

More or less creative? A comparison of the composition processes and products of "highly-creative" and "less-creative" children composers.

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A growing body of research is that which examines the processes and/or products of children's music compositions (i.e. Barrett, 1997; Carlin, 1997; Ernst, 1993; Gromko, 1996; Henry, 1995; Seals, 1990; Wilson & Wales, 1995). These studies, along with those that look at the use of digital technology in music composition (i.e. Emmons, 1998; Erkunt, 1998; Folkestad, Lindström & Hargreaves, 1997; Hickey, 1997; Landányi, 1995; Robinson, 1995; Tsisserev, 1997) and those that take an ethnographic view of children's composing and improvising (e.g. Campbell, 1998; Harwood, 1987; Marsh, 1995), support the notion that children of all ages are able to compose music. The various lenses researchers use to study the composition processes and products of children will continue to inform diverse aspects of musical learning and development. The purpose of this study is to look explicitly at the *creative* aspects of the compositional processes of children.

Because of the many possible connotations associated with the term "creative" in this context, it must be defined carefully. A widely used and accepted definition in the field of creativity is that a creative product is one that is both novel (to its creator) and is "appropriate" or "valuable" in the context of a domain (Mayer, 1999). A creative person is one who produces creative products. This definition proves useful in suggesting that musical creative thinking is a cognitive act that takes place while fashioning a creative product such as a musical composition. Musical creativity, like general creativity, is an innate ability that is manifest in varying degrees in all humans. Therefore, children are more or less musically creative.

Measurement of Musical Creativity

Studying the processes of children whose compositions are highly creative can inform teachers and researchers about the processes and strategies these children use when composing. Determining which children and music compositions are the most creative, however, poses a problem. Amabile proposed that the most valid way to measure creativity is by using experts' global and subjective assessment of creative products—a technique which she has labeled "Consensual Assessment Technique" (1996). In other words, the most creative composers will produce the most creative musical compositions, and the technique needed to rate the compositions requires judges to rate creativity using their own subjective definition rather than any given objective criteria or checklists. Amabile has shown the Consensual Assessment Technique to be a valid and reliable tool for measuring the creativity of artistic as well as business products (1996). Others have also successfully utilized the Consensual Assessment Technique in a variety of artistic settings and with a variety of subjects (Barnard, 1993; Hennessey and Amabile, 1988; Hennessey, 1994; Koestner, Ryan, Bernieri, and Holt, 1984). The Consensual Assessment Technique has been modified and used successfully for rating the creativity of musical compositions by Bangs (1992), Hickey (1995, 2000), Daignault

(1997) and, Brinkman (1999), and for rating musical improvisations by Amchin (1996) and Priest (1997).

Webster's Measure of Creative Thinking in Music (MCTM-II) (1994) is the most recent, and probably most studied attempt at measuring creative aptitude in music. The tool measures factors of musical extensiveness (fluency), flexibility, originality and syntax. Criticism toward the factorial approach for the measurement of creativity argues that tools that measure the divergent/convergent factors measure only these factors and not necessarily genuine creativity (Hocevar & Bachelor, 1989; Plucker & Renzulli, 1999; Plucker & Runco, 1998). Validity in the form of product based creativity (i.e. musical compositions) is needed to make these measures stronger.

The use of consensual assessment of musical compositions as a measure of creativity is very different than the approach taken by the MCTM. If they are highly correlated, then perhaps they are measuring the same construct and provide a sort of concurrent validity for each other. If they do not correlate, more study is warranted to see what each measure is indeed measuring in relation to musical creativity. For that reason, it is an intent of this study to examine the relationship between these two measures.

Process and Product

A point of this study is to determine what differences exist, if any, between the most and least creative subjects in terms of their approach to music processes or exploration. There are very few studies that have compared musical process or exploration data to product data when the product data are judged for the creativity of the music compositions. While Kratus (1989, 1991) examined the composing process data of children and compared these data between highly successful and less successful groups, his measures of composition success were replication ability and "craftsmanship" rather than creativity.

Hickey (1995) compared the musical exploration process data of 4th and 5th-grade children and compared these data between high creative and low creative groups. Distinct exploration process differences were found and reported. Hickey (1995) also found no correlation between creativity scores of these children and scores from Webster's Measures of Creative Thinking in Music (1994). Daignault (1997) followed a similar procedure by examining differences in children's approach to MIDI improvisation and composition tasks based on high or low creativity grouping. Quantitative and qualitative analyses revealed that while the low groups of subjects tended to generate process-oriented improvisations, the high groups improvised product-oriented music. Daignault also found differences between subjects in a group rated for high craftsmanship to subjects in a group rated for high creativity: the high craftsmanship group generated much of the musical material found in their finished compositions by manipulating the notation rather than by improvising as did the high creativity group. Both Hickey and Daignault discovered clear differences between process orientation of high and low creativity groups. Further examination of these differences in approaches to improvisation and compositions are warranted in order to better understand the creative thinking styles of children.

It is proposed here that one way to learn about the characteristics and development of musical creativity in children is to examine the differences between the processes and products of children who fall on either end of the musically creative spectrum. By carefully analyzing the processes and products of the most creative as well as less

creative music makers, we can learn more about creative musical thinking development in children—hopefully in order to develop and nurture more creative musical thinking in all children. The purpose of this study was to examine and then compare the compositions and the music exploration processes of 3rd-grade children who are separated into groups of “high” and “low” creativity based on creativity ratings of their musical compositions. A second purpose of this study is to compare MCTM scores to the creativity ratings from these children’s musical compositions.

Methodology

The subjects for this study consisted of 29 children, ages 9- and 10-years, who volunteered for a music composition class held in a computer music lab at a University School of Music. The musical background of the subjects ranged from no music instruction outside of their general music classes to 4 years in band/orchestra instrument or piano instruction. There were 16 girls, 13 boys.

Procedure

Subjects came to a computer music lab on the University campus for 3 consecutive Saturdays, for 2 hours each session. The first session they learned to use the MIDI sequencing program and synthesizer to compose music, were individually administered the MCTM, and also composed songs. Instruction for their first compositions was to compose a “musical scenery.” They could use as many of the timbres or tracks as they liked and could re-record or edit as much as they needed until they had a composition that they liked.

In the second session, subjects worked with a researcher-designed program (“Music Mania”) that introduced them to the concepts of composing by exploring melody, timbre, texture, rhythm and dynamics. Through a series of lessons subjects were introduced to concepts within each of the musical elements for composing and encouraged to experiment with the ideas on their synthesizer/keyboards (e.g. in “melody” the idea of steps and leaps, in texture the idea of thick and thin texture). During this time, all of the exploration on the synthesizer was recorded in the background (unknowing to the subject) and used as “process” data.

The third session was used to finish exploring in “Music Mania” and then to compose music using the MIDI sequencing program. The instructions for the final composition were to compose anything they liked, with ideas they learned in Music Mania (if desired) or a musical scenery. Most of the subjects composed more than one composition during the first and third sessions, so each subject was asked to identify their favorite composition from each session. These were used as the compositions to be rated for creativity.

Data Analysis

Three judges (elementary and middle school music teachers) were given a CD recording with random and different order of 53 compositions. The judging instructions, following Amabile’s consensual assessment form, were as follows:

First listen to the first 6 or so compositions on the CD to get a feel for the range and variety of the compositions. Then begin to listen to all of the composition and rate each composition for “Creativity” by placing an “X” on the point in the continuum that corresponds to your assessment. Try to rate the compositions based on their relation to each other—a standard for 3rd-grade children—not a standard that you may have for compositions done by professional composers.

The judges then rated each composition using a scale as shown in Figure 1.

Figure 1. Scale for consensual assessment of creativity

Using your own subjective definition of creativity, the degree to which the composition is creative.						
_____	_____	_____	_____	_____	_____	_____
Lo			Med			High

Interjudge reliability for all compositions using a coefficient alpha was .68.

Interjudge reliability for the top 3 and bottom 3 compositions only was .85

Based on the judges' ratings, the top 3 and bottom 3 composers were selected for further study. The data generated from these subjects while they explored in the Music Mania program were examined based on analysis used in Hickey (1995). These MIDI files were listened to and qualitative features described for each. They were then categorized according to descriptors used in Hickey, 1995 as well as new categories that emerged in the present study.

The process data were described in four different categories: General descriptors; Overall process style; Composition emergence, and; Recurring musical patterns. General Descriptors emerged from the analyses of process data and provided a portrayal of subjects' musical exploration "demeanor" while they explored in the different areas of Music Mania. The eight possible descriptors are shown in Figure 2. Subjects' "Process styles" provided what was seen as an overall approach to all of their exploration (see Figure 3). Another characteristic of the MIDI data that emerged was the timing at which subjects' musical compositions—in whole or in part—appeared within their process data. To describe this, subjects' exploration data were labeled as "Early," "Mid," "Late," or "Not at all." Finally, upon examination of the musical process data, it became apparent that most subjects favored unique musical patterns and/or phrases. These ranged from short motives to large phrases to whole songs. Any motives or phrases that subjects used consistently in their process data were logged in such a way to best describe what was heard.

Figure 2. Descriptions of MIDI process data:

1. LITERAL. This subject played exactly what the Music Mania cards suggested. Showed very little musical experimentation or imagination beyond this.
2. CLASSICAL. This subject displayed fine piano technique often through performances of classic piano lesson excerpts. As with the “Literal,” however, very little musical imagination or experimentation was heard beyond this.
3. REBEL. Opposite of the “Literal.” This subject either did nothing remotely close to what the Music Mania cards suggested or did not play much of anything at all.
4. NON-CREATIVE. This subject did not show any imagination at all in his/her playing. MIDI data excerpts contained mostly short, nonsensical and seemingly random note playing.
5. FLUENT MOTIVIC. This subject played a wide variety and a large number of different motives. These motives were often developed and returned to throughout the process. In some cases, motives were combined together as well.
6. DEVELOPMENT MOTIVIC. This subject not only played a variety of motives but was able to continually develop and experiment with these motives in a variety of ways, employing such compositional techniques as sequence, variation, combination and inversion.
7. PHYSICAL. The observation of MIDI file data revealed that some subjects relied mostly on physical “gestures” to produce musical sounds. Though the sound of these files seemed unorganized and random, a visual analysis revealed that the sounds were organized by distinct physical patterns.
8. REPETITIVE (new). These subjects had a few motives that they repeated throughout.

Figure 3. Overall Process Styles

1. DEVELOPMENT/EXPERIMENTATION. These subjects were characterized by their manipulation of musical materials—either small patterns (2 or 3 notes) and/or whole phrases. Subjects either experimented with short musical ideas by playing around with them and changing them slightly or worked extensively at developing whole musical ideas based on previous played musical materials.
2. REPETITION. These subjects were characterized if the musical materials sounded the same as most music played earlier. These could be very short musical patterns or larger musical phrases.

Results

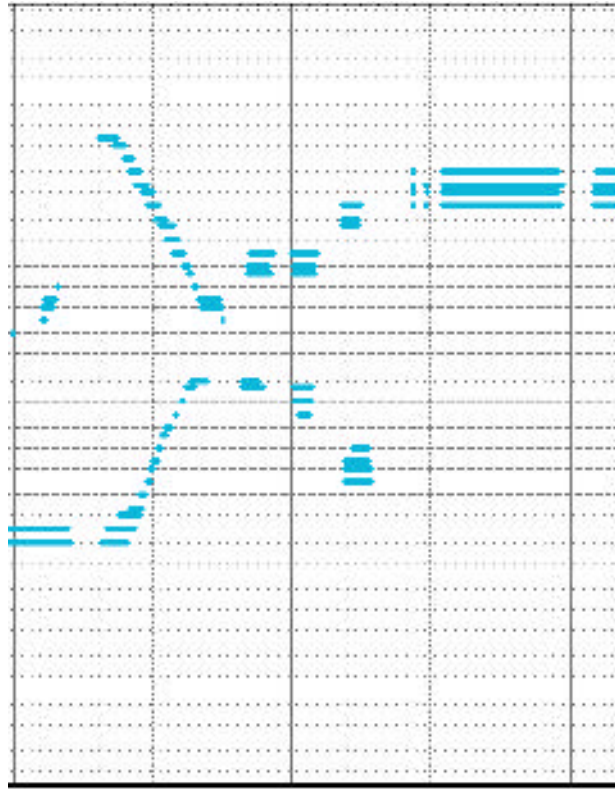
The first purpose of this study was to examine and compare the music exploration processes of 3rd-grade children who are separated into groups of “high” and “low” creativity based on creativity ratings of their musical compositions. Figure 4 displays the subjects’ composition/creativity ratings as well as information about their approaches to the Music Mania program in the four categories used to rate their exploration styles. The results show clear differences between the top 3 subjects and the bottom 3 subjects as far as their approach to exploration and learning in the Music Mania program.

Figure 4. Product and process information for bottom 3 and top 3 subjects.

	Creat Rating	Musical Exp	General Descript.	Process Styles	Composition Emergence	Recurring Musical Patterns
Bottom Creative Subjects:						
Ann	2	None	- physical - repetitive motivic - literal	Repetition	Early	- glissandos - soft noodling (one hand)
Edith	2.3	Violin 1	- literal - non-creative	Repetition	Early	- repeat notes - stepwise monophonic motion - 1/2 step cluster
Mark	2.65	Viola 1	- physical - non-creative	Repetition	Early	- clusters - glissandos
Top Creative Subjects:						
Rose	5.3	None	- Fluent motivic	Experimental Variety	Middle - just favorite motivic parts	- 2 hands opposite movement - clusters - glissandos - 1/2 step - rolling clusters - random - two 8ths quarter note
Mary	5.85	Piano 2	- Literal - Fluent motivic - Developmental motivic	Experimental Variety	Never	- arpeggios - scalar - random hits - 2 hands together - piano songs
Char	6.2	Violin 4	- Literal	Only 3 files - too few to describe (literal in those files)	Not in the few files	

The low group of subjects mostly repeated a small number (three or less) of musical patterns with no attempt toward experimentation or development of those motives. Two of the subjects, Ann and Mark, also approached much of the exploration in a very physical manner, suggesting a kinesthetic approach toward the keyboard/synthesizer rather than an aural approach. An example of this “physical” approach is shown in Figure 5 in a MIDI graphic snapshot of Mark’s exploration in the Introduction section of “Music Mania.” At the end of this excerpt, there is also a sample of Mark’s “signature” cluster approach to the keyboard. These clusters were found throughout his exploration data as well as throughout the entirety of his composition.

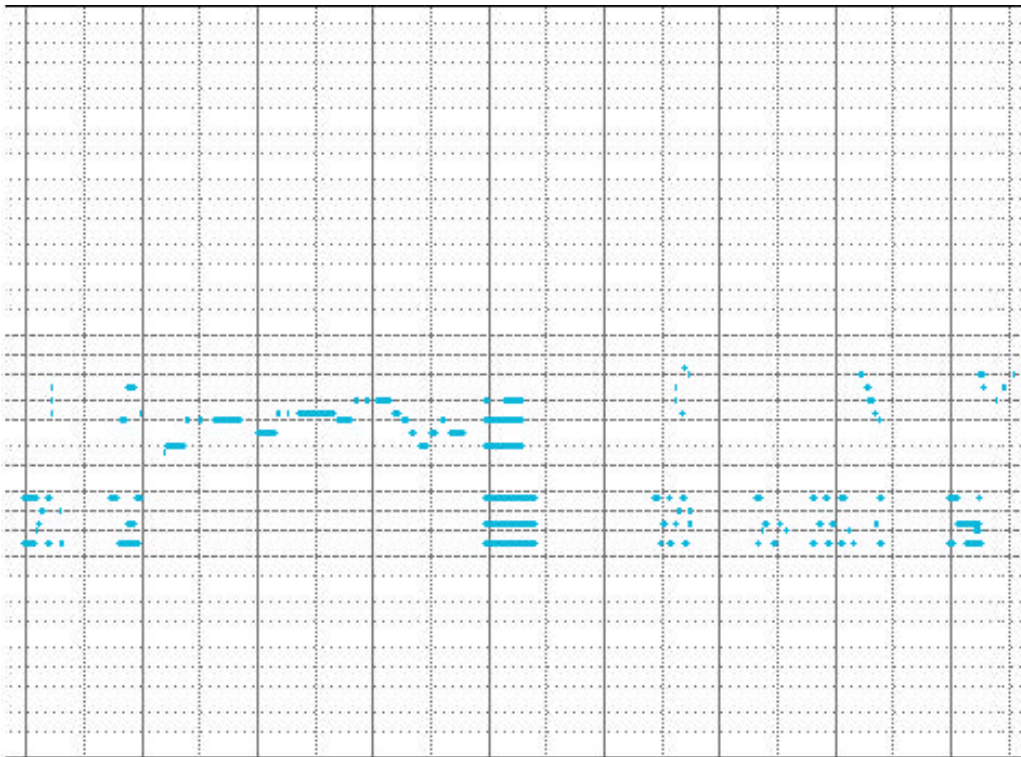
Figure 5. Mark's "Physical" approach to the keyboard:



In addition, the low group of subjects approached each section of Music Mania in a manner described as “non-creative” because of the seeming non-intended and random approach to the keyboard, or simple repetition of small motifs (such as the cluster in Mark’s case or the simple and repeated stepwise motion in Edith’s case).

In contrast, Mary and Rose, from the high creative group, displayed a greater number and variety of musical patterns and evidence of developing these patterns. A typical example of this behavior is illustrated in Mary’s exploration while in the “Timbre” section of Music Mania (Figure 6).

Figure 6. Mary’s motivic development in Music Mania



Charlotte was a clear exception in the high group of composers. Though she explored all of Music Mania, she only played on the keyboard/synthesizer while in 3 lessons. These 3 MIDI files were simple reactions to the content in the lessons (labeled “literal”). Therefore it was not possible to place descriptors, other than literal, or overall process style for Charlotte’s approach.

One final difference between the top and bottom groups was the appearance of their composition while exploring in Music Mania. While ideas from compositions appeared early in all cases for the low group of subjects, it did not appear or appeared middle to late in the data of the top subjects.

A second purpose of this study was to compare MCTM scores to the creativity ratings from these children’s musical compositions. A correlation was calculated to

determine the relationship between the 2 scores. The resulting correlation was .43, which was not significant.

Conclusions

From an examination of six subjects in this study, it is clear that there are differences between the top and bottom creative composers in their approaches to exploration and learning in a music composition program. The results found in this study are nearly identical to the results found in a previous study (Hickey, 1995). That is subjects in the high group showed more fluent and experimental process styles than subjects in the low group. The high group developed and experimented with a variety of musical motives whereas the low group did not. The low group mostly played simple random, short, and nondescript musical patterns. In addition, the subjects in the high group did not have their compositions emerge until the middle of their exploration process or not at all, while those in the low group had ideas from their musical compositions appear early in the process. In contrast, Kratus (1989) found that the most successful composers (rated for craftsmanship and replication) stopped exploring early in their process data and began their compositions early. This however seems logical that when compositions are rated for “replication” ability or craftsmanship, then the most successful composers are those begin their composing early in the process but when examining the most creative compositions, composers explore longer and compose later in the process.

Also similar to the Hickey (1995) study was the lack of relationship between the MCTM scores and creativity ratings. The correlation of .43, however, was higher than the correlation of .27 found between these scores in the previous study (Hickey, 1995). The reason for this higher correlation, however, may be because only the exceptional (high and low) subjects were compared. This prompts further research into the meaning of creativity ratings of children’s compositions as well as the use of a measure like the MCTM for rating children’s creativity.

Implications

What can we learn from successful (and less successful) children's compositional processes that may help teaching composition? In this study we learned that the more creative children composers approached their music exploration differently than the less creative composers. It may prove useful to use the strategies employed by the most creative composers as aids to prompt all children to be creative in their approach toward music composition. It is recognized, however, that a simple rating of compositions does not tell all about the children composers. Additional research in this area should also strive to interview the children composers themselves to learn of the intent of their compositions as well as gain more insight into the processes they use as successful composers.

This study also prompts several questions about the measurement of creativity in children. While the MCTM (Webster, 1994) attempts to measure a creative musical aptitude, there is a need for further examination of this aptitude as well as alternative approaches toward the measurement of musical creativity such as the consensual assessment technique.

Musical composition is an important musical activity that should be a part of all children’s musical education. The more lenses researchers use to view the processes and

products of musical composition in children, the more researchers will be able to help inform music education.

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