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Donald J. Running  
*Bridgewater State College*

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Creativity Research in Music Education:

A Review (1980-2005)

Donald J. Running

University of Minnesota

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## Abstract

This article lays a foundational groundwork of what is currently known regarding creativity and music education to encourage future research. It explored principal research avenues within various scholarly journals related to creativity and music education including: (1) definitions of creativity, (2) empirical measures of creativity, and (3) effects of music instruction on general creativity scores. Definitions (and consequently assessments) of creativity fall into three general categories: (1) product based, (2) process based, and (3) performance based. These definitions have generated a number of new theories and tests designed to assess the creativity of both products and individuals.

## Creativity Research in Music Education: A Review (1980-2005)

### Introduction

Creativity is a much discussed and debated topic in music education today. Researchers have explored what it is, if it can be assessed, if it can affect (or is attached to) other areas of academic study, and if it can be taught. Creativity has been explored quantitatively, qualitatively, historically and philosophically. Much of this research into creativity was brought about by the 1994 National Standards for Arts Education decision to include improvisation and composition (Consortium of National Arts Education Associations). The No Child Left Behind research-based assessments makes exploration of the content and context of creativity as important than ever (Moran, 2005). This document represents an exploration into the research based on definitions and measurements of creativity in music education from 1980 until 2005.

Carol Peterson Richardson's (1983) previous review of literature relating to creativity and music education explored research from roughly 1922 until 1979 with the bulk of the presented material between 1962 and 1979. Since 1980, creativity has remained a topic that has generated much interest, research and a little controversy. Other authors including Henry (1996) and Rohwer (1997) have completed more recent reviews in creative composition and assessment of creativity. Yet a comprehensive exploration targeting contemporary studies regarding how creativity and music education relate is overdue. There has been much research into creativity in the 25 years since

Richardson's (1983) review. It is time to reexamine how far research in this area has progressed.

As an extension to Richardson's examination, this review was limited to articles written for scholarly journals published between 1980 and 2005. The studies under consideration are categorized by research topic. The first section discusses various definitions of creativity. The second section examines various empirical measures of musical creativity, and the third section explores the effects of music instruction on general creativity scores. Although every attempt was made to be comprehensive, this review may not be all-inclusive.

### Definitions of Creativity

A formal agreement of what creativity actually is has eluded scientists, artists, philosophers and researchers alike – from Socrates to Csikszentmihalyi. Much of the more recent research has focused on deciding (or defining) exactly what creativity is and who has it. This exploration had led researchers like Balkin (1990) to claim that creativity is “overused, misused, confused, abused, and generally misunderstood” (p. 29). Is creativity a gift, or can it be developed? Can it be learned? Can it be taught? The following section will explore these questions and describe what is thought about creativity and music education. Researchers such as Perkins (1981), Weisberg (1986), Balkin (1990), and Clark (1986) have put forth a variety of explanations as to who is creative and what creativity is.

The theories of creativity put forth by David Perkins (1981) and Robert Weisberg (1986) state that creativity is a process of application of knowledge, logical reasoning, memory recovery, and visualization. Both authors related artistic creativity to puzzle solving (i.e. person A asks person B a question and either confirms or denies the answer until person B answers correctly). In his 1990 retort, Thomas Leddy plays the role of devil's advocate to the views of Perkins and Weisberg by offering several contradictions and alternatives to their view of creativity. Leddy believed that true creativity requires more than the sum of a person's prior knowledge and a 'novel' means of applying it.

Contrasting with Perkins and Weisberg, Alfred Balkin (1990) defined creativity through a process of contrasting it with other words and concepts commonly confused with creativity. For example, Balkin contrasted creativity with talent by explaining that talent is an innate and unlearnable gift while creativity is an acquired and developable behavior. Oftentimes talented people are creative, and creative people can be talented, but there is no causal correlation that exists between these two concepts. Balkin also contrasted creativity with originality (flamboyant or bizarre behavior), IQ and cleverness. Again creative people *often* possess these characteristics, but not necessarily so. In fact, while theorists differ on their views of what constitutes a creative person, a general agreement exists – summarized by Balkin –that creative people tend to demonstrate certain characteristics (e.g. confidence, intellectually “playful”, persistent).

If creativity is not directly connected to talent, IQ, originality, or cleverness, then what is it? Balkin (1990) claimed that what separates creativity from simple spontaneity is a final result that represents an important contribution to society – a product. This product is the result of a four-stage process (first postulated in 1926 by Wallas). The first

step in this process is preparation wherein one gathers the necessary information and skills needed to complete the task. This is followed by an incubation period in which one allows the unconscious to develop ideas and concepts. This incubation process is followed by an illumination or eureka moment where the great idea is formed. The last stage in this process is one's verification of this great idea through time and testing. This four-stage process also appears in the research of Oehrle (1986) and Hickey and Webster (2001).

The importance of product also appears in the research of Amabile (1983), Symes (1983), Tang and Leonard (1985), and Clark (1986). Amabile (1983) suggested “a product or response is creative to the extent that appropriate observers independently agree it is creative. Appropriate observers are those familiar with the domain in which the product was created or the response articulated” (p. 359). This consensual assessment has become the cornerstone of much research into the evaluation of creative work. Clark (1986) added that in order for the product to be considered creative, it must possess both descriptive and evaluative functions that are both novel and deemed desirable by society. Because society is ultimately responsible for determining whether an individual is creative (through the product that they deliver) – creativity (in part) is taken completely out of the hands of the creator. Tang and Leonard (1985) add that the truly creative product must be the “unique solution to a problem (p. 7).” In musical terms, this problem is the need for a product that will be considered both original and desirable.

David Elliott (1989, 1995) described creativity as a family of concepts that are often confused with originality. Elliott stated that one engages in a creative process through actions such as composing or improvising which result in a final product. This

product will not be considered creative unless there is a substantial level of quality (determined in a social-cultural environment). This theory led to Elliott's 'head-and-shoulders' model. Elliott believed that creative products are a combination of the familiar and the un-familiar based on a network of the creator's prior musical experience. Take for example (as Elliot does), the Beethoven *Eroica* Symphony. Beethoven did not invent symphonic music or create a bizarre work of art. Beethoven created a timeless work of quality art that combines both the ordinary and extraordinary on the 'shoulders' of past creations.

Johnson-Laird (1987) hypothesized that creativity can be expressed as an algorithm (a limited set of instructions). To demonstrate this point, Johnson-Laird designed a computer program that would test three creative algorithms by 'improvising' jazz bass lines, melodies and chord sequences. These programs were instructed to use the 'grammar' (existing motifs) of jazz to 'create' new improvisations. These computer generated improvisations varied widely in quality, and led to Johnson-Laird describing the creative process of a successful improvisation as having two stages: 1) combine and modify components within the limit of the constraints and 2) make an impulsive decision from the available options.

Not only is there controversy over what creativity is, but numerous music educators have inquired whether creativity can be taught. Clark (1986) explains that the product of creativity is not a separate action from the creative processes any more than winning a race is not a separate act from running the race. Educators may teach all of the tools necessary for a student to be creative, but this does not directly yield a creative product. However, Clark also believes that "Much that students learn from their teachers,

and especially in the area of values and dispositions, is learned by example. I think that this is especially likely to be true in teaching creativity (p. 31).” This belief in the importance of a teacher’s openness to personal creativity is shared by others, including DeTurk (1989) and Harris and Hawksley (1990).

Gordon (1993) stated that the degree to which a child is creative is directly dependent upon the child’s tonal and rhythmic vocabulary. Morin (2002) agreed and explored teaching composition through the expansion of the student’s base of knowledge. Morin suggested that in order for students to display creativity, they must have a fundamental knowledge of melody, harmony and rhythm. Morin offered examples of her method in action.

Numerous educators have forwarded theories of how to incorporate creativity into the classroom. The majority of these classroom activities are in the areas of improvisation (Addison, 1988; Fratia, 2002; Hickey, 1997; Nolan, 1995; Rooke, 1990) and composition (Collins, 2005; Dunbar-Hall, 1999; Reynolds, 2002; Stauffer, 2001, 2002; Wiggins, 1999; Wilson, 2001). Other researchers have explored ways in which the curriculum itself may be structured to promote creativity (Byrne, 2002; Davidson, 1990; Kratus, 1990; Moore, 1990; Sullivan, 2002). Finally, a great deal has been written about the use of technology to aid in teaching creativity (Demonline, 1999; Howell and Murphy, 1993; Pike, 2000; Reese, 2001).

Clearly a great deal of thought, time and research has been undertaken in the name of creativity. The next section will examine various methods in which musical creativity has been analyzed and quantified since 1980.

## Empirical Measures of Musical Creativity

Based on the Works of Gordon, Guilford, Torrance, and Vaughan

Research into a means of quantifying an individual's or a work's creative value is essential to the understanding of what creativity is and how it can be developed. The latter half of the twentieth century has been an exciting time for the development of empirical measures of creativity in music. Torrance's *Tests of Creative Thinking* (1966) and Guilford's 1971 *Structure of Intellect (SI)* model did much to standardize the evaluation of creativity. Much of the research from 1980 to the present has been based on the foundational work of these pioneers. This section will examine the work of other researchers who have developed means to calculate and quantifiably assess creativity.

Peter Webster's investigations into measuring creativity have been highly influential on other researchers' attempts to explore and quantify creativity. Published in 1980, Webster's *Measure of Creative Thinking in Music (MCTM)* is directly related to the prior research of Guilford, Vaughan and Gordon. The *MCTM* is designed to evaluate a child's (age 6-10) musical creativity and expressivity by engaging them in a ten-task guided improvisatory session lasting 20-25 minutes. The subject's work is then scored by one or more judges. Based on roughly 300 student subjects, the inter-scorer reliability has been found to average .70.

Hickey and Webster (1999) reviewed and improved Webster's previous work with the *MCTM* by incorporating a MIDI-based instrument into the test, principally in order to make judging results both easier and more consistent. Subjects for their research consisted of 3<sup>rd</sup>-grade students ( $N = 28$ ) and like the original *MCTM*, this

instrument was designed to test for creative elements that might not appear on other standardized tests or teacher ratings. Hickey and Webster not only improved reliability for the *MTCM*, but also simplified the administration of the test.

Schmidt and Sinor (1986) employed Webster's *MCTM* along with Gordon's *Primary Measures of Musical Audiation (PMMA)*, and Kagan's *Matching Familiar Figures (MFF)* to investigate whether creative achievement in convergent and divergent musical assignments is connected with the cognitive dimensions of reflection/impulsivity. The researchers employed second-grade students ( $N = 34$ ) as their test subjects and while they discovered that 15% of the variance of the *PMMA* can be attributed to reflection/impulsivity, the researchers did not find any significant relationships between reflection/impulsivity and the various dimensions of musical creativity.

Like Webster, Gorder (1980) used the research of Guilford and Torrance to design a new empirical method of evaluating creative work. Gorder's *Measures of Musical Divergent Production (MMDP)* evaluates the divergent abilities of music fluency (producing musical ideas from supplied music information), flexibility (producing musical ideas that emphasize shifts in musical character such as from staccato to legato), originality (producing musical ideas that emphasize musical concepts rarely found in the subject's overall population), elaboration (producing musical ideas emphasizing detail or complexity), and quality (producing musical ideas that are musically desirable) among instrumental music students. The *MMDP* was administered to 80 randomly selected junior high school and high school students and Gorder discovered that a student's 'Ability to Improvise' and their 'Musical Creativity Rating' served as significant predictors for flexibility ( $R^2 = .301$ ) and elaboration and ( $R^2 = .433$ ). While these two

variables, combined with age, were substantial predictors of quality ( $R^2 = .573$ ), the Musical Creativity Rating provided only a weak predictor of originality ( $R^2 = .168$ )

The Torrance *Tests of Creative Thinking* (along with the Vaughan *Test of Musical Creativity*) appeared once again in the research of Mark Kiehn (2003). Kiehn studied the results of students ( $N = 89$ ) in grades 2, 4 and 6 on two measures of creativity. The results of the Vaughan test were scored by expert judges to determine the creative quality of the students' improvisations. Kiehn discovered that boys scored significantly higher than girls ( $p < .05$ ) and found significant differences between grades ( $p < .01$ ). A Tukey test revealed a significant difference between grade 2 and grades 4 and 6, but no significant difference between grades 4 and 6. Kiehn stated that there is a leveling of creativity that occurs between grades 4 and 6, and that while boys scored significantly higher on the tests for fluency, originality, and composite scores.

#### Other Methods for Evaluation of Creativity

While certain researchers (Amabile; 1983, Balkin; 1990, Elliott; 1995) have defined creativity as a fundamentally product-centered, others (James; 1997, Johnson-Laird; 1987) believe that creativity is process-centered. These differing concepts of creativity have led to multiple means of measurement and quantification. This review will categorize various methodologies into three overarching categories: 1) product centered measurements, 2) process centered measurements, and 3) performance centered measurements (a combination of product and process).

## Product Centered Methods of Measuring Creativity in Music

Perhaps the most influential independent empirical measure of creativity was put forward by Teresa M. Amabile. Amabile (1983) believed that appropriate observers (i.e. experts within the field) are able to independently judge the creative merit of a product and by examining the analysis of multiple experts, one can have a reasonably reliable measure of the creative value of a product. Amabile called this process of evaluation “consensual assessment,” founded on the concept that the most valid means of judging creativity is through the subjective assessments of experts within the domain.

Hickey (1997) employed this consensual assessment model when she explored a possible relationship between a child’s musical explorations and the quality of their compositions. Subjects ( $N = 21$ ) for this study were 4<sup>th</sup>-, 5<sup>th</sup>- and 6<sup>th</sup>-grade students working on MIDI-keyboards connected to computers. These students were efficiently divided into groups based on their ability level (low, middle and high) as determined by a panel of experts evaluating the students’ creative work. An analysis of the various products demonstrated that what separated students in the high ability level from the middle and low level was an advanced ability to manipulate and experiment with musical motifs as well as invent new musical ideas quickly.

Amabile’s work on creativity resurfaced in another study by Hickey (2001). Hickey specifically tested Amabile’s consensual assessment technique on the musical compositions of 4<sup>th</sup>- and 5<sup>th</sup>-grade students. Five independent groups of judges examined the students’ compositions and discovered the consensual assessment to be a reasonably reliable means of judging student creativity, particularly when the most knowledgeable

judges are employed. Of the five groups of judges, general music/choral teachers displayed the highest interactive agreement for creative quality (.81) while second-grade students and ‘mixed-experienced’ teachers, teachers with experience in both instrumental and vocal/general music, displayed the least agreement (.50 and .53 respectively). Interestingly, composers scored had such little agreement (.04) that their input was removed from the study.

Priest (2001) designed an experiment in which undergraduate students ( $N = 54$ ) enrolled in a foundational music course were assigned three composition projects. The final project was judged by an independent panel of eight judges and rated (relative to each other) for perceived creativity. The projects were then divided into three groups (low, middle and high) of eighteen based on the perceived quality of the works. The subjects then completed *Creativity and Craftsmanship Assessments (CCA)* to describe five compositions from a previous class. Priest discovered that the students in the high creativity group tended to describe music in ‘temporal’ terms (statements relating to musical transformations over time) while those in the middle and low groups tended to use metaphors or similes (describing the music using non-musical descriptors).

#### Process Centered Methods of Measuring Creativity in Music

Another school of research in creativity and music education focuses on the cognitive and experimental processes that lead to creativity. Cecilia Wang’s 1985 *Measures of Creativity in Sound and Music (MCSM)* was designed to measure “the fluency and imagination factors of divergent thinking skills of lower-elementary grade

children” (Wang; n.d.) and was based on the model of the Torrance *Tests of Creative Thinking*. This four-activity test is designed for students between the ages of four and eight and has proven to be a consistent measure of a student’s ability to demonstrate fluency and imagination. Currently, the *MCSM* remains unpublished.

The reliability of Wang’s *MCSM* was the focus of a study by Baltzer (1988). Baltzer randomly selected male and female subjects ( $N = 32$ ) from eight different second-grade classrooms to take the *MCSM*. The scores of these students were tabulated by two judges and correlated with Likert-type questions administered to the subjects’ classroom and music instructors in order to estimate the students’ musical and general creativity. The results of the *MCSM* were also correlated with the students’ *Stanford Achievement Test (StAT)* scores, age (in months) and sex. Baltzer indicated that there were no significant differences within the *MCSM* scores for the variables of age or sex and that ratings given by teachers for individual creativity displayed a higher correlation with *StAT* scores than *MCSM* scores. Interjudge reliability coefficient scores for imagination and for fluency were .90 and .99 respectively and interitem coefficients fluxuated between .83 and .92. Baltzer concluded that the *MCSM* is a valid measure of musical creativity in elementary schools and can be a valuable tool in future research into musical creativity.

#### Performance Centered Methods of Measuring Creativity in Music

An investigation into how creativity can be a predictor of a student’s achievement level in vocal jazz improvisation was undertaken by Madura (1996). Madura measured

eighteen elements in vocal improvisations in college students ( $N = 101$ ) studying vocal jazz. The results of this study suggest that the most significant predictors of a student's abilities to improvise in a vocal jazz style were: jazz experience, knowledge of jazz theory and imitative ability. Madura suggested that in teaching vocal jazz improvisation, emphasis should be placed on jazz theory, imitative exercises, and methods to increase a student's jazz experiences such as critical listening. Madura also emphasized the importance of attending and giving live jazz performances. General creativity, as measured by the Torrance Tests of Creative Thinking, was not found to be a significant predictor of achievement in vocal jazz. Laczó (1981) discovered similar results and claimed that the quality of a student's ability to improvise is determined primarily by musical experiences and education. Age was found to be significantly less important than other factors when examining creative improvisation.

It is important to note that, the majority of measures described above were designed with elementary school children as subjects. Lapp and Lungren (2000) reminded educators that teaching creativity should not be limited to elementary students. They cited a high school's song-writing course for increases in both individual and group student participation. Participation in this class also greatly expanded the students' knowledge of music.

### Effects of Music Instruction on General Creativity Scores

Another area for investigation in creativity and music education is the effect that formal music training has on the general creativity of subjects. Hamman, Bourassa and

Aderman (1990) investigated whether undergraduate music majors are significantly more creative than non-music majors as measured by the *Consequences form A-1* (designed to test subject's ability to find multiple new ideas out of new and unusual circumstances) of Guilford & Guilford's (1980) test for individual creativity.

The researchers discovered that the scores of the music majors were significantly higher ( $p < .02$ ) than the scores of the non-music majors. Also significantly higher scores ( $p < .02$ ) were discovered among the scores of students that had more than ten years of arts experiences than those that had less than ten years of experience. In 1991, Hamann and Aderman replicated their study using high school students ( $N = 144$ ) in order to determine the extent to which these subjects' creativity scores were correlated with the subjects' gender, GPA and participation in the arts (jazz, music, art, theatre and combined experiences). The researchers found no significant differences between creativity scores by gender, visual arts, jazz, or combined arts. In fact, GPA represented nearly all of the variation between these scores. Subject who rated themselves as low and moderate in musical experiences had significantly lower scores than those that rated themselves as high.

Lufting (2000) designed an experiment to determine whether 2<sup>nd</sup>-, 4<sup>th</sup>-, and 5<sup>th</sup>-grade students would be positively affected, in terms of creativity, scholastics, self-esteem and locus of control (LOC), by being enrolled in a SPECTRA+ program; a school wide, interdisciplinary arts education program emphasizing improved performance in all facets of a student's education through arts integration. Subjects ( $N = 615$ ) were separated into two control groups and one experimental group and given a pre-test prior to two days of instruction within the SPECTRA+ environment. Following the instruction

period, a post-test was given to all participants. Lufting concluded that the SPECTRA+ program had a significant impact ( $p < .019$ ) on the creativity scores (as measured using the Torrance *Tests of Creative Thinking*), particularly in the areas of elaboration ( $p < .01$ ) and originality ( $p < .01$ ). Lufting displayed mixed results for scholastic ability, self-esteem and LOC.

Byrne, MacDonald and Carlton (2003) used Csikszentmihalyi's concept of 'flow' (a sense of optimal and effortless involvement in an engaging activity) in combination with student compositions to see whether there are any correlations between creativity and engagement in the process. University students ( $N = 45$ ) were separated into small groups and selected one of three musical stimuli to build their compositions around. Following group compositional sessions, the subjects filled out Experience Sampling Forms (ESF) to help them reflect on the process of writing music. The ESF was a survey filled out by the students describing how they felt while accomplishing the compositional activity. A panel of experts evaluated the compositions for creativity and found significant agreement ( $r = .76, p < .01$ ) for compositional creativity. When these creativity scores were compared to the students' ESF scores, the researchers found that student composers who were most actively engaged in the task produced significantly ( $p < .01$ ) more creative work.

### Conclusions and Suggestions for Future Research

There is a large body of research regarding creativity and music education. The research described here represents selected studies conducted subsequent to 1980.

Research prior to that year has been reviewed by Richardson (1983). Much research remains to be done on measuring musical creativity. The majority of the tests cited in this review relating directly to the assessment and measurement of creativity were designed between the years 1980 and 1986. Reexamining previous methods for measuring creativity is important for increased application and reliability and technological advancements in computer hardware and software offer potential for new methods for evaluating creativity. Both new and established methods of evaluating creativity should be employed to explore the appropriateness of using product-centered methods of measuring creativity in music versus process-centered or performance-centered methods. Also, it will be important to determine whether there are relationships between students, scores on product-centered measures of creativity and their scores on process-centered or performance-centered methods.

An additional avenue should be an attempt to determine whether creativity is something that can be taught and, if so, establish best methods for teaching it. Madura (1996) found creativity in vocal jazz improvisation to be related to knowledge of theory and jazz experience – both teachable concepts. Similarly, Lufting (2000) linked creativity to classroom participation in a school wide arts program. Conversely, Hamman and Aderman (1991) found creativity in high school students to be most highly correlated with general GPA scores.

Creativity is a vital factor within the context of a complete education in music. The research investigated here covers an extensive assortment of feasible topics and has practical applications to current musical instruction. Amabile's (1983) technique of consensual assessment has provided an excellent means of judging the relative creativity

of musical products (Hickey, 1997, 2001). In the process of teaching and evaluating creativity, classroom teachers could readily employ this consensual assessment. Another practical measure of creativity, Webster and Hickey's 1999 updated version of the *MCTM*, was redesigned specifically to be more accurate and easier to administer. This new version of the *MCTM* could be assist with the longitudinal exploration of how a student's creativity changes from a young age through high school or college.

While there is still much to be learned about developing the creative abilities of student musicians, it is my hope that this examination of the literature will lead to superior teaching methods and to the establishment of an environment that develops students' capabilities as independent music learners.

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