yes, it clearly was...actually, I thought of my grandmother more, and in a way expressed it through her, her state of mind. And my father's as well.

Other approaches

There were six improvisations that did not fall into any of the above categories. One participant, for example, mentioned that he simply played what he felt. Another participant entered into a type of “flow” state (see e.g. Sawyer 2011) during his improvisation on sadness, saying, "This time, I got lost in the performance. I drowned in it. I don't know...I don't remember anything I played..." A similar situation was described by another participant, who stated: “I didn’t think about anything. That's what I felt at the moment." Meanwhile, one participant had the opposite issue: "This was difficult for me. It might be too foreign of a concept for me, anger. It's hard to try and play anything. I don't know, I didn't think of anything, no situation or anything." Since approaches like these did not clearly fit into the above categories, they were placed in the “other” category.

Multiple and missing approaches

Since participants were able to discuss their approaches freely, their approach sometimes fell into multiple categories. The use of multiple approaches was mentioned thirteen times; over half of these cases (seven of thirteen), involved a combination of a technical and emotional nuance approaches. The remaining multiple-approach improvisations featured a technical or an emotional nuance approach combined with another approach. An example of a combined technical / nuance approach is the following (the participant was improvising on fear):

This was a pretty stereotypical interpretation, perhaps. I sought to play a pure kind of fear. The fear of the unknown, which is at the core of all fear. A kind of dark fear, sneaky. I perhaps used a more traditional approach to express this feeling...I used a lot of musical elements: uneven rhythms and long held notes, among other things. I tried to be a part of the playing.

Finally, improvisers failed to comment on the approach to their improvisations five times. This was an unfortunate effect of the dynamic group discussions and was not noticed before reviewing the session recordings.

4.1.2 Occurrences of Improvisation Approaches

Overall, of the 80 improvisations recorded, 63 had a single approach mentioned, 13 had two approaches mentioned, and five did not mention any approach. The number of times each approach was used can be seen in Figure 2.

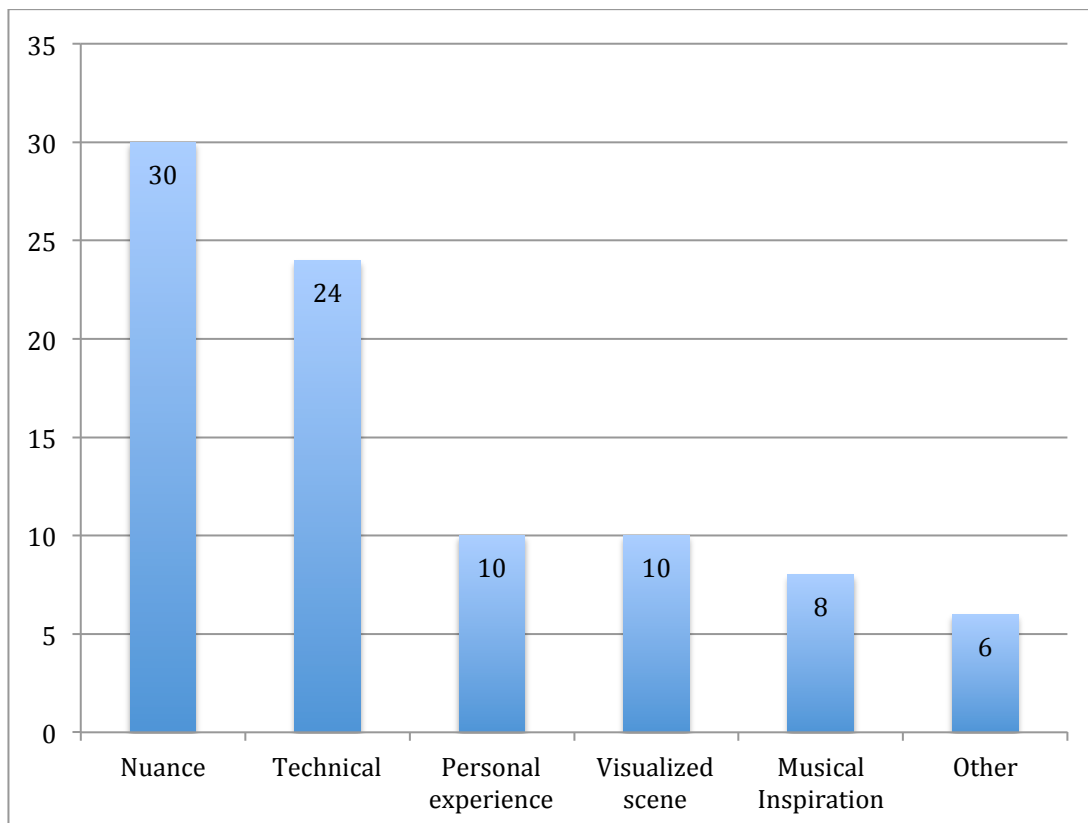


Figure 2: Number of times each approach was used (in all 80 improvisations)

The most popular approach used was the nuance approach, followed by the technical approach, and so on. The approaches are further broken down for each emotion in the following charts (Figures 3-7)

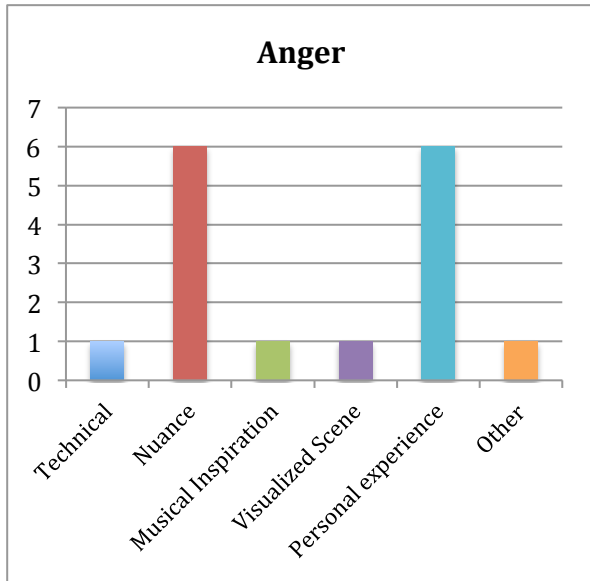


FIGURE 3: Number of times each approach was used (Anger)

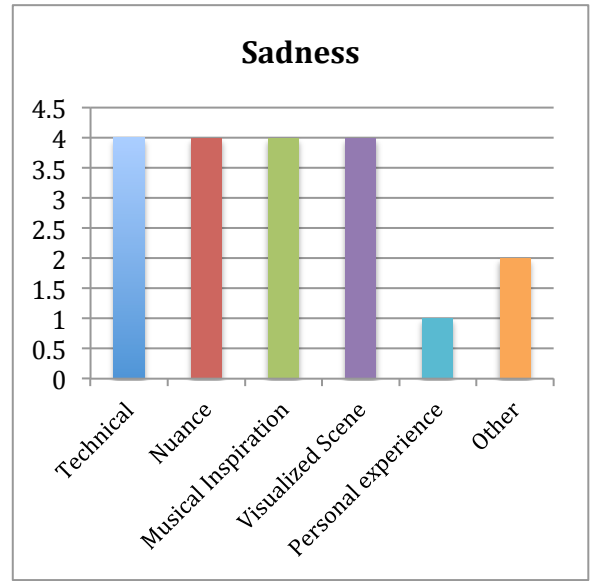


FIGURE 4: Number of times each approach was used (Sadness)

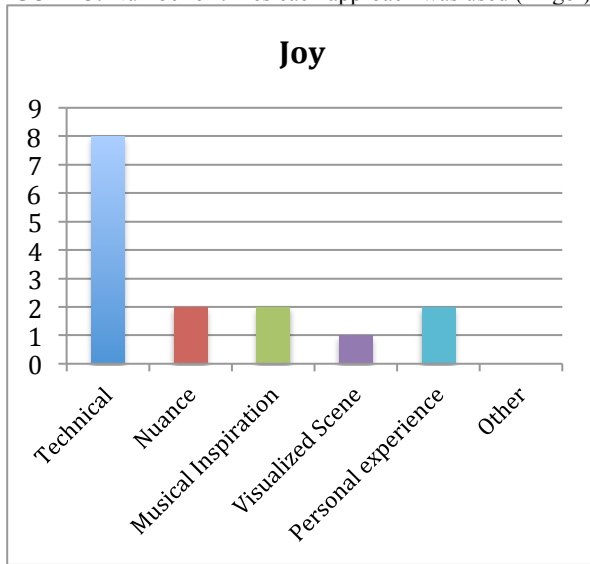


FIGURE 5: Number of times each approach was used (Joy)

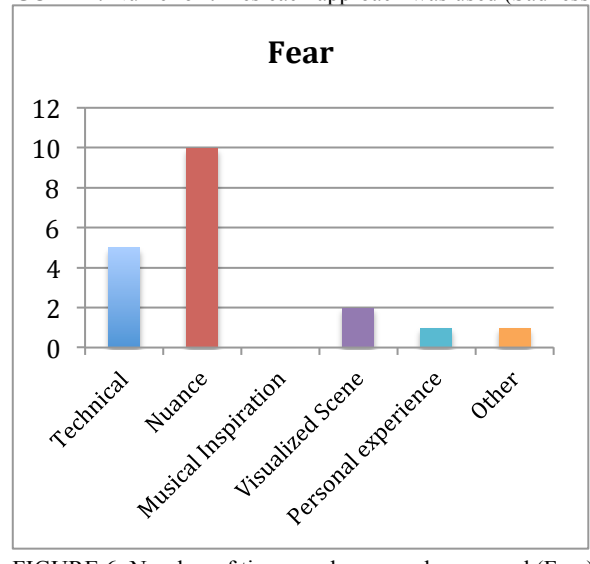


FIGURE 6: Number of times each approach was used (Fear)

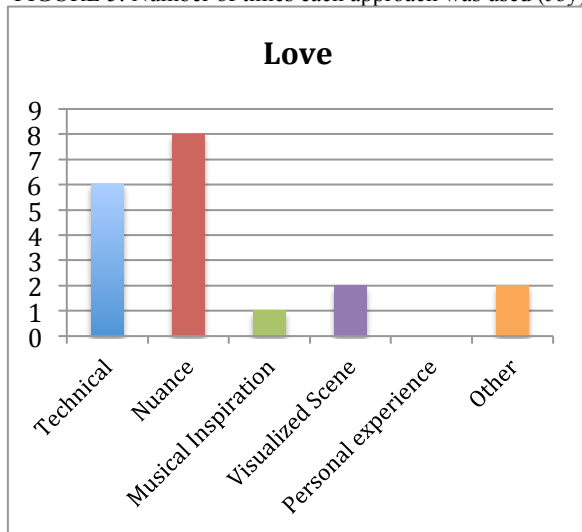


FIGURE 7: Number of times each approach was used (Love)

As can be seen from the charts, the specific approach varied according to the emotion on which the improvisation was based. The emotional nuance and personal experience approaches were overwhelmingly used for the “anger” improvisations, whereas a technical approach was by far the most popular for improvisations based on joy. Improvisers performing fear almost exclusively favored the emotional nuance approach, perhaps due to the variety of nuances possible in this emotion category (nuances mentioned included “lonely fear,” “terror,” “fear mixed with sadness,” “hysterical fear,” etc.). Love, meanwhile had a near-equal number of emotional nuance and technical approaches. Sadness was the most well-rounded emotion in terms of approaches used, with only the personal experience approach being used less than the others.

4.1.3 Approaches to improvisation used by individual participants

A clear majority of participants (14 out of 16) used a total of three or more different approaches to improvisation within the five improvisations they each performed. The remaining two participants, however, used a single approach for all of their improvisations. Interestingly, both participants were in the same group (Group 3), but the improvisation approach they used differed: one participant consistently used a technical approach while the other used a nuance approach. The participant who used a purely technical approach received the lowest expert ratings for all three quality-related questions among all participants. The participant who used an emotional nuance approach, meanwhile, received near-average ratings from the expert reviewers for all three ratings.

4.2 Expert questionnaire results

The expert questionnaire (see Appendix 1) yielded ratings for the perceived strength of particular emotions heard in each recorded improvisation, as well as ratings on aspects of performance, improvisational originality and compositional strength. The ratings for perceived emotional content will be addressed first, then the ratings for quality-related features.

4.2.1 Emotions ratings

Expert reviewers were asked to rate each improvisation on scales for each emotion (anger, fear, joy, love, and sadness) for the following question: “How well do the following emotion words, in your opinion, describe this piece of music?” The emotion that received the highest averaged rating on an improvisation from the four expert reviewers was regarded as the strongest perceived emotion. Interestingly, it was found that of the 80 improvisations, the expert reviewers gave the performed emotion the highest corresponding emotion rating (i.e. they rated the emotion “correctly”) 53 times.

Some emotions were more strongly related to each other in the expert reviewers’ emotion perception ratings. The results of the averaged emotion ratings, sorted by the performed emotion, can be seen in the heat map in Table 2 (darker colors indicate a stronger relationship).

TABLE 2: Average expert ratings for perceived emotional content for each performed emotion

		PERCEIVED EMOTION				
		Anger Rating	Fear Rating	Joy Rating	Love Rating	Sadness Rating
PERFORMED EMOTION	Anger	1.88	1.17	0.33	0.56	0.92
	Fear	1.03	1.97	0.30	0.39	0.98
	Joy	0.17	0.23	1.55	1.14	0.28
	Love	0.02	0.13	1.27	1.97	0.94
	Sadness	0.08	0.22	0.56	1.44	2.08

Another way to view the same data is by converting the above values to percentages, where the score of the intersecting “correct” emotion provides a ceiling of 100% when calculating the other relationships in the same row. This is shown in Table 3:

TABLE 3: Average expert ratings percentage for perceived emotional content for each performed emotion

		PERCEIVED EMOTION				
		Anger Rating	Fear Rating	Joy Rating	Love Rating	Sadness Rating
PERFORMED EMOTION	Anger	100%	62%	17%	30%	49%
	Fear	52%	100%	15%	20%	50%
	Joy	11%	15%	100%	74%	18%
	Love	1%	6%	64%	100%	48%
	Sadness	4%	11%	27%	69%	100%

As can be seen in the table, the improvisations for love received high average ratings for joy (1.27, or 64%) and somewhat high ratings for sadness (0.94, or 48%), relative to the evaluators' rating of 1.97, at 100%. The improvisations based on sadness, in turn, received high ratings for love (1.44, or 69%) but relatively low ratings for joy (0.56, or 27%). The improvisations based on anger, meanwhile, were rated high for "fear" content, at 1.17 (or 62%), while the improvisations based on fear had a lower rating for anger of 1.03 (or 52%).

4.2.2 Improvisation quality ratings

Average ratings for questions 2, 3, and 4 of the questionnaire were sorted by emotion. The results can be seen in Figures 8-10.

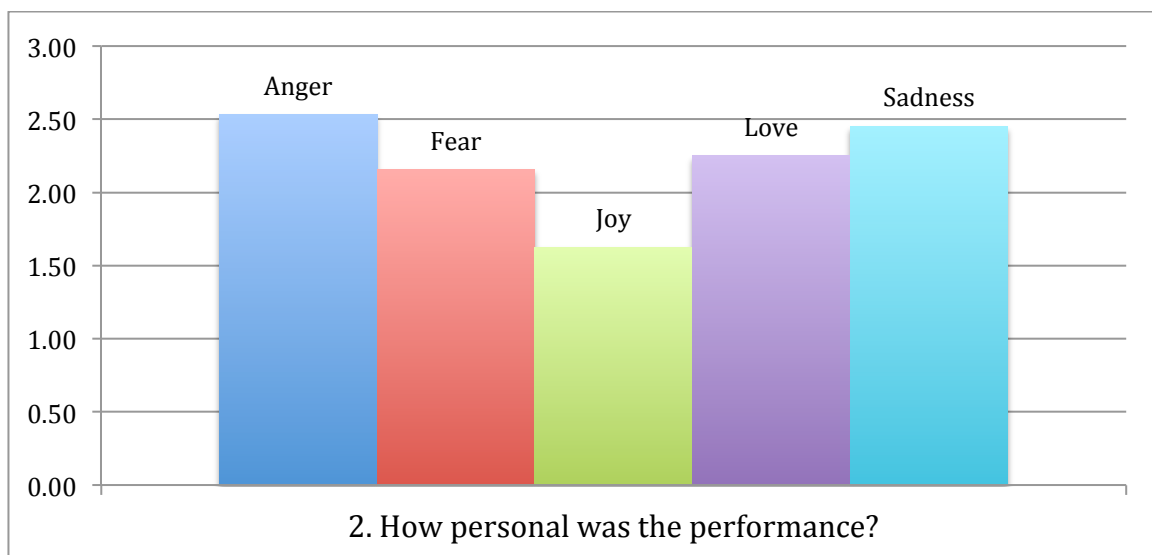


FIGURE 8: Mean expert ratings for the question "How personal was the performance?" sorted by emotion

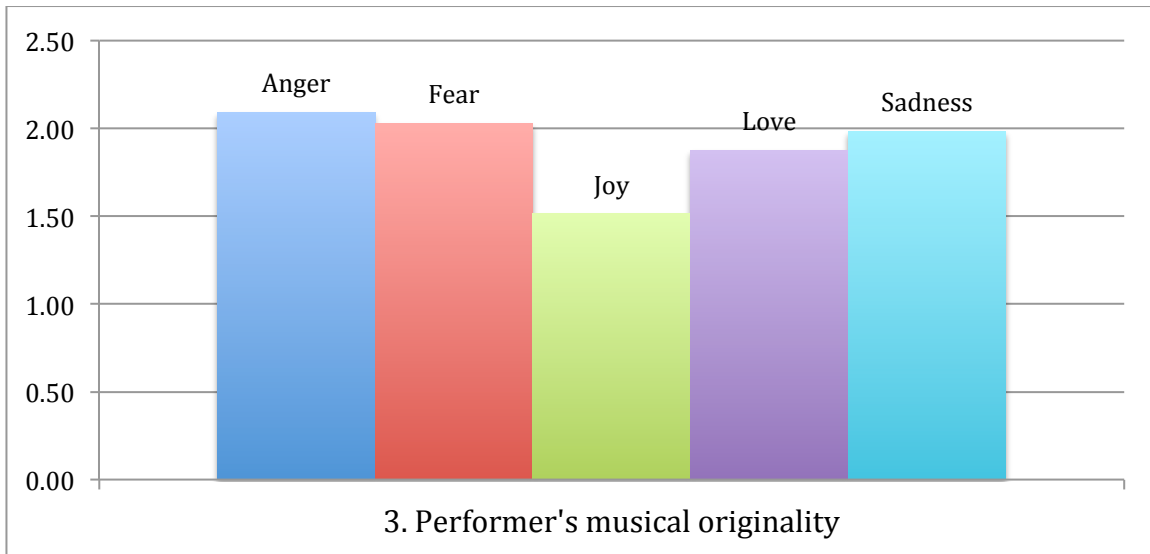


FIGURE 9: Mean expert ratings for the question “Performer’s musical originality” sorted by emotion

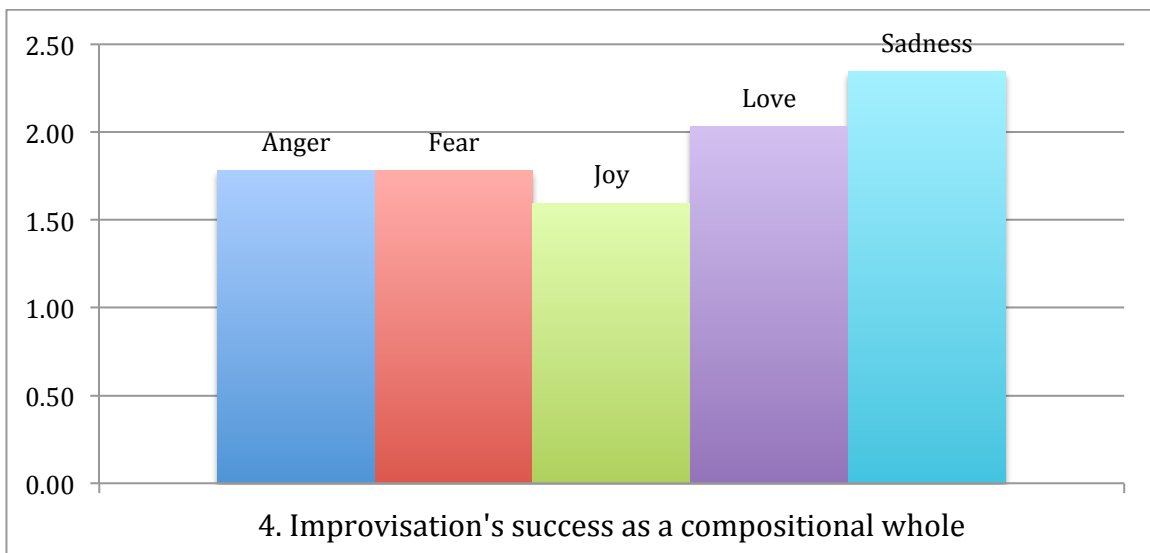


FIGURE 10: Mean expert ratings for the question “Improvisation’s success as a composition whole” sorted by emotion

A Kruskal-Wallis test was performed to ensure the variation in expert ratings between emotions were of statistical significance for each of the three questions. It showed that the differences in ratings between emotions for questions 2 and 4 were significant ($p < 0.05$), while question 3 failed to reach significance. The key takeaways, taking significance into account, is that the improvisations for joy resulted in expert ratings on personal and compositional aspects that were significantly lower than for the other emotions, that improvisations based on the more “negative” emotions of anger and sadness were found to be

more personal, and that the improvisations based on sadness were seen as the most compositionally successful.

4.3 Relationship between expert ratings and approaches used for improvising

Finally, the main results of the study: identifying significant relationships between expert ratings and the improvisation approach used. A T-test was performed to identify significant relationships between the approaches with the ratings from each of the expert reviewers' quality-related questions. The following tables show the mean ratings for each question separated by approach, the mean ratings for all other approaches for comparison, and the P-value acquired through a two-tailed T-test for each approach. Significant results are bolded.

TABLE 4: Relationship between approaches and three expert quality-related questions

Question 2: How personal did the performance sound, in your opinion?			
Approach used	Mean rating for improvisations that used the approach	Mean rating for improvisations that did not use the approach	T-test P-value
Technical	1.87	2.27	0.010
Nuance	2.20	2.13	0.624
Musical inspiration	2.38	2.13	0.353
Visualized Scene	2.40	2.12	0.199
Personal Experience	2.28	2.14	0.514
Question 3: Improviser's musical originality			
Approach used	Mean rating for improvisations that used the approach	Mean rating for improvisations that did not use the approach	T-test P-value
Technical	1.71	1.93	0.153
Nuance	1.96	1.81	0.279
Musical inspiration	1.78	1.87	0.705
Visualized Scene	1.78	1.88	0.604
Personal Experience	2.11	1.83	0.270
Question 4: Improvisation's success as a compositional whole			
Approach used	Mean rating for improvisations that used the approach	Mean rating for improvisations that did not use the approach	T-test P-value
Technical	1.64	1.99	0.040
Nuance	1.86	1.91	0.724
Musical inspiration	2.22	1.85	0.075
Visualized Scene	2.18	1.85	0.301
Personal Experience	2.03	1.87	0.436

As can be seen from the above table, the only relationships that reached significance were between improvisations utilizing a technical approach and two of the three questions (“How personal did the performance sound, in your opinion?” and “Improvisation’s success as a compositional whole”). This confirms the first hypothesis, which stated that improvisations using a more technical approach would receive lower ratings on compositional quality compared with improvisations using other approaches.

A natural next step of analysis would be to calculate the significant relationships between improvisation approach and expert ratings within each performed emotion. However, due to the limited sample size for each method when viewed within the context of each emotion (n=between 0 and 8), the individual samples were too small for reliable results. Repeating this study with a larger sample size could result in interesting correlations within each set of emotions.

4.4 Relationships between participants’ experience and other factors

Correlations were also calculated to determine statistically significant relationships between participants’ instrumental experience, improvisation experience, or piano playing experience and any of the expert reviewers’ ratings. It would be natural to assume that improvisation experience is responsible for improvisation skill, and that improvisation skill in turn is directly responsible for the quality of improvisations. However, no significant correlations were found between improvisation experience and expert ratings for quality of improvisation. Improvisation experience may still be responsible for another type of effect, however: the ability to accurately perform what you intend to perform. As explained by one participant with less than one year of improvisation experience: “I had the feeling that this [improvisation] was too hopeful...I somehow didn’t know how to delve into a kind of very dark sadness.” Another participant with a lack of experience had similar thoughts: “I tried to play something like major, but it may not have been so clear.”

Likewise, it would have been natural to assume a tendency for less-experienced improvisers to use a technical approach, as declared in the second hypothesis. In spite of these

expectations, however, no significant correlations were found between the participants' musical experience and the specific improvisational approaches used, leading us to reject hypothesis 2. The latter correlation was near reaching significance, however ($p < 0.10$), so revisiting this study with a larger sample may provide different results.

5 DISCUSSION

The results of this study led us to accept the first hypothesis (improvisations using a more technical approach will receive lower ratings on compositional quality compared with improvisations using other approaches) and reject the second hypothesis (that less experienced improvisers will tend to use a more technical approach). This section delves further into the results of the study, offering two possible ways of organizing the improvisation approaches, compares the classification system with other systems, and addresses possible issues with the study.

5.1 Organization of improvisation approaches

Musical associations can be organized in many ways, as has been seen, for example, in Mountain's categories of imagery (2001) and Tagg's taxonomy of referents (2013). The five approaches identified in this study can also be organized in multiple ways. Here, two distinct organization systems are suggested.

5.1.1 Cognitive-intuitive scale of improvisation approaches

One proposed system of organizing the approaches is on a scale from most cognitive to most intuitive, such as shown in the following figure:

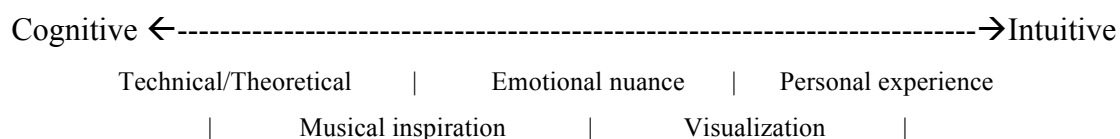


FIGURE 11: Cognitive-Intuitive improvisation approach scale

According to this scale, the technical/theoretical approach requires significant cognitive abilities while not relying much on intuitive factors. A personal experience approach, meanwhile, involves a performer remembering a specific situation and translating that into music, which—while it also requires a specific level of technical/theoretical thought—focuses more on metaphorical aspects, which can be generally thought of as more intuitive.

Musical experience may influence which part of the scale a musician feels most comfortable with (see Koutsoupidou, 2008); in their early days of music making, a cognitive approach may be preferred, with the performer progressing to more intuitive approaches as his or her technical skills and comfort with the instrument progress. In this study, however, no such progression was found—there was no clear connection between a performer’s musical experience and his/her mentioned approaches, though this may be partly due to the small sample size. It should be noted that this scale is for classifying musical approaches; the resulting improvisations, in the meantime, may be perceived by listeners as having completely different cognitive/intuitive content—e.g. a piece made using a personal experience approach could *sound* very technical, or vice versa.

The idea of a dichotomy of improvisation approaches came up in one discussion where the performer gave the following insight:

You can perform analytically, or then more descriptively or empathetically. If you have your own ideas that you can use, then [the improvisation] will certainly be good, while using a more analytical style is more experimental. That can also work well.

In this case, the participant viewed performance style as a dichotomy with analytical and descriptive/empathic ends.

5.1.2 Multi-layer categorization of approaches

It should be reiterated that a piece of music can be performed using multiple approaches, and these approaches need not be mutually exclusive. One participant, after improvising in the

first session, described his performance using the words “gray,” “sadness,” “minor sevenths” and “peaceful and pictorial”. All of these descriptors are consistent with the emotion that the performer was improvising (sadness), but they described the improvisation using different conceptual categories. This suggests that a multi-layer categorization of improvisational referents (similar to the taxonomy developed by Tagg [2013]) may be useful. A multi-layer categorization based on the approaches in this study would look something like this:

- **Emotional nuance layer:** Descriptive adjective (e.g. “melancholic sadness,”) or more specific/situational feeling (e.g. “sadness like when you miss someone”)
- **Technical layer:** Mode/chords, dynamics, phrasing, and musical excerpts from familiar pieces
- **Imagination layer:** Imagined visual scenes (e.g. “a rainy day by the lake”) or imagined situation (e.g. “a death in the family”)
- **Memory layer:** A memory of a personal experience (e.g. “remembering summer and I was at the cabin, just being there and enjoying life”)

A single improvisation may utilize an approach that includes elements from one or more of these layers. In addition, the distinctions between layers may not always be perfectly clear, and a single approach can have traits that fit into multiple categories, ultimately relying on the researcher’s interpretation for approach placement. Note that this categorization combines the technical and musical inspiration approaches into a single layer, resulting in four layers instead of the five original approaches.

Both the cognitive-intuitive scale and the multi-layer categorization have distinct uses. The cognitive-intuitive scale may find use in pedagogical situations—for example, it could be used as a reference tool for determining how intuitively a student is able to perform—while the multi-layer categorization of approaches is more of an analytical tool that could be used to determine related features in an improvisation.

5.2 The Five Improvisation Approaches compared with other classification systems

As mentioned in Section 2.2.1, Mountain (2001) organized musical referents used by composers into five categories:

- Auditory imagery, e.g. a familiar segment of a melody
- Visual imagery, e.g. a squiggle or graphic representation of a melodic contour
- Kinesthetic imagery (i.e. movement and gestures)
- Sound effects (i.e. nonmusical sounds)
- Metaphors and analogies, which included the following subcategories:
 - Animate beings
 - Inanimate objects, processes, or concepts

Some commonalities can be seen between Mountain's categories and the proposed five categories for musical improvisation approaches. For example, "auditory imagery" is roughly equal to the "musical inspiration" approach identified through group discussions, and "metaphors and analogies" encompasses much of the "visualized scene" and "emotional nuance" approaches. However, Mountain's classification system is based on composers' own writings about their compositions; as such, it concerns compositions as a whole as well as specific sections of compositions. This presents some issues when analyzing complete compositions—for example, it would be difficult to find an entire piece dedicated to a specific kinesthetic gesture. In the improvisations in this study, on the other hand, no participants mentioned changing approaches within a piece—they may have used multiple approaches, but the approaches mentioned were consistent within each improvisation.

Interestingly, kinesthetic imagery did come up occasionally during the group discussions in this study, but it was generally related to a nuanced emotion (e.g. a type of "beating anger") rather than an independent movement, and so it fell into the former category. In other cases, movements were sometimes mentioned as a part of "visualized scene" descriptions, but these clearly played a subservient role to the scene itself.

In addition, visual imagery of the type that Mountain mentions (e.g. graphics and shapes) were not mentioned in the discussions in this study. This type of visual imagery (as used by Mountain) is possibly more of a compositional tool (a type of “visual shorthand”) than a source of inspiration in composition. For example, a composer may desire the intensity of a particular passage to grow at a certain time, and this can be represented by a line with a bump in the middle. This line is not considered the inspiration for the piece, however. Rather, the composer’s idea of how the finished piece should sound is inspiration for this line, and the line will be used as a visual representation of how the emotional arch of the piece will be composed.

A similar concept may apply to specific sound effects that are intended to represent particular emotions or situations. Indeed, aspects of particular sound effects were mentioned by some participants in this study; for example, one participant used high-pitched, dissonant repetitive notes to represent a “complaining woman”. A separate “sound effects” category was not deemed necessary, however, since these sound effects (such as “complaining woman”) were encompassed by the “visualized scene” category. Additionally, Mountain’s category for metaphors and analogies seems extraneous, considering that the other categories of imagery could also be considered a sort of metaphor when expressed by music.

In summary, Mountain’s system of classification is not sufficiently focused to be of great use for improvisations; it provides categories of tools and descriptions of compositions that are provided by composers themselves but it is too scattered to be a proper system of classification for most other applications.

Persson (2001) identified two methods that pianists used to help conceptualize pieces prior to and during a performance. There were “visual imagery” and “memory of an emotion.” Both techniques involved the performer’s memory: “visual imagery” involved recalling scenes that might trigger an emotion, whereas “memory of an emotion” involved remembering a feeling in order to enter into a certain state of mind. “Visual imagery” can be seen as a rough combination of the “visualized scene” and “personal experience” approaches identified in this study, since both of these involve imagery of some kind. The “memory of an emotion”

technique, meanwhile, can be seen as a combination of “personal experience” and “nuance” approaches—leaning more heavily into the “personal experience” since it is based in memory. It seems, then, that the more technical approaches (“technical” and “musical inspiration” approaches) did not come up for the performers in Persson’s study, which makes sense since any technical issues are generally dealt with in the early stages of learning a piece. Since the act of improvisation involves both compositional and performance elements, it is expected to see approaches that exist outside of those mentioned by Persson.

Tagg’s (2013) taxonomy of verbal and visual associations to musical themes provides a clear and comprehensive list of musical referents from the listeners’ perspective (see Section 2.2.1). Many of the approaches in the “visualized scene” category could be coded according to Tagg’s list. However, since Tagg’s list does not address the composer’s creative process, instead categorizing listener’s responses to existing compositions, it is limited in its usefulness as a categorization of musical improvisation approaches and was mainly used as a reference for the categorization process in this study.

5.3 Implications for emotions research

The group discussions that took place during the improvisation sessions provided insight into how improvising musicians view emotions. Some of the main insights are covered in this section.

5.3.1 Improvised emotions: real or representations?

Some of the performers tended to produce emotionally caricatured improvisations, most likely due to the “guessing game” idea that was presented to participants in each group’s first improvisation session. This opens up the issue of felt (or “real”) emotions versus perceived emotions (see Eerola & Vuoskoski, 2013, for an overview of felt vs. perceived emotions). If asked to perform a certain emotion, some improvisers—particularly those with less improvisation experience—performed in ways that would make guessing the emotion obvious, generally by using a specific technical/theoretical mechanism. Some examples

mentioned by participants include the use of major seventh chords while improvising based on love (see Section 4.1.1), or the act of playing in a “chopping” manner to signify anger. The participants each had some kind of idea about how to communicate each emotion, and the main thing that differed between performances was the method used. As Tagg (2013) stated:

In order to convincingly communicate a sense of grief, loneliness, joy, contentment, or whatever other state of mind is required, the musician (composer, arranger, performer, etc.) must first be in some way aware of that state of mind. (p. 71)

In other words, performers should be familiar with an emotion and its effects, even if they do not feel it while they are performing. Interestingly, one more experienced performer admitted not really understanding the emotion of anger: “Perhaps it’s too unfamiliar, the concept of anger, for me,” he said after performing the improvisation. It should be noted that the other participants in the session had no issues identifying which emotion was performed by the improviser. Tagg (2013) continues:

Viewing musical competence in this prosaic way is useful because it makes the essential distinction between *emotion* and the *representation of emotion*. That doesn’t mean the artist’s composition or performance is fake. It’s simply a presentation, based on a combination of memory, retrospection, empathy, sensitivity, imagination and skill. (p. 71)

According to Tagg, then, a performance involves a cognitive representation of an emotion. The idea that all performers remain disconnected from the emotions they are attempting to portray may not be entirely accurate, however. Several times during this study, participants specifically mentioned feeling the emotion they were attempting to improvise, generally when improvising based on anger or sadness. For example, one participant, after improvising on the emotion “anger”, said the following: “For a moment, a quick second, I was actually angry. Since this [thing that I was thinking of while improvising] annoys me in every day life, the anger rose to the surface again.” Another participant, also improvising on anger, explained the importance of entering the right mindset before performing: “It is very difficult to begin if you just have an abstract feeling. You have to feel the feeling yourself. You have to get into an angry mood to be able to play.” Interestingly, improvisations based on anger scored highest on the experts’ ratings for “How personal was the performance?” and participants were much more likely to use a personal experience approach when improvising

on anger (using it six times compared with twice for joy, which was the second highest occurrence).

One participant described his experience improvising on sadness as follows: “This time I sank into the performance. I totally drowned in it. I don’t know, I don’t even remember what I played.” This participant seemed to enter into a type of musical “flow” state, where the music was simply made without thinking (see Sawyer, 2011). A third participant shared his similar approach to improvising:

...usually I don’t have these thoughts [having to think about what to play].... If I feel something, I just sit down and play it. But I’m not sure if it would be guessable for others. But in this case, the circumstances [having to perform a certain emotion in a group setting] kind of repressed me.

Interestingly, these latter two performers had above-average improvisation experience and both received above-average ratings for their improvisations on questions 2 and 3 in the expert questionnaire (“How personal was the performance?” and “Performer’s musical originality”). Perhaps their increased improvisation experience allowed them to use these unique, personal methods for improvising, which in turn resulted in improvisations that scored highly on personality and originality. It could also be that these two performers shared similar personality characteristics that facilitated emotional expressivity and originality in their performances, since specific personality traits (namely, agreeableness) have also been found to influence the intensity of music-induced emotions (Ladinig & Schellenberg, 2012). This would be a worthy subject of a follow-up study, utilizing the personality assessment completed by the participants of this study (the results of which have not yet been analysed).

Joy may be an emotion that is more difficult to perform in certain situations. Several participants in this study, when it came time to perform joy, mentioned having difficulty performing the emotion due to being in the wrong mindset. Interestingly, this difficulty was associated with joy far more than any other. This may also explain why participants tended to use a technical approach for improvisations based on joy (see Figure 5 in Section 4.1.2), since this emotion may call for a more cognitive and less intuitive approach than, say, a personal experience or nuance approach.

Eerola and Vuoskoski (2011) found that ratings for beauty in film music excerpts tended to be much more highly correlated with sadness than with happiness. This seemingly inherent idea of happy music being less beautiful or artistic than sad music could also be related to the low expert ratings for the improvisations based on joy.

5.3.2 Improvisation and originality

Simonton, in an analysis of melodic content by 479 composers, found that originality is lowest at the beginning of the composer's career but increases with experience (Simonton, 2001). It would be natural to assume that a similar relationship exists within the improvisation spectrum: that improvisational originality increases with experience. However, no such relationship was found between various aspects of musical experience (years of improvisation experience, years playing a primary instrument, years of piano playing experience) and the expert ratings for improviser's musical originality in this study. This is consistent with Schlicht (2007), who also found no connection between the originality of students' improvisations and a student's musical experience during a University-level course on musical improvisation.

These inconclusive results seem to be at odds with one of the oft-advertised benefits of improvisation training: that improvisation increases a student's musical creativity (see Koutsoupidou & Hargreaves, 2009; McMillan, 1997). One reason for this may be the difficulty in defining and measuring musical creativity. Koutsoupidou & Hargreave's study (2009), for example, utilized Webster's Measure of Creative Thinking in Music (Webster, 1987) to compare students' performance before and after six months of musical improvisation training and found a significant increase in test scores compared to a control group. The Webster test analyzes various aspects of children's performance on a variety of non-traditional musical tasks using a combination of instruments. The test, therefore, may not be directly related to real-world improvisational originality on a familiar instrument. McMillan's 1997 study, meanwhile, consisted of a three-year investigation into improvisation in the development of a personal musical identity. The study, summarized by Tafuri (2006), concluded that "five of the ten students selected had begun to develop a

personal way to express themselves on their instruments.” These results, while anecdotally interesting, can hardly be considered conclusive due to the small sample size.

5.4 Implications for improvisation pedagogy

“There is a complete absence of an accepted pedagogy in support of the nontechnical elements of musicianship.” (Cahn, 2005)

Though this study makes it clear that many different approaches to improvisation exist, the results indicate that no single approach consistently results in improvisations of higher quality than others (though improvisers may want to avoid using a purely technical approach). Instead, certain approaches may work best for certain individuals or for expressing certain emotions. A student, therefore, should be introduced to a variety of approaches and encouraged to experiment in their use. This is consistent with Huovinen et al.’s 2011 pedagogical study, which found that providing some restricting ideas may be more important than the specific style of instructions employed in a teaching situation. The general consensus is that a student would be best able to develop their own methods of improvisation and, hopefully, form an individual musical identity by being exposed to a variety of exercises and methods (see e.g. Schlicht, 2007; Huovinen, 2006; Cahn, 2005; Burnard, 2000).

As mentioned in Section 2.1, improvisation pedagogy has traditionally focused on developing a musician’s technical skills. More recently, however, the focus has seen a shift toward creating a deeper understanding of one’s “musical identity” (see e.g. Schlicht, 2007; Pett, 2007; Cahn, 2005). The results of this study suggest that there exists many naturally occurring ways that musicians approach improvisation; an ideal teaching system would therefore seek to address and build all of these approaches in music students, consistent with the view that a teaching style that uses multiple approaches is ideal (Koutsoupidou, 2008, Alperson, 1984).

5.5 Possible issues

This section addresses possible issues concerning the general idea and use of referents, the use of discrete emotions categories, and use of group sessions and self reports.

5.5.1 The use of referents

Smeijsters (2005) argues for a concept of *embodied meaning* in music, which would mean that music does not refer to anything outside of itself, and therefore is not a language with symbols, but is in itself the beginning and end of its meaning. As Smeijsters (2005) puts it, “music is meaningful not because it represents something outside itself, but because musical processes in itself [sic] are psychological processes.” (50). Smeijsters is writing as a therapist, so there are naturally different end goals and perspectives compared with performance-focused musical improvisation. The problem with this position, however, is that it denies the existence of referents because it argues that the meaning of music does not lie in its referents. In other words, musical meaning does not lie in the things music may refer to, therefore the things music may refer to do not exist. Once viewed from this angle, this is a difficult position to defend. Tagg (2013) argues against this kind of (mis)conception of “absolute music”, arguing that all music must refer to something, even if it refers to aspects of the broader compositional context, such as the composer’s personality, the culture in which was written, or the time during which it was written. Therefore, the ideal of absolute, purely aesthetic music as such does not exist. This study, obviously, sides with Tagg’s viewpoint and does not see an issue with the concept of referents—and consequently, metaphorical approaches—used in musical improvisation.

5.5.2 The use of discrete emotion categories

Both discrete and dimensional models of emotion have their respective drawbacks for music research. Gabrielsson & Lindström (2001) argued that two or three dimensions in a dimensional model of emotions “cannot capture all possible emotional nuances that we may perceive in music” (p. 244). On the other hand, they also argued that an overabundance of phenomenological terms in a discrete model of emotions may overwhelm participants with

too many choices. Additionally, the distinctions between specific nuanced emotions are not always clear and universally recognizable.

This study utilized a discrete emotions model due to its limited variables and its popular use in music studies (see Juslin, 2001). It was found that this lack of clear boundaries between emotions had a twofold effect on the improvisations produced in this study: (1) it led some participants to perform emotions in a stereotypical way in an attempt to accurately communicate the emotion; and (2) some of the more emotionally complex improvisations did not cleanly fit into a single emotional category. We attempted to compensate for the first issue by having participants perform using the 10 nuanced emotion words in the second session, which introduced participants to the idea of more complex emotions being contained within the primary emotion categories. Since this study focused on improvisation approaches rather than accurate representation of emotions, we did not see the second issue as affecting the results of the study.

The findings did, however, provide for some interesting relationships. For example, the improvisations based on love were rated high in both joy and sadness content by the experts in Stage 2 of this study (see Tables 2 and 3 in Section 4.2.1). In addition, there were high ratings for love on improvisations based on sadness. One possible explanation for this trend is the subjective aesthetic quality (i.e. the inherent “beauty”) related to music based on sadness (see Eerola & Vuoskoski, 2011).

5.5.3 Issues with using group sessions

Participants were placed into groups of four for the improvisation sessions. Initially, this was due to the constraints of the pop and jazz improvisation class in which a majority of participants were enrolled (and for which they received course credit for participating). Additionally, the strict timetable of the study did not allow for organizing 16 individual sessions.

Organizing participants into groups increased the efficiency of the study and provided a forum for natural group discussions; however, there were some downsides in implementing

group sessions compared with individual sessions. First was the effect of performing in front of a group. We realized the potential anxiety effects associated with performance in front of an audience (see e.g. Beckstead 2013, Cahn 2005, Bitz 1998) and sought to minimize these effects by (1) frequently reminding the participants that they would not be judged or graded in any way and that technical proficiency was not the subject of this study; (2) organizing three sessions for each group, which would allow participants to become comfortable with improvising in a group setting; and (3) setting the room up so the listeners sat facing away from the piano, so as to avoid comparison with a traditional audience-performer layout (see Figure 1 in Section 3.1.2). In addition to this, all sessions were discussion-focused, with discussions taking up approximately 60-70 minutes of the 90-minute session time, allowing for a natural group dynamic to form.

In spite of these efforts, however, the group dynamics varied widely between groups. For example, in Group 2 (incidentally, an all-female group), participants tended to be very open with personal stories and had an active group dynamic, as judged by the amount of laughter and overall tone of the conversation; whereas Group 4, a group with three younger (average age: 24) females and an older (age: 31) male, had a more subdued dynamic, with minimal laughter and less conversational depth. These dynamics may have affected the discussions that occurred in each group, influencing how much the participants were willing to share about their method of improvisation (especially when using a more intuitive/personal approach). This was an issue also faced by Persson (2001) in his study involving interviews with musicians on the topic of emotional aspects of preparing for a performance. He attributed the reluctance to delve deeper into emotional matters to be influenced by social and personality aspects.

5.5.4 Issue of using self-reports

Asking an improviser to reflect on his or her performance after the fact carries with it inherent risks. Schön (1987, p. 31) explains it thusly: “it is one thing to be able to reflect-in-action and quite another to be able to reflect on our reflection-in-action so as to produce a good verbal description of it.” Additionally, the performer’s improvisational process often

occurs subconsciously, thereby making it difficult to verbalize. This is the sentiment explained by Mountain (2001, p. 271):

Much of the compositional process can take place in the subconscious and composers have rarely felt any need to examine their strategies, much less to articulate them. Typically, the process and strategies employed differ widely according to the characteristics of the people involved.

We sought to minimize these possible adverse effects by having the discussions follow the sessions quickly after each improvisation (in the first two sessions) and after each round of improvisation (in the third session). Additionally, after going through the discussion process many times during the three-week period, participants were likely more aware of their own thoughts before and during the improvisation and were therefore better able to accurately articulate them by the third session.

6 CLOSING

The idea that performers are able to express different emotions through various compositional and performance features is nothing new, and the various ways music can express distinct emotions has been the subject of many studies. However, the methods that improvisers use prior to and during improvisation is an area of research that has not had much attention.

This study sought to shed light on naturally occurring improvisation methods and their effect on the resulting improvisations. As a result, five distinct approaches were identified, and negative correlations were found between a technical approach and two aspects of improvisation quality. In addition, two different ways of categorizing the approaches (a scale and a multi-layer categorization) were proposed.

A possible future areas of research would include looking into the personality traits and aspects that may influence the approaches used (e.g. personality traits, musical background, etc.). Personality data of the participants of this study was collected but has not yet been analyzed. A practical application of this research could include the development of improvisation teaching models that take each of these approaches into account.

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Appendix 1: Expert Questionnaire

1. How well do the following emotion words, in your opinion, describe this piece of music?

Joy: 0 1 2 3 4

Sadness: 0 1 2 3 4

Love: 0 1 2 3 4

Fear: 0 1 2 3 4

Anger: 0 1 2 3 4

2. How personal did the performance sound, in your opinion?

0 1 2 3 4

3. Improviser's musical originality:

0 1 2 3 4

4. How well did the improvisation work as a compositional whole?

0 1 2 3 4