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ABSTRACT

This paper discusses music creativity. Offering no simple definition of music creativity, it suggests that music creativity cannot be taught. What can be taught are the readinneses for one to fulfill potential for music creativity. The quality and extent of one's early musical environment, that will affect one's overall music aptitude, are perhaps the most powerful factors in determining the extent to which one can become musically creative. For students to learn to be as musically creative as their potential will allow, a teacher must know whether the student's aptitudes in tonal creativity are higher or lower than their aptitude in rhythm creativity, so that in instruction, the separate aptitudes may be compensated for and enhanced. Without acquiring an audiation vocabulary that includes a large number of tonal patterns and a large number of rhythm patterns in as many tonalities and meters as possible, levels of music aptitude notwithstanding, students will not have the necessary readinneses to become musically creative. Therefore, teachers must concentrate on teaching readiness for music creativity, not music creativity itself. It is the indirect, not the direct approach that will make the difference. Music aptitude is different from music achievement. Music aptitude represents one's potential to learn to audiate, whereas music achievement represents, among other things, what one has learned to audiate. There are two types of music aptitude: (1) developmental and (2) stabilized. Music aptitude is multidimensional. Addendums included in the document are: (1) types and stages of audiation; (2) music learning theory; (3) "Improvisation: Spontaneous Composition" (Billy Taylor); and (4) "Orientation and Intentionality as Components of Creative Musical Activity" (John Kratus). Contains 23 references in all. (DK)

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Audiation, Music Learning Theory, Music Aptitude, and Creativity

Edwin E. Gordon

It seems natural that when one thinks of the arts, he thinks of creativity, and when one thinks of creativity, he thinks of the arts. Thus it is not surprising that when one thinks of music, which is one of the arts, he thinks of creativity. That has advantages and disadvantages. One of the advantages is that music is immediately treated with awe in the minds of many sensitive, thoughtful, and influential persons. One of the disadvantages is that music teachers are expected by those persons to know how to teach their students to be musically creative. To teach a student to be musically creative is a complex, if not an impossible, undertaking. The reasons are varied. Those reasons are best understood by exploring the nature of audiation, music learning theory, and music aptitude.

My reasons for believing that music creativity cannot be taught should become increasingly clear as I explain the nature of audiation, music learning theory, and music aptitude. I will expound my belief that a student can be taught only to acquire the necessary information that will enable him to become musically creative to the extent that his potential will allow. I shall begin with audiation, move to music learning theory, describe music aptitude, and then conclude by explaining how all of them must serve as readinesses for music creativity, and how they collectively give rise to music creativity.

Audiation

A person audiates when he can hear and comprehend music for which the sound is not physically present. Audiation is not imitation. For example, I shall sing a short song without words, and then I would like you to sing it back to me. It is apparent that you imitated the song, but I am not sure that you audiated it. Did you know that the song is in Lydian tonality and that the meter of the song changed back and forth between triple meter and duple meter? If you did not, you were imitating but not audiating the song, because you did not comprehend what you were hearing. You simply learned the song by rote. Take another example. All of you, of course, can audiate Happy Birthday as being in major tonality and in triple meter. Are you able to audiate Happy Birthday, however, in harmonic minor tonality and duple meter? If not, your ability to audiate is limited.

Neither is audiation recognition. For example, most, if not all, of you would recognize the Mozart Symphony in G Minor upon hearing it, but would you be able to audiate all of the major themes of the symphony before, or even after, you heard the work? If not, you are capable of recognizing the symphony but not of audiating it. If I am asking you to do things which you cannot do, do not be too critical of yourselves. Remember, most of the music instruction you received in elementary school, in high school, and at the college and university levels emphasized imitation and recognition at the expense of audiation. Rarely, if ever, was audiation taught as a natural follow-up to imitation. At this point in the discussion I might ask you to give some preliminary thought to the question: Is it possible for one to become musically

creative if he cannot audiate, even though he may be able to imitate and recognize music?

Although imitation is the necessary readiness for learning how to audiate, audiation is significantly different from imitation as well as from recognition. Moreover, audiation is not the same as memorization. That an instrumentalist or a vocalist may perform in concert does not mean that either is necessarily audiating what he is performing. Many young, and some more mature, musicians simply have memorized what they perform without audiating what they perform. They have memorized the order and sequence of the music that they have learned by rote without comprehending it. Of course one can learn to memorize by reading notation as well as by listening to someone else perform.

As a result of the foregoing distinctions made among audiation, imitation, recognition, and memorization, perhaps many of you may be beginning to make a comparison between the roles of audiation and notation in music education. Unless one can audiate what is seen in notation before he produces sound on an instrument as dictated by the notation, what he is reading will have only theoretical meaning for him. Unfortunately he will be engaging in the act of attempting to take theoretical meaning from the notation rather than to give musical meaning to the notation. Without an idea of what the music should sound like before he reads it in notation, he cannot learn much about the music itself from the notation. Notation can only help one recall what he can already audiate. Moreover, one cannot learn to audiate notationally unless he has first learned to audiate. To attempt to teach musical creativity by using notation to one who cannot notationally audiate, or even audiate, is the handmaiden of folly.

Before leaving the topic of audiation, I should mention, although it is probably obvious, that there are various types and stages of audiation. Types of audiation include listening to music, reading music, writing music, performing music from recall, and improvising and performing music creatively. The stages of audiation are not so clear cut. Though the stages are hierarchical, two or more of the stages usually are concurrent. Consider, as an example, the stages of audiation that one ideally passes through when he listens to music. First, sound is audiated. Second, the sounds are grouped in audiation into tonal patterns and into rhythm patterns. Third, the tonality and the meter of the tonal patterns and rhythm patterns are audiated. Fourth, at the same time that the tonal patterns, rhythm patterns, tonality, and meter of the music heard just seconds earlier are being sustained in audiation, the forthcoming sounds of the music are being audiated. Fifth, tonal patterns, rhythm patterns, tonalities, meters, modulations, style, and form, to name only a few of the dimensions of music, are recalled from music that was heard days, weeks, months, or even years ago to help interpret the music which is currently being heard. Sixth, what will be heard next in the music is being predicted in audiation at the same time as what has been heard in the music is being sustained in audiation. (See Addendum A for more detailed information about the types and stages of audiation.)

It might be helpful to clarify the stages of audiation with an analogy. Consider language. You have been listening to me speak for a few minutes now. Think about how and in what sequence you are giving meaning to what I am saying. You are not giving meaning to what I am saying at the moment I say it. You are giving meaning to what I am saying by audiating what I said just a fraction of a second after I said it. To that extent, there is no present; there is only a past and a future. To be able to give meaning to what I am saying, you need to sustain

in audiation and to think about what I have said as you are hearing what I am saying. As you are sustaining in audiation and thinking about what you have heard and what you are hearing, you are recalling words and phrases that you have heard at previous times to assist you in thinking about and giving meaning to what you are not hearing me say. Finally, while you are doing all of that, you are thinking about and predicting what you believe I will be saying next.

Music Learning Theory

Music learning theory is simply an account of how we learn when we learn music. (See Addendum B for more detailed information about music learning theory.) Although music is not a language, we learn music in the same way that we learn a language. Audiation is to music what thinking is to a language. Pretend that you are listening to a piece of music. Consider how you give meaning to that music and the sequence in which you give meaning to that music. You give meaning to musical sounds by organizing them into tonal patterns and rhythm patterns in terms of one or more tonalities and meters. Tonal patterns and rhythm patterns are to music what words are to language, and tonality and meter are to music what syntax is to language. The more tonal patterns and rhythm patterns that you can audiate in different tonalities and meters, the more meaning you can bring in audiation to the music that you are hearing. That is, the more tonal patterns and rhythm patterns that you have in your audiation vocabulary, the better meaning you can bring to the music that you are listening to. You will not only interpret better what you have heard, but also you will understand better why what you may or may not have predicted to come next in the music does or does not make sense. Just as the number of words one can think with is highly correlated with language aptitude, the number of tonal patterns and rhythm patterns that one can audiate is highly correlated with music aptitude.

In language, one does not retain in thought all words that he has heard spoken in a lecture. In music, one does not retain in audiation all tonal patterns and rhythm patterns that he has heard performed in a piece of music. Only the essential patterns are retained in audiation. The summarization and organization in thought of the essential words into sentences provide the basis for syntactical linguistic meaning. Likewise, the summarization and organization in audiation of the essential tonal patterns and rhythm patterns into phrases provide the basis for syntactical musical meaning.

The fundamental premise of music learning theory is that one cannot efficiently or adequately give meaning to music that he is listening to, performing through recall or notation, or performing through improvisation or creativity unless he can audiate. If that is the case, it follows that one cannot be taught to create or improvise music with any degree of sophistication unless he can audiate. And if that is the case, it follows that one must teach himself how to create and improvise with tonal patterns and rhythm patterns that he has in his audiation vocabulary in the same way that one must teach himself how to develop sentences with words which he has in his thinking vocabulary. In a word, the act of music creativity and improvisation is the act of audiating *familiar* tonal patterns and rhythm patterns and then reorganizing them into an *unfamiliar* order and sequence.

Unless one can think about what he is going to say in a novel way before he says it, all

that he may produce is an endless stringing together of "like," "you know," "I mean," and "OK," each of which will be made to serve as a noun, verb, adjective, or adverb. There is a similar situation in music. Unless one can audiate what he is going to create and improvise before he performs it or even attempts to notate it, all that may be heard at best are the mechanics of scales and arpeggios, and at worst, mere exploration.

In the foregoing, I have not restricted my remarks to creativity. I have also talked about improvisation. I believe that creativity and improvisation are related to each other in the form of a continuum. The fewer restrictions there are, the more creativity takes place. The more restrictions there are, the more improvisation takes place. Thus improvisation is a limited type of creativity. For example, one is encumbered by few restrictions when he begins to create a piece of music. Once the tonality and meter, and perhaps the melodic range and the complexity of rhythm are decided upon to suit the intended performer or performers, the composer is relatively free to create what he pleases. On the other hand, when one improvises a variation, he follows a melodic line, and if one improvises in a jazz style, he typically follows a series of chord progressions.

A more extensive audiation vocabulary of tonal patterns and rhythm patterns is required to improvise than to create. That is particularly so in the sixth stage of audiation, in which one predicts what will be heard next. In improvisation, and to a more limited extent in creativity, rather than actually predicting, one is selecting from a number of patterns in his audiation vocabulary the pattern or patterns which might most logically and reasonably follow all of the patterns that have thus far been performed, and, in particular, the pattern that is being performed.

Music Aptitude

Before engaging in a discussion of music aptitude, I feel that I must make a few preliminary remarks to put you at ease. I know that when many of you hear the term "music aptitude," you immediately think of invalid and threatening music aptitude tests which are used to deny music instruction to enthusiastic students who demonstrate low levels of music aptitude. That should not be the case at all. There are valid music aptitude tests which are rather enjoyable to take. Moreover, the purpose of a well-designed music aptitude test is not to deny anyone music instruction. The purpose of a valid music aptitude test is to improve music instruction by teaching to students' individual musical differences. When a teacher teaches to students' individual musical needs in terms of the students' potential to learn music, students with low music aptitude do not become frustrated and frightened, and students with high music aptitude do not become bored and complacent. In the best tradition of music education, music aptitude tests are used to improve music instruction.

Music aptitude is different from music achievement. Music aptitude represents one's potential to learn to audiate, whereas music achievement represents, among other things, what one has learned to audiate. There are many aspects of music aptitude: it is normally distributed; just as there is no one without some degree of intelligence, so there is no one without some degree of music aptitude; music aptitude is not correlated with race, religion, nationality, or social status; and highly intelligent persons are not necessarily highly music nor

are highly musical persons necessarily intelligent. I will limit myself, however, to two concepts that are relevant to our topic today.

First, there are two types of music aptitude: developmental and stabilized. From the time a child is born, if not before birth, until he is approximately nine years old, his music aptitude is a product of both nature and nurture. He is born with a certain level of music aptitude, which may rise or fall, depending upon the quality of his music environment. The younger he is, the greater the effect his environment will have on his music aptitude. Because a child's level of music aptitude is subject to change, depending upon his musical surroundings, until he is nine years old, his music aptitude during that time is defined as developmental. After a child is nine years old, his music aptitude becomes stabilized. His musical environment will no longer have any effect on his level of music aptitude. That is not to say that a child cannot achieve in music after he is nine years old. What it means is that a child who is older than nine will not be able to achieve in music any higher than his level of stabilized music aptitude will allow. It follows that a child's early exposure to music may well be the most important determining factor of the extent to which he will be able to create musically when he is older.

Second, music aptitude is multidimensional. As an example, ask yourself if your tonal aptitude is higher than your rhythm aptitude or if your rhythm aptitude is higher than your tonal aptitude. You would be a rare person if in fact your tonal aptitude and rhythm aptitude are at the same level. If you have a high tonal aptitude, you are probably average or low in rhythm aptitude. If you have a high rhythm aptitude, you are probably average or low in tonal aptitude. To make matters more complex, in my initial research into the nature and description of music aptitude more than thirty years ago, I identified no fewer than thirty-two different music aptitudes. Music creativity and music improvisation were two of those stabilized music aptitudes. The typical person has a music aptitude profile in which creativity aptitude and improvisation aptitude are at different levels, and each is at a different level from his tonal aptitude and rhythm aptitude levels.

Summary

It is clear that I have no simple definition of music creativity. It is clear, however, that I believe that music creativity cannot be taught. What can be taught are the readinesses for one to fulfill his potential for music creativity. Moreover, the quality and extent of one's early musical environment, which will affect one's overall music aptitude, is perhaps the most powerful factor in determining the extent to which one can become musically creative. For a student to learn to be as musically creative as his potential will allow, a teacher must know whether his aptitude in tonal creativity is higher or lower than his aptitude in rhythm creativity, so that in instruction his separate aptitudes may be compensated for and enhanced.

It is true that unless one learns early to feel free while still following a discipline, he will find it difficult to emerge at a later time as a creative musician. There is little doubt in my mind that to be able to create is one thing and to be able to create in a given style is another. Without constant early exposure to a given style, the likelihood that one will be able to create in that style is questionable. Nevertheless, I do not want to give the impression that music aptitude and the quality and quantity of one's musical environment are the only factors that play important roles

in music creativity. I hope that I have emphasized that without acquiring an audiation vocabulary that includes a large number of tonal patterns and a large number of rhythm patterns in as many tonalities and meters as possible, levels of music aptitude notwithstanding, one will not have the necessary readinneses to become musically creative. So I say we must concentrate on teaching readiness for music creativity, not music creativity itself. It is the indirect, not the direct, approach that will make the difference.

Edison said that it took ninety-nine percent perspiration and one percent inspiration to create the light bulb. I believe that it takes much work and motivation on the part of the music student, as well as on the part of the music teacher, for the student to acquire an audiation vocabulary of tonal patterns and rhythm patterns large and varied enough to form a foundation for becoming a musically creative artist. To that extent, perhaps there is no pure creativity at all. There may be only the continual rediscovery of eternal truths.

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Addendum A*

Types and Stages of Audiation

Type 1: The most common type of audiation takes place as we are listening to music. When we listen to familiar and unfamiliar music, we audiate familiar and unfamiliar tonal patterns and rhythm patterns, and then connect them in order to give syntactical meaning to the music. The same procedure takes place as we listen to someone speak. We attend to the individual words, put them together into phrases and sentences, and then give syntactical and grammatical meaning to what is being said. In speech we audiate only those words that are essential to the meaning of what is being said and dismiss the unessential words that we hear. In music we audiate only the essential pitches of a tonal pattern and the essential durations (note values) of a rhythm pattern. We dismiss the pitches and durations, perhaps even entire patterns, that are not essential for giving syntactical meaning to the music. Because the patterns that we are audiating include only essential pitches and durations, they are abbreviations of the complete patterns that we are hearing. Moreover, the patterns of essential pitches and durations that we are audiating are not exactly the same as the complete patterns that we are seeing in notation.

Essential pitches and durations in a pattern are those which establish the function of a pattern and contribute to the syntactical meaning of the music. Essential pitches in a tonal pattern may indicate, for example, a tonic or a dominant function in major or minor tonality. Essential durations in a rhythm pattern may indicate, for example, a macro and micro beat or division and elongation function in duple meter or triple meter. Unessential pitches in a tonal pattern may be consecutive or non-consecutive repeated pitches, and unessential durations in a rhythm pattern may be durations which are divisions of micro beats or elongations of macro beats.

Type 2: The second type of audiation takes place as we are reading the notation of familiar and unfamiliar patterns in familiar and unfamiliar music. It is called notational audiation. We may read silently, or we may perform what we read with our voice or on an instrument, or we may read as someone else performs the music. To read is to audiate through notation what is to be performed before it is performed. When reading the notation of familiar and unfamiliar music, we should be able to organize and audiate familiar and unfamiliar patterns from the series of symbols that we see in notation without the aid of aural perception. Unessential pitches and durations in the tonal patterns and rhythm patterns that we are reading are unconsciously excluded from the patterns of essential pitches and durations that we are audiating as we are reading.

Type 3: A third type of audiation takes place as we are writing from dictation familiar and unfamiliar patterns in familiar and unfamiliar music. It is also notational audiation. When writing familiar and unfamiliar patterns in familiar and unfamiliar music from dictation, we audiate what we have aurally perceived. Then we represent what is being audiated with symbols in notation. Although we audiate only the essential pitches and durations of the tonal patterns and rhythm patterns that are to be written, we unconsciously place the unessential pitches and durations of the tonal patterns and rhythm patterns in the complete patterns as they are being written.

Type 4: A fourth type of audiation takes place as we are recalling without the aid of notation familiar tonal patterns and rhythm patterns in familiar music, and performing them silently, vocally, or on an instrument. Each of the familiar patterns in the familiar music that we are organizing and audiating in recall guides us in organizing and sequentially recalling in audiation the remaining familiar patterns in the familiar music. The process continues throughout that piece of familiar music. We do not recall a familiar piece of music as a result of memorizing it. We recall a familiar piece of music by organizing and sequentially audiating familiar tonal patterns and rhythm patterns of essential pitches and durations and by unconsciously placing unessential pitches and durations of the tonal patterns and rhythm patterns in the complete patterns as they are being recalled in audiation. When we are performing, vocally or instrumentally, familiar music that we are recalling in audiation, muscular activity, such as fingering and vocal cord movement, may aid us in our organization and recall.

Type 5: A fifth type of audiation takes place as we are writing familiar patterns in familiar music that we are organizing and recalling through audiation. It is also notational audiation. Each of the familiar patterns in the familiar music that we are organizing and audiating in recall guides us in organizing and sequentially recalling in audiation the remaining familiar patterns in the familiar music. The process continues throughout the piece of familiar music. As in Type 4, where familiar music is recalled but not written, when the music is written it is not recalled as a result of memorizing it. Although we audiate only the essential pitches and durations of the tonal patterns and rhythm patterns that are to be recalled and written, we unconsciously place the unessential pitches and durations of the tonal patterns and rhythm patterns in the complete patterns as they are being recalled and written.

Type 6: A sixth type of audiation takes place as we are creating or improvising unfamiliar music, using both familiar and unfamiliar patterns, and performing it silently, vocally, or on an instrument. Each of the familiar and unfamiliar patterns in the unfamiliar music that we are creating or improvising in audiation guides us in recalling in audiation familiar patterns and in organizing and recalling in audiation familiar and unfamiliar patterns. The process continues throughout the piece of unfamiliar music. Unessential pitches and durations are unconsciously placed in the complete tonal patterns and complete rhythm patterns as the unfamiliar music is being created and improvised in audiation.

Type 7: A seventh type of audiation takes place as we are writing unfamiliar music, using both familiar and unfamiliar patterns, that we have just recently or are presently creating or improvising. It is also notational audiation. When we are writing music that we are creating or improvising, each of the familiar and unfamiliar patterns in the unfamiliar music that we are creating or improvising in audiation guides us in recalling in audiation familiar patterns and in organizing and recalling in audiation familiar and unfamiliar patterns. The process continues throughout the piece of unfamiliar music. Unessential pitches and durations are unconsciously placed in the complete tonal patterns and complete rhythm patterns as the unfamiliar music is being written in audiation.

The six stages of audiation as well as the process can only be theorized at this time. When, however, learning conditions for a given type of audiation are ideal in terms of music learning theory, none of the stages of audiation is omitted. In that case, the stages of audiation are hierarchical. When one or more of the stages are omitted in the audiation process, the

stages of audiation are usually not hierarchical, and learning is far from ideal. After the first stage of audiation is initiated and the ideal audiation process continues however, from two to six stages of audiation occur concurrently. Moreover, it is possible to combine different types of audiation. For example, one typically engages in Type 1 of audiation as he is engaging in Type 4 of audiation.

There are small differences in how the first stage of audiation is initiated in six of the seven types of audiation. The differences, however, do not affect the hierarchical nature of the stages of audiation. The six stages of audiation are explained below as they occur in Type 1 of audiation, listening to familiar and unfamiliar tonal patterns and rhythm patterns in familiar and unfamiliar music. The types of audiation in which the first stage of audiation is initiated in the same way and those in which it is initiated differently are identified after every stage of audiation is discussed.

Stage 1: Before we audiate the essential pitches and durations in the music that we are hearing, we are unconsciously audiating short series of pitches and durations that we heard just a moment earlier in the music. Because there is no conscious present, but rather, an immediate past, we do not audiate what we hear at the exact moment that we heard it. We audiate the series of pitches and durations that we aurally perceived in terms of immediate impressions without giving the series of pitches and durations any musical meaning. We retain the series of pitches and durations as an "after-sound" for only a few seconds, about the same length of time that we retain an afterimage of what we have just seen. As with an afterimage, unless musical meaning is given to the after-sound in Stage 2 within a few seconds, what is being retained in Stage 1 is lost.

Stage 2: As we hear the music and unconsciously audiate the series of pitches and durations, we are consciously and silently imitating all of the pitches and durations in the series. Then we consciously organize through audiation the series of pitches and durations into one or more tonal patterns of essential pitches and one or more rhythm patterns of essential durations. We organize the tonal patterns and rhythm patterns of essential pitches and durations on the basis of consciously recognizing or identifying the pitch center and the placement of the macro beats in the music. The process is a continuous interaction between organizing tonal patterns and rhythm patterns of essential pitches and durations, and recognizing and identifying the pitch center and the placement of macro beats in the music. The more sure we are of the pitch center and the placement of macro beats in the music, the better we can recognize or identify the tonal patterns and rhythm patterns of essential pitches and durations in the music.

Stage 3: As a result of recognizing or identifying the pitch center and the placement of macro beats, and continuously organizing tonal patterns and rhythm patterns of essential pitches and durations in the music, we are consciously establishing the tonality and the meter of the music. The more sure we are of the tonality and meter of the music, the better we can recognize or identify the tonal patterns and rhythm patterns of essential pitches and durations in the music. We are engaging in the first three stages of audiation simultaneously. The process is a continuous interaction between organizing tonal patterns and rhythm patterns of essential pitches and durations and of establishing the tonality and meter of the music. Such interaction may result in making us assess and possibly restructure the tonal patterns and

rhythm patterns of essential pitches and durations that we have organized earlier and are retaining in audiation. We may also clarify and make better decisions about the tonality and meter that we are audiating, about the tonal patterns and rhythm patterns of essential pitches and durations that we will be organizing, and about tonality and meter modulations that may have occurred and will be occurring in the music.

The tonal patterns and rhythm patterns of essential pitches and durations, each of which must contain at least two pitches or two durations, are organized separately. How tonal patterns and rhythm patterns of essential pitches and durations are organized, however, cannot be explained precisely. There are individual differences in how persons in the same culture choose essential pitches and durations to organize tonal patterns and rhythm patterns in audiation. It follows that persons from diverse cultures would also choose different essential pitches and durations in organizing tonal patterns and rhythm patterns in audiation. Nonetheless, the essential pitches and durations that we, in our culture, choose to organize tonal patterns and rhythm patterns is directed by the tonality and meter that we are audiating. For example, essential pitches may be organized to outline a tonic or dominant function in the tonality that we are audiating, or to outline pivotal points in changes of tonality, keyality, or melodic contour. Essential durations may be organized to outline a macro and micro beat function or a division and elongation function in the meter that we are audiating, or to outline pivotal points in changes of meter, tempo, rhythmic structure. Factors associated with form, style, dynamics, and timbre may also have an effect on how essential pitches and durations are organized. A pattern of essential pitches may have absolutely nothing in common with a pattern of essential durations in a given piece of music.

Stage 4: As we are engaging in Stages 1, 2, and 3 of audiation, in Stage 4 of audiation we are consciously retaining in audiation tonal patterns and rhythm patterns of essential pitches and durations that we have already organized in the music. We are engaging in the four stages of audiation simultaneously in a cyclic process as the stages are interacting with one another. Such interaction may result in making us further assess and possibly restructure the tonal patterns and rhythm patterns of essential pitches and durations that we have organized earlier and are retaining in audiation. Moreover, we may also clarify and make better decisions about the tonality and meter that we are audiating, about the tonal patterns and rhythm patterns of essential pitches and durations that we will be organizing, and, for example, about tonality and meter modulations that may have occurred and will be occurring in the music. It is in Stage 4 of audiation that we bring into fulfillment our recognition or identification of sequence, repetition, form, style, timbre, dynamics, and other relevant factors that enable us to give musical meaning to music. For example, it is not possible to recognize or identify a canon without engaging in Stage 4 of audiation. As more stages of audiation are introduced, tonal aptitude and rhythm aptitude largely determine the extent to which one can audiate and learn from the audiation process.

Stage 5: As we are engaging in Stages 1, 2, 3, and 4 of audiation, in Stage 5 we are consciously recalling patterns of essential pitches and durations that we have organized and audiated in other pieces of music. We do this in terms of present music. We may have heard the other pieces of music a day, week, month, or years ago. We are engaging in the five stages of audiation simultaneously in a cyclic process as the stages are interacting with one another. Such interaction may result in making us further assess and possibly restructure the tonal

patterns and rhythm patterns of essential pitches and durations that we have organized earlier and are retaining in audiation. Moreover, we may also clarify and make better decisions about the tonality and meter that we are audiating, about the tonal patterns and rhythm patterns of essential pitches and durations that we will be organizing, and, for example, about tonality and meter modulations that may have occurred and will be occurring in the music.

The more music that we have heard and the larger our established vocabulary of patterns of essential pitches and durations in various tonalities and meters, the better we can engage in Stage 5 of audiation. If we have heard very little music and thus have developed a vocabulary of only a few patterns of essential pitches and durations, we can profit little from Stage 5, if indeed we can even engage in audiation beyond Stage 4. As with language, the more words that we have in our vocabulary, the better we can communicate. In music, the more patterns of essential pitches and durations that we have in our vocabulary, the better we can audiate. Moreover, if music that we are hearing is familiar, the audiation process becomes relatively simple. If music that we are hearing is unfamiliar, the audiation process can become complex.

Stage 6: As we are engaging in Stages 1, 2, 3, 4, and 5 of audiation, in Stage 6 we are consciously predicting the next patterns of essential pitches and durations that we will be audiating in the music. With the possible exception of Stage 5 of audiation, more patterns of essential pitches and durations are audiated at Stage 6 of audiation than at any other stage. Our predictions are based upon the tonality and the meter that we are audiating and upon the patterns of essential pitches and durations that we are retaining in audiation from the music that we are hearing, as well as from other pieces of music that we have heard. The more accurate our predictions, the better we understand the music. If our predictions are not borne out in the music that we are hearing, we will encounter some difficulty in understanding the music. If only a few of our predictions are inaccurate, we will continue the cyclic process of audiation and make only simple alterations in our further predictions. Should our predictions be grossly inaccurate or should we make no predictions at all, the audiation process will revert to and probably remain a Stage 1, and the music will have no musical meaning for us.

The stages of audiation are the same for Types 1 and 2 of audiation with the following exception: visual perception activates the first stage of audiation when we read music. That is, immediate visual impressions replace immediate aural impressions in Type 2 of audiation. The stages of audiation are exactly the same for Types 1 and 3 of audiation. The stages of audiation are the same for Types 1 and 4 of audiation and for Types 1 and 5 of audiation with the following exception: unconscious audiation activates the first stage of audiation when we recall music. That is, unconscious audiation of the short series of pitches and durations replaces the immediate aural impressions of the short series of pitches and durations in Types 4 and 5 of audiation. The stages of audiation are the same for Types 1 and 6 of audiation and for Types 1 and 7 of audiation with the following exception: unconscious audiation activates the first stage of audiation when we create and improvise music. That is, unconscious audiation of the short series of pitches and durations replaces the immediate aural impressions of the short series of pitches and durations in Types 6 and 7 of audiation.

With specific regard to creativity and improvisation, we activate sounds unconsciously at Stage 1 of audiation. At Stage 2 of audiation, the sounds are organized into tonal patterns

and rhythm patterns which will be used as we create and improvise. At Stage 3 of audiation, the patterns that we are using to create or improvise are given further syntactical meaning by audiating one or more tonalities and meters. At Stage 4 of audiation, we retain in audiation the patterns that we have already created or improvised in the piece of music. At Stage 5 of audiation, we recall from other pieces of music that we have heard, created, and improvised patterns, tonalities, keyalities, meters, and tempos to assist us in further creating or improvising the music at hand. At this stage of audiation, a great deal of revision and interpretation may take place in our audiation with regard to the music that we are creating or improvising. At Stage 6 of audiation, we audiate concurrently a host of patterns, some of which are and others which are not suitable for use in what we will be creating or improvising next. In a sense, we are beginning to predict the nature of patterns that will be of use to us when we cyclically return to Stage 1 of audiation in the creative or improvisatory process.

*Taken and adapted from Learning Sequences in Music: Skill, Content, and Patterns by Edwin E. Gordon. Chicago: GIA, 1989, pp. 10-18.

Addendum B*

Music Learning Theory

Music learning theory includes three categories of music learning sequence. They are 1) skill learning sequence, 2) tonal content learning sequence, which includes tonal pattern learning sequence, and 3) rhythm content learning sequence, which includes rhythm pattern learning sequence. All three are considered part of music learning theory, because skill learning sequence must be used in conjunction with either tonal content learning sequence or rhythm content learning sequence. That is, it is impossible to teach a skill without some content (tonal patterns in a given tonality and keyality, and rhythm patterns within a given meter and tempo). For purposes of this paper, however, it is necessary to describe only skill learning sequence.

Skill learning sequence is divided into two general types: discrimination and inference. Discrimination learning is fundamental: it is the readiness for inference learning. Discrimination learning and inference learning, however, are not mutually exclusive. The two types of learning take place concurrently as one or the other receives emphasis. Rote learning is accentuated at discrimination levels of learning and conceptual learning is accentuated at inference levels of learning. We use limited types of inferences when we are engaging in discrimination learning, and we use much, if not all, of what we have discriminated in terms of rote information when we are engaging in inference learning. Unless a student has learned to make discriminations, he cannot learn. Without the ability to discriminate, he would find that everything sounds the same in his limited ability to audiate.

Discrimination learning takes place when students are conscious of, though they may not fully understand, that they are being taught, for example, that two familiar tonal patterns sound the same or different. Students are conscious of what they are learning because they are being taught by someone else, usually a parent or teacher. Inference learning takes place when students are not conscious of what they are learning, because they are teaching themselves, for example, that two unfamiliar tonal patterns sound the same or different. Through the use of learning sequence activities, a teacher teaches students how to learn and what to learn in discrimination learning, but only how to learn in inference learning. A student acquires by rote the majority of tonal patterns and rhythm patterns that are in his audiation vocabulary through discrimination learning. He then conceptualizes those tonal patterns and rhythm patterns, as well as some unfamiliar ones, when he creates and improvises through inference learning.

Discrimination learning and inference learning are divided into hierarchical levels. Some of the levels are further divided into hierarchical subparts. On the following page is an outline of the discrimination and inference levels and subparts of the levels of learning. The levels are in capital letters and subparts are in lower case letters. The most elementary level of learning is found at the top and the most elementary subpart of a level of learning is found to the left under the level of learning. Also, "Reading," to the left, precedes "Writing," to the right, under the subpart "Symbolic" in two levels of inference learning. It is important to understand that after each level or subpart of a level is achieved in the learning sequence, it becomes

combined with and interacts with the next higher level or subpart of a level of learning in the learning sequence hierarchy. Just as inference learning incorporates discrimination learning, every level of learning (except, of course, the most elementary) incorporates all lower levels of learning, and every subpart of a level of learning incorporates all lower subparts of that level of learning.

DISCRIMINATION LEARNING

AURAL/ORAL
VERBAL ASSOCIATION
PARTIAL SYNTHESIS
SYMBOLIC ASSOCIATION
Reading-Writing
COMPOSITE SYNTHESIS
Reading-Writing

INFERENCE LEARNING

GENERALIZATION

Aural/Oral Verbal Symbolic
Reading-Writing

CREATIVITY/IMPROVISATION

Aural/Oral Symbolic
Writing

THEORETICAL UNDERSTANDING

Aural/Oral Verbal Symbolic
Reading-Writing

*Taken and adapted from Learning Sequences in Music: Skill, Content, and Patterns by Edwin E. Gordon. Chicago: GIA, 1989, pp. 33-37.

Improvisation: Spontaneous Composition

Billy Taylor

When Africans were brought to the United States as slaves they were forced to be imaginative and resourceful in order to survive the harsh, restricted and demeaning realities of enslavement. Individually and collectively, they restructured and retained as many cultural supports as they could. They were very creative.

Since, in Africa, music was utilized to teach, to heal, to accompany work and play, to celebrate events and communicate ideas and feelings, they adapted their musical concepts to their new situations and created new musical forms to satisfy their needs. These displaced Africans, who were separated without regard to family, tribe, or country of origin, created new work songs, spirituals, folk songs, play songs and other types of music to help them cope with their new difficulties. The music they created has become the base upon which indigenous American music has been built.

Jazz, America's classical music, can be traced back to the spirituals, work songs and other music created by black slaves. It has been defined as a way of playing music, a repertoire which documented and codified that way of playing as it developed and evolved through many historical periods and styles and a means of personal expression. Jazz is all this and much more. It has withstood the test of time. It has served as a model for countless musical styles. It is the most influential music of the twentieth century. It has transcended its roots and reached out to people of all cultures in every corner of the world. The history of jazz and jazz concepts are being taught in Austria, Bulgaria, Czechoslovakia, England, the Federal Republic of Germany, Finland, France, Holland, Hungary, Italy, Norway, Poland, the Soviet Union, Spain, Sweden, Switzerland and in many other countries throughout the world. In Europe alone there are more than 555 jazz festivals every year. Freedom of personal expression is not taken lightly outside of the continental United States and jazz graphically expresses this freedom.

Creativity is of paramount importance to jazz musicians, so the creative process has traditionally been taught from the perspective of the jazz composer/performer who must use his/her skills and experience to create music spontaneously. For years, this was done in a master/pupil relationship. More recently, this training has taken place in schools, workshops, clinics, master classes and through other school and community based programs. This trend has enabled musicians trained in the European classical tradition to learn a great deal about the creative process from another perspective when they studied jazz seriously.

What jazz musicians refer to as improvisation is a form of spontaneous composition. The performer/composer uses timetested jazz concepts and resources to express personal ideas and/or feelings. These concepts and resources include, but are not limited to, jazz forms (Blues, jazz waltz, etc.). Those jazz forms are codified in the historically chronological styles of jazz (ragtime, swing, bebop, etc.).

The drum provided the rhythmic center for the music of many Africans. It was also used as a means of communication. When the use of the drum was forbidden and banned by law,

slaves became very creative in devising workable alternatives. The importance of imagery in their languages was expanded into musical devices which helped make the music they created more effective as an interactive process. Call and response provided one structure which allowed for individual creativity of expression. Another structure was the evolution of today's drum kit - a base drum played with the right foot, two cymbals mounted on a stand and played with the left foot, a snare drum, several tom-toms and several cymbals mounted on individual stands and played with drum sticks, mallets and wire brushes. This arrangement of instruments gives one player the ability to do what it takes several players to do in a band or symphony orchestra. There are many other examples.

Creativity often stems from the musician's need to solve a problem. Jazz musicians have traditionally been both inventive and innovative as problem solvers. The music they created was used in many social situations, so they had to be sensitive to the expectations of their audiences as well as the aesthetic needs of their fellow musicians. Each soloist had to master the art of composing a melody spontaneously. Sometimes that melody was the lead melody and sometimes it was a counter melody or a bass line, but no matter what it was, the musician creating it had to be prepared to use the jazz vocabulary effectively in his/her development of the melody, harmony and rhythm of the music being played.

In the early days of jazz, the jam session was the venue of choice for experimentation, exploration and stylistic development on both the individual and group level. Adventurous improvisors expanded the jazz vocabulary melodically, harmonically and rhythmically, codified the styles in distinctive compositions and stimulated further musical advances.

When one examines the compositions of jazz composers like Duke Ellington, Charlie Parker, James P. Johnson and Horace Silver one finds music which codifies the individual and collective experimentation, exploration and stylistic development of the jazz styles which those musicians epitomize. These composers and others have fused together concepts and devices which define very well the jazz they identify with, yet their music is original and complex as well as traditional and accessible.

Tenor saxophonist Lester Young often spoke of the process of improvisation as "telling your story." His approach to improvisation was intuitive and very imaginative. He seemed to convey an aural imagery which was very personal. Two generations later, John Coltrane projected an aural imagery which was just as original but much more highly energetic and complex. He was telling a different story but he was equally creative.

In his book, Fundamentals of Musical Composition, Arnold Schoenberg says, "The chief requirements of a comprehensible form are logic and coherence." This statement is as true for a jazz improvisation as it is for a composition created in the European classical tradition. Serious jazz musicians do not want their improvisations to ramble or to be incoherent, so they use all the technical resources they have mastered in their attempts to give their spontaneously created music the same kind of unity and coherence that is found in compositions in which every element has been worked out before hand.

In my work with students I have applied some of the improvisatory principles of jazz to other disciplines such as visual arts, dance and the spoken word. Starting with simple

problems which required no special techniques from the students, we progressed to more structured creative efforts which gave the students motivation to try to develop skills which would enable them to express ideas and moods on a higher aesthetic level. For example: "Pick a subject you feel you know a lot about and tell me something I don't know. For instance, what do you do for fun?" - "I ride my skateboard." - "Are you any good?" "Yeah!" - "Did you have to practice so that you wouldn't fall off?" - "Yeah." "Tell me what you did to get good at it." - The student told me in great detail what he went through in order to be able to go up a wall on a skateboard. Because I was interested, standing two feet from him and looking him directly in his eyes, he proudly explained how he developed his skill, forgetting for the moment the others in the class. When he finished I thanked him for telling me about his accomplishments and explained to him that he had improvised with words in the same way that I sometimes improvise with music. He was pleased because he realized he had held the interest of his classmates as well. I also pointed out the time, effort and practice it took to develop the skills he needed to "walk the wall" on his skateboard. I showed him a simple motive on the piano. As he played it I played a few different rhythmic and harmonic devices under it. I gave other members of the class some rhythm instruments, showed each of them different rhythms and asked them to play along with us. At one point I asked each player to improvise a four bar solo while the rest of us played accompanying figures. As we went around the class, some developed more confidence and took a few chances. I made a few suggestions and then we put it on tape. They really liked the result and I asked them to listen first to see if they could really hear what everyone was playing. I played the tape again and asked them to focus first on the part they played then on the part someone else played. This was a one day workshop so I did not have an opportunity to follow up on any of the ideas I presented to the class but my objective was to give them a musical experience which would demonstrate the creative process on a very basic level and then involve them in a musical setting which would allow them to interact with their fellow students.

Improvisation has played an important role in the development of jazz. It should be used more effectively by music teachers as a tool which will help students develop musical skills which will enable them to use the creative processes utilized by jazz musicians to express their personal thoughts and feelings. Jazz is America's classical music, we can all learn a great deal from it. There are no wrong notes when one is spontaneously composing music. There are only wrong solutions to musical problems. Every professional jazz musician uses a common vocabulary and many shared resources and devices to create his/her improvisations and since many jazz musicians are also teachers and writers a lot of this information is available to music teachers and the general public. We can help students develop their musicality to a higher level by using improvisation as a vehicle.

Reference

Schoenberg, Arnold. (1967). Fundamentals of Music Composition. Edited by Gerald Strang, with an introduction by Leonard Stein. New York: St. Martin's Press.

Orientation and Intentionality as Components of Creative Musical Activity

John Kratus

Vignette No. 1

The 3-year-old boy sits cross-legged on the floor in front of a wooden xylophone. Clutching a mallet in his small fingers, he hits the longest bar at the end of the instrument. He likes the sound, so he hits the bar again, this time with more gusto. The effect is even better, and he would like to hit it again, but there are all those other bars to attend to. So many choices! He aims the mallet at the next bar in line and the next, until he arrives at the smallest bar. Then he carefully begins to reverse his actions, moving down to the largest bar again. The entire sequence of actions is repeated several times in a mechanical process not unlike counting numbers or saying the alphabet. Suddenly he begins to bash at the instrument, hitting all the bars as fast as he can. All the sounds seem to be happening at once -- what wonderful music!

In the next room, the boy's mother, a professional composer, is putting the finishing touches on a new string quartet. As is her habit, she works quietly, away from a piano, letting the swirling sounds of the quartet fill her mind. She imagines an ascending chromatic passage in the viola, which unites the melodies she has previously written for the cello and the first violin. At first she struggles to hear inwardly the clashing chords that the viola would create with the other instruments. The passage plays in her head several times as she considers the merit of the new line. She decides that the musical effect is glorious, and she smiles to herself as she writes the part. As she writes, she allows herself to focus on the sounds coming from the next room. 'Are these percussive sounds the first sparks of musical genius or are they simply noise?' she wonders.

Introduction

Both the young child exploring sounds on a xylophone and the adult composer writing a string quartet are engaged in creative musical activities. In fact we might speculate that the child's and adult's acts represent two ends of a continuum of creative musical activity. To move from novice to expert on such a continuum might require musical knowledge, aptitude, and experience.

I believe that this view is flawed, however, because it does not account for fundamental, developmental differences in the perspectives of the creators. Developmental psychologists have shown that the difference between child and adult cognitive functioning is not simply a matter of adults knowing more than children. Child thought differs from adult thought in qualitatively different ways. Piaget and other developmental psychologists have shown that children's logic is different from adults'. I propose that similar developmental differences exist for musical creativity. The child and the adult in Vignette Number 1 are not engaged in different levels of the same activity. There are qualitative differences in their approach to creative

musical activity.

The aim of this paper is to discuss two ways in which the creative functioning of the child or novice musician differs from that of the knowledgeable creative musician. This discussion will be limited to creativity as it relates to production of new and original music, and will not include reference to creativity as it occurs in the performance of music composed by others or creativity as it occurs in creative listening. Specifically, I will consider two assumptions about musical creativity that I believe are inappropriately applied to all creative musical work. The first assumption is that one engages in musical creativity to create something. The second is that the way music created on an instrument sounds is the way that its creator intended for it to sound. Based on my discussion of these two assumptions, I will propose four types of creative musical activities and will conclude the paper with implications for research and teaching.

An examination of the perspective of the child or novice musician is necessary, because the few models we have for musical creativity (Lerdahl, 1988; Pressing, 1988; Webster, 1987) are derived from creative activities as engaged in by knowledgeable musicians. These models are certainly useful as researchers begin to examine musical creativity in greater depth. But I believe that researchers and educators must also consider the ways in which children's approach to creative activities differ from these models, if we are to successfully understand children's musical creativity and appropriately educate children through creative musical activities.

Vignette No. 2

The bemused parent stands behind the young child painting at an easel and asks, "What is it?" Before answering, the child hesitates for a moment and looks with a puzzled expression at the painting. 'How cute,' the adult thinks, wondering whether these blobs of green, orange and blue are a car or a dog or a boat in the child's mind. After a few flickering seconds, the child mumbles a response, leaving the adult to marvel at the green chimney on a blue horse.

Process Orientation and Product Orientation

If we examine the moments of indecisiveness between the adult's question and the child's response, we might be led to hypothesize about the nature of the child's creativity. Could it be that the child pauses when asked "What is it?" because the answer to the question is "nothing"? By "nothing" I do not only mean that the child is not painting a representation of objects in the real world. I suggest that when most young children engage in creative artistic work, they are creating "nothing" in the sense that they intend to create *no thing*. Adult observers of children commonly take the view that a child engages in creativity to create something (i.e., a product). Adult reactions to children's creative work are usually focused on the created product. But I think that for many, if not most, children, creativity is an end unto itself, not a means to create a product. Certainly, products arise from creative work, but for children who simply wish to engage in the creative process, the product is incidental, a byproduct of the process.

Consider an analogy between musical creativity and bicycle riding. For some people, a bicycle is considered transportation, and riding a bicycle is a means to reach a desired outcome, i.e., arriving at a specific destination. For others, though, bicycle riding is an end unto itself, and the joy of riding with no particular destination is a sufficient outcome. Both types of riders can derive pleasure from the activity, but the first type uses the process of riding to achieve the product of arrival, whereas the second type engages in the process for its own sake. The former rider can be referred to as having a product orientation, and the latter as having process orientation.

I do not mean to imply that persons approaching a task with a process orientation are not goal-directed. They are. But the goal for process oriented persons is the experience of travel, not the pleasure of arrival.

Similarly, one can approach musical creation with a product orientation or a process orientation. The question an observer must ask is: Is the creator's intent to produce a product (i.e., a composition or an improvisation), or is the creator interested in engaging in the process for its own sake? The difficulty for teachers and researchers is that they typically assume a product orientation in children, when, in fact, a process orientation may be more common. For example, if a teacher asks a child to compose a song on a xylophone, the teacher assumes that the child will work to produce a unique, fixed set of pitches and durations. The child, instead, may create music with pitches and durations that are not fixed, so that each time the child is asked to perform the song, the "song" is different. In such a case, the product is not a product at all, in that it does not exist as a fixed entity; rather, the child's music could be considered a continuation of the creative process.

What are the standards for a product orientation resulting in a created product? Music exists as a created product when the creator means to share it with others and structures the music in such a way that it can be shared. Therefore, a product orientation results from an awareness of an audience for a finished created product. The creator with a process orientation does not mean to share the music or is unable to share it. Furthermore, a product orientation results in closure on a single, perceivable musical entity, whereas a process orientation does not result in a single entity but in many possible entities.

If a musical composition is notated, then it certainly exists as a product. Pitches and durations are fixed by the notational system, and a single, perceivable entity results. But what if a person unable to notate music says that he has composed a piece? The test for whether such a composition is the result of a process or product orientation is to ask the composer to perform and then repeat the composition. A composition as a product exists in the composer's mind as a fixed sequence of pitches and durations, and if a composition cannot be repeated by its composer, then it cannot be defined as a product.

As for improvisation, one can improvise without creating an improvisation, "an" being the operative word. Improvisation can be a process oriented or product oriented behavior. For improvisation to exist as *an* improvisation, i.e., a product that can potentially be shared with others, it must conform to some external standard. This standard may be provided by the limitations imposed by the musical materials. For example, if one improvises variations on the song "When the Saints Come Marching In," the chord changes in the melody provide the

external standard. Similarly, if a student is asked by a teacher to improvise a rhythmic ostinato to "This Old Man" while the class sings the song, the tempo, meter, and length of the song impose an external standard.

Music created as a result of the creator's process orientation has no external restrictions. A musician with a process orientation can create music idiosyncratically without tailoring it to share with others. When one creates music in such a way, one need not be concerned with making music that is understandable to anyone else, because a creator with a process orientation has an audience of one. For example, the young boy in the opening vignette of this paper explored the sounds of the xylophone for his own pleasure, not for the enjoyment of his mother. When a musician "doodles" at a piano or explores timbres on a synthesizer, he or she does so for the pleasure of the process, rather than for the purpose of sharing the music with an audience. If the fragments of melody that derive from this "doodling" are not cohesive or make little sense to an outside listener, it does not matter to the creator. When listening to music created by one with a process orientation, it is possible to listen to the resulting music as a product, but it is inappropriate to do so, because creating a product is not the creator's intent.

Perhaps children learn to value their created products only because adults seem to value them so. If a child returns home after an afternoon of sledding, a parent would be more likely to ask, "Did you have fun?" rather than "Did you get to the bottom of the hill?" The first question asks about the process of sledding, while the second asks about the product. But when the activity is creative, we adults tend to focus on the product instead of the process. If the same child said that she had painted in art class, the parent would be more likely to ask to see the painting rather than ask if the child had fun. As children learn through experience that adults value the created product over the creative process, children may come to value the product as well. As a result, the act of creating evolves into the act of creating *something*.

Evidence exists for proposing a developmental progression from process orientation to product orientation. Data on children's ability to replicate original songs were collected in two developmental studies of children's musical compositions. The first study (Kratus, 1986) was an analysis of the musical characteristics of songs composed by 80 children aged 5 to 13. The second study (Kratus, 1989) was an examination of the musical processes used by 60 children aged 7 to 11 in composing songs. The tasks given subjects in both studies were nearly identical. Children with no previous compositional experience were given ten minutes to compose short songs on a small electronic keyboard. They were then asked to play their finished songs twice, and the performances were audio taped. There were two slight differences between the studies in terms of the task given subjects. In the first study subjects were not told in advance that they would be asked to perform their songs twice, whereas in the second study this was made clear to the subjects before they began composing. And in the first study subjects took between eight and eleven minutes to compose their songs, but a time limit of ten minutes was strictly enforced in the second study.

In both studies two independent judges evaluated the degree of correspondence between the first and second performances of the subjects' songs. Judges used a 5-point rating scale in the first study to evaluate subjects' replication of their songs, and correlation

between the judges' ratings was .87. A rating of 4 indicated that the two versions of the song differed on only an occasional pitch or duration, and a rating of 5 indicated perfect replication of the song. In the second study two different judges rated subjects' replication of their songs using a 3-point rating scale, in which a rating of 3 indicated that the replication was the same or almost the same as the original. Interjudge correlation for the second study was .71. Given the levels of the rating scales, a rating of 4 or 5 in the first study was analogous to a rating of 3 in the second study. Despite differences in subjects, task instructions, judges, and rating scales, there was great similarity between the two studies in the percentage of 7-, 9-, and 11-year-old subjects able to compose replicable songs, as shown in Table 1. I suggest that these results imply that as children grow through the elementary years, their orientation to creative musical activity changes from a process orientation to a product orientation.

TABLE 1

Percentage of subjects able to replicate an original song

Age	1986 study* % of S's w/mean replication ratings of 4+ (n = 80)	1989 study** % of S's w/replication ratings of 3 by both judges (n = 60)
5 years	0.00	---
7 years	25.00	10.00
9 years	25.00	35.00
11 years	50.00	55.00
13 years	43.75	---

* Rating of 4 = two versions of the song differed on only an occasional pitch or duration, rating of 5 = perfect replication of the song.

** Rating of 3 = replication was the same or almost the same as the original.

One may argue that differences in one's ability to replicate original songs reflect differences in musical memory, rather than differences in orientation to creative activity. However, it is interesting to note that the older subjects placed greater constraints on their musical materials than did the younger subjects, enabling the older subjects to create products within the limitations of their memories. Eleven-year-old subjects composed significantly ($p < .05$) shorter songs than did 7-year-olds (median of 27 notes per song for the 11-year-olds

compared to 56 notes for the 7-year-olds). In addition, the 11-year-olds imposed significantly ($p < .05$) greater restrictions on the pitch range of their songs (mean range of less than an octave) than did the 7-year-olds (mean range of an 11th) (Kratus, 1986). These self-imposed limitations in song length and pitch range indicate that the 11-year-olds understood what musical requirements were necessary to produce replicable songs. The 7-year-old subjects, even those in the second study (Kratus, 1989) who were told in advance that they would be asked to repeat their songs, did not place similar limitations on their musical materials, and most 7-year-olds were unable to replicate their songs (see Table 1). Although memory may play a part in producing replicable original music, orientation to creating a product accounts for differences in the selection of musical materials used by the 11-year-olds as compared to those used by the 7-year-olds.

Vignette No. 3

The trumpet player waits nervously for her solo with her high school jazz band. Any moment now she will have to stand up in front of all these people and play her improvised solo. Actually her solo was carefully prepared in advance; she didn't want to make a mistake and look foolish in front of the whole school. The director gives her her cue, she stands to perform, and for a moment she freezes. She recovers quickly, but the band is already two measures into her solo. The trumpeter plays her prepared solo with the band two measures ahead of her. To her, the solo sounds all wrong with the clashing harmonies of the band. But the director gives her a smile. He didn't realize this student was capable of such a harmonically adventuresome improvisation.

Intentionality

In many human actions there are differences between the conscious intentions of the actor and the resulting action itself. For example, I may introduce myself to someone and, in retrospect, feel that I acted more formally than I had intended. The more conscious one is of the action, the greater the possibility for the actor to perceive a difference between the act and the intent. I would be unlikely, for example, to feel a difference between the action of my walking down a hall and my intent to walk down the hall, because I do not bring much conscious thought to the action. If I had a broken leg, however, and was forced to be conscious of my walking behavior, I might feel frustration at the difference between my intent and my resulting action. When an act corresponds to the conscious intent of the actor, the act is said to have intentionality. The degree of intentionality in an act is the degree of correspondence between the intent of the actor and the resulting action.

Educators use student behaviors as indicators of student learning. However, this system works only if educators can assume the intentionality of the behaviors. When a student's actions do not correspond to his or her intent, a teacher may be led into making an incorrect assessment of the student's achievement or ability. For example, if a beginning violin student plays a piece with an unsteady tempo, a teacher may infer that the student has difficulty keeping a steady beat. The teacher in this case would be assuming the intentionality of the

music played. In fact, the student's problem may be difficulty in moving the fingers fast enough to produce the music the student intends to perform. In other words, the tempo of the music performed does not reflect the intent of the student, and the tempo as performed can be said to have little intentionality.

Similarly, when a student creates music, especially on an instrument, the music may not reflect the intent of the creator. Three variables would seem to determine the degree of correspondence between the creator's intent and the resulting created music: 1) the creator's ability to audiate the music played prior to performance, 2) the creator's orientation to process or product, and 3) the creator's use of time in creating the music.

Gordon wrote that audiation occurs "when one hears music through recall or creation, the sound not being physically present (except, of course, when one is engaging in performance) and derives musical meaning" (1980, p. 2). Audiation allows a creator to anticipate the effect of a creative decision. For example, a child who is able to audiate melodic patterns will be able to anticipate the effect of playing a certain combination of notes as the next pattern in a melody. This anticipation is not perfect in that a creator cannot predict exactly what musical effect a particular combination of sounds will have. The greater one's ability to audiate sounds while creating, the greater the potential for intentionality in the resulting music.

Persons who are unable to audiate sounds while creating can still explore possibilities on an instrument, but this exploration is not guided by meaningful, musical decision making. Such exploration is not meaningless, however. Through this kind of creative activity the creator gains experience with the materials of music and learns through repetition to audiate patterns and combinations of patterns.

The creator's orientation to process or product is a second factor affecting intentionality. When one creates with a product orientation, one is conscious of an audience. This consciousness is greater than when one creates with a process orientation and no sense of audience is felt. The increased consciousness requires a creator to pay attention to the intentionality of the created music, so that the music heard by an audience corresponds more accurately to what the creator intended. Therefore, music created as a result of a product orientation generally has higher intentionality than music created as a result of a process orientation.

A third factor affecting the intentionality of created music is the use of time during the creation process. Both improvisation and composition can be created products. Composition, though, is more intentional than improvisation, because the process of composition allows the creator time to try new combinations of sounds, revise the sounds, and test the validity of the sounds, allowing a greater correspondence between the creator's intent and the resulting music. When a musician creates an improvisation, he or she may be able to audiate the sounds, and form some predictions about the effect of certain musical patterns. But the predictions are not perfect, and the improviser cannot erase or modify sounds, unlike a composer who can change the sounds over time to more accurately match his or her intentions.

Furthermore, within the composing process the composer's use of time affects intentionality of the finished product. The more a composer refines a piece and tests its validity

through repetition, the greater the intentionality of the piece. As a composer refines the work, greater consciousness is brought to bear on the music, thus allowing for greater correspondence between the conscious intent of the composer and the resulting music.

The data from the two studies described earlier (Kratus 1986, 1989) provide evidence for proposing a developmental progression toward increasing intentionality. The process of composition for the 11-year-old subjects was quite different than that for the 7-year-old subjects. It was found that the 11-year olds spent significantly ($p < .05$) more time repeating their musical ideas and revising their musical ideas while composing than did the 7-year olds, who spent significantly ($p < .05$) more time exploring new ideas while composing (Kratus, 1989). As a result of the additional time spent revising and repeating, the songs composed by the 11-year-old subjects were likely to be more intentional than the songs composed by the 7-year-olds.

Four Types of Creative Musical Activities

Given the concepts of orientation and intentionality, creative musical activities can be divided into four types, as shown in Figure 1. They are (a) exploration, (b) improvisation as a process, (c) improvisation as a product, and (d) composition. Two types of creativity are the result of a process orientation, and two are the result of a product orientation.

FIGURE 1

Orientation and intentionality in creative musical activities

Creative Activity	Orientation		
	Process	Product	
Exploration	X		
Improvisation	X	X	
Composition		X	

Note: An "X" indicates existence of a type of creative musical activity.

Exploration can be considered to be a pre-improvisational creative activity. It is the result of a process orientation. The creator's inability to audiate the sounds before performing them leads to little intentionality over the resulting music. Such activity is not only for young children or novice musicians. For example, an experienced composer can engage in exploration of the timbre settings on a new

synthesizer.

Improvisation differs from exploration in that an improviser can audiate the sounds while creating, and an explorer cannot do so. Audiation enables an improviser to choose sounds with meaning, but he or she cannot revise the sounds once they are made. Improvisation can result from either a process or product orientation. Improvisation as a process occurs when the creator is conscious of no external constraints on musical materials and does not intend to create for an audience. Improvisation as a product occurs when the creator consciously conforms the musical materials to external restrictions and intends to create for an audience.

Composition is also the result of a product orientation. The main difference between composition and improvisation as a product is that in composition the creator has time to revise musical ideas, allowing for greater intentionality than in improvisation, in which no revision is possible.

Research Implications

This paper suggests that the perspective of the child or novice musician engaged in creative activities differs from that of an experienced musician. Children's approach to composition may be more process oriented than product oriented. For researchers, it may be inappropriate to analyze the created products of process oriented children as products. Instead, analysis and description of children's creative processes may be more appropriate.

In addition, younger children and persons with minimal experience on a particular instrument will have only limited success in creating on that instrument products that match their intentions. This suggests that researchers determine the intentionality of the music created by their subjects. One way in which this could be done is to ask subjects to sing and then play the patterns in their improvisations and compositions.

Curriculum Implications

The ideas outlined in this paper also suggest implications for the scope and sequence of creative activities for music instruction. Specifically, implications can be drawn for writing objectives and sequencing instruction.

Instructional objectives, as they are usually written, specify the intended results of learning in terms of product outcomes. For example, the objectives, "to identify by name the sections of the orchestra," and "to play a C major scale on the flute," specify unique outcomes. Teachers can measure student attainment of these objectives by matching the students' responses (i.e., their products) with the predetermined outcomes specified by the objectives. Instructional objectives of this type, however, require a student to have a product orientation while engaging in the musical activity. As I have suggested in this paper, the assumption that students engaging in creative activities have product orientations may be unjustified.

Creative activities require a different type of instructional objective which describes the

nature of the educational activity in which the child engages but not the nature of the outcome. Eisner (1974) referred to such an objective as an expressive objective, and he described it as follows:

An expressive objective does not specify the behavior that the student is to acquire after having engaged in one or more learning activities. An expressive objective describes an educational encounter: It identifies a situation in which children are to work, a problem with which they are to cope, a task in which they are to engage; but it does not specify what from that encounter, situation, problem, or task they are to learn (p. 51).

Eisner provided examples of expressive objectives, such as "To interpret the meaning of *Paradise Lost*" and "To visit the zoo and discuss what was of interest there" (1974, p. 51). Objectives of this type do not specify product outcomes, and instead focus on the students' engagement in the process. Although the use of expressive objectives result in the creation of products by students, such products should not be considered the outcome of the instruction. Instead, the educational focus of the activity should be on students' interaction with the musical materials and creative process.

Expressive objectives can be used to plan creative musical activities with a process orientation. Elements that can be varied in such expressive objectives are: timbre, available pitches, and length of student involvement in the process. An example of an expressive objective for exploration is: "To explore combinations of sounds on a 5-bar pentatonic xylophone for five minutes."

Expressive objectives can also be used to plan instruction resulting from a product orientation. These objectives can be used to place restrictions on the product outcomes by specifying musical materials to be used in the finished product. For example, an expressive objective for composition is: "To compose a four-phrase song with a phrase structure of a-b-b-a."

The four types of creative musical activities (exploration, improvisation with process orientation, improvisation with product orientation, and composition) form a logical sequence of instruction. For initial creative experiences, students should explore sounds with little overt guidance from the teacher. Through free exploration students become familiar with the sound possibilities of an instrument and learn to associate patterns of movement on an instrument with patterns of sound produced. Gradually, students begin to audiate the sounds prior to performance, and musical choices made while exploring become less random and more intentional. Teachers can help to guide the process first by limiting the musical materials at the student's disposal, then by increasing the available materials. For example, a teacher may limit a student's exploration on a xylophone by removing all but three bars. As the child begins to audiate music produced by the three bars, additional bars can be added.

Improvisation should be taught as a process first, then as a product. Initial improvisation activities for students are similar to exploration activities, because both activities are the result of students' process orientation. The differences between the two is in the nature of the

performed music. Improvisations sound more pattern-dominated, because the child's increasing ability to audiate what is performed allows him to organize the music through the use of repeated patterns. As students become more adept at improvising, they develop strategies for producing and developing musical patterns. These strategies enable students to conform their improvisations to external restrictions, and students can begin to improvise products.

To compose with meaning, students must have an ability to audiate sounds produced on an instrument, which is learned through exploration, and a knowledge of strategies for producing patterns, which is learned through improvisation. Teachers can encourage students to compose with greater intentionality by showing students how to develop and test musical ideas. This can be accomplished by leading students through group composition activities. As a group composes together, the teacher can ask questions such as, "What sounds should come next?" or "Which ending do you prefer?" In effect, through group composition, the teacher can model the process of composition for students. Students can learn to ask themselves similar questions when they compose individually.

Summary

This paper presented a description of and rationale for two components of creative music activities: orientation and intentionality. Four types of original creative behavior were identified, and implications were presented for research and teaching.

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