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Creative thinking in elementary general music: a survey of teachers' perceptions and practices

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CHAPTER II EMPIRICAL STUDIES OF CREATIVE THINKING

Chapter I discussed the influences that gave rise to creative thinking and its role in the American music education curriculum. Subsequently, as music educators have taken greater notice of the benefits of creative thinking as part of teaching and learning, research focusing on creative thinking has also increased (Webster, 1992). This chapter examines research on creative thinking in music, with an emphasis on how it relates to the pedagogical practices of teaching students in the elementary general music classroom.

Chapter Organization

The first part of the chapter provides an historical overview of psychological research that formed the foundation for current research in music and education regarding the construct of creative thinking. The second part of the chapter examines research describing the development of musical creative thinking in children. It also describes studies relating to music educators' perceptions and practices of teaching creative thinking in music. An examination of these studies provides a critical background that helps inform the pedagogical decisions of teachers when facilitating creative thinking experiences for children. The literature in this chapter is organized into the following categories: (a) psychological research of creative thinking that forms a foundation for scholarly research, (b) the development of measurement techniques for musical creative thinking, (c) investigations that describe creative thought processes and products of children, (d) teachers' perceptions of creative thinking, and (e) an examination of the music teachers' role in facilitating these experiences.

Theories and Definitions of Creative Thinking:
An Historical Perspective

One key difficulty when conducting research on creative thinking is the lack of an operational definition of creative thinking (Maslow, 1959). One of the earliest steps toward a definition of creative thinking is the result of landmark research conducted by three scholars: Graham Wallas (1858-1932), Joy Paul Guilford (1897-1987), and E. Paul Torrance (1915-2003). The research of these individuals provides the fundamental tools necessary to analyze identifiable components of creative thinking in modern research (Arieti, 1976).

Graham Wallas: The Thought Processes of Creativity

Graham Wallas (1926) presents one of the earliest, most widely accepted theories of the processes of creative thinking. He views creative thinking in terms of the individual's thought processes, dividing it into four basic stages: (a) preparation, (b) incubation, (c) illumination, and (d) verification. According to Wallas, the creative process does not always occur in a linear, step-by-step fashion. Instead, the stage of verification is often interrupted by returning to previous steps, in a recursive manner. As Wallas suggests, the creative process is messy, and it is in this messiness that fresh new insights and connections can occur (Wallas, 1926, pp. 40-60).

In his theory, Wallas describes "preparation" as a combination of skills and thought, in which one explores and clarifies the problem to be solved. "Incubation" involves a subconscious form of thought that occurs during unfocused reflection of the problem, while occupied with another task, or when resting. Wallas suggests that incubation might occur during unconscious mental activity, such as sleep, or while

thinking about unrelated issues. Because this stage occurs subconsciously, he notes that it is difficult to describe in detail. However, Wallas infers the process of incubation from the reorganization of thoughts leading up to the next stage, "illumination." The illumination stage is often described as a sudden change in perception, a moment of inspiration or an "aha" moment, in which the mental pieces of a puzzle all seem to fall into place. The final stage in this process is termed "verification," in which an idea is put to a test for its appropriateness.

Wallas's theory, sometimes referred to as "stage theory," laid the foundation for examining the process of creative thinking. The impact of his work is still evident today (e.g., Barron, 1988; Csikszentmihalyi, 1996; Fritz, 1991) as these scholars have developed alternate models of creative thinking processes, yet their theories still possess characteristics similar to those described by Wallas. While Wallas's work helped delineate the process of creative thinking, another notable scholar, J.P. Guilford examined a different aspect of creativity, by identifying personality characteristics of individuals that exhibited high levels of creative thinking.

J. P. Guilford's Intellectual Factors

In 1949, J. P. Guilford addressed the American Psychological Association, speaking as their association president. In his speech, he stated:

I discuss the subject of creativity with considerable hesitation, for it represents an area in which psychologists generally, whether they be angels or not, have feared to tread. It has been one of my long-standing ambitions, however, to undertake an investigation of creativity. (Guilford, 1950, p. 444)

Guilford also encouraged his colleagues to devote more attention to the study of creative thinking, which he believed was a crucial aspect to human development and of the

greatest social importance.

Guilford's speech represented a historical starting point for empirical investigations of creative thinking, by providing an operational definition of those traits that contribute to creative thinking (Sawyer, 2006). Guilford's (1950) research suggested that creative thinking was largely dependent upon learned patterns of behavior. He hypothesized that creative people typically possess the following intellectual factors:

1. *Sensitivity to problems*—the ability to detect subtle features of a problem
2. *Fluency*—the ability to produce a large number of ideas per unit time
3. *Novelty*—uncommon, yet acceptable answers to problems
4. *Flexibility*—to branch out into new ideas, rather than being rigid in thinking
5. *Analyzing and Synthesizing*—to break down and then rebuild symbolic structures
6. *Redefinition*—creating a new phenomena from an already existing one
7. *Complexity*—ability to think about a number of related concepts simultaneously
8. *Evaluation*—knowing the difference between an appropriate or inappropriate idea (pp. 451-454)

Over time, Guilford expanded his model of creative thinking as an operation of 24 divergent thought processes. Of these divergent thought processes, four primary concepts emerged as closely connected with creative thinking: fluency, flexibility, novelty, and evaluation.

The divergent thinking abilities identified by Guilford form the underlying basis for many of the approaches used to study creative thinking today (Webster, 1992). These concepts are embedded in much of the research on general and musical creative thinking, as well as measurements of creative thinking ability.

E.P. Torrance: Measures of Creative Thinking

Building on the work of Guilford, E. Paul Torrance developed one of the most widely used measures of creative thinking (Torrance, 1974). The *Torrance Tests of Creative Thinking* (TTCT) used Guilford's concepts (fluency, flexibility, novelty, and elaboration) as a basis for measuring creative ability. These tests yielded high levels of validity, reliability, and normative data based on subsequent investigations (Cropley, 2000; Davis, 1997; Kim, 2006). The TTCT is still widely used today by the business world and in education (Kim, 2006).

Torrance also identified 84 personality traits (such as curiosity, adventurousness, independence of thought, and intuitiveness) that are most often associated with creative individuals. He developed his list by cross-referencing the personality traits of individuals with high scores on measurements of creative thinking and then ranked these traits by those that occurred most often. Torrance suggested that it was critical for educators to identify students with creative potential, as well as to understand their personality traits, so as to best serve them in the classroom (Torrance, 1974).

The Development of Measurements for Creative Thinking in Music

Little to no data-based research has identified the personality traits of children who are musically creative, as well as teachers' attitudes towards them. However, a large body of research in the field of educational psychology, known as psychometrics, led to the development of tests meant to identify musically creative children. Vaughan (1971), Webster (1977), Gorder (1976), and Wang (1985) were among the first to apply psychometrics in the field of music education, for the purpose of measuring creative

thinking ability in students. A subsequent test designed by Webster (1994) is now frequently in use and available to teachers and researchers.

Based on the work of Guilford and Torrance, Vaughan (1971) developed the first psychometric study specific to musical creative thinking. She designed a series of six tasks for elementary-aged children that measured the factors of musical fluency, rhythmic security, synthesis, and ideation [defined as “the quality of variety and suitability within the given framework” (pp. 65-66)]. Vaughan’s test required children to improvise rhythmic and melodic patterns in response to different kinds of stimuli, using percussion instruments, vocal sounds and/or bells. A small panel of judges scored the compositions, using a five-point scale for each factor. Reported inter-judge reliability of her measure ranged from .67 to .90, which is relatively strong (Vaughan, 1977). However, Vaughan’s work was considered incomplete because content validity was never established (Webster, 1992).

Gorder (1976) developed one of the first studies measuring the musical creative thinking of junior high and high school students. Using the *Measure of Musical Divergent Production* (MMDP), Gorder evaluated the improvisations of 81 participants. Each participant responded to four different tasks using their own instrument, or by whistling or singing. Gorder scored the improvisations by using a music content checklist of 78 items relating to rhythm, melody, tempo, style, expressive devices, and form. The checklist helped assign a score for each improvisation based on fluency, flexibility, elaboration, originality, and musical appeal.

Gorder consulted a panel of experts to establish construct validity of the musical elements used with the MMDP. Construct validity was obtained by comparing the

MMDP to other tests that measured similar constructs, such as the *Seashore Measure of Musical Talents* (Seashore, Lewis, & Sactveit, 1960), which had already been purported to be a valid measure of musical elements. Gorder's study was influential because it successfully defined the components of musical creative thinking (Webster, 1992).

Webster's (1977) measure of creative thinking abilities in music was more extensive than either Vaughan's or Gorder's, because it assessed three different modes of musical creative thinking: composition, improvisation, and listening. Initially, Webster administered his test to 77 high school musicians. Participants completed several tasks including: improvisations, a series of take-home compositional assignments, and an analysis/listening component in which participants were asked to make imaginative and original observations about the structure and design of a melody from *Volume I* of Bartok's *Mikrokosmos*.

Webster (1977) used a scoring approach similar to Gorder's, implementing a checklist and a small panel of judges to rate the creative tasks. The judges scored each task using a four-point scale in the areas of fluency, flexibility, originality, and elaboration. Scoring reliability for Webster's test ranged from .81 to .93 and inter-judge reliability ranged from .70 to .90.

Wang (1985) designed the *Measures of Creativity in Sound and Music* (MCSM) for use with young children ages 3 through 8. The MCSM consisted of four activities, providing scores for both musical fluency (number of responses) and imagination (appropriateness of response and freedom of expressive elements). The four tasks required a wide variety of responses including using recycled objects as instruments, creating improvisations out of small percussion instruments, generating multiple versions

of an ostinato using only two notes, and moving in response to recorder music. To date, two pilot studies have evaluated the effectiveness of the MCSM (Baltzer, 1988, 1990). Baltzer's investigation of the MCSM indicated a high inter-item and inter-judge reliability, ranging from .83 and .99, respectively.³

The work of Vaughan, Gorder, Webster, and Wang helped operationally define some of the components that contribute to creative thinking in music. Their studies demonstrated that fluency, flexibility, elaboration, and originality are highly correlated with creative thinking ability.

Webster's Measure of Creative Thinking in Music

Building on his previous work, Webster (1987) created the *Measure of Creative Thinking in Music* (MCTM), designed for use with students in early elementary school. The MCTM contains ten tasks requiring the child to improvise and/or compose using temple blocks, a Nerf ball on a piano, their voice, and various elements of stimuli including music, stories, and visual aids. Musical products are scored based on: (a) *musical extensiveness*, the length, measured in seconds, of a musical response, (b) *musical flexibility*, the use of range, dynamics, and tempo, (c) *musical originality*, the uniqueness of the musical response, and (d) *musical syntax*, the extent to which the response makes musical sense (Webster, 1989, p. 62).

For best results, Webster suggests using a panel of judges to score responses to musical originality and syntax. The MCTM provides rating scales based on the author's criteria for judging student responses. Pilot studies of the MCTM suggest a strong

³ Wang has yet to formally publish this measurement tool, however it is available to teachers and researchers upon request.

content validity for the assessment, based on the examination of musical experts (Webster, 1987). Other studies reveal that reliability for the factors of musical originality and syntax range from .53 to .78; internal reliability, measured in the form of Cronbach Alpha coefficients ranges from .45 to .80; and test-re-test reliability indicates a range between .56 to .79 (Webster, 1987; Swanner, 1985; Baltzer 1990).

The Use of MCTM in Music Education Research

While Webster's MCTM is typically used to rate the skills of an individual, it has also been applied to determine the effect of encouraging creative thinking during instruction. Fung (1997) examined the effects of an Orff-based sound exploration program on children's scores of musical creative thinking. Student participants in first and second-grade took Webster's MCTM and their scores were compared to second-grade non-participants in similar schools within the same district. Fung reported that the students who participated in the exploration program received significantly higher scores in the areas of musical flexibility, originality, and syntax, but not in extensiveness. His findings suggest that students who engage in sound exploration may be more ready for creative work than those who do not.

Koutsoupidou and Hargreaves (2009) examined the effect of improvisational instruction on the MCTM scores of two classrooms of second-grade students.⁴ Using a quasi-experimental design, they administered the MCTM to each child as a pre-test and then again as a post-test, after six months of either improvisational instruction (experimental group) or non-improvisational music instruction (control group). Prior to

⁴ Two groups of students were observed in this study, a control group ($n = 13$), and an experimental group ($n = 12$).

the beginning of instruction, the MCTM scores indicated little difference between the two groups. However, the post-test showed statistically significant gains by students enrolled in the experimental group, while students in the control group made little to no progress on the MCTM. Statistical analysis indicated that the main effect for “test” times “group” was significant [$F(1, 23) = 35.966, p < .001$]. Based on these results, Koutsoupidou and Hargreaves suggest that encouraging students to engage in creative thinking, especially in the form of improvisation, may promote increased creative thinking abilities in music.

Conclusions from Studies on Measures of Creative Thinking in Music

The psychometric studies discussed in this chapter provide a theoretical framework for understanding the key components that contribute to creative thinking in music. These studies suggest that the factors of musical extensiveness (the length of a musical response), flexibility (the use of varied range, dynamics, and tempo), originality (the uniqueness of the response), and syntax (the extent to which the response makes musical sense) are correlated to creative thinking in music.

The reliability and validity demonstrated by the MCTM suggests that an operational definition of creative thinking exists within the context of scholarly research of music education. However, whether or not teachers are aware of the MCTM as a measurement tool, as well as the defining factors that contribute to creative thinking, has not yet been addressed in peer-reviewed research literature.

The significance of the MCTM as a measurement tool has important implications for this study. The findings of Fung (1997) and Koutsoupidou and Hargreaves (2009) suggest that the process of teaching and learning positively influences ability in creative

thinking. However, it is not clear if elementary general music teachers consider creative thinking a teachable skill. This question is important to examine, as it leads to an understanding of the perceptions of educators regarding the nature of creative thinking.

The Consensual Assessment Technique

While psychometric studies are useful, they are not without criticism. Critics of the psychometric approach suggest that measuring creative ability using only the variables of fluency, flexibility, originality, and elaboration ignores the real-life aspects of this phenomenon (Amabile, 1982b; Brown, 1989). Additionally, scholars have expressed concern over the factorial approach used to determine the content validity of creative thinking measurements. Brown (1989) explains that psychometric studies are problematic because of circular reasoning: theoretical constructs come first and are then validated using factor analysis to identify the factors. Brown, among others (Hocevar & Bachelor, 1989; Michael & Wright, 1989), questions the validity of using extensiveness as a measure, noting that output per minute may be irrelevant in assessing one's creative thinking ability.

Among the detractors of the use of psychometric studies for the assessment of creative thinking is Teresa Amabile. Amabile (1982b) suggests that it is impossible to articulate clear, objective criteria for a creative product. Instead, she proposes that the most valid way to measure such products is through experts' subjective and personal definitions of creative thinking, a method referred to as the "consensual assessment technique" or CAT, rather than using a checklist or other given criteria. The CAT has successfully rated creative products in a variety of subject areas, such as visual art, dance, creative writing, and music. A comprehensive review of studies utilizing the CAT in

several domains indicates that reliability for this method is consistently high (Amabile, 1996; Kaufman, Lee, Baer, & Lee, 2007).

Amabile (1982b) developed a list of criteria for implementing the technique properly: (a) the judges must have some knowledge of the subject matter, (b) they should make their assessments independently of one another, (c) in addition to rating creative thinking, the judges should be asked to rate other dimensions of the product such as aesthetic appeal, (d) they should be instructed to rate the products relative to one another, rather than against some absolute standard, and finally, (e) each judge should review the products, as well as the dimensions of the product, in a random order.

The Use of the CAT in Elementary Education

The CAT has become a common tool in research examining the creative products of children. Several researchers used the CAT to determine the effects of various environmental constraints on children's creative thinking (Amabile, 1982a; Amabile & Gitomer, 1984; Berglas, Amabile, & Handel, 1979; Hennessey, 1989). These studies suggested that the use of rewards, lack of choice, and evaluation inhibit creative thinking, while freedom of choice and intrinsic motivation enhance creative thinking.

Amabile (1982a) investigated the effects of extrinsic motivation on creative thinking. Girls, ages 7 to 11, created mixed media collages during two different art sessions, experimental or control. Researchers told the experimental group that the girls having the most creative collages would receive door prizes. Conversely, girls in the control group received prizes through a raffle. The data indicated that girls in the experimental group scored significantly lower on ratings of creative thinking than girls in the control group. Analysis of the collages revealed that girls in the experimental group

used significantly less variability in colors and pieces of media. Amabile suggested that, because of the promise of a reward, the girls might have been less willing to take risks. Lepper, Greene, and Nisbett (1976), Amabile, DeJong, and Lepper (1976), Amabile, Hennessey, and Grossman (1986), and Hennessey (1989) reported similar findings.

Amabile and Gitomer (1984) investigated the effect of choice on creative thinking. Pre-school aged children were assigned to one of two groups. In the first group, each child received five boxes of materials from which to create a collage. In the second group, each child chose five boxes from a collection of ten. The group that chose boxes created significantly more creative products than the group that had no choice. Additionally, children who chose materials showed more interest in making collages after the initial experiment than the students who were not given a choice.

Hennessey (1989) examined the effect of anticipated evaluation on ratings of creativity. Children, ages 7 to 13, completed an art project using a computer. Hennessey assigned students to one of three groups: a control group that did not have any kind of final evaluation, an experimental group that the researcher evaluated, and another experimental group that a computer evaluated. Hennessey's research indicated that students assigned to the evaluation groups scored significantly lower on creative thinking than students who did not receive an evaluation.

Berglas, Amabile, and Handel (1979) examined the effect of prior evaluation on children. Students in grades two through six completed two separate art projects, in one of two groups. In the experimental group, students made their first piece of visual art, and regardless of the quality of their work, received a positive evaluation from the researcher. Then they made a second piece of artwork. In contrast, students in the

control group were not evaluated on either task. After the second task, judges rated the products using the CAT. The control group scored significantly higher on scores of creative thinking than the group that received evaluation, even though their evaluations were positive.

Studies using the CAT provide a basic understanding of factors that may inhibit creative thinking, such as extrinsic motivation/rewards, lack of choice, and prior or anticipated evaluation. It is important to know teachers' perceptions of factors that enhance or inhibit creative thinking. However, in examining such studies it becomes evident that there are too few published studies examining the effect of these factors on creative thinking in the general music classroom.

The Use of the CAT in Music Education

While the CAT has not been used to determine the effect of environmental factors on musical creative thinking, it has been used successfully as a tool for rating children's creative musical products (Bangs, 1992; Brinkman, 1999; Daignault, 1997; Hickey, 2001; Preist, 1997; Webster & Hickey, 1995). Overall, reliability of the CAT in the domain of music typically falls between moderate to high.

Hickey's (2001) research is one of the most relevant investigations to the present study. In addition to evaluating the reliability of the CAT, Hickey investigated whom would best qualify as a group of "experts" when evaluating the compositions of young students. Five groups of judges (composers, music theorists, music teachers, seventh-grade students, and second-grade students) listened to recordings of compositions and rated them, relative to one another, on a seven-point Likert-type scale, with the anchors of low, medium, and high. The directions stated, "using your own definition of creative

thinking, rate the degree to which the composition is creative” (Hickey, 2001, pp. 238-239). The judges also rated the craftsmanship and aesthetic appeal of each composition. Small changes simplified the form used with second- and seventh-grade students.

Hickey’s results indicated that composers were, by far, the least reliable judges with an inter-reliability rating of $r = .04$. Vocal/general music teachers and theorists were the most reliable judges, with an inter-reliability rating of $r = .81$ and $r = .73$, respectively. The remaining judges (instrumental teachers, seventh-grade students and second-grade students) had moderate inter-reliability ratings of $r = .65$ to $.50$. The reliability of all judges combined was reported to be $r = .48$. However, when the composers’ ratings were removed from the combined reliability score, the overall reliability of the judges increased to $r = .78$. Hickey’s study suggests that the CAT is a valid and moderately reliable way of judging children’s musical products.

The findings from the CAT studies have important implications for teaching and research. While the criteria for judging the creative thinking of musical products is entirely subjective, the research literature typically indicates a high level of agreement among judges (Priest, 1997). While it is hard to articulate a definition of creative thinking, observers can still identify its presence and impact. Thus, while a specific definition of musical creative thinking has yet to be described in the literature, there is, in fact, shared understanding within the educational community as to its meaning.

The Processes of Children’s Creative Thinking in Music

Several studies have followed the tradition begun by Moorhead and Pond (1941, 1942, 1951) and Dorothea Doig (1941, 1942a, 1942b), as discussed in Chapter I. Studies by Barker (2003), DeLorenzo (1989), Levi (1991), Miell and MacDonald (2000), Hickey

(1995), Wiggins (2003), and Younker (2000) employed a naturalistic approach of observing children engaged in creative thinking. Alternatively, investigations by Flohr (1979), and Kratus (1989), used controlled experimental settings.

DeLorenzo (1989) examined the decision-making of sixth-grade students completing musical problem-solving tasks. She identified four primary characteristics that guided student behavior:

1. *Perception of the problem*: Students who understood that there were many choices for solving the problem spent more time exploring musical events and making revisions than students who thought there were only limited choices.
2. *Search for the musical form*: This refers to the shaping of an entire musical thought. Some students spent a great deal of time listening to and analyzing their musical composition as a set of interrelated phrases, while other students failed to successfully link phrases together as a cohesive unit.
3. *Capacity for breadth of musical possibilities*: Students displayed a wide range of abilities when thinking in sound. Some students remained focused on unchanging repetitive patterns while others seemed more able to develop, shape, and transform musical material.
4. *Degree of personal involvement in the task*: The more students fully engaged in the creative aspect of the project, the greater interest and excitement they demonstrated throughout the process, especially as they neared a solution. Uninvolved students, on the other hand, were easily distracted and showed little interest in the creative outcome (pp. 195-196).

DeLorenzo suggests that general music teachers can enhance their students' ability to

perceive the problem, by engaging in exploratory experiences designed to increase students' understanding of the breadth of choices for musical material, as well as expressive elements, which can dramatically alter the product. Additionally, teachers can help guide students through discussion and reflection of the process and creative products of musical thinking.

Levi (1991) observed second-grade children as they freely explored and created musical compositions using xylophones, over a period of eight weeks. Levi set out to determine whether: (a) phases of the compositional process were observable, and (b) if so, what specific behaviors characterized each phase? Anecdotal records, field notes, and musical scores were used to summarize the composing process.

Levi delineated five non-linear phases of the composing process: exploration, focus, rehearsal, composing, and editing. The exploration phase occurred during the initial collection of ideas, and was characterized by experimentation and divergent thinking. At some point, a noticeable shift occurred from the process-oriented exploration phase to the product-driven focus phase. Levi suggested that the focus phase became the most important component of the composing process, because this is where children develop the majority of their ideas. Additionally, children came back to this phase repeatedly. Following the focus stage, children typically enter the rehearsal stage, identifiable by the repeated playing of motivic material developed in the focus phase. After the rehearsal stage, students typically engaged in composing, where they linked together motivic material into a larger formal structure. Finally, the students would enter an editing phase where they often added expressive elements. Overall, Levi described the composing process of children as dynamic, flexible, and recursive, as participants

moved into and out of various phases repeatedly.

Hickey (1995) investigated the relationship between the thought processes and products of fourth- and fifth-grade students involved in a MIDI (musical instrument digital interface) based compositional task. She recorded the students' musical explorations and final compositions, in order to provide insight into their thought processes. A small group of judges then rated the compositions using the CAT. Finally, Hickey used the scores from the CAT to divide the students' creative products into two categories, low- and high-creativity, for the purpose of analysis. Hickey's findings suggested that the higher-creativity group displayed more flexible and fluent musical behavior, used a larger melodic range, played more measures, and spent more time revising their products than those of the lower-creativity group.

Using data from a decade's worth of naturalistic observations, Wiggins (2003) developed a theory explaining the creative thought processes of children engaged in classroom composition. Wiggins indicated that her theory does not represent a universal model for describing the compositional thought processes of all children, but rather a frame through which educators can better understand what students are doing while they compose.

Wiggins suggested that students typically begin their work by making three or four key decisions: (a) selecting a sound source, (b) determining what role each individual will play within the group, (c) creating music for each instrument and, if applicable, (d) the subject matter of the song and creation of song lyrics. Wiggins noted that students composed in chunks, typically having a notion of what they want the piece to sound like beforehand. Thus, the ideas came from students' holistic conceptions of

what they wanted the piece to sound like, rather than from their initial explorations. Additionally, she observed that in shared compositions, the instrument a student chose often determined that individual's role within the group. For example, less experienced students often made several trips to the instrument shelf, choosing a new instrument each time. She observed that while this was a form of musical exploration, the students' focus was on examining the instrument, and was ultimately irrelevant to the final outcome of their composition. On the other hand, experienced students would choose an instrument quickly, and often become leaders of the group by contributing more musical material to the final creative product.

Once the student group had a musical idea, they immediately began setting it into a larger context by organizing, evaluating, revising, and refining their composition. However, as students developed their musical idea, they often returned to the initial stages to invent new musical material. When students were ready to perform a composition, they perceived their product as finished. Thus, students typically had little interest in refining their compositions based on teacher or peer feedback after a performance. However, Wiggins indicated that they would often consider feedback on the development of future projects.

Flohr (1979) investigated the improvisational products of children 2 to 5 years of age over a four-year period in a lab school setting. Children improvised on a xylophone with a two-octave pentatonic scale. They received verbal and musical stimuli from the researcher. Flohr's research suggests that there are three distinct stages of development for young children. The first stage is labeled "high motor energy" in which the child is engaged in improvising in a very kinesthetic manner. The second stage is evident by the

child's experimentation with motives, in which he or she has little need for sound to have a formal structure. The final stage is characterized by the use of formal properties, such as strong use of tonality, evolution of motives, and discernable form.

Kratus (1989) examined the amount of time children, ages 7, 9, and 11, spent engaged in periods of exploration, development, repetition, and silence, during a ten-minute composition task. He found that children at age seven spent much less time engaged in repetition and preferred to spend their time exploring sound possibilities. He also observed that spending more time engaged in repetition was a necessary component for song replication and that 9- and 11-year olds were therefore better able to repeat their songs than their younger counterparts. Kratus suggested that the compositional process of 9- and 11-year-olds is similar to that reported by adult musicians, in that they explore sounds, develop ideas, and repeat musical patterns while composing.

It is interesting to note that in these studies (DeLorenzo 1989; Levi, 1991; Hickey, 1995; Wiggins, 2003; Kratus, 1989) the thought processes of children engaged in creative musical activity were inferred, using only observable behavior and resulting products as a measurement. Researchers have also interacted with students in order to get a clearer picture of children's thought processes. Miell and MacDonald (2000), Younker (2000), and Barker (2003) collected data through questionnaires, think-alouds, field notes, audio- and video-taped recordings, and MIDI files.

Miell and MacDonald (2000) examined the impact of the social variables of friendship and collaboration on children's creative thinking. In this study, children were assigned to one of two same gender groups: an experimental group in which children chose a friend, and a control group in which children were assigned a partner who they

did not know very well. Researchers gave the students a training session on musical composition, and then asked the student groups to compose a piece of music, using the idea of a rainforest as inspiration. Researchers also videotaped the students' interactions during the composition process.

Their study indicated that working with a friend yielded more creative results than working with a non-friend, even when more experienced groups were compared to less experienced groups. Additionally, the quality of their compositions directly related to the quality of conversation between the children during the composing process. Friends engaged in conversation more frequently than non-friends, and their conversations tended to include elaboration and extension of one another's ideas. Non-friends engaged in much less conversation, focusing on either agreeing or disagreeing, with very little idea generating.

Yunker (2000) examined the thought processes of nine children ages 8, 11, and 14, engaged in a computer-based composition project. Using in-depth descriptive analysis, she engaged in personal interviews, reflective think-alouds, and compositional artifacts from the students, in order to analyze her data. She found that timbre played a more important role in the compositions of younger children than older children. However, an audible and steady beat, as well as vertical harmony was more common in the compositions of older students. Yunker's research indicates that a developmental pattern exists in relationship to age, and that as children become older, their compositions become increasingly more complex.

Barker (2003) examined children's creative thinking strategies when composing. She was also interested in any correlation between gender, age, experience, and previous

musical training on compositional ratings. Forty children ages 8 to 12 participated in the investigation. Participants composed a melody on a MIDI keyboard, using only the black keys, and judges rated their compositions using the CAT. Barker collected data through questionnaires, interviews, field notes, audio-taped recordings, and MIDI files. In these studies, Barker observed that age and family participation in music were highly correlated with compositional ratings. She also found that students' verbal and behavioral responses revealed a great deal about their creative thinking strategies and that their use of complex strategies correlated with judges' ratings.

Conclusions from the Studies on Children's Creative Thinking

A recurring theme in the reviewed studies is how children think in a non-linear fashion while engaged in the creative processes. Although the stages of such thinking processes have various labels, each researcher noted the presence of some sort of exploration or readiness stage, problem solving and/or identifying, rehearsal, and finishing stages. Some confusion still exists regarding the nature of the exploratory phase. Levi (1991) suggests that the exploratory phase includes the development of musical ideas, while Kratus (1989) and Wiggins (2003) indicate that the exploratory phase has little to do with the musical product, but rather it is an exploration of the performance medium. Regardless of the purpose, the research literature demonstrates that children typically engage in some form of exploration at the beginning of creative processes. This suggests that teachers need to provide ample opportunities for children to explore instruments, and engage in compositional tasks.

Another commonality inferred from these studies is that creative musical thinking

processes change with experience and age. As students become more accustomed to thinking in sound, their process changes from highly physical and repetitive to expressive and coherent (DeLorenzo, 1989; Kratus, 1989). Accomplished students engage in more purposeful playing, spend less time in an exploratory phase, and more time developing their own musical gestures (Hickey, 1995; Kratus, 1989).

Wiggins (2003) suggests that, in the case of elementary general music, much of the creative work takes place in small social settings. Miell and MacDonald (2000) suggest that working with friends yields greater works of creative thinking than working with non-friends. To date no published research examines teachers' perceptions of these findings.

Little research suggests that teachers are aware of such stages or consider them when planning creative thinking activities. Yet, a thorough understanding of the students' processes of engaging in creative thinking tasks is essential for designing effective lessons. One key component of the present study is to examine teachers' understanding of the process of children's creative thinking, how social variables impact students' products, and how teachers may use their understanding to design learning experiences.

Characteristics of Children's Creative Musical Products

While the studies in the previous section focused on explaining processes of children's creative thinking in music, other research has examined the characteristics of students' musical products, manifested in the form of composition and improvisation. Davies (1992), and Swanwick and Tillman (1986) described children's musical compositions, while studies by Barrett (2006), Brophy (2002), and Smith (2008)

examined the features of children's improvisations.

Characteristics of Children's Compositions

Swanwick and Tillman (1986) used qualitative descriptions of children's musical compositions to chart the developmental progression of young composers at various ages. Using a descriptive analysis of 700 compositional products created by children ages 3 to 15, Swanwick and Tillman proposed a spiral sequence of musical development. The sequence contains four developmental stages: (a) ages 0-4, mastery of materials; (b) ages 4-9, imitation and expression; (c) ages 10-15, imaginative play; and (d) ages 15 or older, metacognition. As children move through the four stages, they become less experimental and more conventional in manipulating musical material.

Davies (1992) examined the songs of 5 to 7 year old children. Her research indicated that even young children are able to work within all four levels of the sequence proposed by Swanwick and Tillman (1986). Davies speculated that young children were able to invent songs that presented formal structures with expressive elements. She found that the children typically framed their songs with distinctive beginnings and endings, which then provided structure for the middle phrases. Children typically grouped their songs into two or four measure structures. Additionally, Davies suggested that children's intuitive musical understanding was evident through their compositions. Their ability to compose complex music preceded their ability to conceptualize or verbalize their understanding.

Smith (2008) studied the compositions of 9 and 10 year old recorder students ($N=12$), who had attained a basic mastery of the instrument. Each student wrote six compositions under various conditions: two unprompted recorder pieces, a song for a

given poem text, a song for a given melodic motif, the musical answer to a musical question, and a piece that reflected a strong emotional mood. In this study, Smith found that the poem task resulted in compositions of higher musicality based on craftsmanship, originality, imagination, and idiomatic recorder sounds.

Characteristics of Children's Improvisations

Brophy (2002) conducted a widespread study of 840 improvisational products by 280 children, ages 6 through 12. Judges scored the improvisations based on melodic range and motion, use of a tonic, motivic development, attention to pulse, and use of phrase structure. Brophy suggests that as students' age, there appears to be an increase in motivic development, greater sense of pulse, and greater structural organization.

Barrett (2006) studied the spontaneous music-making of primary-aged children in a naturalistic school setting, over a two-year span of time. The researcher developed a "music corner," where children could sing, play with musical instruments, and write down songs. Use of the music corner was optional (as part of daily centers time) and the children determined the length and frequency of their visits to this center.

Barrett observed that some of the children who visited the music corner were prolific music-makers. When Barrett asked children to repeat their pieces, they rarely did so in the same way, making changes to their songs, suggesting a more improvisational nature of music-making. However, each time they repeated their piece, their improvisations grew more elaborate and complex. Over time, the children utilized repetition, accentuation, theme and variation, anticipation, surprise, and climax and resolution in their songs. Barrett suggests that having the opportunity to compose plays an important role in building cultural and emotional knowledge in the lives of children.

Conclusions from Studies on Children's Musical Products

Studies focusing on the characteristics of children's musical compositions and improvisations indicate that students' products typically move through several developmental stages with early products being repetitive (Swanwick & Tillman, 1986) and having an unsteady pulse (Brophy, 2005). As children become more experienced, their compositions and improvisations take on greater structural form, steady pulse, motivic development, and expressivity.

While the large scale of Swanwick and Tillman's (1986) study makes their work compelling, it is still unclear as to whether the developmental stages of musical products are based on age, musical understanding, or compositional and improvisational experience. The research of Davies (1992) and Barrett (2006) suggests that experience and understanding, rather than age, is important in the development of children's creative products.

The implication of this research is highly important for the practicing teacher. The findings of Davies (1992), Barrett (2006), and Brophy (2002) indicate that general music teachers need to offer students repeated experiences in both improvisation and composition to ensure growth of creative, aesthetic and expressive elements. For the purposes of the present study, examining the frequency of creative work in the classroom may provide insight into how successful teachers are at implementing such experiences.

Teachers' Perceptions of Creative Thinking

Research emphasizing teachers' perceptions of creative thinking, also referred to as "implicit beliefs" or "conceptions," began to emerge in the mid-1980s (Kampylis et

al., 2009). Perceptions of creative thinking gained interest from researchers because implicit beliefs guide teachers' choices in the classroom, resulting in facilitating or inhibiting students' creative thinking (Beghetto, 2006; Runco, Johnson, & Bear, 1993). Although teachers report valuing creative thinking as part of the process of education, they hold little tolerance for the behaviors and traits associated with creative thinking, and fear losing control of classroom management (Beghetto, 2006; Diakidoy & Kanari, 1999; Runco, 2003; Westby & Dawson, 1995).

Teachers' Perceptions of Students with Creative Personalities

E. P. Torrance recognized that challenges exist in encouraging creative behavior in the classroom (Davis & Torrance, 1965). Studies by Torrance (1962) suggest that teachers prefer students with high I.Q. scores and lower scores on tests of creative thinking to those who have outstanding scores of creative thinking and lower I.Q. scores, despite the fact that the groups typically yield similar educational achievement.

Following the work of Torrance, a number of studies have examined teachers' perceptions of creative students (Bachtold, 1974; Cropley, 1992; Dettmer, 1981; Scott, 1999). Research by Westby and Dawson (1995) indicates that elementary classroom teachers dislike the personality traits associated with creative thinking. Creative children tend to exhibit traits like negativity, defiance, disruptiveness, and self-centeredness, while the traits that teachers prefer, such as tolerance, dependability, sincerity, reliability, and pleasantness, tend to run counter to creative thinking.

While Westby and Dawson's research indicates that teachers dislike many of the traits typically associated with creative personalities, the research of Davis and Torrance

(1965) suggests that elementary visual art teachers are more accepting of creative behavior than elementary classroom teachers. To date, there are few published studies that examine the perceptions of elementary music teachers regarding the traits of creative children.

Despite the challenges of working with creative children, educators have reported that overall, they value creative thinking in the classroom (Westby & Dawson, 1995). Feldhausen and Treffinger (1975) reported that 96% of teachers surveyed thought that daily classroom time should be devoted to creative thinking. A number of other studies confirmed this perception (Fleith, 2000; Fryer & Collings 1991, Kampylis et al., 2009; Westby & Dawson, 1995). Westby and Dawson (1995) suggested that the reason for this puzzle is that teachers conceive of creative thinking differently than researchers.

This contradiction mirrors findings within the music education community that teachers both value and yet often neglect creative thinking (Strand, 2006; Webster, 1990a; Whitcomb, 2005). However, while general education teachers' perceptions have received a fair amount of attention, to date only a few published studies have examined the perceptions of music educators.

One aim of the present study is to gain a deeper understanding of elementary general music teachers' (EGMTs) perceptions of creative thinking. It is critical that researchers inquire into teachers' perceptions because their expectations of students have a significant impact on student performance (Kenealy, Frude & Shaw, 1991). If teachers perceive certain children as disruptive rather than creative, it seems unlikely that they will recognize and nurture such students (Westby & Dawson, 1995). Additionally, teachers' perceptions of creative thinking will certainly guide their pedagogical decision-making.

In response to the lack of such research, the present study examines music teachers' perceptions of the value of creative thinking as part of the elementary general music curriculum.

Facilitating Creative Thinking Experiences in the Music Classroom

Only a few empirical studies have examined teachers' practices of creative thinking instruction in the elementary general music classroom. Byo (1999), Orman (2002), and Bell (2003) investigated teachers' use of class time, in relation to the National Content Standards for Music Education. These studies indicated that teachers typically devote only a small portion of their class time to creative thinking. Research by Miller (2004) examined methods of designing creative thinking tasks that mitigate some of the challenges identified by educators as inhibiting the inclusion of creative thinking in the curriculum. Two studies investigated music teachers' perceptions and practices regarding composition and improvisation (Strand, 2006; Whitcomb, 2005).

The National Content Standards for Music Education

Byo (1999) examined the perceptions of both EGMTs and classroom teachers ($N=177$) regarding the feasibility of teaching all nine content standards for music education. She reported that elementary classroom teachers (non-music) thought they were unprepared to teach any of the nine content standards, reporting a lack of training, experience, time, and resources. EGMTs, on the other hand, believed that they were well-trained to teach all nine standards. However EGMTs rated improvisation, composition, and playing instruments as the three most difficult components to implement.

Orman (2002) examined the use of elementary general music class time in relation to the nine content standards. Thirty general music teachers supplied a videotape of their teaching. Orman determined how much time these teachers spent on each content area by analyzing the videotapes. The results indicated that while the EGMTs addressed all nine content areas, those areas relating to creative thinking (composition and improvisation) received the least amount of attention; participants spent less than 5% of class time composing or improvising. Additionally, Orman found that students spent 57% of their time passively involved in class with 46.4% of that time devoted to listening to the teacher talk or give directions. The researcher suggested that students should take a more active role in the classroom.

Bell (2003) examined K-12 music teachers' perceptions of the National Content Standards for Music Education. Participants were teachers engaged in a 16-week graduate course taught by the researcher about the national standards. Each of the nine standards received equal attention. Participants used resources from MENC regarding the national standards, including such publications as *Opportunity to Learn Standards* (MENC, 1994), *The School Music Program – A New Vision* (Lehman, Hinckley, Hoffer, Lindeman, Reimer, Shuler, & Straub, 1994), and *National Standards for Art Education: What Every Young American Should Know and Be Able to Do in the Arts* (MENC, 1994).

Following the course, teachers who had taken the course ($N=14$) voluntarily participated in completing an open-ended questionnaire regarding the national content standards. The questionnaire focused on three primary areas: (a) awareness of the content standards, including its use in district curriculums, (b) changes to teaching as a result of having completed the course, and (c) challenges of teaching each content area.

Participants reported that improvisation was a very difficult standard to implement, even after having completed the course. However, they reported giving greater attention to composition and improvisation after completing the class. Overall, participants reported that they lacked the time, space, and equipment, as well as sufficient training necessary to fully facilitate composition and improvisation in their classrooms.

Teachers' Facilitation of Improvisation and Compositional Tasks

Miller (2004) engaged in an action research project designed to investigate the use of composition within the context of the researcher's own general music classes, grades K-5. Miller sought to determine whether she could implement composition in whole classes of general music (20 to 25 children), within a limited time span of 20 to 35 minutes per week, and whether or not such experiences would meet the needs of a population of diverse learners. Miller indicated that she successfully implemented composition in all grade levels. She also indicated that despite the small amount of class time, students were able to recall enough to continue a composition from week to week, when necessary.

In order to overcome the challenge of limited class time, Miller broke compositional projects into a series of mini-lessons, only giving students small assignments until the project was complete. Miller also described her method for keeping each child working at his or her own pace. Miller's observations were congruent with other studies that indicate a lack of time for implementing creative thinking in instruction.

Whitcomb (2005) examined the role and extent of improvisational activities in elementary general music classrooms in Indiana, using a questionnaire ($N=144$). The

author investigated the issues of teacher attitude and educational background, teaching materials, and factors that challenged or aided in the teaching of improvisation.

Overall, the results were favorable: 87% of the subjects reported implementing improvisation in their classrooms, in some way; 83% of subjects reported feeling somewhat (or more than somewhat) successful in teaching improvisation. While 87% of the EGMTs in Whitcomb's study taught improvisation in some way, only 69% of the subjects thought improvisation should remain in the national standards.

Whitcomb's study indicates that EGMTs are facilitating student improvisation, however, it is not happening very often. A fairly large number, 40% of participants, reported teaching improvisation fewer than once every 10 lessons. Additionally, participants rated how much time they devoted to each of the national content standards, and improvisation and composition came in last.

Strand (2006) researched whether K-12 music educators in the state of Indiana used composition in their classrooms, and if so, why. She also examined whether or not the participants had a similar operational definition of composition. In Strand's study, 88.5% of the participants ($N=339$) reported teaching composition. However, of those that taught composition, only 5.9% stated "often," while 39.8% reported "sometimes," 19.5% reported "rarely," and 23.0% reported "very rarely." Strand also reported that there was no statistical significance between type of subject taught (generalist or ensemble) and the amount of composition used in the classroom.

Comments as to why teachers incorporated composition into music instruction included statements such as "children learn more through composing" (71.9%), or "I use it to enrich other learning" (65.4%). Other reasons provided for using composition were

the national standards (62.2%) or as an assessment tool (49.8%). Many teachers (48.4%) also reported using it as a fun and creative outlet for their students.

Additionally, respondents reported several reasons for not including composition: lack of time to teach this area of the curriculum, lack of access to technology, too noisy, and not enough instruments. Other issues included teaching too many students, school performance pressures, loss of classroom control, and difficulties with technology. A few participants reported that they did not think composition was appropriate for elementary general music, or that it was not a useful learning tool.

In her investigation, Strand uses the terms “composition” and “improvisation” interchangeably, suggesting a lack of clarity on the part of music educators and thereby making creative thinking in music difficult to define. Strand states she was unable to find a unified definition of composition, and that the definition of composing differed between researchers and teachers.

The studies of Strand (2006) and Whitcomb (2005) provide a basic understanding of the compositional and improvisational activities occurring in today’s music classrooms. However, the present study extends this knowledge base by examining EGMTs practices of a number of creative thinking activities, including movement, invented notation, and arranging. The present study also examines a number of aspects related to EGMTs’ perceptions of creative thinking. Runco and Bahleda (1986) and Sternberg (1985, 1988) suggest that investigating teachers’ conceptions of creative thinking is critical for a thorough understanding of teacher behavior. While teachers may generally value creative thinking, they may also engage in teaching behaviors that unintentionally impede students’ ability to develop creative thinking, without being

aware that their teaching practices are negatively impacting student progress (Alencar, 2002; Westby & Dawson, 1995).

The present study differs from the Strand and Whitcomb studies in two primary ways. Rather than just examining the practices of teachers on a state level, the present study investigates teachers on a national level. Additionally, this study uses a broader definition of creative thinking by examining the use of mediums such as including movement, iconic notation, and listening maps.

Summary of Research Literature

Creative thinking is a very complex and broad issue, spanning multiple fields including psychology, education, and music. Studies in the field of psychology have had a significant impact on research in music education by helping to operationally define the components that comprise creative thinking in music. The elements of musical extensiveness, flexibility, originality, and elaboration are all highly correlated with creative thinking (Webster, 1987). Additionally, the ability to measure musical creative thinking in individuals has allowed researchers to determine that creative thinking in music is indeed a teachable skill (Fung, 1997; Koutsoupidou & Hargreaves, 2009). However, research indicates that little of this information is passed along to in-service teachers (Mack, 1987). The present study examines teachers' understandings of the components of creative thinking and teachers' implicit beliefs regarding their ability to teach creative thinking.

Research in the field of educational psychology suggests that teachers' perceptions are significant because they guide teachers' behaviors (Sternberg, 1985). However, examination of teachers' perceptions reveals several contradictions. While, on

the one hand, teachers highly value creative thinking, it is often neglected in the music classroom (Strand, 2006; Webster, 1990a; Whitcomb, 2005). Additionally, research suggests that the majority of teachers dislike students with the personality traits most often associated with highly creative individuals (Bachtold, 1974; Westby & Dawson, 1985). However, to date, none of the research examining personality traits in creative individuals has taken place within the context of music education. More research is necessary to determine if these findings are consistent with the perceptions of music educators.

In the field of educational psychology, the consensual assessment technique for rating creative products has proved a useful tool in determining factors that either inhibit or enhance creative thinking (Amabile 1982a, 1996). The factors of lack of choice, extrinsic motivation/reward, and anticipated evaluation are all negatively correlated with creative thinking in the field of visual arts. Again, we find a gap in research, as these factors have not yet been evaluated in relation to creative thinking in music. However, it is possible to examine teachers' implicit beliefs regarding inhibiting factors. The present study examines teachers' perceptions of environmental factors that may either inhibit or enhance creative thinking.

A fair amount of research also exists on children's creative thinking processes and products (Barker, 2003; DeLorenzo, 1989; Flohr, 1979; Hickey, 1995; Kratus, 1989; Levi, 1991; Wiggins, 2003; Younker, 2000). Research suggests that while engaged in the compositional process, students work through a series of stages including readiness, problem solving and/or identifying, rehearsal, and finally, completion. Observations indicate that these stages are recursive, and that students move through these stages a

number of times before developing a finished product.

Understanding children's musical products has also been the objective of many research studies (Barrett, 2006; Brophy, 2002; Davies, 1992; Swanwick & Tillman, 1986). These studies suggest that children's products fall into one of several developmental stages, in which children's compositions become more complex, expressive, and consistent with musical syntax. Research also suggests that as children become more experienced at composing, they benefit from training which focuses on aesthetic, creative, and expressive elements of music (Barrett, 2006; Brophy, 2002; Davies, 1992.) However, there is little research to support the idea that EGMTs have an understanding of children's developmental stages, as they pertain to creative thinking in music.

To date, the teachers' role in facilitating musically creative experiences for children has been examined in only a few studies. Research indicates that music educators are interested in implementing composition and improvisation (Byo, 1999; Miller, 2004; Smith, 2008), and see it as an important component of general music (Whitcomb, 2005). However, educators struggle with the implementation of creative thinking tasks in their teaching because of a lack of time, training, and resources (Bell, 2003). Some teachers have also reported that class management is difficult when facilitating creative thinking tasks and that the classroom becomes too noisy (Strand, 2006).

Implications for the Present Study

The review of literature suggests that scholars have a fairly robust understanding of the components that contribute to musical creative thinking, children's processes of