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## The Relationship Between Creativity Style and Music Career in University Music Students

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THE RELATIONSHIP BETWEEN CREATIVITY STYLE  
AND MUSIC CAREER IN UNIVERSITY  
MUSIC STUDENTS

by

David A. Zmudka

A Thesis  
Submitted to the  
Faculty of The Graduate College  
in partial fulfillment of the  
requirements for the  
Degree of Master of Music  
School of Music

Western Michigan University  
Kalamazoo, Michigan  
April, 2006

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2006

## ACKNOWLEDGMENTS

*Dedicated to the memory of my sister Christine*

I would like to thank my family for their support, especially my daughter Elizabeth for acting as my proofreader, and my son James for shouldering the many responsibilities I could not during the writing of this paper. Without their help, completion of this project would have been impossible.

Secondly, I would also like to offer my deepest thanks to my faculty advisors, Dr. James McCarthy, who started me on this journey before he retired, and Dr. David Smith, who's attentive eye has guided me to it's completion, in spite of his many duties at the School of Music. I would also like to thank the remaining members of my thesis committee, Dr. Delores Gauthier and Dr. John Lychner, for taking the time to review and evaluate my work.

Thirdly, I would also like to thank Dr. Don Treffinger, president of the Center for Creative Learning in Sarasota, Florida for his help with data and analyses, as well as the other authors of *VIEW: An Assessment of Problem Solving Style*, Dr. Ed Selby and Dr. Scott Isaksen for their advice and support. I am deeply indebted to these authors and researchers for supplying me with the copies of VIEW required to complete this study. My association with them has opened new horizons for me to explore as my future unfolds.

Lastly, I would be remiss if I did not thank the students of the School of Music, Western Michigan University, who took the time to participate in this study. Without them the results of this study would not have been possible. Furthermore, I would like to express my appreciation to the music professors who graciously gave up

### Acknowledgments—continued

precious rehearsal and classroom time so I could administer VIEW to the student volunteers.

David A. Zmudka

THE RELATIONSHIP BETWEEN CREATIVITY STYLE  
AND MUSIC CAREER IN UNIVERSITY  
MUSIC STUDENTS

David A. Zmudka, M.M.

Western Michigan University, 2006

This study investigated the relationship between creativity style and choice of musical career among university students. Data was collected from 74 students enrolled in one of four majors in music; music education, music therapy, instrumental performance and jazz performance, as assessed by *View: An Assessment of problem solving style*, which included 34 items defining problem-solving style across three dimensions including Orientation to Change (OC), Manner of Processing (MP), and Ways of Deciding (WD) scales. Subjects also provided demographic information concerning their declared major, preferred musical career, and level of education. Significant differences were found between the four groups on the OC and WD dimensions when using preferred musical career as the category variable. No differences were found when declared major was used as the category variable. Results suggest problem-solving style is likely to be associated with problem types found in specific musical activities and therefore a musician's preferred career in music. Implications for music education and teaching creativity are discussed.

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## CHAPTER I

### INTRODUCTION

#### Creativity in Music Education

In spite of centuries of study and debate, creativity remains one of the most enigmatic concepts of human behavior. Performers of the musical, written, and visual arts have always been considered “creative” in spite of the lack of a clear and concrete understanding of the word. Music educators, as well as educators in all the creative arts, having long focused on the performance aspects of their disciplines, are now being encouraged to teach students how to be creative. Among the many goals set forth for music education at the Tanglewood Symposium in 1967 was to teach creativity in music. Since then, teaching creative thinking in the creative arts has been espoused regularly as natural and appropriate (DeTurk, 1989, 29). In the music classroom however, cultural awareness, musical concepts and performing skills are still the primary emphasis. In practice, creativity is rarely encouraged in this subject, the most abstract of the creative arts (DeTurk, 1989, 29).

Current arts and music education curricula, along with countless articles in any number of Music Education journals stress the importance of teaching and encouraging students to be more creative. We have also seen the development of *The National Standards for Arts Education*, which eventually evolved from the proceedings at Tanglewood. The Symposium drafted the Tanglewood Declaration, which stressed the necessity for the music education profession to address current and

future musical needs of students in terms of civil rights, rapidly developing technology, and schools that were rapidly becoming inadequate for the education needs of the populace. This vision, realized by the Music Educators National Conference (MENC) through the implementation of the Goals and Objectives (GO) Project in 1969, identified thirty-five objectives that evolved into *The National Standards For Arts Education* (Consortium of National Arts Education Association, 1994), written under the auspices of the MENC in response to the *Goals 2000 Act* of 1994 (Mark, 2000). The National Standards call for our young people to be fully educated and to obtain competence in the arts by developing the physical and mental abilities needed to learn any art form (Mark, 2000). Competence, as defined by the National Standards, means the ability to use an array of knowledge and skills. Behaviors exhibiting these abilities include *creation* (emphasis mine), performance, production, history, culture, perception, analysis, criticism, aesthetics, technology, and appreciation (Consortium of National Arts Education Associations, 1994, 18). To this end, each Content Standard at each level of the National Standards includes achievement standards specifying creative activities that will result in a creative product.

Current curriculum models, such as the Wisconsin Guide to Curriculum Planning in Music (Wisconsin Department of Public Instruction, 1989), prescribe modes of musical behaviors or outcomes for each element of music and its associated group of concepts at each level. These behavior modes, or active musical learning experiences, include performing, describing, and creating. Creating activities are

intended to give students an opportunity to apply what has been discussed and performed for each experience or activity. These activities, such as composition and improvisation, should show that students possess a "broad, synthetic understanding of various musical concepts" (Wisconsin Department of Public Instruction, 1989, 9).

In spite of the various suggestions, criteria, and standards to further this end, it seems that, at least in practice, most music programs avoid directly addressing the problem of creativity education.

Understandably, many educators are content with the "status quo" leaving the emphasis on performance aspects of music. After all, how can you teach something that is so poorly understood? It is highly probable that music educators themselves have only a meager understanding of what creative thinking is, much less how they themselves demonstrate their own creativity, or why they prefer a given mode of creative expression. In the past, students have been encouraged to understand creative thinking rather than taught to do it (DeTurk, 1989, 29). This approach to teaching creativity, achieved through recognition and appreciation of creative thinking in others (e.g., Copeland, Stravinsky, etc), can be strengthened, by doing it (DeTurk, 1989, 29). This thinking is echoed by Hoffer (as cited in De Turk, 1989, 29), who states "musical learning should not be confined to the re-creation of what others have done. At a level consistent with their musical sophistication, students should engage in creating music through composition or improvisation, or both".

Methodology for the teaching of creativity is controversial (DeTurk, 1989, 29). The personal nature of creative thinking almost dictates that assessment be made

on an individual basis (DeTurk, 1989, 30). Studies often mention three different aspects of creativity: Process, product, and characteristics of the individual. Only the first two aspects are appropriate for evaluation in the schools since the third does not vary as a result of instruction (DeTurk, 1989, 30). Kratus (as cited in DeTurk, 1989, 30) presents a series of evaluation scales, checklists, and data collection techniques for assessing the processes and products of creative thinking rather than the traits of the creative thinker. It is Kratus' position that by focusing on process or product instead of the person, measurement can more directly measure a music lesson's objective or a music program's goals in terms of student behavior in specific activities.

While one can see the logic in this methodology for teaching creativity, there is some difficulty with this thinking. Characteristics of the individual, including cognitive and personality factors, may directly affect the way an individual exhibits their creativity, as has been found to be the case with learning styles. Learning style, as summarized by Keefe (as cited in Wisconsin Curriculum, 80), can be described as the "characteristic cognitive, affective, and psychological behaviors" which indicate the way in which learners "...perceive, interact with, and respond to the learning environment". Current thinking about learning suggests that teachers do not teach the way they were taught. Rather they teach the way they themselves prefer to learn.

For this reason a teacher whose style of learning is primarily visual, sequential, and reflective may have trouble understanding a kinesthetic, random-thinking, impulsive student. The teacher will need to adapt his or her teaching so that



it aligns with this student's learning style (e.g. help the student grasp a concept through some sort of activity involving bodily movement). Although children are more alike than different in their learning patterns, the average classroom contains learners who exhibit different cognitive, affective, and psychological learning strengths (Wisconsin Department of Public Instruction, 1989, 80). In view of the fact that creativity is primarily a cognitive function (Kirton, 2003; Guilford, 1964), it is likely that the same issues will hold true for teaching creativity. This, along with insufficient training in teaching methods and evaluation, may provide at least a partial explanation for music educators' lack of understanding of creativity, and the resulting reluctance to include it in their musical activities.

Adaption – Innovation Theory (Kirton, 1976) postulates a theory of creative style based on cognitive and personality factors (Goldsmith, 1984). Subsequent study indicates that creative style, or more accurately, preference of creative style as determined by personality factors, plays a role in the choice of career by an individual based on the style of creativity required to successfully solve problems in that field (Kirton, 2003). Recent study has expanded on this theory and developed new, more robust models of problem solving style such as *VIEW: An Assessment of Problem Solving Style* (Selby, Treffinger, Isaksen, and Lauer, 2004a).

Based on these theories, while musicians may be considered "creative" in general, we cannot simply assume that all are equally creative, or exhibit the same style of creativity. Furthermore, the term "musician" is not one-dimensional. Most of us have observed the widely varying temperament and personality types among

musicians practicing the many career paths within the field of music, some of which are familiar stereotypes. These observations suggest that various aspects of personality traits may play a role in what we do and how we do it in music.

Musical experiences such as performance, improvisation, and composition, provided through elementary and secondary school music programs, reflecting the National Standards, are similar to those encountered in, and may lead to “interesting and valuable career and avocational opportunities” in music (Wisconsin Department of Public Instruction, 1989, 3). Music programs in our colleges and universities provide formal education and training in these career paths.

The list of fields of study in music includes, but is not limited to, performance, jazz studies (improvisation and performance), music education, musicology (theory and history), music therapy, composition, arranging, and conducting. Practitioners in these areas rely on a common set of musical concepts, skills and proficiencies, while employing widely differing skills and knowledge requirements. These differences are deep and significant, and suggest that the style of creativity exhibited by a concert performing artist is different from that of the jazz improviser, the composer, the conductor, the music instructor/pedagogue, and so on. If there is a range of creative styles, as Kirton and Selby, et al, assert, it is at least a reasonable conjecture that creativity styles play a role in the expression of creativity and therefore would be related to the choice of a musical profession as well. Furthermore, it would make sense that an understanding of one’s own creative style, as with learning style, will

enable music educators to teach creative musical thinking in the classroom more effectively.

### Statement of the Problem

The purpose of this study is to determine if a range of creativity or problem solving styles, as described by Kirton's Adaption-Innovation theory and measured by *VIEW: An Assessment of Problem Solving Style*, is present in musicians enrolled in the study of music at the university level, and to determine if there is a relationship between creativity style and a student's choice or preference of music major or profession in music.

## CHAPTER II

### REVIEW OF THE LITERATURE

#### Historical Perspectives of Creativity

##### Defining a Difficult Concept

To understand creativity, it is first necessary to understand how creativity is defined from both current and historical perspectives. Any research into definitions of creativity quickly reveals a multitude of definitions varying in scope and depth that often conflict. Analyzing the domain, L.C. Repucci (1988) has identified between fifty and sixty different definitions of creativity and divided them into six categories. These include: Gestalt/Perception definitions describing the recombination of ideas, concepts or symbols to form new or better ones; End Product/Innovation definitions that describe the qualities of something newly produced; Aesthetic/Expressive definitions emphasizing self expression deemed to be “creative”; Psychoanalytic/Dynamic definitions of the creative person, based on personality traits; Solution/Thinking definitions based on thinking processes; and various other definitions not fitting into the above categories. In this light, E. Paul Torrance (1988) may be correct when he says “Creativity defies definition . . . creativity is almost infinite. Much of it is unseen, nonverbal, and unconscious. Even if there were a precise concept of creativity, I am certain we would have difficulty putting it into words.” These reservations notwithstanding, progress has been made in the understanding of creativity in recent years. In this light, the various definitions of

creativity will be reviewed from a historical perspective, tracing the evolution of our present understanding, and debate, of creativity.

### Ancient Portrayals – Mystical Inspiration or a Gift From the Muse

Ancient philosophers believed creativity to have mystical origins. Both Plato and Aristotle wrote about the concept of creativity, referring to it as either inspiration (the breathing of an insight into the mind of man from a god) or natural talent. These qualities were bestowed upon the creative person, an empty vessel to be filled with an inspiration, as dictated by the Muse. The individual would then reveal these inspired ideas in the form of a creative product (i.e., choral songs or epic poems). Both Child and Dudek (cited in Albert and Runco, 1999) observe that originality, a present-day indicator of creativity, was not considered a necessary component of creativity during this period of history. The word genius (derived from the Latin *ingenium*), originally associated with the mystical powers of protection and good fortune, first appeared in Plautus (circa 300BC). It was defined as a “tutelary spirit embodied in each man, not entirely identical with him, but intimately connected with his personality,” and was considered both a natural disposition and innate ability (Eysenck, 1995). The aspects of genius proceeding from ancient times consist of natural endowment (intelligence), hard work (persistence), divine or mystical inspiration (creativity) and a personality indulging in behavior that is distinctively unusual, often thought of as madness or frenzied inspiration. Perceptions of such behavior linked with the creative individual persist to this day.

### The Influence of the Catholic Church – Devine Inspiration

The view of creativity as a mystical or divine endowment has persisted through the centuries. As the power of the Catholic Church grew after the fall of Rome, the focus of the source of inspiration changed from the mystical Muse to the Divine Spirit (i.e., the Holy Spirit). The idea that the creative individual (usually male) was merely a conduit through whom artistic, musical, or other extraordinary talents and abilities were expressed persisted throughout the middle ages. In the second century A.D., St. Augustine, in his manuscript *City of God* (p.55, cited in Albert and Runco, 1999), set forth a new doctrine urging Christians to turn their eyes to the future, proclaiming that “Christianity . . . played a leading role in the discovery of our power to create”. However, the idea that humans possessed the power to create did not take hold until the arrival of the Renaissance when the attribute of genius, the power to create found in great artists and artisans, was recognized as an attribute possessed by the individual (Albert and Runco, 1999). Nonetheless, the influence of the Catholic Church and the teaching that all things flow from the Divine Creator was unmistakable. Creative ability, as with all human talents, although possessed by the individual, was believed to be a gift bestowed by God, rather than an inspiration mystically implanted in or channeled through a chosen individual.

### The Great and Endless Debates – Creativity as a Human Endeavor

In the 1700’s philosophical discussions and debates concerning imagination, talent, and genius began to take place, mainly in England, generating much progress

in the understanding of creativity. The goal of these debates, involving philosophers such as William Duff and his contemporaries, was to define the differences between the concept of creativity and the concepts of genius, originality, talent, and formal education. By the 1750's, the phrase "creative imagination" was used extensively in these debates. Duff (1767), reflecting this thinking, stated that "of those that apply themselves to the pursuit of either the sciences or the liberal arts, only a small number were . . . qualified to extend their empire and advance their improvement in any considerable degree. To explore unbeaten tracks, and make new discoveries in the regions of Science, to invent the designs and perfect the productions of Art, is the province of Genius alone. These ends are the objects to which it constantly aspires; and the attainments of these ends can only fall within the compass of the few enlightened, penetrating, and capacious minds that seem destined by Province for enlarging the sphere of human knowledge and human happiness." Duff goes on to state: "Having suggested the objects to which genius naturally aspires, it will be more easy to discover the means by which it attains them; or, in other words, the principal ingredients which constitute the singular accomplishment. These are imagination, judgment, and taste," where imagination is defined as "having the plastic power of inventing new associations of ideas."

By the late 1700's, although creativity was still referred to as genius, imagination was viewed as that which governed creativity. In addition, four distinctions forming the foundation of present-day views of creativity were widely accepted: Genius was divorced from the supernatural; genius, although exceptional,

was a potential in every individual; talent and genius were distinguishable from one another; and their potential and exercise were dependant on the socio-political atmosphere of the time. Genius was now recognized as a human phenomenon. While not all humans possessed it, any human, under the proper social and political (nurturing and allowing freedom of thought versus repressive) environments, would be able to display it (Albert and Runco, 1999).

### Nineteenth Century Origins of the Scientific Investigation of Creativity

However, divorcing creativity from the supernatural was one thing; explaining it was quite another. The traditional 19<sup>th</sup> century view of the nature of creativity, in spite of the debates of the previous century, still placed heavy emphasis on its mystical and mysterious nature and saw the fine arts and poetry as the only creative endeavors. Nevertheless, vanguard efforts were underway that would begin to redefine the understanding of creativity. Sir Francis Galton (cited in Eysenck, 1995) defined genius in terms of achieved distinction, or reputation, which he stated as “the opinion of contemporaries, revised by posterity...the reputation of a leader of opinion, of an originator, of a man to whom the world deliberately acknowledges itself largely indebted”. Later, employing the principles of scientific investigation to eminence-achieving subjects, Galton (as cited in Albert & Runco, 1999, 24 - 25) found evidence to support the four distinctions of genius arrived at in the debates of the 18<sup>th</sup> century: Genius was divorced from the supernatural and, although exceptional, was a potential in every individual because ability (as postulated by Darwin) is distributed throughout



populations. He concluded (as cited in Albert & Runco, 1999, 25) that “creative products” came largely from “general ability” which he believed was one of the essential capacities for genius.

What was perhaps the most far-reaching intellectual (and creative) breakthrough of this period was implied in the role that Darwin (as cited in Albert and Runco, 1999), a contemporary and associate of Galton, gave to adaption in survival (i.e., natural selection). It was only after Darwin worked out the processes underlying adaptation and natural selection that the characteristics of creativity as problem solving (behavioral and genetic) was recognized, and that solved problems (of survival) leading to “successful” adaptations were individual in character to be passed on to the general population. While these concepts had little impact on the understanding of creativity during the 19<sup>th</sup> century, they became the basis for several theorists’ views of creativity in the 20<sup>th</sup> century.

Becker (as cited in Albert and Runco, 1999) has documented the first indications of interest in the concepts of creative and divergent thinking that began to develop during the 19<sup>th</sup> century as well. He observes that as early as 1837, Bethune was interested in the ability to “originat[e] new combinations of thought” and felt that creative genius could “store away ideas for future combinations”. Becker also quotes Jenons definition of genius as being “essentially creative” and “manifest when there is a divergence from the ordinary grooves of thought and action”. He also cites William James, who in his unique description displayed an understanding of the rarity of ideational complexity, included the elements of “abrupt cross-cut transitions, unheard

of combinations of elements, and subtle associations of analogy” in his discussion of what is now identified as divergent thinking. James further described the process as being “suddenly introduced into a seething cauldron of ideas...where partnerships can be joined or loosened in an instant, treadmill routine is unknown, and the unexpected seems the only law.”

### Psychology and the Study of Creativity in the Modern Era

Around 1900 Sigmund Freud, the father of modern Psychoanalysis, began his attempts to define the human psyche. As the field of Psychology grew in the early 20<sup>th</sup> century, and its various branches began to appear, creativity studies began to focus on the various aspects of creativity and the creative person, resulting in a multitude of definitions, if not a good deal of confusion. It is with Freud’s attempts to describe the creative process in terms of human cognitive processes (this will be discussed in one of the following sections) that real progress into understanding the full breadth of the nature of creativity began. Most modern era definitions of creativity fit into three basic categories, the creative product, the creative person (personality traits), and the creative process (cognitive processes). Definitions for each of these three categories will be presented separately, along with a new “confluence” category that combines theories or definitions from each category. As the various approaches to creativity developed, progress was hampered by both ambiguity in the definitions as well as a lack of consensus among researchers and theorists, fueled perhaps by the resistance of some to remove creativity from its shroud of mysticism. The definitions will first be

presented chronologically in each category, eventually demonstrating how the three categories interact to provide a broad, in depth view of the manifestation of creativity in the individual. It is the blending of certain aspects of personality and cognitive processes that result in a creative product. These interactions provide the underlying structure of this thesis.

### Product Definitions of Creativity

Most product definitions of creativity include the characteristics of novelty and appropriateness. Amabile (1996) cites the definitions of Barron, Bruner, Ghislen, Jackson and Messick, and MacKinnon in her discussion of the creative product. Barron proposed that to be judged as “original” the response should possess a “certain stated uncommonness in the particular group being studied”, it must be “to some extent adaptive to reality”. Bruner describes a creative product as anything generating “effective surprise in the observer”, as well as a “shock of recognition that the product or response, while novel, is entirely appropriate”. Ghislen articulates the following somewhat ambiguous criteria: “This quality of uniqueness, recognizable and definable, either is present in full force or is absent entirely. The products to be dealt with are not more or less suffused with creativity as an object may be tinged with color in one or another degree of saturation. Either a product of the mind is creative in one respect or another or else it is not creative in any”. Jackson and Messick proposed that creative products should “elicit a distinct set of aesthetic responses from observers: surprise, satisfaction, stimulation, and savoring”. Stein suggests that

creativity results in the “production of some novel result that is useful, tenable, or satisfying, and represents a real “leap” away from what has previously existed”.

MacKinnon, adopting Barron’s two criteria, added a third that hints at a description of the creative process: “true creativeness involves a sustaining of the original insight, an evaluation and elaboration of it, a developing of it into the full”. Perkins (1981) holds that “products judged highly creative by the society will have features such as scope and significance, which in addition to originality imbue creative products with value.” Gedo (1996) concludes “it is essential that the novel configuration created represent the creator’s authentic point of view, that it transcend one specific instance by transmitting as clearly as possible something of wider significance, and should have a commitment to ethical values, at the very least in terms of formal or technical excellence. In all these ways, creativity goes beyond utilitarian goals – without disregarding the value of social utility.”

### Defining the Creative Person – Personality and Creative Behavior

Attempts to define creativity in terms of the creative person did not gain popularity until J. P. Guilford (as cited by Amabile, 1996) offered his definition of creativity in his address to the American Psychological Association convention. This approach, attempting to identify those personality traits associated with creativity in individuals through the means of psychometric evaluation, is still popular in creativity research today. Guilford (as cited by Amabile, 1996) felt that “in its narrow sense, creativity refers to the abilities that are characteristic of creative people...In other

words, the psychologist's problem is that of creative personality, . . . those patterns of traits that are characteristic of creative persons. Guilford, noting the limitations faced by creativity researchers due to the rarity of highly creative individuals, proposed that a psychometric approach using paper and pencil tests be used to study creativity in everyday subjects (Sternberg and Lubart, 1999).

Guilford's proposal resulted in many attempts by a number of researchers to develop valid tests able to identify creativity in individuals. What is perhaps the most successful of these measures is the Torrance Tests of Creative Thinking (as cited in Sternberg and Lubart, 1999). This instrument, requiring the use of divergent thinking and other problem solving skills, identifies an individual as creative based on his/her fluency (total number of relevant responses), flexibility (number of different categories of relevant responses), originality (the statistical rarity of responses), and elaboration (the amount of detail in the responses) (Sternberg and Lubart, 1999).

Gardner (1993), in a study of a number of pre-eminent gifted individuals throughout history, identified a number of personality traits common in highly creative individuals. These include: being driven, demanding of self as well as others, committed and wholly absorbed in their project, self-confident, proud, stubborn, difficult towards other people, self absorbed, able to deal with false starts, unwilling to admit mistakes, perfectionist, tends to be competitive, tends to be religious, allows the child to show through in his personality, rebellious against control. Alfred Balkin (1991) relates creativity to talent as follows: "The talented person may be, and often is creative. The creative person may be, but less often is

talented. The creative person makes things happen; the talented person might.” He goes on to say that “creativity is not a talent . . . it is an acquired behavior – learnable, teachable, tangible and crucial to human development.” Gardner (1993) later describes the creative individual as “one who regularly solves problems, fashions products, or defines new questions within a domain in a manner considered novel.”

The social-personality approach discussed by Sternberg and Lubart (1999) focused on personality variables, motivational variables, and the socio-cultural environment in which they occur as sources of creativity. Like Gardner, several researchers including Amabile, Barron, Eysenck, Gough and MacKinnon have noted that certain personality traits often characterize creative people (Sternberg and Lubart, 1999). A large set of creativity-relevant personality traits have been identified by Barron and Harrington (1981) through the analysis of a large number of correlational studies. These studies, conducted by a number of researchers (including those previously mentioned) from several domains (art, music, literature, science/technology, etc.), employed various measures of creativity, and paper and pencil measures of personality. These traits include, but are not limited to, high energy, autonomy, intuition, a firm sense of one’s self as “creative”, independence of judgment, individualistic, self-confidence, attraction to complexity, aesthetic orientation, and the willingness to take reasonable risks. The relationship between some of these personality traits and creativity will be discussed further.

Researchers have also attempted to establish a correlation between IQ and creativity (Getzels & Jackson, 1962; Smith, 1970; Rossman & Horn, 1972; Schubert,

1973; Barron & Harrington, 1981). Sternberg and O'Hara (1999) summarize three basic findings linking intelligence (as measured by IQ) and creativity. First, as observed by Renzulli (as cited in Sternberg and O'Hara, 1999), creative people often exhibit an IQ above 120. Those with low or average intelligence below 120 have poor representation among persons considered highly creative. Second, creativity and IQ correlations are somewhat high when IQs are below 120, but quite low when IQ is above 120 (Fuchs-Beauchamp, Karnes, & Johnson, 1993; Gowan, 1971; Guilford & Christensen, 1973; Yamamoto, 1964). This is often referred to as the threshold effect, where a phenomenon does or does not appear until a certain threshold is reached. Studies by Barron (as cited in Sternberg & O'Hara, 1999) also suggest that extremely creative people often have a high IQ, but those with a high IQ will not necessarily be exceptionally creative. Third, the correlation between IQ and creativity depends, in part, on what aspects of creativity and intelligence are measured, how they are measured, and the field in which the creativity is observed. Noting differences in the way individuals in different domains exhibit creativity, McNemar (1964) suggests that the role of intelligence in art and music may be different than it is in math and science (Sternberg & O'Hara, 1999).

### Defining the Creative Process – A Cognitive Approach to Creativity

Process definitions of creativity seek to describe the mental images and cognitive processes underlying creative thought, resulting in creative behavior and creative products. While these definitions vary widely in their scope, and are at times

quite ambiguous, it is those involving the cognitive processes forming the underlying structures of creativity (i.e., thinking and learning) that are of prime importance to this paper. The discussion of confluence definitions of creativity will show how cognitive processes, mediated by various personality traits of the creative person, result in creativity and ultimately a creative product.

In one of the earliest definitions of the creative process of the modern era, Freud in his 1908 treatise *Creative Writers and Day-Dreaming* (as cited in Dervin, 1990), describes three essential steps in the creative process: “Unable to meet demands for instinctual renunciation the artist turns away from reality; in fantasy, like a child at play, the neurotic in conflict, or the adult in daydreaming, he/she gives vent to erotic or ambitious wishes; but unlike the child, or the neurotic as such, the artist finds a way back to reality by molding his/her fantasies into a new kind of reality”. In a less colorful approach, Watson (as cited in Amabile, 1996) wrote, “new verbal creations such as a poem or brilliant essay were created by manipulating words, shifting them about, until a new pattern is hit upon”. Gestalt psychologists (e.g., Wertheimer, as cited in Amabile, 1996) put forth the proposal that “creativity and insight arise when the thinker grasps the essential features of a problem and their relation to a final solution”. After 1960, process descriptions became more detailed and technical. Koestler (as cited in Amabile, 1996) proposed that creativity involved what he called a “bisociative process” where the individual deliberately connects two previously unrelated “matrices of thought” to produce a new insight or invention as opposed to random associations made by the individual. Perkins (1981) felt that



“creating is the process of producing outcomes that are original and of high quality; going beyond what a person can simply, straightforwardly and effortlessly do because of four fundamental moves.” These moves include planning (rather than producing the work directly), abstracting (conceptualizing new ideas from specifics as well as from other sources), undoing (reworking parts of the work until they are satisfying), and making means into ends (addressing each means as an end, in and of itself, without being preoccupied with the final product).

Gardner (1982), voicing a structuralist point of view, defines creativity as “the creation of new symbols within a domain from old symbols. Through the use of these symbols the human mind can create, revise, transform, and re-create wholly fresh products, systems, and even worlds of meaning.” In his view, the process of problem solving is “in fact the process of applying old symbols to a problem, synthesizing a solution, thus creating a new symbol within the domain, or an entirely new domain.” Gardner argues: “In the arts, the combination of native talent, appropriate pedagogy, and high skill does not suffice to yield the creative artist. These may yield competent craftsman perhaps, but personality, motivational and character traits will be the determining factors of the innovative master.” Weisberg (as cited in Sternberg & Lubart, 1999) proposes that creativity “is the application of ordinary conventional cognitive processes (such as analogical transfer) to knowledge already stored in memory that yields extraordinary products”. In a somewhat more complex view, Webster (1989) sees creative thinking as “a dynamic process that alternates between divergent (imaginative) and convergent (factual) thinking, moving in stages over time,

enabled by internal skills and outside conditions, resulting in a final product that is new for the creator.”

In their Geneplore Model of Creativity, Finke, Ward, and Smith (as cited in Sternberg & Lubart, 1999) cite two main processing phases in creative thought: “a generation phase where an individual constructs mental representations or pre-inventive structures that promote creative discoveries; and an exploratory phase where these properties are used to come up with creative thought. A number of mental processes may enter into these phases of creative invention, including the processes of retrieval, association, synthesis, transformation, analogical transfer, and categorical reduction” (i.e., mentally reducing objects or elements to more primitive categorical descriptions).

In his Theory of Conceptual Intelligence (with roots in Darwin’s theories), Li (1996) views creativity as the “human enterprise of extending from the known to the unknown, of venturing from existing knowledge and domains of human endeavor to new knowledge and endeavor.” Creativity then is an “extension of learning, moving from imitation, to understanding, to routinization, and then into the post-learning or creation stage where we explore for new ideas and possibilities.” “Creative thinking is an extension and special case of conceptual thinking where the individual will reflect on, evaluate, criticize, re-interpret, revise, consider new evidence or options, and re-evaluate finally resulting in the creation of new knowledge or a creative product.” “All existing knowledge is the product of creative thought, and is the basis of new creative thought.”

David Bohm (1998), observing how creativity causes evolution in domains, describes the creative act as an “act of perception where one becomes aware of a new set of differences and begins to feel out or otherwise note a new set of similarities, which do not come merely from past knowledge, either in the same field or a different field. This leads to a new order, giving rise to a hierarchy of new orders that constitutes a set of new kinds of structure.”

### Confluence Theories of Creativity

Recognizing that single facet definitions of creativity fail to adequately define the full scope of creativity and the creative person, some theorists have developed multi-componential theories referred to as “confluence theories” by Sternberg and Lubart (1999). These authors hold that there are several possible ways that components can combine to effect creativity. First, creativity may not be possible if some components (i.e., intelligence) do not meet a certain threshold, regardless of abilities within other components. Second, weakness in one component (i.e., motivation) may be counteracted by strength in another component (e.g., environment). Third, components such as intelligence and motivation may interact to produce extraordinary levels of creativity. This approach reflects the way most people view creativity. Sternberg (as cited in Sternberg & Lubart, 1999), during an investigation of people’s implicit theories of creativity, found that common perceptions of creativity contain a combination of cognitive and personality elements, such as “connects ideas,” “sees similarities and differences,” “has flexibility,” “has

aesthetic taste,” “is unorthodox,” “is motivated,” “is inquisitive,” “and “questions societal norms”.

Amabile (1983, 1996), one of the earliest to use a confluence approach, defines creativity as a response or product judged creative by appropriate judges, resulting from the interaction of intrinsic motivation, domain relevant knowledge, skills, talents and abilities, and creativity relevant skills. Creativity-relevant skills include: Cognitive style; the application of heuristics that develop new paths for solutions to problems; and appropriate work style. Gruber, and Gruber and Davis (as cited in Sternberg & Lubart, 1999), noting the acquisition and development of skills and knowledge, have proposed a Developmental Evolving Systems model for understanding creativity. A person’s purpose, knowledge, and affect grow over time, amplifying deviations encountered by an individual, leading to creative products. These authors define purpose as the set of personal goals that develop and guide the individual’s behavior, and note that affect, or mood system, includes the influence of joy or frustration on the projects undertaken.

Mihalyi Csikszentmihalyi (1996) theorizes a systems approach to creativity stressing the interaction between the individual, a domain, and what he terms a field. Individuals draw upon the domain specific knowledge they possess, and alter or extend it by solving a problem chosen from within the domain by means of their cognitive processes, personality traits, and motivation. The field, people who control or influence the domain (e.g., art and music critics and gallery owners), then evaluate this creative output, selecting those new ideas or creative products deemed

appropriate to become part of the culture. The domain, a culturally defined symbol system, then preserves and transmits creative products to other individuals and future generations.

Sternberg (1988, p.64), in his Three Facet Model of Creativity, contends that creativity overlaps with other related components, especially intelligence, cognitive style, and personality. While these three components aid the understanding of the creative individual and contribute to the phenomena labeled as creativity, it is not equivalent to any of them. In this theory, intellectual facets are those aspects that can be accounted for in terms of a theory of intelligence. The cognitive style facet, the manner in which one directs his intelligence (i.e., style of self-government), is important in determining whether or not we are creative, not intelligence itself. If the style of self-government is conservative (follows rules, resists change, prefers familiarity, avoids ambiguous situations), the individual will be less creative. If it is progressive (goes beyond rules and procedures, enjoys and maximizes change, prefers unfamiliarity and the unusual and seeks ambiguous situations) creativity is more likely to result. Sternberg emphasizes that at least some of the progressive style is necessary to display creative behavior. The Personality Facet outlines those personality attributes that are more conducive to creative performance than others. These include tolerance of ambiguity, willingness to surmount obstacles, willingness to grow, intrinsic motivation, moderate risk taking, desire for recognition, and a willingness to work for recognition.

The Investment Theory of Creativity, according to Sternberg and Lubart (as cited in Sternberg and Lubart, 1999), identifies creative people as those willing and able to “buy low and sell high” in the realm of ideas. Buying low means pursuing ideas that are unknown or out of favor but have growth potential. According to this theory, creativity requires a confluence of six distinct but interrelated resources: intellectual abilities, accumulated knowledge, styles of thinking (i.e., cognitive style), personality, motivation, and environment. Sternberg (as cited in Sternberg & Lubart, 1999) also suggests that the simultaneous use of three intellectual abilities is of particular importance. These abilities include the *synthetic ability* to see problems in new ways, combine non-related ideas and arrive at solutions while escaping the bounds of conventional thinking; the *analytic ability* to identify those ideas worth pursuing and those that are not; and the *practical-contextual ability* to effectively persuade others of the value of one’s ideas.

These definitions provide a broader view of creativity along with a better sense of the interactions between components. While still limited in their agreement of what creativity is, one of the important issues that these theories underscore is that the various components outlined in each may combine in varying ways in each individual, affecting the way creativity is exhibited by each individual. Two important terms that are fundamental to any discussion of the nature of creativity, mentioned both here and previously, are problem solving and cognitive style. These form the “what” and “how” of creativity and creative behavior and will be discussed in the following sections.

## Creativity and Problem Solving

In the previous discussion, references to problem solving were made by a number of authors in their definitions of creativity. Some seem to use this term in place of, or synonymous with, the term creativity. The use of these terms in this way raises several questions: What is problem solving? Is it the same as creativity? If it is not equivalent, what is the relationship between them? It is important to define this relationship and the relationship of both to novelty, not only to clarify previous discussion, but also to provide important background for subsequent discussion. Several authors have provided some insight. However, as might be expected, there is not a consensus among researchers and theorists as to the nature of this relationship, although most consider the two closely related. Problem solving, from a Darwinian and biological point of view, is the capacity of an organism to detect changes influencing its operation within an environment (consciously or not) and to successfully respond by effecting another change (biological, behavioral, or environmental), allowing the organism to meet its next challenge (Kirton, 2003). Humans have developed what is commonly called creativity to solve not only problems of survival, but all of the problems we encounter as individuals and as a species. Creativity and problem solving are the cultural equivalents to biological adaption and evolution (Csikszentmihalyi, 1996).

Guilford (1964, 1977) argues that the two terms refer to essentially the same mental phenomena and therefore are the same process. Other investigators however, take the position that creativity is either part of, or a special form of problem solving.

Newell, Shaw, and Simon (as cited in Kirton, 2003) describe creative activity as a “special class of problem-solving activity characterized by novelty, unconventionality, persistence, and difficulty in problem formulation”. They are in agreement with Guilford however, finding no particular differences between the (cognitive) *processes* involved in creative thinking and those involved in non-creative thinking in their research. Feldhusen and Treffinger (as cited in Nickerson, 1999) combine creativity and problem solving into “a single complex concept,” put forth the argument that “creative abilities such as fluency, flexibility, and originality . . . are in reality indispensable components of realistic and complex problem solving behavior”. Mumford et al. (as cited in Nickerson, 1999) simply refer to creative thought as a form of problem solving.

Kirton (2003), reflecting Guilford’s views, contends that creativity, problem solving, and decision making are terms for the “cognitively driven operations, or products of cognitive function, by which change is brought about by humans and are substantially overlapping, if not synonymous. If not synonymous, they are closely linked because each is involved in the generation and resolution of novelty: Novelty is generated in order to resolve a novelty, as the process of resolving each problem, and the solution when it emerges is always new. In every case where there is creativity, there is also problem solving and decision-making.”

Amabile (1996), expanding this narrow distinction, groups creative tasks into three domains: verbal creativity, artistic creativity, and problem solving creativity. Problem solving, in her view, may or may not be creative, depending on *how* the



problem is solved. A solution is non-creative if the path to the solution employs a previously established algorithm (a step-by-step problem-solving procedure that solves a problem in a finite number of steps), whereas a solution is creative if the path to the solution is heuristic (a path that helps to discover or learn; that guides or furthers investigation). It is interesting to note that Amabile views problem solving as a distinct kind of creativity from verbal and artistic creativity. While she gives no explanation, the answer may lie in a quote from Driver (2001): "Unlike creativity in art or music, creativity in business is not an end in itself." In this light, verbal and artistic creativity are problems of expression, and creative expression is a solution in and of itself, whereas in business, or most any other field for that matter, creativity and problem solving are the means to the solution of the problem, not the solution itself.

The main distinction between these two concepts then is distinguished by whether or not the method or path used to solve a problem, and the resolution or solution of the problem is new or novel for the individual solving the problem. The problem itself may or may not be new, as problems often recur, and new solutions can, and often must be generated. As you will see later, these distinctions have an impact on how researchers view this issue and use these two terms.

### Cognitive Style

The second term requiring clarification is cognitive style. If cognition is the process through which the individual obtains information from the environment,

transforms it, and uses it to respond to the environment (Rastogi, 1987), then cognitive style is the way in which cognition is applied while problem solving (Sternberg, 1988). Kogan (as cited by Kirton, 2003) supports this assertion, describing cognitive style as the “manner in which problem solving is undertaken” and is “dependent on the manner [in which] individuals acquire, store, retrieve and transform information”. In a slightly different approach, Sternberg (1988) describes cognitive style as the manner in which one directs his intelligence, and that it is how we use our intelligence that is important in determining whether or not we are creative, not intelligence itself. Kirton (2003) observes that the first time anyone becomes aware of cognitive style is when a consistent and predictable difference is noted between the ways (manner, style) in which any two people appear to go about solving similar problems. These behavior differences exhibited by individuals while problem solving, driven by underlying personality traits, form the basis of cognitive style (Kirton, 2003).

Once again, theorists describe cognitive style in varying ways. Perhaps the first to discuss cognitive style, Witkin, et. al. (1954) postulated two cognitive patterns, field dependence and field independence. Both types of cognitive style are defined in terms of an individual's ability to perceive contexts embedded within a field. Individuals who are able to easily break up an “organized perceptual” field, or who can readily separate an item from its context, possess the field independence mode of perception. In this mode, parts of the field are experienced in a discrete and analytical manner. Conversely, those who readily accept the prevailing field or context as a

whole, or have difficulty in separating an item from its context are field dependant perceivers. In this mode of perception the parts of the field are experienced as “fused” and the individual has difficulty or is unable to differentiate between its parts due to his perception of the field’s overall organization. This view parallels Kirton’s concept of cognitive style.

In a similar but more complex point of view, Amabile (1996) contends that cognitive style is a component of creativity, and describes it in terms of certain required features or abilities. These include the ability to break perceptual set (how one perceives an object), to break cognitive set (use new strategies for problem solving rather than old), understand complexities (the appreciation of and ability to deal with complexity), keep response options open as long as possible (avoiding foreclosure of alternatives), and suspension of judgment (not discounting possibilities). Other features include the use of wide categories and the ability to perceive relationships between diverse bits of information, an accurate memory, breaking out of “performance scripts” (set sequences) for solving problems, and perceiving creatively (seeing things differently, recognizing the importance of new and perhaps seemingly unrelated information). A cognitive style not including these abilities is considered less creative.

In his Three Facet Model of Creativity, Sternberg (1988) describes two contrasting cognitive styles based on the individual’s style of self-government, which serves as a bridge between intelligence and personality. This description of cognitive style is also similar to Kirton’s theory. However, as previously discussed, Sternberg

(contrary to Kirton's views) considers the conservative style to be less creative while the progressive style is more creative, maintaining that at least some progressive style is required in order to display creative behavior.

Policastro and Gardner (1999) identify a "*generative cognitive style*", involving the following three components: (a) imagination, (b) sense of domain relevance, and (c) intrapersonal intelligence. They define imagination as a form of playful analogical thinking (as opposed to logical thinking with its strict, algorithmic rules) that combines knowledge learned from previous experiences in unusual ways, thus generating new creative ideas that have contextually valid patterns of meaning. They warn that imagination, serving as an adaptive function toward reality, is not to be confused with fantasy, the subjective expression of needs, conflicts or wishes that may result in illusion. Sense of domain relevance is the ability to distinguish what is important from what is not; in essence to sift out relevant information from what Einstein terms "the multitude of things that clutter up the mind and divert it from the essential (quoted from Gardner, 1993, p. 104, in Policastro and Gardner, 1999). Gardner defines (as cited in Policastro and Gardner, 1999) intrapersonal intelligence as the capacity of an individual to understand and guide his or her own creative behavior by discerning the subtle distinctions among the various cognitive and emotional processes that may occur during a creative undertaking. It is the ability to distinguish between productive imagination (what will work) and fantasy (what will not). Policastro and Gardner view these components of cognitive style as operating in the following fashion: "imagination leads to originality, sense of domain relevance

leads to high quality, and intrapersonal intelligence checks illusory and/or emotional interferences in the process of constructing a novel representation.”

These authors clearly view cognitive style as an important factor contributing to creativity, based on how it directs one’s intelligence or thinking while engaging in creative behavior. However, they do not view all cognitive styles as creative. If the cognitive style varies significantly from an author’s concept, it is considered either less creative or non-creative. In general, if the cognitive style seeks solutions to problems in ways that are new, novel, and untried, it is considered more creative. Conversely, if the cognitive style seeks solutions within set procedures and paradigms, it is considered less creative.

In a view consistent with Kirton’s, Selby, Treffinger, Isaksen, and Lauer (2004a) define problem-solving styles as “consistent individual differences in the ways people prefer to plan and carry out generating and focusing activities, in order to gain clarity, produce ideas, and prepare for action.” They believe an individual’s “natural disposition towards change management and problem solving is influenced in part by mindset, willingness to engage in and respond to a situation as presented, and the attitudinal dimensions of one’s personality.”

By offering an alternative view of cognitive and problem-solving style, as defined in his Adaption-Innovation Theory, Kirton has expanded traditional views of creativity. Kirton’s theory is no longer concerned with the “who” or “what” of creativity. His theory assumes that everyone is capable of creativity in some way, at some time, and at some level. Instead, his theory is concerned with *how* we are

creative, stating that creativity is manifested in a range of styles, emanating from two basic cognitive or creative styles that approach creativity and problem solving in fundamentally different ways. It is important to note that while Kirton's descriptions of cognitive style bear many similarities to those previously discussed, his theory regards all cognitive styles as creative, in stark disagreement with other authors.

It is the concept of cognitive style that is of importance in attempting to answer questions regarding different kinds or styles of creativity. This issue is at the center of Kirton's Theory, and fundamental to this thesis. These differing styles have far reaching consequences, not only in how individuals prefer to solve problems, but in several related areas as well. These include the kinds of problems we prefer or choose to solve, the methods we use to solve them and the contexts or environments in which we choose to solve them. These issues will be discussed within the context of Adaption – Innovation theory, exploring how they influence and guide career choices as well as performance and satisfaction in those careers.

### Adaption – Innovation Theory

Kirton's theory expands traditional views of creativity, stating that innovation is only one kind of creative style, and that these innovators are the same highly creative individuals described by the creativity tests used by researchers (Goldsmith, 1985). Recent thinking, as characterized by Sternberg and Lubart (1999), now recognizes the importance of "everyday" creativity of individuals, necessary in solving the problems encountered in daily living, as well as at the collective and

societal level where creativity leads to scientific discoveries, new movements in art, new inventions, and new social programs (Sternberg, 1999).

Kirton's theory (1976, 2003), attempting to explain how we bring about change through problem solving, identifies two types of creators or problem solvers: Adaptors and Innovators, based on his observation that people characteristically either adapt or innovate. To quote Goldsmith (1987): "Adaptors are meticulous, prudent, careful with the details, and promote immediate consistency and efficiency. Innovators are less careful, leave the details to others, easily jump from one idea to the next, and may sacrifice short-run efficiency for long-run effectiveness. Adaptors work more readily in groups and in formal structures because they find support and comfort in rules, hierarchies and regulations. Innovators tend to resist rules and have a difficult time conforming." Adaptors then, preferring to solve their problems within existing consensually agreed structures and the parameters of existing rules and paradigms, seek to do things better. On the other hand, Innovators, preferring a loose, guiding structure, seek solutions to problems outside of existing rules and paradigms, choosing to do things differently. These guiding structures and paradigms, whether rigid or loose, include cognitive structures, the means by which we arrange and group information and experiences in a meaningful manner, allowing understanding of that information. Without such structure, there can be no thought, analysis, classification, abstraction, or ordering of information, experiences and the surrounding environment to facilitate learning, problem solving, and ultimately, change.

Most of the creativity literature supposes an inverse relationship between creativity and structure, where less structure and greater freedom generates a more creative idea. Adaption - Innovation theory differs significantly, suggesting that at least some cognitive structure is required for all problem solving, with limits in both directions. At one end of the spectrum, excessive structure will impede the generation of new thought. At the other end, too little structure will result in too few frames of reference for thought processes to operate effectively. Kirton notes that the range of structure required for the generation of new ideas may be narrower than it appears (Kirton, 2003).

Hunt, Krzystofiak, Meindl, and Yousry (1989) observe that consistent differences in the way individuals' perceive and comprehend information amount to "styles" of thinking and will typify the way in which a person will deal with complex problems, both in terms of conscious strategies and unconscious habits. As such, cognitive style is closely connected to those "thinking practices" associated with our decision-making processes. These authors' view cognitive style, based on the concept of field dependence (as previously discussed), as a significant and influential factor of problem solving and decision-making. Quoting Henderson and Nutt (as cited by Hunt, Krzystofiak, Meindl, and Yousry, 1989), they define field dependence as the "ability to separate an object or phenomenon from its environment. Therefore, individuals showing high field dependence prefer problem solving approaches emphasizing detail and basic relationships. The field dependant person shows less ability (or perhaps less inclination) to separate objects from their environment. Field dependant



individuals would prefer more global, perhaps intuitive, approaches to problem solving.” They also cite a related set of categories that distinguish “Analytic” and “Intuitive” individuals. The analytic individual is seen as concentrating on detail and is thus able to break that which is observed into component parts. In contrast the intuitive individual comprehends the field as an integrated whole.” Simply stated, style of thinking (cognitive or creative style) determines how an individual will make decisions regarding the methods or strategies necessary for solving a given problem (Hunt, Krzystofiak, Meindl, and Yousry 1989), and is determined by the personality traits of the individual. Goodenough (1985) concurs, stating, “the field dependence dimension appears to have more to do with *how* the...problem is solved than with *how well* the problem is solved (p.221). Goodenough’s discussion of personality correlates and characteristic behaviors of field dependent and field independent individuals are very similar to descriptions of adaptors and innovators, respectively. These personality traits and their Adaption - Innovation correlates will be discussed in depth later in this paper.

Kirton’s creative styles lie on a normally distributed continuum, ranging from high adaptation at one end to high innovation at the other and are measured using Kirton’s Adaption-Innovator Inventory (Kirton, 1976). As previously discussed, Adaption-Innovation theory assumes that creativity is part of, or synonymous with, problem solving in that each creativity style involves the generation and resolution of novelty. Since both styles employ the same cognitive process, Kirton considers them to be “cognitively synonymous”. Furthermore, Kirton postulates that all individuals

are creative stating that “we all solve problems using our cognitive abilities; therefore, we are all creative” (Kirton, 2003). It is important to note that this theory is concerned only with style, that is, with *how* people solve problems. Both potential capacity (intelligence or talent) and learned levels of problem solving ability (skill or competence) are completely independent creativity characteristics assessed by other measures of creativity. Goldsmith (1987) confirms this assertion. His findings conclude that the contradictions and inconsistencies associated with many creativity measures exist because they contain a mixture of measures, confusing to some degree the issues of level and style. Gelade (1995) continued the investigation of the relationship between cognitive style and creativity. This study compared KAI scores with creativity scores as measured by three subscales of Guilford’s Structure of Intellect Model. Results indicated that both adaptors and innovators had similar levels of ideational fluency, a trait generally associated with creativity. Gelade also found innovators to be both more flexible and more original than adaptors, as would be predicted by Adaption-Innovation Theory and its subscales, which will be discussed below. Gelade concludes that Kirton’s assertion that style is independent of creative level is confirmed, but that adaptors may differ from innovators on some dimensions of creative ability, but not others. Brinkman (1999) also confirmed the distinction between style and level in a study attempting to establish a link between problem finding and creativity style in musical composition. While he could not confirm a relationship between creativity style and problem type (i.e., open vs. closed problem types), creativity level and creativity style were confirmed to be distinct entities.

Level, therefore describes “how much”, whereas style describes “in what manner”. We are able to measure creativity/problem solving in terms of both level and style, but no one can be categorically labeled as “uncreative”(Kirton, 2003).

Adaption and innovation need not occur separately. A creative product may be functionally both adaptive and innovative at the same time, depending on the perspective from which the product or process is viewed. In fact, the history of the Art of Music is filled with examples that demonstrate how adaption and innovation can interact, one leading into the other in the progress of sustained creativity. A few examples of this phenomenon are the development of musical notation, the development of the modern symphony, and the progression of musical style from earliest monody to the present. These kinds of progressions not only include creative products that can be viewed as simultaneously innovative and adaptive, but also involve a progression of adaptive acts linked to, and generated by, innovative acts and vice versa. From this historical perspective, neither adaption nor innovation should be judged more or less creative than the other (Kirton, 2003).

### The Kirton Adaption-Innovation Inventory

Kirton, (1976) developed the Kirton Adaption – Innovation Inventory (KAI) as a pencil-and-paper measure to determine the cognitive style used by individuals in problem solving and decision-making (Goldsmith, 1984). The KAI is a 32 item self report measure, with scores ranging from 32 to 160 and with a theoretical mean of 96 and a standard deviation of 17. Scores above 96 identify innovators, and scores

below 96 identify adaptors (Kirton, 1976). Kirton (2003) has found that only a small difference between the KAI scores of two people, or between a person and the mode of a group, is necessary to notice a difference in styles. These differences or gaps in KAI scores between individuals are referred to in the Adaption – Innovation literature as “cognitive gaps.” While less than 10 points is unlikely to be noticed, 10 points or more is sure to be, over time. This aspect allows for the straightforward interpretation of research findings; people having scores 10 points or less apart are regarded as having “same” score, between 10 and 19 apart as “similar” scores, and scores in excess of 20 apart are considered to be “different”.

Kirton has determined these values by combining the standard error of measurement of 6 for the KAI and one half of the standard deviation of 9, equaling 10.5, or in round figures 10. Kirton claims this aspect of Adaption – Innovation theory has been tested in “some research” and “much practice”, but provides no citations to substantiate this claim. He further states that “in psychological terms”, if a “10 point difference is just noticeable, then a 20 point difference is very noticeable, and large enough to require care to avoid breakdowns in communications (e.g., McCarthy, 1988).” Lindsay, Kubes and Spillerova, and Rickards and Moger, (as cited by Kirton, 2003) confirm Kirton’s assertion that within groups of individuals working together, gaps in excess of 30 or 40 points can cause real problems that “require constant attention to avoid friction and misunderstanding” between individuals.

### Subscales of the KAI

The essential differences identified by Adaption – Innovation theory are three closely related bi-polar behavioral patterns labeled idea generation, method of problem solving and social structures. These differences, obtained by factor analysis, compose the three subscales of the KAI. These subscales, named *sufficiency/proliferation of originality*, *efficiency of operation*, and *rule/group conformity*, respectively, will be discussed below. These subscales, while significantly interrelated are conceptually and statistically separate. As such, they provide a useful means for additional and in-depth interpretation of KAI scores (Kirton, 2003).

The first, *sufficiency/proliferation of originality*, is described as the tendency to depart from the consensus by breaking usual patterns of thought with novel ideas. Innovators, possessing a loose regard for the prevailing cognitive structures, prefer to generate as many ideas as possible that may or may not provide a viable solution to the problem. These ideas may include both paradigm-consistent and paradigm-cracking concepts, as innovators are either unconcerned or unaware of where the boundaries of the paradigm structures are. Those ideas found to be exciting and satisfying are most likely to be chosen for implementation by innovators. On the other hand, as a by-product of operating within the prevailing paradigm, adaptors, seeking the shortest route to a solution, will produce only as many sound, useful, and relevant ideas as necessary to complete the task. This manageable and efficient strategy is gratifying for adaptors.

The second, *efficiency of operation*, is described as the tendency to be methodical, prudent, disciplined, and to work within structured, bureaucratic settings. Adaptors, concerned with precision and reliability, prefer to be thorough, detail oriented, highly efficient, and therefore less prone to failure. Innovators are more willing to sacrifice this efficiency, in spite of the possibility of failure to experiment and achieve a wider overview, and see what lies outside of the paradigmatic structures. This gives them the appearance of an inefficient, meandering, undisciplined approach to problem solving. Innovation involves a good deal of discontinuity, and solutions may appear to be irrelevant to the problem and are often unrefined in nature. These products will reach a state of efficiency only through development, a process that is adaptive in nature.

The last, *rule/group conformity*, referring to the expression of risk aversion and the need for certainty, rules, and norms, is the creative style preference for relating (or conforming) to structure. Those who are more adaptive endeavor, whenever possible, to solve problems through relevant rules and groups. Conversely, innovators are willing to solve problems at the expense of rules (or at least by rearranging or redefining a rule), and organizational unity, the integrity of which is unimportant to their cognitive operation or sense of well being (Goldsmith, 1984, 1987; Kirton, 2003). While Kirton was the first to formulate a theory relating cognitive style and creativity/problem solving, along with a means to measure it, others would follow suit, expanding and improving the understanding and measurement of problem solving style.

## VEIW: An Assessment of Problem-Solving Style

Adaption – Innovation Theory and the KAI stood alone as the primary theory and measure for creative/problem solving style for many years. However, recent research, with its roots in Kirton's work, has expanded the view of creativity and problem-solving style, resulting in a number of new instruments for describing and measuring problem-solving style. These instruments vary in the approach to describing problem solving style. Some identify how individuals fit into and prefer certain steps of a creative problem solving process such as FourSight (Puccio, 2002). Others identify types of problem solvers such as Creatrix (Byrd, 1986) or internal modes, or systems of problem solving such as InQ (Harrison, Bramson, Bramson, & Parlette, 2003). Another approach is to identify the role individuals prefer perform in the problem solving process such as the Innovate with CARE inventory (Fahden and Namakkal, 1995). Most of these instruments are more commonly used as corporate development and team building tools rather than for research purposes. Of these new instruments, the only instrument developed as a concise multi-dimensional psychometric evaluation of problem solving style for use by educators, researchers, corporate team developers and creative problem solving practitioners is VIEW: An Assessment of Problem Solving Style (Selby, Treffinger, Isaksen, and Lauer, 2004c). This instrument is the result of studying the link between the psychology of the person and the processes utilized in creative problem solving, such as those found in the Creative Problem Solving (CPS) Version 6.1 process (Treffinger, Isaksen, and Dorval, 2006). The VIEW instrument, a descriptive tool designed to accurately

define problem solving styles, is intended to help individuals “identify their own personal problem-solving style preferences and understand how those preferences can be used in a constructive, forward-looking way when people are solving problems or dealing with change.” It is not a generic style or type measure and is not intended to replace other cognitive style, learning style, or personality assessment tools (Selby, Treffinger, Isaksen, and Lauer, 2004c).

While developing the CPS 6.1 process, the developers of VIEW observed a large variation in the ways individuals approach the tasks of clarifying opportunities and challenges, generating ideas, and preparing for creative action. These observations identified a variety of individuals. Some seek originality, while others approach a problem with caution. Some would generate a large number of ideas while others produce only a sufficient number of ideas to keep the process moving. Some employ a methodical, in-depth approach, while others act quickly on their ideas. These observations led to the conclusion, confirmed by Schoonover, and Martinsen and Kaufman (as cited by Selby, Treffinger, Isaksen, & Lauer, 2004c) that the manner in which one learns problem solving skills, the application of those skills, the approach to the situation and available tools, and the level of creative productivity, whether acting alone or in groups, are all influenced, at least in part, by the individual characteristics people bring to the learning or problem solving situation (Selby Treffinger, Isaksen, & Lauer, 2004c). This range of individual preferences suggested that several areas of psychological theory and research would contribute to the development of VIEW, specifically in the areas of personality, individual differences,



the construction of meaning, and metacognition. While there is a large body of literature in each of these areas, only the specific theories and research contributing directly to VIEW and this paper will be discussed below.

Selby, et. al., looked to these theoretical and research foundations to explain the important interactions between the CPS process and the psychology of the person (specifically those issues concerning personality and individual differences). The study of these interactions led to the creation of the Cognitive Styles Project in 1982, a research program that has continued for more than two decades. This project, initiated in by Isaksen and Treffinger, investigated the conceptual and practical relationships between aspects and characteristics of the creative person, and the operations of the creative process.

The Cognitive Styles Project generated a number of studies employing a variety of measures of learning styles, including studies by Corbett-Whittier, McEwen, and Wittig (as cited by Selby Treffinger, Isaksen, and Lauer, 2004c, p.15); cognitive styles, including studies by Hurley, Selby, Selby, Treffinger, Isaksen and Powers, Puccio, Wheeler, and Zilewicz (as cited by Selby Treffinger, Isaksen, and Lauer, 2004c, p.15), and psychological type, including a study by Tefft (as cited by Selby, Treffinger, Isaksen, and Lauer, 2004c, p.15). Other studies examined the relationships between and among various stylistic measures, such as a study by Joniak and Isaksen (as cited by Selby, Treffinger, Isaksen, and Lauer, 2004c, p.15), between measures of style and level of creativity such as the studies by Dorval, Isaksen, Dorval and Kaufmann, and Isaksen and Puccio (as cited by Selby, Treffinger, Isaksen, and

Lauer, 2004c, p.15), and between measures of style and various manifestations of creative behavior, including studies by Franklin, Holmes, Isaksen and Pershyn, Pershyn, Puccio, and Treffinger and Talbot (as cited by Selby, Treffinger, Isaksen, and Lauer, 2004c, p.15). Finally, other studies investigated the relationship between cognitive style and psychological climate, including studies by Isaksen & Kaufmann, and Isaksen & Lauer (as cited by Selby, Treffinger, Isaksen, and Lauer, 2004c, p.15)) and the impact of these relationships upon organizational behavior, including studies by Dutcher, and Kaufmann, Isaksen, and Lauer (as cited by Selby, Treffinger, Isaksen, and Lauer, 2004c, p.15).

From this body of theory and research, three important components of problem solving style were identified by Selby, et. al.: Learning Style, Cognitive Style, and Psychological Type. Each of these components served to provide valuable insight into the issues surrounding problem-solving style and the constructs necessary to develop a comprehensive measurement instrument. For each component, the following areas were found to be highly important: An examination of the literature and research concerning learning styles stimulated interest in the idea that learning preferences may become key factors in problem solving issues; a thorough study of cognitive style broadened the understanding of creativity/problem solving styles, especially in emphasizing the need to separate the concepts of creative level and creative style; and finally, a study of psychological type stressed the need to understand and constructively use individual differences as well as the function of perception and judgment in problem solving processes.

### Learning Style and VIEW

As with the concept of creativity, learning style may be defined in a number of ways. For the purposes of its application to VIEW, according to Hilgersom-Volk, learning style may simply be described as the “unique internal processes that guide how we take in information from our environment” (as cited by Selby, Treffinger, Isaksen, and Lauer, 2004c). Another view posited by Gregorc (as cited in Selby Treffinger, Isaksen, & Lauer, 2004c, 54.) described learning style as “mind qualities that serve as mediators as we learn from and act upon our environment”. Gregorc further described stylistic differences as “powerful indicators of deep underlying psychological forces that help guide a person’s interactions with existential realities.

Any brief inspection of the available literature will reveal a number of models attempting to describe learning style. Kolb (as cited in Selby Treffinger, Isaksen, & Lauer, 2004c) used a model placing preferences along two intersecting continua: Converger / Diverger and Accommodator / Assimilator. These two bi-polar style preferences represent the major ways in which people differ while they perceive and process information. Gregorc also viewed learning styles as the influence of preferences along two similar intersecting continua. His model labeled these continua as “concrete to random” and “abstract to sequential”, resulting in four possible learning styles when combined on a quadrant plane. Dunn and Dunn (as cited in Selby Treffinger, Isaksen, & Lauer, 2004c) developed a multi-faceted learning style model that included 21 style elements distributed within categories they labeled environmental, emotional, sociological, physical, and psychological. A key

understanding of this model is that each element impacts a learner at one of three levels of intensity. For some individuals an element will have no effect at all and will play no part in the individual's ability to learn new and difficult material. For others, some elements may enhance learning and improve a learner's performance, however learning will continue if the element is not present. For others, the element must be present in order for learning to take place. The Dunn's describe elements that enhance learning as *preferences*, while elements required for learning to take place are considered to be *factors* of the person's learning style.

Several elements from the work of Dunn and Dunn became significant to the development of VIEW. These included the elements of need for structure, need for proximity to authority, persistence, working alone or in groups, and the psychological elements of analytic/global and reflective/impulsive. Dunn and Dunn noted that some individuals learn best in well-structured environments while following a well-structured plan, while others find that their ability to learn new and difficult information is limited by structure. Likewise working close to authority figures may enable some individuals, whereas others will be disabled by close proximity. Findings by Houtz, Selby, Esquivel, Okaye, Peters, and Treffinger, and Alter (as cited in Selby Treffinger, Isaksen, & Lauer, 2004c) regarding preferences for proximity to authority and structure reinforced the Dunn's observations (Selby, Treffinger, Isaksen, & Lauer, 2004c).

## Cognitive Style and VIEW

Cognitive style has already been discussed at length in this paper, however Selby, Treffinger, Isaksen, and Lauer (2004c) present additional citations and observations of this concept. In addition to the definitions of cognitive style previously set forth, Martinsen and Kaufmann (as cited in Selby Treffinger, Isaksen, & Lauer, 2004c) maintain that cognitive style involves “the overlap of the independent constructs of personality and cognition, and can be located where cognition and personality intersect”, a view supported by the research relating cognitive style and personality types previously cited in this paper. From this definition, these authors offer the Assimilator-Explorer (A – E) theory. This theory proposes two approaches to creativity lying along a single bi-polar continuum, similar to Kirton’s A-I theory. Their observations led them to conclude that some subjects “spontaneously vary their solution strategies without any prompting by task requirements or instructions” during creativity and problem solving tasks. These individuals were labeled *explorers*. Conversely, those following pre-specified algorithms throughout the process were labeled *assimilators*. Martinsen and Kaufmann’s work differed from Kirton’s in that A-I theory examined the distinction between adaptors and innovators in the context of problem solving in general, while A-E theory was located within the more specific domain of creativity (Selby, Treffinger, Isaksen, & Lauer, 2004c).

The authors of VIEW summarize their review of cognitive style in this way: “Theory and research on cognitive style influenced the development of VIEW in

several ways. The first was the separation of people's level of creativity from their style of creativity, with the resulting emphasis of identifying people's preferred ways of accessing, expressing, and applying their creativity. In addition, in depth study of cognitive style emphasized the importance and value of looking beyond isolated personality traits alone and emphasizing "higher-order" variables relating to information processing strategies. Work on cognitive style (as well as learning style) also supported our emphasis on the importance of value neutral style labels and descriptions" (Selby, Treffinger, Isaksen, & Lauer, 2004c).

#### Psychological Type and VIEW

Selby, Treffinger, Isaksen, and Lauer (2004c) looked to Psychological Type theory and research to further refine and articulate their definition of problem solving style. Their examination of this body of literature focused specifically on the important constructs associated with problem solving style and change management, including those constructs they found omitted from other measures of cognitive style or creativity style. Descriptions of these personality "types", along with the emphasis in the literature on the constructive use of individual differences, provided the foundation necessary to formulate the basic structure and organization of a problem-solving style measurement instrument capable of accurately assessing these concepts.

Of particular interest to Selby, et. al. in the development of VIEW is Jung's Type Theory (cited in Selby Treffinger, Isaksen, & Lauer, 2004c). Developed over many years, this theory is rooted in the classical ideas of the temperaments, Jung's

observations of patients in his psychoanalytic practice, and his empirical research.

This theory postulates three pairs of opposing psychological types of introversion/extroversion, sensation/intuition, and thinking/feeling.

An individual's preference for either introversion or extroversion influences the choice of when others and the environment will be engaged during the problem solving process, as well as the preference for verbal vs. non-verbal interaction. Extroverts tend to interact with others and the environment both verbally and actively from the beginning of the process. They will modify ideas as information is received and exchanged. Introverts on the other hand, will tend to consider ideas and other non-verbal input quietly and carefully before engaging with others (Selby, Treffinger, Isaksen, & Lauer, 2004c).

A preference for one of two opposing perceptual functions, either sensing or intuition, are important in the information gathering process. Those with a preference for sensing tend to base perception on what is practical. They tend to be careful and specific, preferring to begin with a focus on the real life, concrete facts of the case, then moving to the formation of more abstract ideas. Those with a well-developed preference for intuition tend to focus on inspiration and meaning. They look for meanings, insight, patterns and relationships, and general concepts, beginning with abstract ideas from which will emerge concrete plans.

Thinking and feeling are judging functions referring to the ways in which individuals make decisions and reach conclusions. People with a thinking orientation prefer to stay detached from emotion during problem solving, making decisions

objectively and impersonally, considering causes and logical outcomes, logical principles, order, standards, and rigor. They prefer to begin by offering a critique, finding the flaws in a plan or idea, and mastering the material. Those with a feeling orientation prefer to stay tuned to emotions, making subjective and personal decisions weighing the values of each choice and how it will affect others. They attend to personal relationships, seeking harmony in their outcomes. Their judgments are based on their appreciation of people and things (Selby, Treffinger, Isaksen, and Lauer, 2004c).

Myers and McCaulley, and Myers, et. al., (cited in Selby Treffinger, Isaksen, & Lauer, 2004c), expanding Jungian theory, add a judging/perceiving dimension. This dimension describes an individual's attitude towards the outer world. These orientations influence how an individual approaches the other three dimensions of Type Theory. Those with a judging orientation prefer to begin the problem solving process with a clear structure and to work with an orderly, consistent, predictable plan aimed at regulating and controlling events, until closure is reached. Those with a perceiving orientation seem to prefer dynamic structure and planning, marked by open exploration through which structure emerges, but is ever fluid, as they are stimulated by new and different ideas, and experience. These individuals prefer a spontaneous, flexible way of life, aimed at understanding life and adapting to it (in Selby et., al., 2004c). These psychological types form the basis of the Meyers-Briggs Type Indicator, a psychometric evaluation instrument designed to identify the psychological type of individuals.



Lawrence (as cited in Selby, Treffinger, Isaksen, & Lauer, 2004c) conducted an investigation exploring the connection between psychological types and learning styles. Rather than concentrating specifically on the behaviors associated with various psychological types, this study was concerned with the values and priorities that provide the motivating energy sustaining the behaviors associated with psychological types. His findings indicate that individuals of particular types exhibit very clear learning preferences. Lawrence (cited in Selby Treffinger, Isaksen, & Lauer, 2004c) concluded, based on his findings, that if the learning preferences of individuals are not appropriately addressed or respected during instruction or training, students may well be unable “to bring their best energies and effort to the learning tasks.”

From this body of theory and research emerged a broader understanding of problem solving styles. From this understanding, Selby, Treffinger, Isaksen, & Lauer (2004c) have defined problem-solving styles as “consistent individual differences in the ways people prefer to plan and carry out generating and focusing activities, in order to gain clarity, produce ideas, and prepare for action. An individual’s natural disposition towards change management and problem solving is influenced in part by mindset, willingness to engage in and respond to a situation as presented, and the attitudinal dimensions of one’s personality.”

### The Three Dimensions of VIEW

In order to produce a clear picture of an individual’s problem-solving style, the authors of VIEW determined that an instrument providing data along three distinct,

but related dimensions would be required. These dimensions were selected because “they synthesize efficiently important constructs from varied theoretical perspectives”(Selby, Treffinger, Isaksen, & Lauer, 2004a) directly influencing “the ways people perceive problems and information, process data, generate possible solutions, make choices and decisions, and prepare to implement solutions” (Selby, Treffinger, Isaksen, & Lauer, 2004c). These three bi-polar dimensions, each of which will be discussed below, are: Orientation to Change (OC), Manner of Processing (P), and Ways of Deciding (D).

### Orientation to Change

This scale, describes perceived preferences in two general styles for managing change and solving problems creatively. It is defined as the “dispositions and preferences for responding to and managing structure, novelty, and authority, when . . . dealing with change or solving problems” (Selby, Treffinger, Isaksen, & Lauer, 2004a). Located at either end of this scale are two contrasting style preferences, the Developer and the Explorer. While it may be convenient to characterize these style preferences using the behavior descriptors of either extreme of the scale, most people share preferences associated with both styles in varying degrees. The location of the overall preference score for a given individual along the Explorer—Developer continuum determines how these styles are exhibited for a given individual. This typical behavior will be consistent across varying contexts, over a sustained period of time, as will the consistency and clarity of these

preferences. If the style described by that score is accurate, the person will find that style description very natural and comfortable. This scale addresses questions concerning an individual's preferences for boundaries and parameters, as well as how one feels and reacts to structure, novel challenges and change (Selby, Treffinger, Isaksen, & Lauer, 2004a; 2004c).

The Explorer Style. Total scores below the mean on this VIEW dimension reflect a preference for the Explorer style. Explorers enjoy initiating a broad range of tasks while thriving on new, ill-defined, and ambiguous situations and challenges. While problem solving, Explorers may seek to create a number of unusual and original options that, if developed and refined, might provide the foundation for productive new directions. However, they may prefer to leave the refining and developing to others in order to move on to new challenges. Explorers are good at seeing unusual possibilities, patterns, and relationships that may be difficult for others to understand or embrace initially. They tend to throw themselves into a situation, embracing risk and uncertainty, improvising their planning as the situation unfolds, following the possibilities wherever they might lead. Efficiency is often forgotten or ignored as they become involved in the excitement of new, leading edge ideas. External plans, procedures, and structures are often considered to be confining and limiting to their imagination and energy. Unwilling to limit their thinking, explorers may continue to consider new ideas about a project even after its conclusion. Likewise, these individuals may abandon a project before reaching closure in order to pursue new challenges (Selby, Treffinger, Isaksen, & Lauer, 2004a; 2004c).

The Developer Style. Scores above the mean on the Orientation to Change dimension reflect a preference for the Developer style. Developers are proficient at bringing tasks (which include ideas, problem statements, action plans, products, or programs) to fruition. Beginning with the basic elements or ingredients, these individuals organize, synthesize, refine, and enhance them, resulting in the formation and shaping of a complete, functional, and useful condition or outcome.

Developers concern themselves with practical applications and the reality of a task, using their creative and critical thinking in ways that may be characterized as helpful and valuable. They prefer and seek out problem and solution types lying within the framework of current experience, preferring to seek change that is incremental, practical, and easily assimilated by the current reality. Developers will tend to formulate only a small number of workable possibilities that may be successfully guided to realization, preferring to focus on bringing one task to closure before taking on a new challenge. They tend to be careful, methodical, and well organized, using this strategy to minimize risk and uncertainty. Comfortable with plans, details, and structures, they find structure and the guidance of authority helpful, or even enabling, in moving tasks or projects forward in a efficient, deliberate manner. Others often view developers as persistent, careful, practical, methodical, and well-organized individuals (Selby, Treffinger, Isaksen, & Lauer, 2004a; 2004c).

### Manner of Processing

This dimension describes the person's preference for working either *externally* (i.e., working with other people throughout the process) or *internally* (i.e., thinking and working alone before sharing ideas with others) when managing change and solving problems, and can be defined as: The dispositions and preferences for how and when an individual uses his own energy and resources, the energy and resources of others, and the environment; and for the different ways information is processed and used during the problem solving processes. It involves how individuals prefer to manage information and its flow during problem solving, how thinking is shared, and whether or not energy is generated or expended while interacting with others (Selby, Treffinger, Isaksen & Lauer, 2004c; Treffinger & Selby, 2004).

External Style. Scores below the mean on this scale indicate a preference for an "External" style of processing. Individuals exhibiting a well-developed preference for this style draw their energy from interaction with others; discussing possible solutions with them, and building from their input and ideas. They prefer to be physically engaged with the environment. Those with an External style preference attempt to clarify their ideas and understandings through discussion while learning new and difficult material. Not bothered by noise in the study or work area, they approach learning in a variety of ways, often finding that physical mobility enhances their learning, thinking, and problem solving. When solving problems, they seek a great deal of input from others before reaching their conclusions. These individuals tend to be seen by others as good team members and often appear full of energy.

With a preference for action over reflection, they will appear to rush into things before others are ready to proceed (Selby, Treffinger, Isaksen, & Lauer, 2004a; 2004c).

Internal Style. Scores above the mean on this scale reflect a preference for an “Internal” style of processing. These individuals will look first to their own inner resources, drawing energy from this reflective approach. They prefer to consider ideas on their own before sharing them with others, acting only after giving full and careful consideration to the issue at hand. Along with the emphasis on quiet reflection, these individuals prefer to process information at their own pace, becoming absorbed in inner events, ideas, and concepts. They prefer to learn privately, working without the help of others for as long as possible. These individuals often appear to be pensive or withdrawn to those around them (Selby, Treffinger, Isaksen, & Lauer, 2004a; 2004c).

### Ways of Deciding

VIEW’s third dimension describes the emphasis a person places on either *person* (i.e., maintaining harmony and interpersonal relationships) or on *tasks* (i.e., emphasizing logical, rational, and appropriate decisions) while making decisions during problem solving or managing change. This dimension, concerned with deciding which of the available options and possibilities are preferred, may be defined as those “dispositions and preferences regarding the balance and emphasis of task concerns and personal or interpersonal needs when focusing one’s thinking and

moving towards decisions and action.” This dimension involves determining which factors are given first priority while focusing or deciding, the starting point in the process, and the compromises that may need to be made (Selby, Treffinger, Isaksen, & Lauer, 2000a; 2004c; Treffinger & Selby, 2004).

Person. Individuals scoring below the mean of this scale tend to focus on the Person style as their primary emphasis when deciding. Of primary consideration is how choices and decisions will impact the feelings and support of those affected, as well as the needs for harmony and positive relationships. Often seen as warm, friendly and caring, they prefer to be emotionally involved when setting priorities. They tend to be sensitive and empathic, quickly becoming aware of, and responding to, the needs of others. They seek solutions and decisions that are likely to be accepted by all concerned (Selby, Treffinger, Isaksen, & Lauer, 2004c).

Task. Scores located above the mean of this scale indicate a focus on the Task style. These individuals will first consider choices and decisions that are logical, sensible and objectively justified. They avoid emotional involvement, preferring to make impersonal judgments based on well-reasoned conclusions. These individuals seek to master content and information, allowing them to arrive at what they can readily defend and justify as the best possible solution or response. While seeking clarity, precision, and logical order, they will remain calm and free from emotion (Selby, Treffinger, Isaksen, and Lauer, 2004c).

Selby, Treffinger, Isaksen, and Lauer (2004c), observe that Task and Person preferences are clearly related to the ways individuals define tasks and problems.

They report that Task-oriented deciders structure challenges and problem statements that are sound, analytic, and clearly consistent with facts and evidence. Likewise, Person-oriented deciders identify challenges and problem statements addressing personal feelings and needs, as well as interpersonal harmony and relationships. When preparing for action, individuals with a Task preference prefer precise, detailed solutions they can objectively justify and verify. Conversely, individuals with a People preference focus greater attention on personal responsibilities for action, collaboration, and support. Task-oriented deciders prefer explicit criteria when focusing their thinking, while People-oriented deciders prefer implicit criteria. Task-oriented individuals will invest their energy in systematic implementation, driving toward completion and results, while people-oriented deciders will tend to focus on creation of growth opportunities and a favorable climate for those affected by their decisions.

### Behaviors Associated with Problem Solving Styles

Having describe creative style as defined both by A – I theory and the authors of VIEW, it would be beneficial to discuss behaviors associated with these styles. Before proceeding however, it would be helpful to look at creative behaviors as described by other theorists. While many theorists speak of behavior resulting from the creative process in a general sense, most do little to describe those behaviors. Policastro and Gardner (1999) have identified several kinds of creative behaviors directly related to musical fields of study previously listed. (The musical activities in



parentheses after each behavior are my addition.) They identify creators that tend to engage in *problem solving*, highly creative when the problem is important and yet unsolved (music educators, therapists and conductors). Other creators prefer to engage in *theory building*, constructing a set of concepts that account for existing data and shed new light or gives new direction to the domain (music therapists, musicologists). There are the artists and inventors preferring to create *permanent works* in a symbolic system (musical composers/songwriters). There are those that engage in the *performance* of a formal, established work where the significance or meaning is comprehended only in performance, and the creativity is integral to the specific performance (musical performance, conducting). The last kind of creative behavior involves *improvised actions* during a public performance. Unlike the ritualized performances previously described where the performance is rehearsed, this performance is only somewhat planned. It is high stake (at least for the improviser) and the improvisation may change based on the reactions of the audience or participants (jazz improvisation).

These authors view these as “conceptualized forms” of behaviors, and observe that many creative individuals may engage in one or more of them. Even though the creator may engage in these behaviors due to a preference for that activity, Gardner does not go so far as to associate them with specific creative or cognitive styles, although he claims that certain creators are attracted to certain behaviors based on factors of “temperament, ability, and personality” (PolICASTRO & Gardner, 1999). Each of these behaviors, when considered from the point of view of problem solving styles,

occur within distinct paradigms and environments, may occur as a result of distinct creative or cognitive styles, and may be solved/performed at varying quality levels.

Kirton bases his theory on an individual's preference for a certain style of creativity, denoting a clear distinction between a preferred cognitive style and the observed behavior. Preference of style influences behavior. Behavior, in the context of A – I Theory, is the combination of thoughts and actions producing or resulting in a product, idea, or an artifact intended to solve a problem. Since cognitive function, and therefore cognitive style are governed by normally stable personality characteristics, behavior tends to be performed in a similar, stable characteristic fashion. Behavior in turn interacts with the environment, producing feedback, which the individual then collects, organizes, and interprets for further use. Kirton (1976) describes a number of behaviors that are attributed to adaptors and innovators (see table 1). Given that adaption and innovation occur within a continuum, and that an unpredictable environment can provide many unusual circumstances, any individual is capable of exhibiting behaviors from both styles, even employing behaviors from both ends of a given bipolar set at different times.

Table 1. Behavior Descriptions of Adaptors and Innovators

Behavior Descriptions of Adaptors and Innovators	
Adaptors	Innovators
<p>Characterized by precision, reliability, efficiency, methodicalness, prudence, discipline, and conformity.</p> <p>Concerned with resolving problems rather than finding them.</p> <p>Seeks solutions to problems in tried and understood ways.</p> <p>Reduces problems by improvement and greater efficiency, with maximum of continuity and stability.</p> <p>Seen as sound, conforming, safe, and dependable.</p> <p>Liable to make goals of means.</p> <p>Seems impervious to boredom, seems able to maintain high accuracy in long spells of detailed work.</p> <p>Is an authority within given structures.</p> <p>Challenges rules rarely, cautiously, when assured of strong support.</p> <p>Tends to exhibit high self-doubt. Reacts to criticism by closer outward conformity. Vulnerable to social pressure and authority; compliant.</p> <p>Is essential to the functioning of the institution all the time, but occasionally needs to be "dug out" of his systems.</p> <p><i>When collaborating with innovators:</i> supplies stability, order and continuity to the partnership.</p> <p>Sensitive to people, maintains group cohesion and cooperation.</p> <p>Provides a safe base for the innovator's riskier operations.</p>	<p>Seen as undisciplined, thinking tangentially, approaching tasks from unsuspected angles.</p> <p>Could be said to discover problems and discover avenues of solution.</p> <p>Queries concomitant assumptions; manipulates problems.</p> <p>Is catalyst to settled groups, irreverent of their consensual views; seen as abrasive, creating dissonance.</p> <p>Seen as unsound, impractical; often shocks his opposite.</p> <p>In pursuit of goals treats accepted means with little regard.</p> <p>Capable of detailed routine (system maintenance) work for only short bursts. Quick to delegate routine tasks.</p> <p>Tends to take control in unstructured situations.</p> <p>Often challenges rules, has little respect for past custom.</p> <p>Appears to have low self-doubt when generating ideas, not needing consensus to maintain certitude in face of opposition.</p> <p>In the institution is ideal in unscheduled crises, or better still to help avoid them, if he can be controlled.</p> <p><i>When collaborating with adaptors:</i> supplies the task orientations, the break with the past and accepted theory.</p> <p>Insensitive to people, often threatens group cohesion and cooperation.</p> <p>Provides the dynamics to bring about periodic radical change, without which institutions tend to ossify.</p>

Selby, et. al. (2004b), developed VIEW to identify and measure an individual's preferences for specific behavior styles exhibited during problem solving. As previously discussed, these behavioral preferences can be explained by a number of theories and confirmed by research in the areas of psychological type, cognitive style, and learning styles. The development of the VIEW instrument began with their observations of the preference of specific behaviors exhibited by individuals while engaging in a CPS program. These behaviors have been catalogued and categorized under the style dimension with which they are associated (see tables 2, 3, and 4).

Table 2. Behavior Preferences for Orientation to Change

Behavior Preferences for Orientation to Change	
<b>Developers</b> <ul style="list-style-type: none"> <li>• Stay within existing paradigm or system, follow rules and procedures as given;</li> <li>• Find benefits and support in structure;</li> <li>• Emphasize improvement and usefulness</li> <li>• Focus on gradual, incremental change;</li> <li>• Emphasize finding "just enough" new ideas;</li> <li>• Resourceful;</li> <li>• Dependable and Consistent;</li> <li>• Precise, Thorough, Efficient;</li> <li>• Good (Early) Planning and Organizing;</li> <li>• Emphasize thorough completion of tasks and attention to details, seek closure;</li> <li>• Know how to get their ideas accepted by others;</li> <li>• Look to authorities for guidance;</li> <li>• May emphasize focusing.</li> </ul>	<b>Explorers</b> <ul style="list-style-type: none"> <li>• Break away from the system, and redefine the problem;</li> <li>• View structure as limiting, confining;</li> <li>• May challenge authority, "bend" rules;</li> <li>• Emphasize originality and uniqueness—"ideas that stretch us;"</li> <li>• Press for extensive change and commitment to action;</li> <li>• Know newest trends and possibilities;</li> <li>• Ingenious and Unconventional;</li> <li>• Spontaneous and free-flowing;</li> <li>• Emphasize starting new tasks and the "big picture," often resist closure;</li> <li>• Produce ideas that others may not understand easily;</li> <li>• Individualistic, trust own judgment;</li> <li>• May emphasize generating.</li> </ul>

Table 3. Behavior Preferences for Manner of Processing

Behavior Preferences for Manner of Processing	
When processing options or possibilities...	
<p>A person who prefers to process externally...</p> <ul style="list-style-type: none"> <li>• Starts talking about options right away</li> <li>• Puts ideas out tentatively, ready to revise and reformulate along the way</li> <li>• Derives energy from interaction with others (finds reflection challenging)</li> <li>• Urges immediate action—“we can tune it up later if we need to”</li> <li>• Shares ideas freely with a broad range of other people</li> <li>• Seeks a great deal of input from others before reaching closure</li> <li>• May often seem to be “bubbling over” with energy, rushing into things; impatient if asked to think too long about things.</li> </ul>	<p>A person who prefers to process internally...</p> <ul style="list-style-type: none"> <li>• Wants time to think about options before discussing them</li> <li>• Shares ideas with others after time to polish them—“when they’re ready”</li> <li>• Draws energy from reflection and consideration (challenged by feeling pressured to talk about ideas quickly)</li> <li>• Seeks action after giving it careful consideration</li> <li>• Shares ideas with others after establishing trust and confidence</li> <li>• Builds ideas personally, then seeks feedback selectively.</li> <li>• Seems quiet, might be perceived as pensive or withdrawing; impatient if pressed to share too soon.</li> </ul>

Table 4. Behavior Preferences for Ways of Deciding

Behavior Preferences for Ways of Deciding	
When making decisions about options or possibilities...	
<p>Task preference involves giving one’s primary attention to:</p> <ul style="list-style-type: none"> <li>• What’s logical or rational</li> <li>• Criteria they consider objective, authoritative, and verifiable</li> <li>• What’s wrong with an option, what it lacks, or what it needs (which may not mean they really dislike it!)</li> <li>• Considerations of standards, rigor, or quality</li> <li>• “Letting the chips fall where they may...”</li> <li>• Seeking the best solution or response, and being able to defend or justify the choice or decision.</li> </ul>	<p>People preference involves giving one’s primary attention to:</p> <ul style="list-style-type: none"> <li>• What will promote harmony and positive interpersonal relationships</li> <li>• Criteria that are personal, sensitive to people’s feelings, more subjective</li> <li>• What’s good, attractive, or pleasing about an option (which may not mean they really like it!)</li> <li>• Considering the personal or interpersonal impact or consequences of a decision</li> <li>• Seeking a solution or decision that all concerned can buy into.</li> </ul>

Once scores for an individual have been obtained for each of the three dimensions of VIEW, it is possible to use them to combine the behavior descriptors found above and how they may interact for an individual. The behavior constellations for each of the eight combinations of the three VIEW dimensions are found in Tables 5 through 13. Table 5 shows the three-letter designation for each combination of dimensions. Tables 6 through 13 provide descriptions of the behaviors associated with each combination, based on the subjective observations, the understanding of the underlying theories involved, and the understanding of creativity and problem solving of the VIEW authors. These behaviors are considered preliminary by the authors, and as more empirical data is gathered, they intend to formulate more complete and accurate descriptions. It is important to remember that these designations are not to be used to label individuals. They are intended only as a convenient method to designate the VIEW style preferences for individuals and provide a convenient terminology for discussion (Selby, Treffinger, Isaksen, & Lauer, 2004b).

Table 5. VIEW Behavior Interactions

	Explorer		Developer	
	External	Internal	External	Internal
P e r s o n	EEP	EIP	DEP	DIP
T a s k	EET	EIT	DET	DIT

Table 6. Behavior Interactions for EEP

Behavior Interactions for EEP	
	• In groups, pushes for free, open exchange of ideas; enjoys piggybacking on other's ideas.
	• Leads discussion, draws others out.
	• Frames problems with concern for negative effects of the status quo on others.
	• Prefers solutions that change the status quo so others are better served.
	• Encourages others to "join the crusade" for action.

Table 7. Behavior Interactions for EIP

Behavior Interactions for EIP	
	• In groups, listens to and assimilates the exchange of new options.
	• Follows discussion, becomes involved to help others develop their ideas.
	• Frames problems with concern for negative effects of the status quo on others.
	• Prefers solutions that change the status quo so others are better served.
	• Following reflection, focuses on action, developing solutions that will be of benefit to others.

Table 8. Behavior Interactions for EET

Behavior Interactions for EET	
	• In groups, encourages others to open up and explore many possible directions.
	• Seeks to discuss the logic of ideas and new ways of perceiving the task
	• Frames problems in terms of wanting new viewpoints outside the given situation.
	• Prefers logical solutions and many new possibilities derived from the group.
	• Seeks to analyze ideas in ways that lead to new directions.

Table 9. Behavior Interactions for EIT

Behavior Interactions for EIT
<ul style="list-style-type: none"> <li>• In groups, works quietly to explore a variety of intriguing possibilities.</li> <li>• Monitors discussions and checks on logic; seeks new ways to view the task.</li> <li>• Frames problems in terms of the need to examine many viewpoints.</li> <li>• Prefers several novel solutions that can be tested against inner logic and experience.</li> <li>• Seeks to analyze options in ways that lead to new long-term directions.</li> </ul>

Table 10. Behavior Interactions for DEP

Behavior Interactions for DEP
<ul style="list-style-type: none"> <li>• In groups, cautions against risk, especially involving negative effects on others.</li> <li>• Facilitates discussion and exchanging ideas when process lags.</li> <li>• Frames problems in relation to effects on people.</li> <li>• Prefers solutions in which everyone is involved and people choose tasks from a given menu.</li> <li>• Seeks to build consensus on one workable course of action; doesn't dictate a solution.</li> </ul>

TABLE 11. Behavior Interactions for DIP

Behavior Interactions for DIP
<ul style="list-style-type: none"> <li>• Monitors discussions, offering several well-thought-out ideas when ready.</li> <li>• Frames problems in terms of improvements people need.</li> <li>• Prefers solutions that involve others after a careful process of reflection.</li> <li>• Willing to bring inner, personal resources to bear on the situation and solution.</li> <li>• In groups, cautions about risk, especially involving negative effects on others.</li> </ul>



Table 12. Behavior Interactions for DET

Behavior Interactions for DET	
	• In groups, encourages others to stay focused in order to find one best way.
	• Keeps group grounded and returns discussion to original question or theme.
	• Frames problems in terms of what specifically “went wrong”, looks for flaw that needs correcting.
	• Prefers solutions that address the task, are sequential, and group-based.
	• Seeks well-planned group decisions.

Table 13. Behavior Interactions for DIT

Behavior Interactions for DIT	
	• In groups, works quietly (often alone) in order to find one best way.
	• Offers suggestions that are well-developed and on task.
	• Frames problems in terms of personal knowledge and experience applied to the specifics of the situation.
	• Prefers solutions that grow logically from an analysis of the task or situation.
	• High level of persistence in working toward long term success.

Although the descriptions for each combination in the tables appear to represent fixed points, the authors believe that, in practice, individuals behave in a more fluid manner. For some individuals, these descriptions represent a “secure comfort zone” and are likely to behave very much like that description in many situations. However, many individuals may choose different behavior when a situation calls for it, causing them to stretch beyond their descriptors, inducing an increasing level of stress. As the authors of VIEW have cautioned, while it is easy to look only at the behaviors associated with the extremes of each dimension, it is important to remember that we all employ a variety of behaviors from both extremes,

at various times, to varying degrees, under a variety of circumstances. What is important to the study of creative style is the preferred mode of behavior of an individual for each dimension (Selby, Treffinger, Isaksen, Lauer, 2004c).

Kirton (2003) and Selby, et. al. (2004a; 2004c), agree that cognitive style, set early in life, is highly resistant to change. It is how one prefers to conduct oneself. Kirton (2003) points out however, that behavior is highly flexible. When circumstances driven by motivational or environmental influences intervene, behavior appearing to be inconsistent with an individual's preferred cognitive style will result. Kirton (2003) refers to this inconsistency as "cognitive gap." This "cognitive gap" between style and behavior is managed by what Kirton calls coping behavior. Coping behavior, a deliberate response to a particular problem-solving situation where the preferred problem solving style will not work, is a learned behavior. In general, the individual will return to his preferred style once the situation has been resolved. Stated differently, we can all be more adaptive or more innovative, more of a developer or an explorer, more of an internal processor or an external processor, or more people-oriented or task-oriented, if a situation requires us to do so. We simply prefer a given style. This concept of coping behavior is likely to account for a musician's ability to operate competently and effectively in several musical fields at one time, verifying Gardner's observation that individuals may engage in one or more of the creative behaviors he identifies. In the end, it is the preference for certain styles of creative behavior(s) as they may be present an individual's preference for a musical career, and that preference's foundation in cognitive style that is the focus of this

thesis. In order to understand those factors that influence these behaviors, we will now investigate the underlying psychometric factors of IQ and personality characteristics and how they influence cognitive style.

### IQ, Personality, Learning Style, and Creative Style

#### Intelligence

Kirton's theory makes a strong distinction between creative style and creativity level. But what of the cognitive and personality constructs associated with creativity presented earlier? How do they relate to either concept? These personality and cognitive constructs will now be examined in order to determine which are issues of creative style, and which are issues of creative level, beginning with IQ. As previously discussed, some researchers have found a significant correlation between creativity and IQ, with a threshold at 120, which may be dependent, in part, on the aspects of creativity and intelligence being measured, how they are measured, and the field in which the creativity is observed. These studies are now open to dispute. A growing number of studies question the threshold theory and the accepted relationship between creativity and intelligence. Child and Croucher (1977), finding an "irregularity of results", contend there is no support for a threshold effect. Other studies investigating this relationship have found mixed, "insignificant" or "negligible" relationships between IQ and creativity (Hocevar, 1980; Madaus, 1967; Sen & Hagtvet, 1993; Yong, 1994). Still other researchers have gone so far as to label the two as "independent" or "separate" dimensions (Hattie & Rogers, 1986;

Jacobs & Shin, 1975). McNemar (1964), maintains that while “general intelligence still has a rightful place in the science of psychology . . . it is not well understood”, and argues that the generally accepted relationships between IQ and creativity reported by researchers are based on the poor construct validity of most of the creativity measures used, as well as poor research techniques by the researchers themselves.

Similarly, Kirton, questions the threshold theory, cautioning that an IQ benchmark of 120 for creativity would limit any kind of creativity, adaptive, innovative, or otherwise, to only a small percentage of the population. A – I theory avoids this elitist attitude by expanding the definition of creativity to include those who are adaptive as well as the innovative. Several studies directly addressing the issue of IQ and cognitive style have found an insignificant relationship between the two (Kirton, 1978; Kirton & De Ciantis, 1986; Rastogi, 1987), indicating that IQ is a key factor of creativity level, not creativity style. Without a clear distinction between creative level and style built into creativity measurement instruments, it is impossible to know what correlations actually exist between creativity and an IQ either above or below the threshold. Based on these findings, IQ has minimal bearing on creative style and behavior, leaving issues of personality, as Kirton suggests, as the factors that determine cognitive style. Selby, et. al., (2004a, 2004c), basing VIEW on theoretical foundations of personality type and learning styles, are in agreement with Kirton’s assessment.

### Personality and the KAI

Goodenough (1985), in his discussion of the cognitive styles of field dependence/independence concludes, based on the work of Cox and Gall (cited in Goodenough, 1985), that these dimensions are related to personality. Witkin & Goodenough (as cited in Kirton 2003) elaborate, stating that "The differences, described in simplest terms, are that field-dependants tend to have a more social, interpersonal orientation to life," whereas "field-independents tend to be more abstract, impersonal, and self-reliant or inner directed." Goldstein and Blackman, and Messick et al., (as cited by Kirton & De Ciantis, 1986) maintain a similar position: "Cognitive styles are noted as tending towards stability across time and situations. Findings by Kagan & Kogan (as cited by Kirton & De Ciantis, 1986) indicate cognitive style "consequently remains largely unresponsive to specific training." This stability, also observed by Goldstein and Blackman, Messick et al., and McKenna (as cited by Kirton & De Ciantis, 1986), suggests style to be related to underlying personality traits.

In order to confirm this assertion, it was necessary to subject cognitive style, as measured by the KAI, to a good deal of research and study. Messick, et al. (1976) was the first to apply the term cognitive style to similar patterns of behavioral and personality characteristics. Goodenough (1985) identifies some of these behavior patterns, describing field dependant individuals as "gregarious, affiliation-orientated, socially outgoing, interested in people, knowing many people, known by many people." Witkin and Goodenough (cited in Kirton, 2003) use contrasting terms to

describe field-independent subjects: "Individualistic, preferring solitary activities, concerned with ideas and principles, aloof, and cold and distant in relationships with other people." In his original work, Kirton (1976), citing the nature, spread, presumed stability, and ease of measurement of these behavior patterns, found them to be associated personality traits. As such, he expected them to appear in studies of Adaption-Innovation as a cognitive style, and therefore related to each other. A number of studies support Kirton's assertion that the cognitive styles of adaption and innovation are closely related to specific personality traits. Several of these studies will be reviewed, beginning with the relationship between creativity and certain personality traits, followed by the relationships between creative style and personality traits.

As outlined earlier, a major avenue of creativity research has attempted to establish correlations between traditional measures of creativity (i.e., the Torrance Test of Creative Thinking and Guilford Divergent Production Test) and measures of personality (i.e., the Jackson Personality Inventory, the Five Factor Model (FFM), the Eysenck Personality Inventory, or the Meyers-Briggs Type Indicator, or the Cattell Sixteen Personality Factor Questionnaire). Barro (1972) found this to be an appropriate approach to creativity research. Her study determined that personality traits were better predictors of creative production than cognitive ability. Two studies in particular are useful in beginning the discussion of personality traits and creativity.

King, McKee - Walker, and Broyles (1996) conducted a study investigating the relationship between the personality traits (neuroticism, extraversion, openness to

experience, agreeableness and conscientiousness) of the five-factor model of personality (FFM), creative ability as measured by the verbal component of the Torrance Test of Creative Thinking (TTCT), and creative accomplishment as reported by the subjects. This study found the FFM personality traits of openness to experience and extraversion to be positively and significantly correlated to both creative ability and creative accomplishment. However, individuals possessing high levels of creative ability were found to have few creative accomplishments if they scored low in openness to experience. Furthermore, creative ability is positively correlated to creative accomplishment at both medium and high levels of openness to experience. Furnham (1999) confirmed openness to experience as a major personality component in predicting creativity. In addition, King, McKee - Walker, and Broyles found that individuals measuring low in creative talent reported an increased number of creative accomplishments when conscientiousness scores were high. These results led these researchers to conclude that openness to experience and conscientiousness interact with creative ability to predict creative accomplishment, but are independent of creative accomplishment, and that creative accomplishment is attainable by individuals possessing both high and low levels of creative ability, depending on the personality traits used to attain the creative product. These findings are consistent with A-I theory.

Gelade (2002) also conducted an investigation using the FFM, exploring the possible relationships between the FFM and the KAI. Results indicated that the personality factors of openness to experience and extraversion had a strong positive

correlation with total KAI scores (indicating innovation). Conversely, the personality factor of conscientiousness had a strong negative correlation with KAI (indicating adaption), indicating that innovators are more open to experience, more extroverted, and less conscientious than adaptors. The personality factors of agreeableness and neuroticism were not significantly related to either of the cognitive styles. High scores on the personality measures of extraversion and openness to experience were found to be the strongest predictors of creative style for innovators. The opposite was found for adaptors. The opposite relationship was found for conscientiousness. These findings confirm the bipolar nature of cognitive style.

Kirton and De Ciantis (1986), investigating the underlying personality characteristics of adaptors and innovators, found significant correlations between the five bipolar personality traits from Cattell's Sixteen Personality Questionnaire (16 PF) and the KAI. Each bipolar trait of the 16PF ranges from adaptive at one end to innovative at the other. They include humble/assertive (dominance), conservative/experimenting (openness to change), controlled/undisciplined (perfectionism), conscientious/expedient (rule consciousness), and subduedness/independent, (a higher order factor consisting of the personality factors of dominance, abstractedness, open to change, self reliance, warmth and rule consciousness). The personality characteristics in parenthesis are Kirton's name for the personality trait represented by each bipolar pair. Table 3 illustrates the personality traits associated with adaption and those associated with innovation.



Kirton concludes that these factors illustrate the underlying personality structure that forms the basis for A-I theory.

Table 14. Cattell Personality Traits Associated with Adaption and Innovation

Adaption	Innovation
Humble	Assertive
Conservative	Experimenting
Controlled	Undisciplined
Conscientious	Expedient
Subdued	Independent

Three studies were conducted exploring the relationship between the KAI and the Meyers-Briggs Type Indicator (MBTI). The MBTI is composed of 4 bipolar scales: sensing – intuition (S – N), extraversion – introversion (E – I), thinking – feeling (T – F) and judging – perceiving (J – P). Both Carne and Kirton's (1982) and Jacobson's (1993) studies found strong, significant, positive correlations between KAI scores and the perceiving, and intuition factors. In addition, a weaker, positive correlation between extroversion, total KAI score, and the originality subscale of the KAI was also found. Jacobson also found a positive correlation between feeling, total KAI, and the originality subscale, but speculated that this may be related to gender differences in the sample of subjects used. Gryskiewicz and Tullar (1995) confirmed the findings of both studies. Cumulative results from these studies indicate that innovators are intuitive, perceivers, and to some degree extroverted, and that adaptors are sensing, and judging, and to some degree introverts. The thinking – feeling scale

had no significant correlation with KAI scores in either the Carne and Kirton or the Gyskiewicz and Tullar studies.

While many personality factors have been identified to be correlated with creativity by various personality instruments, risk taking is commonly found to have one of the highest correlations with creativity (Pankove & Kogan, 1968; Eisenman, 1969; Joesting & Joesting, 1973) and may be one of the most important personality traits related to A – I theory. Glover and Sautter (1977) found that individuals with a preference for risk taking (as determined by the Kogan and Wallach Choice Dilemma Questionnaire) scored significantly higher on the flexibility and originality measures of the TTCT than those individuals preferring lower levels of risk taking. Low risk-takers scored significantly higher on elaboration than high risk-takers. There was no significant difference found between high or low risk-taking individuals for the fluency measure. They conclude that risk-taking is a function of some aspects of creative ability, but the number of subjects used in this study did not allow general conclusions to be drawn.

Goldsmith (1984) was the first to investigate relationships between the KAI and a number of personality traits, including sensation seeking, risk taking, dogmatism, and innovation (measured by the Jackson Innovation Subscale). Significant positive relationships were found between KAI scores and the personality traits of sensation seeking, risk-taking, and (Jackson's) innovation, confirming that Kirton's innovators are risk takers and have greater preference for novel stimuli compared to adaptors. A weak negative but significant relationship was found

between dogmatism, total KAI score, and the conformity and efficiency subscales of the KAI, indicating that the adaptive trait of dogmatism plays only a minor role in problem solving strategies. A strong significant correlation between the JIS and the originality subscale of the KAI was also confirmed.

In a follow up study, Goldsmith (1986) again explored the relationships between the KAI, risk taking, sensation seeking, various personality traits and creativity, confirming results from his previous study: Innovators were identified as risk takers while adaptors were unlikely to take risks. This study also found that both innovators and adaptors scored similarly on the creativity measure (although correlations with the KAI were insignificant) suggesting that risk taking may be a component of creative style rather than creative level (correlational analysis between KAI, creativity and risk taking was not performed in this study). In addition, a relationship between the MBTI sensing – intuitive (S – N) scale and total KAI score was found, confirming other MBTI findings that individuals identified as an “intuitive” type were likely to be innovators, while those identified as “sensing” types are likely to be adaptors. Gryskiewicz is of the opinion that this indicates a close relationship existing between the way an individual perceives the world and way that individual will approach problem solving. Goldsmith concludes that adaptors and innovators should have available, and make use of, relatively equal numbers of constructs in their cognitive strategies for evaluation, judgment, and problem solving.

Kirton interprets Goldsmith's findings to indicate that risk-taking is not a measure of creativity in and of itself, and that it will load on a style factor rather than a level factor since this trait is a personality component associated with creativity. Based on the above findings, we see that innovation relates strongly to a number of personality traits, including the following: Risk taking/sensation seeking, openness to experience, extraversion, assertiveness, experimenting, undisciplined, independence, flexibility and expediency. Adaption, on the other hand, is related to the following personality traits: Judging, sensing, introversion, conscientiousness, humility, conservative, conforming, self-control, subdued, dogmatism. The personality trait that seems to have the greatest influence on whether an individual prefers an adaptive or innovative creative style is the trait of risk-taking/sensation seeking, due to the very strong and significant correlations with the traits associated with innovation, and creativity in general as quoted above.

#### VIEW, Personality, and Learning Style

Selby, Treffinger, Isaksen, and Lauer (2004a, 2004c) have conducted a number of correlational studies between VIEW and the psychometric instruments representing the theories and models upon which it is based. The measures used in these studies include the Productivity Environmental Preference Survey (PEPS) published by Dunn, Dunn and Price, to measure preferences for work environment, the KAI, the Dunn and Dunn Learning Style Inventory (LSI) also published by Dunn, Dunn, & Price, and the Meyers Briggs Type Indicator (MBTI). To date, these are the

only studies available for this instrument, due largely to the relatively short time it has been in existence.

The Meyers Briggs Type Inventory and VIEW. The last correlational study conducted in this series examines correlations between scores on the three VIEW dimensions and the various psychological types of the Meyers-Briggs Type Indicator. These results also reached statistical significance in the expected directions. The Orientation to Change dimension of VIEW had the strongest correlations with the MBTI dimensions of Sensing/Intuition of .67 ( $p < .01$ ) and .61 ( $p < .01$ ) with Judging/Perceiving and was found to have lower correlations with the Thinking/Feeling (.44) and Extraversion/Introversion (-.27) dimensions. Those with a Developer style on the OC scale showed a preference for the Sensing and Judging types (emphasizing attention to details, an organized, well-structured approach, and completing tasks in a thorough and orderly manner). The Manner of Processing (P) dimension correlated .59 ( $p < .01$ ) with the Extroversion/Introversion scale in the expected direction, indicating that those with a preference for External processing are likely to exhibit behavior associated with the Extraversion Type, while those preferring an Internal processing style indicated a preference for behaviors associated with the Introversion Type. Correlations of the Manner of Processing dimension were minimal and insignificant for the remaining Meyers-Briggs Scales (-.17 with S/N, -.15 with J/P, and .02 with T/F). The Ways of Deciding (D) dimension of VIEW correlated .49 ( $p < .05$ ) with the Thinking/Feeling scale, also in the expected direction. This correlation suggests that task oriented individuals will tend to be a

Thinking Type while those with a Person orientation will tend towards a Feeling Type. The Ways of Deciding scale was minimally and insignificantly correlated with the remaining Meyers-Briggs Type Scales (.24 with Sensing Intuition, .20 with Judging/Perceiving, and only .11 with Extraversion/Introversion) (Selby, Treffinger, Isaksen, & Lauer, 2004c).

The Productivity Environmental Preference Survey and VIEW. Two separate correlational studies involving a total of 219 subjects were conducted, yielding what Selby et. al. report as “several significant correlations in the expected direction” establishing the following conclusions for each dimension of VIEW. For the Orientation to Change dimension, correlations indicate that Explorers tend to prefer Informal Design, Sound, and little or no imposed Structure. Developers on the other hand scored higher on motivation and persistence than Explorers, preferring Quiet, Formal Design, and Structure. Correlations for the Manner of Processing dimension indicated that those with an External processing style preferred Mobility, working with Peers and working in the presence of Authority figures. Conversely, subjects with an Internal processing style, while preferring to work Alone, had no preference for Mobility (Selby, Treffinger, Isaksen, & Lauer, 2004c).

The Dunn and Dunn Learning Style Inventory and VIEW. Correlational studies conducted with 18 high school students using VIEW and the Dunn and Dunn LSI also yielded significant correlations ( $p < .05$  or better) in expected directions. In this study Developers were found to prefer Quiet and Structure, possessed high persistence and motivation, and were motivated by Authority figures. Explorers on

the other hand, had a preference for Sound, low External Structure, and were not motivated by Authority figures. Subjects with a preference for an Internal processing style preferred Quiet, learning alone, learning in a set manner, and visual learning; while those with an External style of processing preferred learning with peers, the presence of an authority figure, and learning in several ways, with sound in the background. In relation to the Ways of Deciding dimension, those with a Task-oriented preference were found to have significantly higher preferences for persistence, mobility, and bright or direct light when studying than students with a Person-oriented preference (Selby, Treffinger, Isaksen, & Lauer, 2004c).

### VIEW and the KAI

A pair of studies established significant correlations between VIEW and the KAI as well. These studies showed strong significant correlations of .89 ( $p < .05$ ) and .73 ( $p < .01$ ) between the Orientation to Change dimension and the total KAI score. This finding indicates that, in some respects, Kirton's Adaptors are similar to VIEW's Developers, while his Innovators are similar to VIEW's Explorers. As expected, the correlations between the KAI and the Ways of Deciding and Manner of Processing dimensions, -.14 and .24 respectively, did not reach statistical significance, indicating that these two scales, as designed by the authors, measure different constructs than the KAI (Selby, Treffinger, Isaksen, & Lauer, 2004c).

## Job Selection and Creative Style

### Job Environment and Cognitive Style

So far, several facets of creativity, problem solving style, and the personality traits and behaviors associated with them have been discussed. Earlier in this paper I speculated that there may be a connection between a given creativity style and a musician's preference for a musical career, based on the observed differences in the way creativity is exhibited by musicians practicing in different fields of music. A – I theory provides us with some insight into this possible connection. How these constructs affect an individual's decisions regarding field of study and career choice will now be discussed.

A-I theory (Kirton, 2003) proposes that those exhibiting a given problem solving or creativity style will gather in, or seek out work environments the individual perceives likely to contain problem clusters best suited to that preference. Furthermore, Witkin (cited in Messick, 1976) states, "the roots of educational and vocational preferences lie in cognitive style and personality". By extension then, creative/problem-solving style will guide an individual's choice or preference for a vocation as well as educational and occupational or work environments. As such, according to Kirton, these environments are identifiable as either primarily adaptive or primarily innovative in terms of the type of creativity or problem solving required to perform adequately within that environment. Regardless of the cognitive style, individuals will perform best within their preferred environment as long as that environment remains stable. In this case, the number of problem types occurring



simultaneously within a given environment will determine the perceived stability of the environment. In situations where a large number of problem types occur within the environment, the individual will be likely to use coping behavior excessively. When this occurs, the individual's performance is likely to suffer (Kirton, 2003; p 171).

### Job Environment and Job Satisfaction

The terms organizational, occupational or work environment have been used, sometimes interchangeably, several times in this discussion. It would be beneficial to briefly discuss what organizational environment or climate is, how it relates to cognitive style, and its impact on an individual's choice to seek, or remain in a given occupation or job. There are several theories that predict a relationship between characteristics of the job environment, the individual, job performance and job satisfaction, based on the reality that any production system requires a triangle composed of the individual worker, a technology, and a work-relationship structure. For the purposes of this discussion, technology may be defined as "the actions that an individual (or organization) performs on an object, with or without the aid of tools or mechanical devices, in order to make some change in that object (Perrow, 1967). The object or "raw material" may be a living being, human or otherwise, a symbol, or an inanimate object." A distinction must also be made between psycho-technical and socio-technical aspects as many production technologies specify a work-relationship

structure based on the individual worker, not on the social group alone (Cooper & Foster, 1971).

The main purpose of these theories is to predict the link between job dimensions and the psychological nature of the workers, as well as the outcomes of the interactions between them, focusing on the relationship between individuals and their work to improve employee motivation and productivity. Attributes involving the individual must be evaluated within the organizational contexts in which they are placed in order for optimal results to occur (Roberts & Glick, 1981). These theories assume that proper job design will motivate the individual to assume responsibility to achieve outcomes, resulting in growth and improved performance, and that he will experience meaningfulness in the performance of the job (Hackman & Oldham, 1975, 1976).

A group of studies offer mixed support for these relationships, but all conclude that there are important interdependencies between characteristics of individuals and characteristics of jobs. Significant, positive relationships were found between organizational climate factors and employee behavior, attitudes, satisfaction, and performance. Organizational or Occupational climate seems to be influenced by factors directly affecting a person's daily work experiences and is strongly related to individuals' feelings about the quality of their work experiences, including process variables such as personal autonomy (the ability of the individual to make decisions regarding how one's job is organized, when it is performed, and how goals are achieved) and tying performance reviews directly to compensation programs

(Hackman & Lawler, 1971; Lawler & Oldham, 1974). Hackman and Lawler (1971) caution that it is critical to achieve a match between the psychological makeup of the prospective employee and the psychological demands of the job. Their results suggest that the substantial motivational potential of jobs can be realized only when the psychological demands and opportunities of jobs mesh well with the personal needs and goals of employees who work on them. However, Schneider and Snyder (1975) found that organizational climate and satisfaction data are not necessarily equivalent. For managers and clerical workers in this study, a strong positive correlation was found to exist between climate perceptions and feelings of satisfaction. However, this positive relationship between climate and satisfaction did not exist for manager trainees, indicating that, for those individuals, satisfaction may have been tied to other elements of the organization not measured in the study (e.g., reward orientation of the agency).

Findings such as these highlight the need and importance of extending the definitions of the working environment and descriptions of the individual to include cognitive or problem solving style, and have created interest in the possible relationships between the cognitive style of employees and organizational environments in which they are employed (Goodenough, 1985). The importance of matching creative style and organizational environment is emphasized by Holland (1987), stating that organizations, or departments within organizations, will display a tendency towards either adaption or innovation based on the functions they perform. Holland advises that the demands of the tasks undertaken by an organization will

require the employment of certain cognitive behavioral types and if employees are appropriately selected the mean KAI scores of these personnel will reflect the organization's climate/environment or "ethos" of adaptiveness or innovativeness.

As such, further investigation into the compatibility between problem solving style and job characteristics produced by technology and other aspects of the occupational environment where work processes are performed have become a concern for theorists and researchers alike. McNeilly and Goldsmith (1992) found that differences between adaptors and innovators on job satisfaction appeared related, at least on some variables, to a number of environmental conditions, including the cognitive style of the managers and what the manager does to the working environment. Additional data collected by Gryskiewicz et al. (1995) is not only in agreement with these findings, but also leads to the conclusion that an individual performing a job that is compatible with one's creativity style will experience high satisfaction regardless of the creative style of the individual.

A related issue of interest to those practicing music and the arts are those relationships concerning interactions between creativity, the creative person, and work environment. Studies investigating these relationships lend further support to the preceding argument. One study of creativity and person-environment fit found environment, organizational supplies for creative opportunity, and the employee's demand or need for creative opportunity, to have a disproportionately large effect on performance, strain, satisfaction, and commitment for workers (Livingstone, Nelson & Barr, 1997). The environmental influence of supply for creativity (opportunity) had

the greatest impact on strain, job satisfaction, performance and commitment for the employee. Strain was most evident in environments where an individual had a need or ability to be creative, but the opportunity for creative production was lacking due to the organizational structure or needs. Commitment of the employee was found to be highest when the organization's need for (or ability to supply) creativity and the creative ability of the employee were both high (matched). When opportunities for creativity were supplied to employees that needed them, greater commitment to the job resulted.

Puccio, Talbot and Joniak (2000), found strong evidence for an interaction effect between creative style and environment. Results indicated that a style match between the cognitive style of the individual and the occupational environment was associated with higher levels of product novelty (the generation of new, original, transformational or germinal ideas for products) and product resolution (the extent to which a product meets its intended purpose). Subjects in this study who indicated they were not employed in their "ideal job" said they were less efficient in their current job than they were required, or wanted to be. They also felt that they would be more efficient if they were employed in their ideal positions. In addition, they concluded that adaptors are better prepared to fit into organizational life, whereas innovators may have to engage in greater coping skills to fit into an organization. Furthermore, some dimensions of creativity may be more relevant for innovators than for adaptors, and vice versa. Therefore, the personal cost is higher for individuals working in an environment demanding behavior styles alien to one's natural

psychological preferences. This finding would at least be a contributing factor in an individual's choice or decision to avoid or leave such occupational environments based on the perception of these incompatibilities.

Kirton (2003) agrees, emphasizing that the adaptive or innovative environment associated with a given occupation will attract, and retain, persons possessing the appropriate cognitive style for that job. Individuals choosing jobs that are not compatible with their cognitive style can be expected to leave such jobs, seeking environments that are more compatible with that their cognitive style. Based on Adaption-Innovation theory and Kirton's assertions, it is expected that individuals employed in occupational environments where problems must be solved within a well-defined system, and where risk levels are low, and safety levels high, will tend to be more adaptive. Conversely, it can be expected that individuals employed in high risk occupational environments composed of multiple systems requiring the individual to work, co-ordinate, communicate, and solve problems inter- as well as intra-systemically, will tend to be innovative.

#### Occupations: Either Adaptive or Innovative

Recent research provides additional support for these findings and Kirton's assertions. Gelade (2002) explored possible correlations between the FFM, the KAI and various occupation "types", including scientist, creative scientist, non-scientists, artist, and the general population. Gelade concluded that the personality of the Innovator seemed remarkably like that of the artist as opposed to the scientist,

however, he does not define who his artist is, nor the art in which he engages. He found additional similarities between the innovator's personality and that of the creative scientist, except that the innovator had lower scores on conscientiousness. These findings suggest a link between not only personality and cognitive style, but also between cognitive style and professional endeavor. An earlier group of studies corroborate this link for a variety of professions. These studies identify occupational groups such as bankers, accountants and production workers who are required to work within a well-defined framework and largely static rules as generally adaptive (Kirton 1980; Thompson, 1980; Hayward & Everett, 1983; Holland, 1987). Conversely, individuals working in areas such as research and development, marketing, and planning, where the work often involves change and new initiatives, are identified as generally innovative (Keller & Holland, 1978; Kirton, 1980; Lowe & Taylor, 1986; Thompson, 1980).

While the intent of these studies was to explore the various aspects of Adaption – Innovation theory within a variety of occupational groups, one of the resulting benefits has been the collection of data linking these occupations to specific creative styles. Kirton has compiled data associating occupation and mean KAI scores from the studies mentioned above, along with a number of additional studies. This data demonstrates that mean KAI scores for cognitive style differ for various professions. Kirton's theory specifies that KAI scores greater than the mean of 96 are, by definition, labeled "innovative" and scores label less than the mean "adaptive". Examples of these scores and their related profession selected from

Kirton's compilation are as follows: Bankers (91.3) Clerical staff (89.2), maintenance and production workers (91.7), managers (99.3), entrepreneurs (113.6), research and development engineers (102.2), and teachers (101.4). Based on the above definition, any given profession can be labeled as either adaptive or innovative based on the mean KAI score of individuals employed in that profession. Based on these scores then, bankers would be considered "adaptive", whereas teachers would be considered "innovative" in agreement with the studies cited above.

Furthermore, Kirton reports a range of KAI scores within occupational groups as well. Such a spread of scores would tend to indicate that, among other possibilities, individuals within a group will display varying degrees of adaptiveness or innovativeness, and will seek jobs within a profession more suited to their cognitive style. Citing the differences found by Nagle (as cited in Goodenough, 1985) in cognitive style between clinical psychologists and experimental psychology as an example, Goodenough expects to find a range of cognitive styles within professional groups, relating cognitive style to what he terms "specialty choices" within a profession.

At least one study supports this position. Goodenough et al. (as cited in Goodenough, 1985) performed a longitudinal study following subjects, in this case medical students, from professional school to professional practice. This study attempted to predict the specialties subjects would choose based on the cognitive style of the subject. Ten years after graduation, field-dependant (perhaps more adaptive)



students were more often found to be certified psychiatrists, while field-independent (perhaps more innovative) students were more often found to be certified surgeon.

### Cognitive Style and Career Selection/Career Interest

Educators and others have long been aware of the concept of individual differences and its importance to students in terms of both teaching and learning. As recognized by Selby, et. al. (2004c), individual differences brought about by variations in psychological type, will influence not only learning style, but also creative, cognitive and problem solving styles. These beliefs are in agreement with Messick (1976), stating “these differences include systemic variations in ability, motivation, cognitive style, and mode of creative expression of individuals, and have important consequences for the ways in which they learn and perform.” As cognitive styles crystallize in development, they influence our “preferences for most aspects of our lives, including our choice or preference of major field, our modes of functioning, whether interpersonal or impersonal, as well as our modes of learning and instruction”. Witkin (as cited by Messick, 1976) concurs: “The roots of educational and vocational preferences lie in cognitive style and personality. Cognitive styles thus influence the choice not only of program content but also of program process, whenever options as to orientation or method are available. Cognitive styles are also likely to influence the amount and type of information the student seeks in informing his judgment and the manner and degree to which he uses that information.

Goodenough (1985) suggests however that much more work must be done to validate potential applications of cognitive style dimensions to problems of vocational guidance. Without adequate research we can only make predictions concerning the compatibility of occupations and the individual based on combinations of cognitive and personality characteristics. Up to this time, most vocational guidance has been limited to instruments based on the vocational interests of the individual, such as the Strong Interest Inventory (SII). Some recent research has investigated the relationship between vocational interests, FFM personality factors and personal styles as measured by the Strong Interest inventory (see Donnay & Borgen, 1996). The SII is an occupational counseling tool used to accurately predict occupational choice by matching personal styles and vocational interests. Lindley and Borgen (2000) found strong correlations between the personality factors associated with adaption and innovation and the Personal Style Scales of the Strong Inventory. Openness and Extraversion (both previously related to Innovation) positively correlate with Risk Taking/Adventure (the preference to take chances, act spontaneously versus acting safely), Leadership style (preference to lead by directing and persuading versus leading by example) and Learning Environment (preference for academic learning versus hands on learning). Work style (working with people versus ideas, data and things) had moderate correlations with Agreeableness and Extraversion (both previously associated with Adaption). The personality factors of Conscientiousness (Adaption) and Neuroticism had insignificant and sometimes negative correlations to the Personal Style scales.

Some informal deductions can be drawn based on these findings and previously stated correlations between Adaption –Innovation theory and FFM personality factors. Innovators are likely to prefer careers where the organizational environment includes the ability to take risks, lead by directing and persuading, work with ideas, data, and things and employ an academic or intellectual learning style. Adaptors, on the other hand are likely to prefer a career where they can work with people, lead by example, act safely, and employ practical hands on learning.

These conclusions are in agreement with Goodenough's conjecture that field-dependent people appear to have a more interpersonal orientation and less visualization ability, and would therefore be expected to be found in occupations dealing more with people such as sales, and social work. In contrast, field-dependent people would be expected to favor occupations such as architecture and engineering, which are more impersonal and visual.

A study by Witkin (as cited by Goodenough, 1985) provides some support for the confirmation of these hypotheses. In this study, the chosen academic majors of a group of college freshmen, identified as either field dependent or field independent, were tracked throughout their college careers. At the conclusion of this study it was found that many students changed majors at some point in their college careers to a major better suited to their cognitive style. In addition, this study also found field-dependent students more likely to graduate with degrees in more people oriented majors such as nursing and education, while field-independent students tended to graduate in more abstract majors such as physics and math. Witkin concluded that an

initial “casual” interest in a given vocational discipline will quickly dissipate once a student identifies an internal incompatibility with it, and will be replaced by a discipline that provides a better personality/cognitive style fit for the student. This same process can be expected to play out in the job world as well.

Nonetheless, Selby et. al., (2004c) caution against using measures of problem solving style as a vocational guidance tool. They prefer to see these measures used to inform students of their strengths in problem solving, what other styles exist, and how to effectively use them in various problem-solving situations. Such instruments provide specific data allowing individuals to formulate their own creative strengths profiles, thus “guiding the effective selection and use of tools, techniques, or strategies for problem solving by using style preference information appropriately”. It follows then, that awareness of personal style preferences will better arm students to make intelligent, informed decisions regarding choice of vocational discipline and the educational and occupational environments they will choose.

### Summary

In summary, the body of theory and research presented indicates that there are two facets to creativity: creative level and style. While creative level may be controlled by a variety of factors that include intelligence level and type, innate skills, abilities, etc., creative style is controlled by factors such as personality and psychological type that directly influence the manner in which creativity is exhibited. This expression or style of creativity includes how decisions are made regarding types

and approaches to problems and the solutions chosen to solve problems, the way we approach and respond to change, and how we process pertinent information during problem solving. Because problems are encountered in every occupation, and occupations seem to be related to specific problem types, these preferences or styles are likely to play a major role in the type of career an individual chooses and the educational and occupational environments or climates in which the individual prepares for and practices that career. Furthermore, there is some evidence that problem solving and creative style plays a role in the selection of a specialty within a given field.

### Statement of Hypothesis

It should follow that these environmental considerations and the kinds of problems to be solved while performing a job would be of equal importance to the musician. To paraphrase Kirton, in order to engage in the art of Music, we must make decisions as to what medium we want to use, what style, to what effect, and upon whom (Kirton, 2003, p. 35). It seems likely then, based on supporting research and the stated line of reasoning that musicians, within the broad field of music, will tend to choose a musical profession within that field that is compatible with their creative/problem-solving style. Decisions guided by cognitive and personality factors and the preferences for a given style of creativity, made either consciously or subconsciously, will influence or guide a musician's choice or preference of both a music major and subsequent musical career.

This study will explore the validity of these assertions, specifically those relating to cognitive style and choice of major within a general field of study. Therefore, based on the strong relationships previously cited between cognitive style, climate/environment fit and job choice, stated as the null hypothesis, it is hypothesized:

There will be no significant differences between the mean VIEW scores of students majoring in music therapy, music education, performance (applied music), jazz performance (jazz studies).

## CHAPTER III

## METHOD

## Participants

This study was conducted among 74 Western Michigan University music students at the junior, senior and graduate levels of study. Subjects were selected from four “majors” or areas of concentration offered by the University’s School of Music; music education (instrumental), music therapy, applied music or music performance (instrumental), and jazz studies (instrumental). A breakdown of subjects by gender and education level is found in Table 15. For the purposes of this study participants were limited to instrumentalists in an attempt to eliminate or minimize the effects of any style differences, real or perceived, between choral and instrumental musicians in any given group (i.e., music education, applied music, etc.).

Table 15. Gender and Education Level of Subjects in Study

	Male	Female	No Gender Indicated	Junior	Senior	Graduate	No Level Indicated
Music Education	13	13		4	15	5	2
Music Therapy	1	17	2	8	3	8	1
Instrumental Performance	10	6	1	9	4	3	1
Jazz Performance	8	3		4	5	1	1
Total	32	39	3	25	27	17	5

## Measures

Participants were asked to fill out two questionnaires; Personal Information and Music Major preference Form and *VIEW: An Assessment of Problem Solving Style*. The Information and Preference form (see Appendix A) includes demographic information (i.e., gender, age, and year of study), as well as declared music major, and preferred musical activity. While the choices for major and activity were identical, the distinction between a declared major and a preferred activity was provided for students who may be obtaining their education in an area of study other than the area of their strongest preference. For instance, a music education major may actually prefer to be a performance major, however due to some circumstance decided not to pursue that as a major.

*VIEW: An Assessment of Problem Solving Style* is a 34-item instrument designed to determine the problem solving style of an individual over three distinct dimensions (as previously discussed). The instrument incorporates eighteen items for the Orientation to Change (OC) scale, eight items for the Manner of Processing (P) scale, and eight items for the Ways of Deciding (D) scale. Each item is designed using an enhanced version of the semantic differential assessment technique. Respondents are asked to mark one of seven points between two bipolar statements for each item. Choices for each bi-polar pair are written as a positive expression of a well-established preference while problem solving. Choices are balanced in terms of social desirability as well, thus reducing respondent's motivation to provide responses perceived to be more (or less) socially acceptable or desirable. The instructions for



VIEW emphasize that responses should reflect the individual's preference for a given item, not what they think is the way they are expected to act, and that there are no right or wrong answers for any item.

The researcher (administrator of the measure) is responsible for scoring each VIEW assessment form and then provide feedback to each subject via the "VIEW Individual Report Form" (see Appendix B). This form provides each respondent with their scores for each VIEW dimension, along with an explanation of each dimension and how the individual's score may be interpreted. Subjects in this study were able to obtain their personal results from the School of Music Office using a claim ticket they received when the View Instrument was filled out.

As previously discussed, each of the three dimensions of VIEW represent a continuum of style preferences, anchored by two clear, but seemingly opposite, styles. A respondent's "location" along each continuum has implications for how a person prefers to define, solve, and carry out solutions for problems and to deal with change. Located in the center of the continuum is an area of "Moderate" preferences. When a person's preferred style on any dimension falls at or very near either pole of the continuum, the style is referred to as "clearly defined" or "strongly differentiated". As scores move toward the center of the continuum, the preference is less defined or differentiated, and is thus referred to as a "moderate" preference. The authors of VIEW define a moderate preference to be a score that is the median or mean score plus or minus one standard deviation for any dimension of VIEW.

Moderate scores suggest that there may be no preference for the individual, or that the style for the individual may be neutral and therefore have little or no effect on problem solving or change management effectiveness. It may also suggest a balanced preference, where the individual responses are more or less evenly split between the elements of each of the style options, or a situation exists in which the style preference is generally descriptive but not strongly or sharply differentiated.

Individuals with a moderate preference may find it easier to understand the outlook and preferences of individuals with clearly defined preferences at either end of the dimension. While an individual with a moderate score is well equipped to play a "bridging" role, it is not always the case that this will happen.

As scores for a given dimension move farther from the mean individuals will begin to experience a style as an essential element of his or her problem solving manner or change management outlook, rather than an option. An individual whose score approaches two standard deviations above or below the mean on a dimension can be said to possess a style that is very clearly defined and sharply differentiated from the style at the opposite end of that dimension. It will be very challenging for individuals with these kinds of scores to understand the opposite style with empathy.

### Procedure

Participants were recruited from a variety of classes offered at the School of Music, including methods classes in the various areas of concentration and performance ensemble rehearsals during the Spring and Fall Semesters. As required

by the University, HSIRB approval (see Appendix D) was obtained before proceeding with the study, and all procedures specified by the HSIRB approved protocol (see Appendix E)) were followed, including the use of approved recruitment scripts and instructions that were read to prospective volunteers. Once volunteers chose to continue with the study, they were read the required informed consent information (see Appendix F) and the instructions for completing the VIEW instrument (see Appendix C). Once the instructions were read, and subjects indicated they understood them, they were allowed to fill out VIEW and return it to the container supplied by the test administrator. Instructions in these scripts included the assurance that participation in the study was strictly voluntary, assurance of the anonymity of the subject, a brief description of problem solving style, and instructions for filling out both questionnaires. Once subjects volunteered, they were read. Efforts were made to achieve a balanced number of subjects in each group, however, scheduling and availability difficulties made this impossible. Where the balance could not be maintained, a minimal number of subjects necessary for accurate statistical analysis were obtained for each group. Mean scores were compiled for each group on each dimension using both the music major and preferred music career categories.

## CHAPTER IV

### RESULTS

*View: An Assessment of Problem Solving Style* was administered to subjects pursuing one of four music majors to gather information describing their problem solving styles as defined by VIEW. VIEW is a 34-item instrument (see appendix C) designed to assess the preferences and dispositions of individuals for change management and problem solving along three independent dimensions: Orientation to change (OC), Manner of Processing (MP) and Ways of Deciding (WD). Descriptive data for each VIEW dimension and each music major group follows.

*Orientation to Change.* This scale describes dispositions and preferences for responding to and managing structure, novelty, and authority during creative problem solving. Two general styles make up this dimension: The Explorer, who prefers to do things differently, and the Developer, who prefers to make things better. Scores for this 18-item scale range from 18 (explorer) to 126 (developer), with a hypothetical mean of 72. In this investigation, mean scores for this dimension range from 70.5 for instrumental performance majors to 80.5 for music therapy majors. Descriptive statistics for each music major group are found in Table 16. Mean scores for this dimension range from 70.5 for the instrumental performance group to 80.5 for the music therapy group.

*Manner of Processing.* This dimension describes individuals' dispositions and preferences for the manner in which they use their personal energy and resources,

Table 16. Descriptive Statistics for Music Major Groups: Orientation to Change

**Orientation to Change**

Music Major Group	N	Mean	Std. Deviation	Std. Error	Minimum	Maximum
Music Education	26	77.1	24.7	4.84	32.00	126.00
Music Therapy	20	80.5	14.2	3.19	51.00	107.00
Instrumental Performance	17	70.5	14.8	3.59	38.00	102.00
Jazz Performance	11	72.5	20.0	6.03	27.00	95.00
Total Music Sample	74	75.8	19.5	2.26	27.00	126.00
Total VIEW Sample	10,151	74.6	15.8	5.68	18.00	126.00

the energy and resources of others, as well as the stage of the problem solving process at which they choose to interact with others and the environment. It also describes the different ways individuals handle information during these processes. This dimension is composed of two styles, an external style, where the individual prefers to work with other people throughout the problem solving process, or an internal style, where the individual prefers to think and work alone before sharing ideas with others. Scores for this 8-item scale range from 8 (external) to 56 (internal), with a theoretical mean of 32. Descriptive statistics for music major groups for this dimension are shown in Table 17. Mean scores for this dimension range from 31.2 for music therapy majors to 35.8 for jazz performance majors. The mean score for the entire music sample is 33.9 compared to 30.1 for the entire VIEW sample.

Table 17. Descriptive Statistics for Music Major Groups: Manner of Processing

**Manner of Processing**

Music Major Group	N	Mean	Std. Deviation	Std. Error	Minimum	Maximum
Music Education	26	34.8	7.7	1.52	22.00	51.00
Music Therapy	20	31.2	9.3	2.09	8.00	46.00
Instrumental Performance	17	34.3	10.5	2.56	21.00	56.00
Jazz Performance	11	35.8	8.4	2.53	17.00	50.00
Total Music Sample	74	33.9	9.0	1.04	8.00	56.00
Total VIEW Sample	10,151	30.1	9.2	3.89	8.00	56.00

*Ways of Deciding.* This dimension describes individuals' dispositions and preferences for balancing and emphasizing task concerns and personal or interpersonal needs while focusing on, thinking about, and preparation for decision making and taking action. Individuals will prefer either a people orientation, where emphasis is placed on maintaining harmony and interpersonal relationships; or a task orientation, where emphasis is placed on logical, rational, and appropriate choices during problem solving and change management processes. Scores for this 8-item scale range from 8 (person orientation) to 56 (task orientation), with a theoretical mean of 32. Mean scores ranged from 26.4 for music therapy majors to 34.5 for instrumental performance majors. The mean for the entire music sample was 30.7 compared to a mean score of 34.6 for the entire VIEW sample. Descriptive statistics for this dimension are found in Table 18.

Table 18. Descriptive Statistics for Music Major Groups: Ways of Deciding

**Ways of Deciding**

Music Major Group	N	Mean	Std. Deviation	Std. Error	Minimum	Maximum
Music Education	26	30.7	10.0	1.96	8.00	50.00
Music Therapy	20	26.4	8.2	1.82	11.00	42.00
Instrumental Performance	17	34.5	8.3	2.02	20.00	49.00
Jazz Performance	11	32.6	12.1	3.66	13.00	50.00
Total Music Sample	74	30.7	9.8	1.14	8.00	50.00
Total VIEW Sample	10,151	34.6	8.5	3.40	8.00	56.00

Graphs comparing the means for each music major group are shown for each dimension in Figures 1 through 3 below.

Figure 1. Music Major Means: Orientation to Change

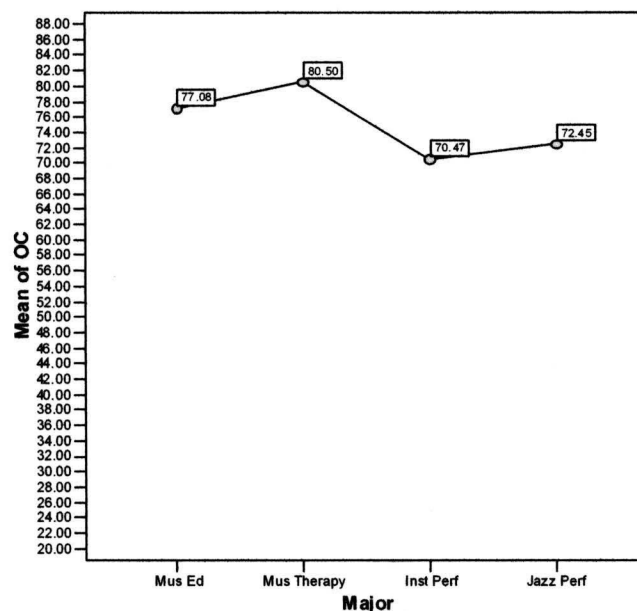


Figure 2. Music Major Means: Manov of Processing

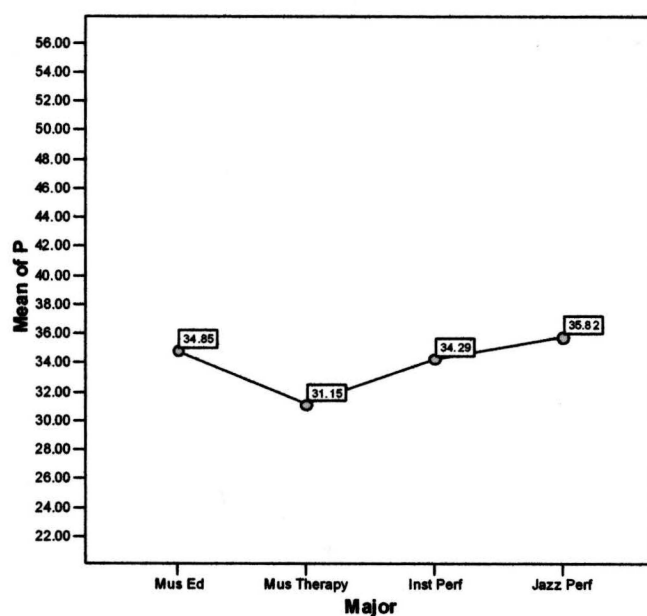
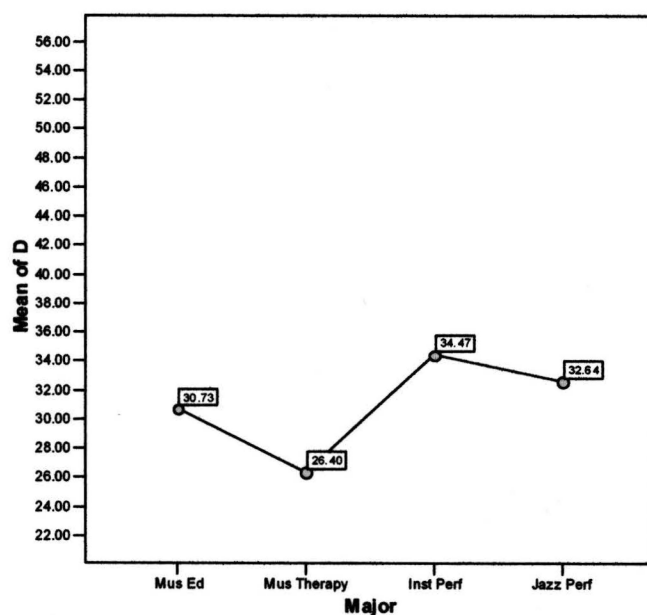


Figure 3. Music Major Means: Ways of Deciding



(For Major: 1.00 = Music Education, 2.00 = Music Therapy, 3.00 = Instrumental Performance, 4.00 = Jazz performance)



A one-way ANOVA was performed to determine if the mean scores for these groups were significantly different. The results, shown in Table 19, indicate no significant differences between the groups for any of the VIEW dimensions. F ratios and probability values are as follows: Orientation to Change,  $F = .957$  ( $p = .418$ ); Manner of Processing,  $F = .901$  ( $p = .445$ ); and Ways of Deciding,  $F = 2.40$  ( $p = .075$ ). Because  $p > .05$ , the level required for significance, for all three dimensions, these results fail to reject the null hypothesis for all four groups of Music Majors. Therefore, when described by the music major they were pursuing, there was no significant difference in mean scores on each of the three VIEW dimensions for the four groups of subjects in this sample. This result suggests that none of the three VIEW dimensions of problem-solving style will play an important role in a musician's choice of major.

Table 19. One-way ANOVA for Music Major Groups

VIEW Dimension		Sum of Squares	df	Mean Square	F	Sig.
Orientation to Change	Between Groups	1090.15	3	363.38	.957	.418*
	Within Groups	26585.81	70	379.80		
	Total	27675.96	73			
Manner of Processing	Between Groups	217.55	3	72.52	.901	.445*
	Within Groups	5635.10	70	80.50		
	Total	5852.65	73			
Ways of Deciding	Between Groups	652.76	3	217.59	2.400	.075*
	Within Groups	6346.70	70	90.67		
	Total	6999.46	73			

(\*  $p > .05$ )

Examination of the graphs in Figures 1 - 3 indicates a large difference between the groups of music majors in the OC scale, with a difference of ten points in the mean score between the Music Therapy and Instrumental Performance groups. Post Hoc analysis, using the Scheffe' test, confirmed there were no significant differences between any of the groups on any of the VIEW dimensions.

In addition to the chosen music major, as indicated in the design of this study, subjects were also asked to choose a preferred musical activity or career. Before making this choice they were given the instruction that this is the musical activity that the respondent would most "prefer to engage in as a career", and that it "need not be the same as the chosen major". The list of choices that subjects were able to choose their preferred career from was identical to the list of choices they were given for music major (see appendix A).

While most subjects chose the same career preference as major, there were nine subjects who chose a preferred career different from their chosen major. These included four music education majors, two who preferred instrumental performance and two who preferred jazz performance; two music therapy majors, one who preferred instrumental performance and one who preferred music education; two jazz performance majors both of whom preferred music education; and one instrumental performance major who preferred music therapy as a career. Interestingly, the scores for the Orientation to Change and Ways of Deciding scales for these individuals were very near to the mean score for the music major group corresponding to their preferred career choice.

While these subjects represented only about 12% of the total sample, re-analysis of the data using the subjects preferred musical career choice as the category variable rather than chosen music major, revealed a vastly different picture of the differences between these groups. Not only were the mean scores for the groups changed, but the number of subjects was more evenly distributed between the groups as well. Descriptive statistics for each dimension using Music Career Preference as the category variable are shown below.

*Orientation to Change.* Recalculated data for this scale is significantly different from data using music major as the category variable. In this set of data, as seen in Table 20, the mean scores now range from 66.2 for the jazz performance group to 82.3 for the music education group, increasing the difference to eighteen points.

Table 20. Descriptive Statistics for Music Career Preference: Orientation to Change

**Orientation to Change**

Preferred Music Career	N	Mean	Std. Deviation	Std. Error	Minimum	Maximum
Music Education	25	82.2	20.9	4.17	36.00	126.00
Music Therapy	19	79.3	14.8	3.40	51.00	107.00
Instrumental Performance	20	69.2	16.8	3.75	35.00	102.00
Jazz Performance	10	66.2	23.2	7.35	27.00	95.00
Total Music Sample	74	75.8	19.5	2.26	27.00	126.00
Total View Sample	10,151	74.6	15.8	5.68	18.00	126.00

*Manner of Processing.* Recalculation using Music Career Preference as the category variable produced changes in mean scores for this dimension as well, as seen in Table 21. However, the differences between the means remain quite small, with mean scores ranging from 30.5 for the music therapy group to only 35.5 for the music education group. This would tend to indicate that the differences between these groups are negligible.

Table 21. Descriptive Statistics for Music Career Preference: Manner of Processing

**Manner of Processing**

Preferred Music Career	N	Mean	Std. Deviation	Std. Error	Minimum	Maximum
Music Education	25	35.5	8.0	1.59	22.00	51.00
Music Therapy	19	30.5	9.5	2.18	8.00	46.00
Instrumental Performance	20	34.3	9.5	2.13	21.00	56.00
Jazz Performance	10	35.4	8.7	2.74	17.00	50.00
Total Music Sample	74	33.9	9.0	1.04	8.00	56.00
Total VIEW Sample	10,151	30.1	9.2	3.89	8.00	56.00

*Ways of Deciding.* The Music Career Preference differences in mean scores for this dimension are also quite different from the means for music major. Mean scores range from 29.1 for the jazz performance group to 33.5 for the music education group. In this case the range of means has increased from six points to eight points, as seen in Table 22.

Table 22. Descriptive Statistics for Music Career Preference: Ways of Deciding

**Ways of Deciding**

Preferred Music Career	N	Mean	Std. Deviation	Std. Error	Minimum	Maximum
Music Education	25	33.8	9.61	1.92	15.00	50.00
Music Therapy	19	25.7	8.2	1.89	11.00	42.00
Instrumental Performance	20	32.3	10.1	2.27	8.00	49.00
Jazz Performance	10	29.1	9.5	3.013	13.00	42.00
Total Music Sample	74	30.7	9.8	1.14	8.00	50.00
Total VIEW Sample	10,151	34.6	8.5	3.40	8.00	56.00

Graphs comparing the means for each music career preference group are shown for each dimension in Figures 4 through 6 below.

Figure 4. Preferred Music Career Means: Orientation to Change

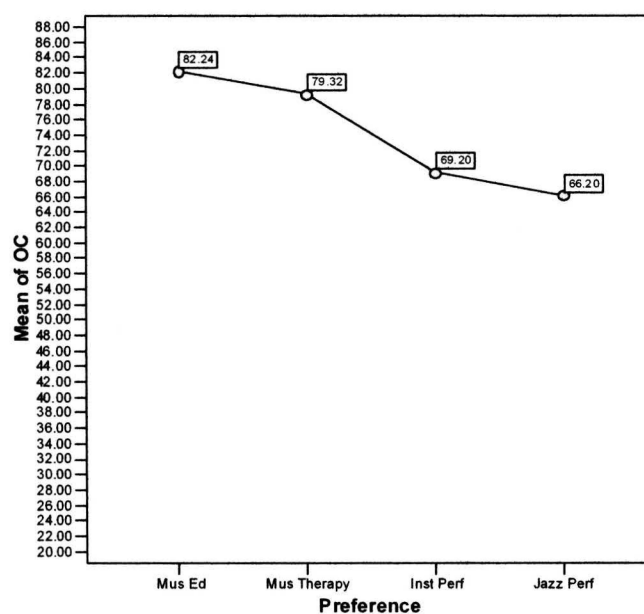


Figure 5. Preferred Music Career Means: Manner of Processing

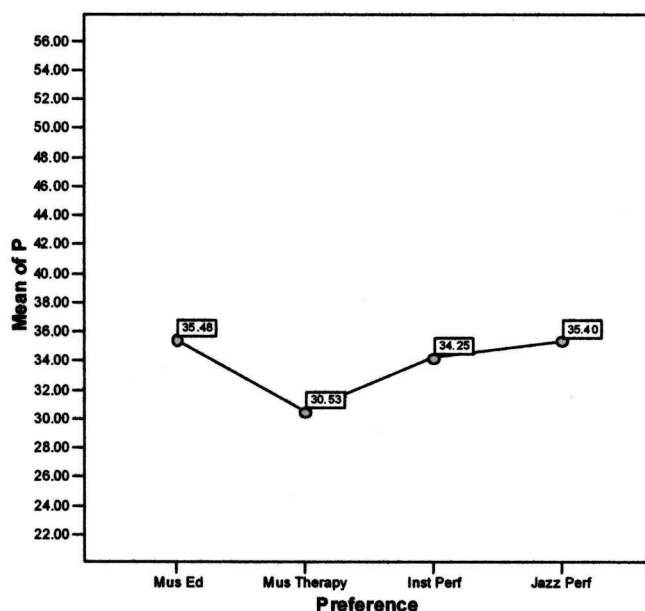
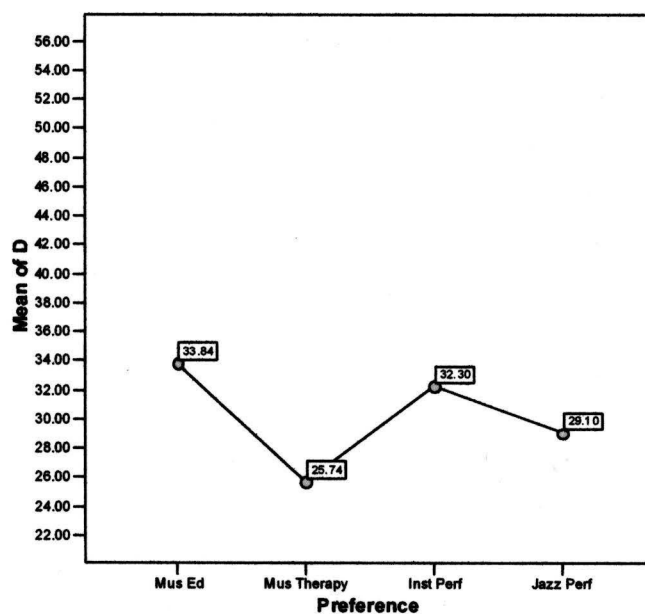


Figure 6. Preferred Music Career Means: Ways of Deciding



These graphs demonstrate the clear differences between the groups, especially in the Orientation to Change scale, using career preference as the category variable.

ANOVA results for the Career Preference category, shown in Table 23, indicates that significant differences ( $p < .05$ ) exist between the four groups for both the Orientation To Change and Ways of Deciding dimensions. F ratios and probability values are as follows: Orientation to Change,  $F = 2.905$  ( $p = .041$ ); Manner of Processing,  $F = 1.276$  ( $p = .289$ ); and Ways of Deciding,  $F = 2.974$  ( $p = .037$ ). As for the Music Major category, means for Manner of Processing ( $p > .05$ ) were not significantly different for any of the groups.

Table 23. One-way ANOVA for Musical Career Preference

		Sum of Squares	df	Mean Square	F	Sig.
Orientation to Change	Between Groups	3064.49	3	1021.50	2.905	.041**
	Within Groups	24611.47	70	351.59		
	Total	27675.96	73			
Manner of Processing	Between Groups	303.52	3	101.17	1.276	.289*
	Within Groups	5549.13	70	79.27		
	Total	5852.65	73			
Ways of Deciding	Between Groups	791.32	3	263.77	2.974	.037**
	Within Groups	6208.14	70	88.69		
	Total	6999.46	73			

(\*  $p > .05$ )

(\*\*  $p < .05$ )

These results fail to reject the null hypothesis for the Manner of Processing dimension only, but clearly reject it for the Orientation to Change and the Ways of Deciding dimensions for the four groups of music students, indicating that responses based on preferred musical career were significantly different between the four groups. It follows then, that when music students are described by the musical career they would prefer to pursue, significant differences are found in their VIEW scores on these two dimensions. These results suggest that these two dimensions of problem solving, Orientation to Change and Ways of Deciding, may play a role in the preference of a musical career, even if that career is not the music major they choose to study.

Examination of the means graphs for both sets of data reveals an interesting relationship between some of the groups. For some of the dimensions, especially the Orientation to Change dimension, it appears that the means for the music education and music therapy groups are fairly close together. The same is true of the means for the jazz performance and instrumental performance groups. This clustering of means suggests the possibility that these groups are very similar in the style of problem solving they prefer to use, and that a different grouping of subjects may be justified. In fact, students enrolled in the music education and music therapy areas are referred to "professional education" majors, while the jazz and instrumental students are referred to as "performance" majors within the School of Music where this study was conducted.



Based on this information, subjects were reassigned to either the “professional education” or “performance” category according to their declared major. Descriptive statistics were again recalculated for both the music major and preferred career categories. For the music major category, as seen in Table 24, small differences

Table 24. Descriptive Statistics for Professional Education and Performance Music Major Groups

Major		OC	P	D
Professional Education	Mean	78.57	33.24	28.85
	N	46	46	46
	Std. Deviation	20.66	8.57	9.40
Performance	Mean	71.25	34.89	33.75
	N	28	28	28
	Std. Deviation	16.71	9.62	9.82
Total	Mean	75.80	33.86	30.70
	N	74	74	74
	Std. Deviation	19.47	8.954	9.79

between the means of the two groups were found in all three dimensions.

Two tailed t-tests for independent samples were then performed. For the Music Major category, shown in Table 25, a significant difference ( $p < .05$ ) between the two groups was found for the Ways of Deciding dimension only. Differences between groups for the Orientation to Change and Manner of Processing dimensions were considered non-significant ( $p > .05$ ). T ratios and probability values were as follows: Orientation to Change,  $t = 1.667$  and  $p = 1.00$ ; Manner of Processing,  $t = -.768$ ,  $p = .458$ ; and Ways of Deciding,  $t = 2.116$ ,  $p = .039$ . This result fails to reject the null hypothesis for the Orientation to Change and Manner of Processing dimensions, but rejects it for the Ways of Deciding dimension for these two groups.

Table 25. T-test for Professional Education and Performance Music Major Groups

		t	df	Sig. (2-tailed)	Mean Diff	Std. Error Diff
Orientation to Change	Equal variances assumed	1.58	72	.118*	7.32	4.62
	Equal variances not assumed	1.67	66.2	.100*	7.32	4.39
Manner of Processing	Equal variances assumed	-.77	72	.445*	-1.65	2.15
	Equal variances not assumed	-.74	52.1	.458*	-1.65	2.21
Ways of Deciding	Equal variances assumed	-2.1	72	.036**	-4.90	2.29
	Equal variances not assumed	-2.1	55.2	.039**	-4.90	2.32

(\*  $p > .05$ )(\*\*  $p < .05$ )

Results were somewhat different in the Music Career Preference category.

Here, as seen in Table 26, larger differences in the means were found in both the Orientation to Change and Ways of Deciding dimensions.

Table 26. Descriptive Statistics for Professional Education and Performance Music Career Preference Groups

Career Preference		OC	P	D
Professional Education	Mean	80.64	33.36	30.62
	N	45	45	45
	Std. Deviation	18.29	8.80	9.89
Performance	Mean	68.28	34.66	30.83
	N	29	29	29
	Std. Deviation	19.14	9.29	9.81
Total	Mean	75.80	33.86	30.70
	N	74	74	74
	Std. Deviation	19.47	8.95	9.79

In the Music Career Preference category, the t-test for independent samples, seen in Table 27, verified a significant difference ( $p < .05$ ) in the Orientation to Change dimension only. Differences between groups in the Manner of Processing

Table 27. T-test for Professional Education and Performance Music Career Preference Groups

		t	df	Sig. (2-tailed)	Mean Diff	Std. Error Diff
Orientation to Change	Equal variances assumed	2.79	72	.007**	12.37	4.43
	Equal variances not assumed	2.76	57.89	.008**	12.37	4.48
Manner of Processing	Equal variances assumed	-.61	72	.546*	-1.30	2.14
	Equal variances not assumed	-.60	57.50	.551*	-1.30	2.17
Ways of Deciding	Equal variances assumed	-.09	72	.931*	-.21	2.35
	Equal variances not assumed	-.09	60.28	.930*	-.21	2.34

(\*  $p > .05$ )

(\*\*  $p < .05$ )

and Ways of Deciding dimensions were found to be non-significant ( $p > .05$ ). T ratios and probability values were as follows: Orientation to Change,  $t = 2.789$ ,  $p = .007$ ; Manner of Processing,  $t = -.600$ ,  $p = .551$ ; and Ways of Deciding,  $t = -.088$ ,  $p = .930$ .

T-test results for this category of groups was similar to the results for the original four group preferred career category for the Orientation to Change dimension. However, significance was not verified for the Ways of Deciding dimension. The

null hypothesis was therefore rejected for the Orientation to Change dimension, but not rejected for the Manner of Processing and Ways of Deciding dimensions. These results suggest that the Orientation to Change dimension may play a role in a musician's preferred career choice, even if it is not the music major they choose to pursue.

## CHAPTER V

### DISCUSSION

It was the intent of this study to determine if significant differences in problem solving style exist between four different groups of music majors; music education, music therapy, instrumental performance, and jazz performance. Two methods of determining the category variable were used, one using the subjects' declared major and one using the subjects preferred musical career. For some of the analyses performed, the four groups of majors were combined to form two new groups, professional education (non-performance majors including both music education and music therapy) and performance (performing majors including both jazz and instrumental performance).

Results indicate that no significant differences in mean scores exist between these four groups for any of the VIEW dimensions when data was analyzed using the subjects' music major as the category variable. However, when redistributing the subjects' scores from a specific major into professional education and performance groups, significant differences between the two groups were found for the Ways of Deciding dimension.

When data was analyzed using preferred musical career as the category variable, significant differences in mean scores of the four groups were found for the Orientation to Change and Ways of Deciding dimensions of VIEW. However, when redistributing the data into professional education and performance groups, significant differences were found only for the Orientation to Change dimension.

So far, discussion has focused on the differences between these groups. If the groups used in the study were to be described by the behavior interactions that correspond with the VIEW mean scores, some interesting similarities appear. Location of the four groups on the behavior interaction table is found in Table 28. These similarities help reinforce the professional education and performance groupings. Regardless of the category variable used (music major or preferred music career), the three letter description for each of the four groups is the same: music education and music therapy subjects can be described as DIP; and both performance groups can be described as EIP. Referring to behavior interaction tables previously presented, the behavior preferences for the professional education subjects would be found in Table 7 on page 67, and the behavior interactions for the performance groups would be found in Table 11 on page 68 of this document.

Table 28. Behavior Interaction Descriptions for the Four Music Groups

Explorer			Developer	
External		Internal	External	Internal
Person		Instrumental Performance  Jazz Performance		Music Education  Music Therapy
Task				

It appears that there is no research available that seeks to determine if significant differences exist between the specialties of a profession. Kirton (2003) did compile data from the many studies using the KAI and compared mean KAI scores for many occupational groups. There were several studies that independently collected data from different specialties within a profession, though specifics about these specialties are poorly documented. These studies include the fields of nursing and engineering. Nursing scores included nurses (92.2), nurse administrators (107.5) and "general practitioners" (91.9). Kirton does not provide specific descriptions of the two nursing groups such as RN or LPN. Engineering scores were somewhat better delineated with maintenance/production (91.7), instructors (86.5), engineers (98.5 weighted mean), and research and development/design (102.4 weighted mean). These differences in mean KAI scores are not dissimilar to the differences in mean VIEW scores found in this study, however, no analyses were performed on the KAI data to determine if the scores differed significantly between groups.

The results of this study suggest that problem-solving/creativity style may be a contributing factor in a student musician's preference of musical career, but that students will not always choose that career as their music major. It is important to understand that these scores represent an individual's preference for a given style of behavior, not the actual behavior they choose to exhibit. Many factors beyond the scope of the VIEW instrument and this study will affect the actual choices and behavior of individuals.

Mean scores for all groups were much closer to the mean for all VIEW dimensions than expected, regardless of the category variable (major or preferred career) analyzed. It is important to note that the differences in mean scores between groups, though significant, are quite small, usually much less than one standard deviation of the mean score for the group. Nonetheless, because we are looking at specialties within a profession, these small differences are understandable. It is possible that expectations for a broader range of scores were shaped by a personal sensitivity of the researcher to the differences observed between these groups, and Kirton's (2003) observations that individuals will begin to notice differences in style when the difference in their scores exceeds ten points. However, it seems likely that within the context of a close knit community of a music department, even small differences, while well tolerated, are much more likely to be observed. Based on the above results the following comparisons can be made for each group. Each VIEW dimension will be discussed separately.

### Orientation to Change

Society generally perceives musicians to be highly creative. As observed by Kirton (2003) and Goldsmith (1984), high innovators, or in VIEW terms, extreme explorers who have achieved high levels of creativity are likely to be the same highly creative individuals described by authors such as Csikszentmihalyi, Gardner, and Amabile. The total music sample mean score of 75.8 was slightly above, or on the developer style side, of the median of 74.6. This indicates that the above



generalization may be a misconception, confirming assertions by both Kirton and Selby et. al. that all cognitive or problem solving styles are creative and capable of high creativity levels, and that the issue of style and level must be considered separately.

There may be additional explanations for this finding as well. Music students are still in the formation phase of their professional development. At this point they are still very concerned with learning what the rules are, and may tend to be overcautious while learning the various rules and foundations of their chosen musical profession, thus, adopting a somewhat conservative approach in their thinking for the time being. It must be noted that music is both an art and a discipline with many rules and established practices, even in the areas where the highly creative would venture to be innovative, and one must know the rules, even if their intention is to bend or break them.

It is important to remember that the Orientation to Change scale involves more than just rule conformity issues. Many other factors contribute to the score on this scale, including our preference for generating new and different ideas, our preference for efficiency and maintaining a stable well-ordered environment, and whether or not we choose a detailed, well-organized approach to our problem solving. It seems likely that, for musicians, we may be more conservative in some of these areas and less so in others. It was not, however, within the scope of this study to determine which of these factors contributed to the mean scores for each group.

The significant differences found between the mean scores of the four music major groups for this dimension, using the different categories for analysis, underscore its importance in decision making during creative problem solving. Comparisons of the music major and preferred musical career means graphs in Figures 1 and 4 for this dimension indicate some clustering of mean scores. The mean scores for the music education and music therapy groups are fairly close together and just above the music group mean while mean scores for instrumental performance and jazz studies groups lie fairly close together but below the mean for the overall sample. These clusters are consistent with the professional education and performance groups used in the t-test analyses.

Professional education students therefore, appear to have a slight preference for the developer style while performance students have a slight preference for an explorer style. Furthermore, when using the preferred musical career as the category variable, music education students appear to have a greater preference for the developer style than music therapy students, while jazz studies students have a greater preference for the explorer style than instrumental majors.

### Manner of Processing

Mean scores for the entire sample of music majors (see Table 17) indicates a slight preference for an internal style of processing compared to the mean for all VIEW subjects. While there were different means associated with each of the groups, these differences were not found to be significant in any of the analyses performed.

Given this result, discussion must be limited to the mean score for the overall sample. The music group mean of 33.9 is close to the VIEW mean of 30.1, indicating a “moderate” manner of processing preference for musicians. While a moderate score can be interpreted in several ways (this will be discussed later), it is likely that musicians possess the ability to process information in both internal and external styles as required by a given situation, and are likely able to work well with individuals possessing scores that are more extreme in either direction.

### Ways of Deciding

The overall mean of 30.7 for the music sample, as found in Table 18, was slightly below the VIEW mean score of 34.6, indicating a moderate, but somewhat people oriented, deciding style for this dimension. Based on the results, differences in task/people orientation seem to be somewhat important to musicians. When looking at the means graph for the music major category in Figure 3, we can see a clear clustering of groups as with the Orientation to Change dimension, though there were no significant differences found between the mean scores for the four groups in this category. However, when subjects' data are analyzed using professional education and performance as the groups (see Table 24), the differences in mean scores becomes significant. In this case the analysis suggests that performance students, with a mean score of 33.8, prefer more of a task orientation, placing a greater emphasis on mastering content and information than on responding to the needs of others, than professional education students with a mean score of 28.9.

These relationships are vastly different when preferred music career (see Tables 24 and 25) is used as the category variable. While the kind of clustering of groups of music majors into professional education and performance categories previously observed (see Table 18 and Figure 3) does not exist with this category, significant differences were found to exist between the mean scores of the groups for this category. In this analysis, a large difference is observed between the music education and music therapy groups. Music education majors appear to have a preference for task orientation, with a mean of 33.8, compared to music therapy students, with a mean score of 25.7, who have a greater preference for a person orientation. Lying between the education and therapy groups (see Figure 6), instrumental performance students, with a mean score of 32.3, were found to be slightly more task oriented compared to the preference for people orientation of jazz students, with a mean score of 29.1. Mean scores for all of these groups were below the mean VIEW score, and are therefore considered to have a moderate people orientation.

#### Moderate Scores

As we have seen, the mean scores for all of the music groups as well as the mean for the entire music student sample, did not vary a great deal from the overall VIEW mean for any of the VIEW dimensions, and have generally been described as “moderate”. It might be of value to discuss the importance and implications of moderate scores for this study. Selby, et., al. (2004c) define a moderate preference as

results that are within one standard deviation in either direction of the mean for any dimension. Examination of tables 16, 17, 18, 20, 21, and 22 indicate that all scores for all groups are within one standard deviation for any dimension, regardless of the category variable used except in the case of the music therapy career preference on the Ways of Deciding dimension.

Individuals with moderate scores, as suggested by Kirton (2003) and observed by Selby, Treffinger, Isaksen, and Lauer (2004c), are often viewed as people who are able to “bridge” between those who have scores near the extremes of each dimension (although they may not always choose to do so). This is an important function within group dynamics where, in the absence of such individuals, little would be accomplished. Many musicians, possessing the moderate scores we have observed, may be in an ideal position to perform this “bridging” function when the opportunity presents itself.

However, this may not be the only, or primary function of moderate scores for musicians. Regardless of musical profession, because they often perform a multitude of roles, most musicians are often required to move quickly and easily from one function to another (e.g., from teacher to conductor, to performer), with each function requiring a different problem solving style. This may be especially true for music educators and music therapists who must evaluate and act on situations not only in terms of musical issues, but also in terms of ensemble/rehearsal issues, classroom and clinical issues as well. Having a style preference that is near the mean of any of the VIEW dimensions allows a musician to move comfortably from one function to

another with a minimum of Kirton's coping behavior. This ability employs what Meyers-Briggs would call flexibility. As previously discussed, both of these behaviors are often attributed to creative individuals.

This study indicates that the small but significant differences in creativity style found between groups of musicians may play a role in the individual's choice of musical career. It is possible that individuals in these groups have, at least in part, chosen their majors, and remained in them, because of a perceived or experienced compatibility between the style requirements for that profession and the style preference of the individual. Stated differently, as suggested by the occupational climate and need for creativity studies cited earlier, it is likely that musicians will prefer and be more satisfied with a musical career that they perceive will provide them with the set of musical activities, problem types and challenges that is best suited to their own preferred style of creativity or problem solving. No one facet (style, talent, skill, etc.) insures success in any field for any individual, but an awareness of creativity style may be just as important to success in a field as musical skills, talent, abilities and intelligence.

It is reasonable to say, then, that knowledge and understanding of style preferences will help guide a musician to make intelligent decisions concerning a musical career and provide a deeper understanding of why they are drawn to a given musical profession or activity. This knowledge will also aid musicians in choosing appropriate approaches to creative problem solving as they encounter different problem types while practicing their chosen profession. It will also help guide the

individual in making intelligent choices concerning the organizational culture and climate of the organizations in which they seek and gain employment, especially if they are forced to find employment outside the music profession!

### Implications

While this study was conducted among university music students, it was conducted for the purposes of music education. If the differences in style described above are significant and important, and specific styles (defined by mean scores on each of the three dimensions of VIEW) can be associated with a given musical career and therefore the prominent activity associated with that career (i.e., the act of performing, improvising, teaching, etc.), then a number of issues become apparent for music educators.

Although our profession, music, is creative, as music educators we are actually taught very little about creativity. Our view of creativity is most likely shaped by the aesthetic view of creativity as voiced by Reimer, or perhaps the “praxial” view voiced by Elliot as expressed in their philosophies of music education. Reimer (1989) would focus on a mysterious, nebulous creative process that does not allow the creator to “direct” or “contaminate” the subjectivity of the creative act with “conscious intent” or by trying to achieve “something external to the needs of his developing feelings.” According to Reimer, “an achievement is creative if its creator conforms to a process of exploring and discovering feeling in communion with the aesthetic qualities of the medium.

Elliot (1995) posits the view that creativity in music is the result of obtaining the “multidimensional form of knowledge called MUSICIANSHIP” (emphasis in original). He claims that a proficient or expert level of knowledge in a field both enables and promotes creativity. Elliot does provide some guidelines for the development of musical creativity for music educators. “First, the enabling and promoting of musical creativity depends on enabling and promoting musicianship. Second, the development of musical creativity requires a receptive environment that encourages risk taking and the constructive evaluation of students’ efforts to achieve creative results. Third, we ought to highlight musical “opportunity finding” by involving students in formulating (rather than just carrying out) worthwhile musical projects. Fourth, students should be encouraged to evaluate performances and compositions for their excellence and creativity in all relevant dimensions. Fifth, music education for musical creativity requires sustained periods of time for students to generate, select, rework, and edit their performances, improvisations, interpretations, compositions, or arrangements. Sixth, we need to avoid undermining our students’ motivation and enjoyment by gushing, hovering, or taking over while they work at producing creative musical results” (Elliot, 1995). While this view begins to take into account some issues of creativity style, it is primarily concerned with the quality of the creative product and providing certain conditions that might be favorable to creative output. In doing so, it avoids recognizing the impact that an individual’s creative style might have on the type of musical problem selected, a



student's ability to deal effectively with creativity assignments, as well as on the possible creative outcomes.

In his most recent work, Reimer (2003) proposes musical "roles" which constitute the musical domain. Each of these roles requires a specific way to be musically creative, and includes, but is not limited to, composing creativity, performing creativity, improvising creativity, and listening creativity. Engaging in each of these roles requires a certain amount of "musical artistry" and the ability to put oneself in a position to self-judge what has just been done to determine if the decision just made is "adequate", thus providing immediate feedback. Central to this evaluative process is a well-trained musical ear, capable of "hearing with imagination, that hears possibilities and potentials, reveals new and fresh solutions, takes the act toward an emergence of meaning not yet achieved. An ear both in control of what is transpiring and responsive to the demands the created music is making. An ear capable of both asserting and acknowledging."

Reimer points out that "all teaching for musical creativity – the skilled sensitive, imaginative, and genuine making of decisions about expressive possibilities of sounds – needs to be aimed toward helping individuals think, do, and feel music more meaningfully." He cautions that teaching for the "knowing how of artistic musical creation" should not be put off until students have acquired a sufficient amount of musical skills, techniques, and ability to be creative. Instead, he suggests the interdependence of creativity and technique should be recognized and cultivated from the earliest stages of music education. What needs to drive our instruction, he

claims, is the “search for creative musical meaning, to create sounds as only a musician can. When technique and creativity are mutually supportive, genuine musicianship occurs, *even at its very beginning*” (emphasis in original). What he calls “the spiritual experience inherent in creating music is available to young children being introduced to it as well as to the few who are world-class masters at it” (Reimer, 2003).

Reimer’s view, in all likelihood, will have little impact on the teaching of creative activities in the classroom. While it is important that he recognizes the interdependence of musicianship and creativity and the different roles or kinds of musical creativity, this view assumes that, given a creativity assignment, the higher order level of aural discernment and evaluative abilities will automatically appear, and students’ feelings will simply flow into and direct their work, and if all goes well will provide a “spiritual experience” for them. This is quite unreasonable insofar as students, when working on assignments involving the emotional risk associated with creative output, are more concerned with accomplishing the work to be done, not with presenting their feelings in the work, or producing a necessarily “artful” product. Elliot’s view, with its emphasis on musicality and musical concepts, is an improvement. Virtually no musical creativity can take place unless there is some understanding of the musical concepts required to accomplish it. There is still, however, an important piece of the puzzle missing.

From a philosophical as well as practical point of view, when all is said and done, Reimer just might be right. The ultimate goal of musical creativity is to allow

your feelings to direct your musicality into an artful, creative product. However, the problem is that there is a huge chasm between the early stages of the acquisition of musical skill, teaching that skill to students, or musicality and the activity of creating a musical work and imbuing it with feeling or aesthetic value. While Elliot's view is valid and generally consistent with the goals of music education, (of course we should expect students to achieve high levels of musicality and musical creativity), he too assumes that creativity automatically flows from musicality and musicianship, although he acknowledges that it does involve hard work. What is missing from both authors' views is *how* we get from basic musicianship to creativity.

Curricula and standards in current use encourage and require the assignment of activities in which students must improvise, compose, and perform musically at all levels of the music curriculum. With the current emphasis on competency tests and obtaining achievement standards, the music and arts classrooms are likely to be the only places in a school where students are exposed to creative problem solving. Within this framework, not only are basic musical performance skills and knowledge important, but the ability and opportunity to use these skills creatively, using creative problem solving techniques and styles, as well. The ability to demonstrate creativity is the student's ultimate demonstration of understanding of the musical concepts being taught. Without the appropriate understanding and skills, these assignments can be more difficult than necessary for the student. To this end, the question becomes, does the music educator have all of the tools necessary to effectively accomplish this task?

Boardman (1989) recognizes and emphasizes the primary goal of modern music education is to teach students to become musically independent. To accomplish this goal, she suggests that “unless we help students develop appropriate thinking processes – that is, learn how to think about music, how to draw on existing musical information and skill (content and behavior) in order to learn to perform a new piece of music, and how to respond to unfamiliar compositions, or to express one’s own musical ideas through improvisation and composition – the time spent in the music classroom has been essentially wasted.” As previously discussed, Kirton (2003), Guilford (1964), and Li (1996) all view creativity as a cognitive process. Kirton (2003) and Selby, et. al. (2004c) have demonstrated that an important part of creativity is the style in which it is exhibited. Recognizing creativity and creative style as thinking processes is central to teaching creativity in the classroom

To “think about music” and to “express one’s own musical ideas” by performing different creative tasks, as suggested by this study, may involve the use of slight but fundamentally different styles of creativity/problem solving to successfully complete them. In order for students to be successful they must have some understanding of these differences. This understanding will allow them to “change gears” as required for different assignments that are part of an overall curriculum that will bring students to musical independence. It also provides students with some understanding of how they are different from others and how no one style is better or more desirable than another; that diversity is not just about ethnicity or culture.

It is important for music educators to understand and recognize these differences as well. The theoretical literature concerning creative/cognitive style suggests that we will tend to seek out and engage in problem types that are similar to our own personal style of creativity/cognition. By extension then, it is likely that some students may prefer and enjoy performing music while others seem to prefer to write music, or improvise. Students who prefer and enjoy a certain musical activity are likely to excel at it, while students who do not are likely to avoid the activity. As noted with learning styles earlier, educators tend to teach using their own preferred learning style, and may need to adapt her teaching so that it "aligns with the student's learning style" (Wisconsin Department of Public Instruction, 1989, 80). The same is likely to be true for creativity/problem solving style. Equipped with a working knowledge and understanding of creativity style, as with learning style, the educator is better equipped to recognize students' individual preferred styles, and provide appropriate individual instructional strategies, environment, and encouragement, that will assist and enhance their success in creative activities. Creativity assignments can then be graded without the teacher's own bias of style preference, but on the student's understanding, ability, and accomplishment of the concepts being taught.

It should be pointed out that caution must be used in identifying creative/problem-solving styles in students. The authors of VIEW have pointed out that no one style is considered to be better or more desirable than another. The VIEW instrument was designed to enable the understanding and appreciation of peoples' unique, personal style differences and allow for the support to use these differences in

solving problems and managing change effectively (Selby, Treffinger, Isaksen, and Lauer, 2004b). We should, as educators, avoid placing a greater value on any one style, and any negative labeling or categorization of students that may result. The application of these concepts in the classroom should be tools used only for positive learning results.

The ability to quantify style differences in terms of VIEW is an effective way for music educators, and educators in general, to apply the concepts of style preferences to the classroom. While VIEW is not the only method available to accomplish this end, it provides a common language and employs a set of underlying theories that are likely to be known and understood by most educators. At the very least, educators should have a working understanding of creativity (cognitive) style, internal/external and people/task orientations to help them understand students behavior in the classroom. VIEW is currently used in tandem with creative problem solving processes with students in extra-curricular programs such as Destination ImagiNation Inc. This program teaches problem solving skills to teams of students in a competitive format, with competitions at local, state, regional, national, and international levels and includes science, math, language, theatrical, visual and musical problem solving activities. When aware of creativity styles, educators will be able to evaluate students with greater objectivity, unhampered by the perspectives and prejudices of their own style preferences. Stated differently, in order to teach and evaluate creativity effectively, we must first understand creativity, not only in terms of level, but also in terms of style and process.

As we include assignments for musical creativity in our teaching, we should be aware that musical creativity, with its basis in musical skills and understanding, has components of both creative style and creative level. An understanding of what creativity is, and of creativity styles, will provide the music educator with another valuable tool, along with an understanding of learning style, with which to understand, teach, and evaluate their students. It is unlikely that anyone would disagree that issues of musical ability directly affect creativity level. However, it is likely that our choice to perform, and how well we perform, in various areas of musical endeavor is likely to be affected by our preference for it, including whether or not we choose to seek problems to solve in that area. An individual is not likely to take even a reasonable risk at a creative activity if they have no affinity or comfort with it.

It is worth pointing out that for many students, the only way to overcome their lack of comfort with a given activity is to acquire enough experience to gain some proficiency with it. We, as educators, can help this along by providing safe, nurturing environments for musical learning to take place, and encourage risk taking as a positive behavior, even if it is not a preferred behavior. After all, not taking even reasonable risks precludes possibilities and therefore opportunities for positive, enjoyable outcomes. In the end, however, even if a student reaches a reasonable level of proficiency, it will be their problem solving preference that determines how often and to what extent they choose to engage in certain activities.

### Orientation to Change

As a description of cognitive or creative style that is relatively unknown among educators, this dimension of problem solving will have the greatest impact on classroom instruction. It is important to understand the components of this scale as they apply to students' behavior while performing classroom activities. Risk taking, the ability to generate many ideas (divergent thinking) for a solution to a problem, narrowing possibilities and focusing on solutions that are appropriate for the required task (convergent thinking), and following rules and authority are among the factors that affect the preference for either an explorer or developer style. For instance, it is likely that a student that is not a risk taker and must always follow the rules (developer style traits) will perform poorly and shy away from improvisation assignments (an explorer style activity) due to the fear of failure and the consequences they may associate with the activity. That same student may do much better on a written composition assignment requiring ornamentation of a melody.

It can be very helpful to understand how each of these factors affects the student's ability to comfortably and successfully engage in a given creative activity. Given proper instruction and gentle encouragement, and removing the consequences of risk associated with failure, students will gain the needed confidence to become competent in a variety of creative activities. Teaching strategies should incorporate a variety of instructional situations, group as well as individual, so both explorer and developer styles can be observed, employed, and experienced by students.



For instance, let us consider a hypothetical assignment given to middle school students to write an original eight-measure melody demonstrating a musical concept discussed in class. Melodies written by developers are likely to sound very much like the last example used to demonstrate the concept. These students will likely finish the assignment in less time than their explorer counterparts, but will fulfill the requirements of the assignment to a "t". Explorers, on the other hand, will likely take longer to finish the assignment. They will need to try several possible options and perhaps even experience some difficulty deciding which is best for the situation. Their compositions may appear as if they did not fully understand the concept behind the assignment, since they were likely to modify things as they worked through the possibilities they generated, not particularly worried about the rules of the concept or assignment. Here again, by understanding and recognizing differences in creativity style, the music teacher can develop strategies tailored to the assignment that will help develop divergent and convergent thinking skills, allowing developers to generate a larger number of ideas that are more original, or help explorers to limit and refine their ideas to remain appropriate and specific to the situation.

### Manner of Processing

Given the same above assignment, students with an external processing style may openly share their ideas with others, giving the impression at least, of attempting to disrupt the classroom. Students with an internal processing style will work quietly by themselves, and may be annoyed when interrupted by others.

### Ways of Deciding

Here, task oriented students will attempt to fully analyze the assignment and give every detail its due attention. To some, these students may appear to make the assignment more complicated than necessary. Students with a people orientation will try to work with others and obtain instantaneous feedback on their ideas, and gain the support of others.

In order to achieve this end, teaching music educators how to solve musical problems creatively should become a standard part of the music education curriculum at the university level (some examples do exist, such as the program designed by Dr. Kratus at Michigan State University). Most universities have required creativity courses for their engineering students. It would make sense to include similar courses in the music education curriculum that include an overview of the theories of creativity, creative processes, creative problem solving, and creative style as they apply to the teaching of music concepts. It makes little sense to give a student a composition assignment if they aren't provided with the necessary tools to accomplish it, including an understanding of the student's personal style preferences and how they relate to the assignment. In the end, lack of attention to creativity style in the classroom is likely to result in the stifling of creative activity for students. Without appropriate attention to style in our teaching, students will continue to view creativity as something only others far more gifted than they are able to achieve.

### Recommendations for Further Research

The results of this study suggest that creativity/problem solving style differences exist between different groups of musicians. Given the way data was re-categorized in this study indicates that more research needs to be conducted to see if these findings can be duplicated with groups of musicians in other settings. This research should be conducted not only among music students, but among practicing professional musicians as well, and extended to additional fields of music, including the fields of conducting and composition/arranging. Research can also be conducted among students in secondary schools to determine if any relationships exist between the musical activities they prefer to engage in and VIEW scores. Only then, if the results are replicated, can we generalize the hypothesis to all groups of musicians and make a strong case for its educational implications.

## REFERENCES

- Albert, R. S., & Runco, M. A. (1999). A history of research on creativity. In R. J. Sternberg (Ed.), *Handbook of creativity*. Cambridge: Cambridge University Press.
- Amabile, T. M. (1983). *The social psychology of creativity*. New York: Springer-Verlag.
- Amabile, T. M. (1996). *Creativity in context*. Boulder, CO: Westview Press.
- Balkin, A. (1991). What is creativity? What is it not? In D. L. Hamann, (Ed.), *Creativity in the music classroom*. Reston VA: Music Educators National Conference.
- Barro, A. R. (1972). Personality and cognitive correlates of creativity in writers. Paper presented at the annual AERA meeting, April, 1972. ERIC Accession No.: ED064394.
- Barron, F., & Harrington, D. M. (1981). Creativity, intelligence, and personality. *Annual Review of Psychology*, 32, 439 – 476.
- Boardman, E. (1989). The relation of music study to thinking. In E. Boardman (Ed.), *Dimensions of musical thinking*. Reston, VA: Music Educators National Conference.
- Bohm, D. (1998). *On creativity*. L. Nichol (Ed.). London: Routledge.
- Brinkman, D. J. (1999). Problem finding, creativity style and the musical composition of high school students. *Journal of Creative Behavior*, 33(1), 62 – 68.
- Byrd, R. E. (1986). *The Creatrix Inventory*. San Diego, CA: Pfeiffer and Co. International Publishers.
- Carne, J.C., & Kirton, M. J. (1982). Styles of creativity: Test score correlations between the Kirton Adaption-Innovation Inventory and the Meyers-Briggs Type Indicator. *Psychological Reports*, 50, 31 – 36.
- Child, D., and Croucher, A. (1977). Divergent thinking and ability: Is there a threshold? *Educational Studies*, 3(2), 101 –110.
- Consortium of National Arts Education Associations (1994). National Standards for Arts Education. Reston, VA: Music Educators National Conference.

- Cooper, R., & Foster, M. (1971). Sociotechnical systems. *American Psychologist*, 26, 467 – 474.
- Csikszentmihalyi, M. (1996). *Creativity: Flow and the psychology of discovery and invention*. New York: Harper Collins Publishers.
- De Turk, M. (1989). Critical and creative musical thinking. In Boardman, E. (Ed.), *Dimensions of musical thinking*. Reston, VA: Music Educators National Conference.
- Dervin, D. (1990). *Creativity and culture: A psychoanalytic study of the creative process in the arts, sciences, and culture*. Cranbury, NJ: Associated University press.
- Donnay, D. A. C., & Borgen, F. H. (1996). Validity, structure, and content, of the 1994 Strong Interest Inventory. *Journal of Counseling Psychology*, 3, 275 – 291.
- Driver, M. (2001). Fostering creativity in business education: Developing creative classroom environments to provide students with critical workplace competencies. *Journal of Education for Business*, 77(1), 28 – 33.
- Duff, W. (1767). *An essay on original genius and its various modes of exertion in philosophy and the fine arts, particularly in poetry*. London: Printed for Edward and Charles Dilly.
- Eisenman, R. (1969). Components of creativity, verbal conditioning, and risk-taking. *Perceptual and Motor Skills*, 29(3), 687 – 700.
- Elliot, D. (1995). *Music matters*. New York: Oxford University Press.
- Eysenck, H. J. (1995). *Genius: The natural history of creativity*. Cambridge: Cambridge University Press.
- Fahden, A. N., & Namakkal, S. (1995). *The Team Dimensions Profile Research Report*. Minneapolis, MN: Inscape Publishing, Inc. Retrieved 1/13/2005 from <http://www.inscapepublishing.com/instruments.asp>.
- Fuchs-Beauchamp, K. D., Karnes, M. B., & Johnson, L. J. (1993). Creativity and intelligence in preschoolers. *Gifted Child Quarterly*, 37(3), 113 – 117.
- Furnham, A. (1999). Personality and creativity. *Perceptual and Motor Skills*, 88(2), 407 – 408.
- Gardner, H. (1982). *Art, mind and brain: A cognitive approach to creativity*. New York: Basic Books.

- Gardner, H. (1993). *Creating minds*. New York: Basic Books.
- Gedo, J.E. (1996). *The artist and the emotional world*. New York: Columbia University Press.
- Gelade, G. (1995). Creative style and divergent production. *Journal of Creative Behavior*, 29(1), 36 – 53.
- Gelade, G. A. (2002). Creative style, personality, and artistic endeavor. *Genetic, Social, and General Psychology Monographs*, 128(3), 213 – 234.
- Getzels, J. W., & Jackson, P. W. (1962). *Creativity and intelligence: Explorations with gifted students*. New York: Wiley.
- Glover, J. A., & Sautter, F. (1977). Relation of four components of creativity to risk-taking preferences. *Psychological Reports*, 41(1), 227 – 230.
- Goldsmith, R. E. (1984). Personality characteristics associated with adaption-innovation. *Journal of Psychology*, 117, 159 – 165.
- Goldsmith, R. E. (1985). The factorial composition of the Kirton Adaption-Innovation Inventory. *Educational and Psychological Measurement*, 45(2), 245 – 250.
- Goldsmith, R. E. (1986). Personality and adaptive – innovative problem solving. *Journal of Social Behavior and Personality*, 1(1), 96 – 106.
- Goldsmith, R. E. (1987). Creative level and creative style. *British Journal of Social Psychology*, 26(4), 317 – 323.
- Goodenough, D. R. (1985). Styles of cognitive – personality functioning. In H. J. Bernadine and D. A. Bownas (Eds.), *Personality assessment in organizations*. New York: Praeger.
- Gowan, J. C. (1971). The relationship between creativity and giftedness. *Gifted Child Quarterly*, 15(4), 239 – 243.
- Gryskiewicz, N. D., & Tullar, W. L. (1995). The relationship between personality type and creativity style among managers. *Journal of Psychological Type*, 32, 30 – 35.
- Gryskiewicz, N., Taylor, S., & Fleenor, J. (1995). Job satisfaction and creativity style: An unexpected empirical finding. *Creativity and Innovation Management*, 4, 258 – 261.

- Guilford, J. P. (1964). Creative thinking and problem solving. *Education Digest*, 29, 21 – 31.
- Guilford, J. P. (1977). *Way beyond the IQ*. Buffalo, NY: Creative Education Foundation.
- Guilford, J.P., & Christensen, P. R. (1973). The one-way relation between creative potential and IQ. *Journal of Creative Behavior*, 7(4), 247 – 252.
- Hackman, J. R., & Lawler, E. E. III (1971). Employee reactions to job characteristics. *Journal of Accounting Education*, 4, 203 – 209.
- Hackman, J. R., & Oldham, G. R. (1975). Developments of the Job Diagnostic Survey. *Journal of Applied Psychology*, 60, 159 – 170.
- Hackman, J. R., & Oldham, G. R. (1976). Motivation through the design of work: Test of a theory. *Organizational and Human Performance*, 16, 250 – 279.
- Hattie, J. and Rogers, H. J. (1986). Factor models for assessing the relation between creativity and intelligence. *Journal of Educational Psychology*, 78(6), 482 – 485.
- Harrison, A. F., Bramson, R. M., Bramson, S., & Parlette, G. N. (2003). *InQ: Your thinking profile*. San Francisco, CA: InQ Educational Materials, Inc. Retrieved 1/13/2004 from <http://www.inq-hpa.com/about.htm>.
- Hayward, G., & Everett, C. (1983). Adaptors and innovators: Data from the Kirton Adaption – Innovation Inventory in a local authority setting. *Journal of Occupational Psychology*, 56, 339 – 342.
- Hocevar, D. (1980). Intelligence, divergent thinking, and creativity. *Intelligence*, 4(1), 25 – 40.
- Holland, P. A. (1987). Adaptors and innovators: Application of the Kirton Adaption – Innovation Inventory to bank employees. *Psychological Reports*, 60, 263 – 270.
- Hunt, R. G., Krzystofiak, F. J., Meindl, J. R., Yousry, A. M. (1989). Cognitive Style and decision making. *Organizational Behavior and Human Decision Processes*, 44(3), 436 – 453.
- Jacobs, S. S., & Shin, S. H. (1975). Interrelationships among intelligence, product dimension of Guilford's model and multi-level measure of cognitive functioning. *Psychological Reports*, 37(3), 903 – 910.

- Jacobson, C. M. (1993). Cognitive styles of creativity: Relations of scores on the Kirton Adaption – Innovation Inventory and the Meyers – Briggs Type Indicator. *Psychological Reports*, 72(3, part 2), 1131 – 1138.
- Joesting, J., & Joesting, R. (1973). Some correlations of What Kind of Person Are You: A test of creativity. *Psychological Reports*, 32(3, part 1), 937 – 938.
- Keller, R. T., & Holland, W. E. (1978). A cross-validation study of the Kirton Adaption – Innovation Inventory in three research and development organizations. *Applied Psychological Measurement*, 2, 563 – 570.
- King, L. A., McKee-Walker, L., & Broyles, S. J. (1996). Creativity and the Five-Factor Model. *Journal of Research in Personality*, 30, 189 – 203.
- Kirton, M. J. (1976). Adaptors and innovators: A description and measure. *Journal of Applied Psychology*, 61, 622 – 629.
- Kirton, M. J. (1978). Have adaptors and innovators equal levels of creativity? *Psychological Reports*, 42, 695 – 698.
- Kirton, M. J. (1980). Adaptors and innovators in organizations. *Human Relations*, 33, 213 – 224.
- Kirton, M. J. (2003). *Adaption – Innovation: In the context of diversity and change*. New York: Routledge.
- Kirton, M. J., & De Ciantis, S. M. (1986). Cognitive style and personality: The Kirton Adaption-Innovation and Cattell's Sixteen Personality Factor inventories. *Personality and Individual Differences*, 7, 141 – 146.
- Lawler, E. E., Hall, D. T., & Oldham, G. R. (1974). Organizational climate: Relationship to organizational structure, process, and performance. *Organizational Behavior and Human Performance*, 11(1), 139 - 155.
- Li, R. (1996). *A theory of conceptual intelligence: Thinking learning, creativity and giftedness*. Westport, CT: Praeger Publishers.
- Lindley, L. D., & Borgen, F. H. (2000). Personal Style Scales of the Strong Interest Inventory: Linking personality and interests. *Journal of Vocational Behavior*, 52, 22 – 41.
- Livingstone, L. P., Nelson, D. L., & Barr, S. H. (1997). Person – environment fit and creativity: An examination of supply – value and demand – ability versions of fit. *Journal of Management*, 23, 119 – 146.



- Lowe, E. A., & Taylor, W. G. K. (1986). The management of research in the life sciences: The characteristics of researchers. *R & D Management*, 16, 45 – 61.
- Madaus, G. F. (1967). Divergent thinking and intelligence: Another look at a controversial question. *Journal of Educational Measurement*, 4(4), 227 – 235.
- Mark, M. L. (2000). MENC: From Tanglewood to the present. *Vision 2020: A report of the Housewright Symposium on the future of music education*. Music Educators National Conference Online Publications. Retrieved July 17, 2005 from <http://www.menc.org/publication/vision2020>.
- McNeilly, K. M., & Goldsmith, R. E. (1992). The moderating effect of sales managers' approach to problem solving on the salesperson satisfaction/intention to leave relationship. *Journal of Social Behavior and Personality*, 7(1), 139 – 150.
- McNemar, Q. (1964). Lost: Our intelligence? Why? *American Psychologist*, 19, 871 – 882.
- Messick, S. (1976). *Individuality in learning: Implications of cognitive styles and creativity for human development*. San Francisco: Jossey – Bass Publishers.
- Nickerson, R. S. (1999). Enhancing creativity. In R. J. Sternberg (Ed.), *Handbook of creativity*. Cambridge: Cambridge University Press.
- Pankove, E., & Kogan, N. (1968). Creative ability and risk-taking in elementary school children. *Journal of Personality*, 36(3), 420 – 439.
- Perkins, D. (1981). *The mind's best work*. Cambridge, MA: Harvard University Press.
- Perrow, C. (1967). A framework for the comparative analysis of organizations. *American Sociological Review*, 32, 194 – 208.
- PolICASTRO, E., & Gardner, H. ((1999). From case studies to robust generalizations: An approach to the study of creativity. In R. Sternberg (Ed.), *Handbook of creativity*. Cambridge: Cambridge University Press.
- Puccio, G. J., Talbot, R.J., & Joniak, A. J. (2000). Examining creative performance in the workplace through a Person – Environment Fit Model. *Journal of Creative Behavior*, 34(4), 227 – 246.
- Puccio, G.J. (2002). *Foursight technical manual*. Evanston IL: Author. Retrieved 1/13/2005 from <http://www.foursightonline.com/downloads/techmanual.pdf>.

- Rastogi, M. (1987). A study of cognitive style in relation to intelligence and creativity. *Journal of Personality and Clinical studies*, 3(2), 161 – 164.
- Reimer, B. (1989). *A philosophy of music education*. Englewood Cliffs, NJ: Prentice Hall.
- Reimer, B. (2003). *A philosophy of music education: Advancing the vision*. Upper Saddle River, NJ: Prentice Hall.
- Repucci, L. C. (1988). Definitions of creativity. Appendix to C. W. Taylor, Definitions of Creativity. In R. Sternberg (Ed.), *The nature of creativity*. Cambridge: Cambridge University Press.
- Roberts, K. H., & Glick, W. (1981). The job characteristics approach to task design: A critical review. *Journal of Applied Psychology*, 66, 193 – 217.
- Rossmann, B. B., & Horn, J. L. (1972). Cognitive, motivational, and temperamental indicants of creativity and intelligence. *Journal of Educational Measurement*, 9(4), 265 – 286.
- Schneider, B., & Snyder, R. A. (1975). Some relationships between job satisfaction and organizational climate. *Journal of Applied Psychology*, 60, 318 – 327.
- Schubert, D. S. P. (1973). Intelligence as necessary but not sufficient for creativity. *Journal of Genetic Psychology*, 122, 45 – 47.
- Selby, E., Treffinger, D., Isaksen, S., & Lauer, K. (2004a). Defining and assessing problem solving style: Design and development of a new tool. *Journal of Creative Behavior*, 38(4), 221 – 243.
- Selby, E., Treffinger, D., Isaksen, S., & Lauer, K. (2004b). *VIEW: An assessment of problem solving style facilitator guide*. Sarasota, FL: Center for Creative Learning, Inc.
- Selby, E., Treffinger, D., Isaksen, S., & Lauer, K. (2004c). *VIEW: An assessment of problem solving style technical manual*. Sarasota, FL: Center for Creative Learning, Inc.
- Sen, A. K., and Hagtvet, K. A. (1993). Correlations among creativity, intelligence, personality, and academic achievement. *Perceptual and Motor Skills*, 77(2), 497 – 498.
- Smith, I. L. (1970). IQ, creativity, and the taxonomy of educational objectives: Cognitive domain. *Journal of Experimental Education*, 38(4), 58 – 60.

- Sternberg, R. J. (1988). A three facet model of creativity. In R. R. Sternberg (Ed.), *The nature of creativity*. New York: Cambridge University Press.
- Sternberg, R. J., & Lubart, T. I. (1999). The concept of creativity: Prospects and paradigms. In R. E. Sternberg (ed.), *Handbook of creativity*. Cambridge: Cambridge University Press.
- Sternberg, R. J., & O'Hara, L. A. (1999). Creativity and intelligence. In Sternberg, R. J. (ed.), *Handbook of creativity*. Cambridge, Cambridge University Press.
- Thompson, D. (1980). Adaptors and innovators: A replication study on managers in Singapore and Malaysia. *Psychological Reports*, 47, 383 – 387.
- Torrance, E. P. (1988). The nature of creativity as manifest in testing. In R. Sternberg (Ed.), *The nature of creativity*. Cambridge: Cambridge University Press.
- Treffinger, D. J., Isaksen, S. G., & Dorval, K. B. (2006). *Creative problem solving: An introduction*. (4<sup>th</sup> Ed.). Waco, TX: Prufrock Press.
- Treffinger, D., & Selby, E. (2004). Problem solving style: A new approach to understanding and using individual differences. *Korean Journal of Thinking and Problem Solving*, 14(1), 5 – 10.
- Webster, P. (1989). *Creative thinking in music: The assessment question*. A paper presented at the Suncoast Music Education Forum, May, 1989. Eric Accession No.: ED378091.
- Wisconsin Department of Public Instruction (1989). A guide to curriculum planning in music. Madison, WI: Author.
- Witkin, H. A., Lewis, H., Hertzman, B., Wapner, S. K., & Meissner, P. B. (1954). *Personality through perception: An experimental and clinical study*. New York: Harper.
- Yamamoto, K. (1964). Threshold of intelligence in academic achievement of highly creative students. *Journal of Experimental Education*, 32(4), 401 – 405.
- Yong, L. M. S. (1994). Relations between creativity and intelligence among Malaysian pupils. *Perceptual and Motor Skills*, 79(2), 739 – 742.

## Appendix A

### Subject Information and Preference Form

The Relationship Between Creative Style and Choice of Musical  
Career In Music Majors

**Personal Information and Preference Form**

Identification Number: \_\_\_\_\_ Age: \_\_\_\_\_ Gender: \_\_\_ Male \_\_\_ Female  
Year: \_\_\_\_\_ Junior \_\_\_\_\_ Senior \_\_\_\_\_ Post Graduate

**Music Major**

(Please Choose Only One)

- \_\_\_ Music Education – Choral/General
- \_\_\_ Music Education – Instrumental
- \_\_\_ Music Therapy
- \_\_\_ Performance (Instrumental)
- \_\_\_ Performance (Vocal)
- \_\_\_ Performance (Keyboard)
- \_\_\_ Performance (Jazz Studies)
- \_\_\_ Musicology (Theory and History)
- \_\_\_ Conducting
- \_\_\_ Arranging / Orchestration
- \_\_\_ Composition

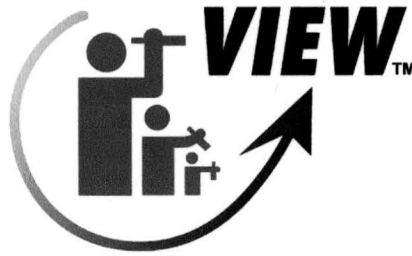
**Musical Activity**

(Please Choose Only One)

Choose the musical activity you would most prefer to  
engage in as a career. It need not be the same as your  
chosen major.

- \_\_\_ Music Education – Choral/General
- \_\_\_ Music Education – Instrumental
- \_\_\_ Music Therapy
- \_\_\_ Performance (Instrumental)
- \_\_\_ Performance (Vocal)
- \_\_\_ Performance (Keyboard)
- \_\_\_ Performance (Jazz Studies)
- \_\_\_ Musicology (Theory and History)
- \_\_\_ Conducting
- \_\_\_ Arranging / Orchestration
- \_\_\_ Composition

**Appendix B****VIEW Individual Report Form**



# VIEW: An Assessment of Problem Solving Style<sup>SM</sup>

## Individual Report Form

**Name:**

**Date:**

### What VIEW Measures

VIEW provides information about your preferences in three areas: *orientation to change* (the *Explorer* or *Developer* style), *manner of processing* (the *External* or *Internal* style), and *ways of deciding* (the *People* or *Task* style).

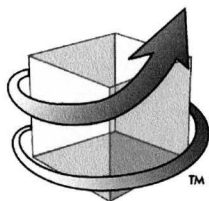
VIEW draws upon the theories and research of several scholars in the areas of personality, cognitive style, learning style, psychological type, and Creative Problem Solving. People use different styles in their approach to defining and solving problems and in their efforts to manage change (on their own or as part of a group).

Use these results as general indicators of your preferred style, and to compare with your own personal reflection and experience. The results will help you to understand your own strengths and opportunities for improvement. They will also provide information to help you in working effectively in teams or groups, managing projects, or dealing with organizational change.

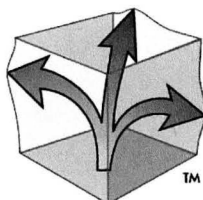
Keep in mind that you should always be open and flexible in your understanding and use of any "scores" from a self-report measure. Do not use the results as if they represented absolute, fixed categories of behavior or kinds of people!

## Orientation to Change

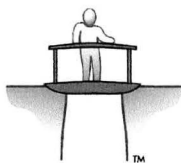
This dimension deals with your preferences for responding to and managing structure, novelty, and authority, when you are dealing with change or solving problems. The questions that represent the principal issues and themes of this dimension are: How do I prefer to deal with boundaries, parameters, and authority? How do I feel about and react to structure? How do I prefer to respond to novel challenges? Your score on this dimension represents your style of approaching change or dealing with problem solving tasks. You may prefer the *Explorer* or the *Developer* style. Possible scores range from 18 to 126, with a theoretical mean of 72. Results below the mean indicate an *Explorer* style. Results above the mean indicate a *Developer* style.



**Explorer Style.** As your score moves closer to 18 you are likely to have a well-defined *Explorer* preference. You may prefer generating new options, and seeking ground-breaking directions for reaching a desired future state. You may have little concern for details, order, and efficiency; you may find structure confining or limiting to your creative problem solving efforts. You may prefer generating many novel ideas that stretch or go beyond the current reality, a spontaneous flow of options, and seeking unusual ideas that may be more challenging for others to accept and apply. You may prefer to follow your own unique pathway (“marching to the beat of your own drummer”), and you may choose not to conform to rules, procedures, or authority that you find arbitrary or that seem to stifle your creativity.



**Developer Style.** As your score moves closer to 126 you are likely to have a well-defined *Developer* preference. You may be strong in focusing activities and prefer a detailed, well-organized approach to problem solving for dealing with the current reality. You may find working in structured situations helpful in managing change and solving problems. You enjoy planning and organizing tasks, and prefer to do that early, carefully, and efficiently in a well-ordered environment. You may prefer to look for a few workable solutions rooted in the current reality; you prefer options that stand a good chance for acceptance and implementation. You prefer having the guidance of those in authority while problem solving, and acting in conformance with existing expectations and procedures.



**Moderate Preferences.** Results closer to the mean suggest a moderate style preference. Lower scores indicate a moderate *Explorer* style, and higher scores indicate a moderate *Developer* style. People with moderate preferences may find it easy to “flex,” or understand and see the value of the approach of the opposite preference, and may be more influenced by other factors (e.g., task, motivation, or situation).



**Your score for Orientation to Change was:**

**Your group's average score was:**

Your group's range of scores was from        to

***Explorer*** 18-----36-----54-----72-----90-----108-----126 ***Developer***

**Implications for the Explorer Style**

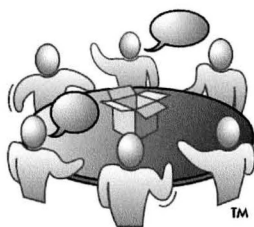
- Works well without structure and authority
- Maintains energy by working on a wide array of tasks
- Gains energy from envisioning the big picture
- Welcomes the freedom to create and follow one's own rules and guidelines
- Sees deadlines as fluid and flexible
- Prefers to work away from guidance or direct supervision

**Implications for the Developer Style**

- Enabled by structure and authority
- Maintains energy through persistence in working on a task
- Gains energy from the details of follow-through and implementation
- Welcomes rules and guidelines for how to complete a task
- Seeks, accepts, and meets given deadlines
- Prefers to work with close guidance or direct supervision

## Manner of Processing

This dimension deals with preferences for how and when you use your own inner energy and resources, the energy and resources of others, and the environment; and for different ways of handling information when managing change or solving problems. This dimension involves asking: How do I prefer to manage information and flow when problem solving? When do I share my thinking? Does interacting with others build or spend energy? Your score on this dimension represents your preferred manner of processing when solving problems or dealing with change. You may prefer the *External* or the *Internal* style. Possible scores range from 8 to 56, with a theoretical mean of 32. Results below the mean indicate an *External* style. Results above the mean indicate an *Internal* style.



**External Style.** As your score moves closer to 8, you are likely to have a well-defined *External* processing preference. If you prefer an *External* approach, you draw your energy from interaction with other people, discussing possibilities, and building one person's thinking on another's. You share your thinking early, seeking input from others to refine and strengthen your thoughts before reaching closure. You may press to move quickly from ideas to action.



**Internal Style.** As your score moves closer to 56, you are likely to have a well-defined *Internal* processing preference. If you prefer an *Internal* approach, you draw energy from opportunities for quiet reflection. You look to your own inner thoughts, considering ideas yourself before you are ready to share them with others. You prefer action that follows careful study.



**Moderate Preferences.** Results closer to the mean indicate a moderate style preference. Lower scores indicate a moderate *External* preference. Higher scores indicate a moderate *Internal* preference. People with moderate preferences may find it easy to "flex," or understand and see the value of the approach of the opposite preference, and may be more influenced by other factors (e.g., task, motivation, or situation).

Your Manner of Processing preference score was  
 Your group's average score was  
 Your group's range of scores was from                      to

**External** 8-----16-----24-----32-----40-----48-----56 **Internal**

#### **Implications for the External Style**

- Prefers social processing and is engaged by the outer environment
- Prefers working in environments with noise and sound
- Learns and works best with others (prefers interaction)
- Learns and works best in several ways
- Learns and takes in information by listening (hearing and talking)
- Prefers freedom to move around when working

#### **Implications for the Internal Style**

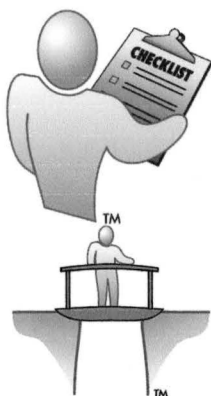
- Prefers private processing and is engrossed in inner events and ideas
- Prefers working in quiet environments
- Learns and works best when alone (prefers solitude)
- Learns and works best with one approach at a time
- Learns and takes in information visually (observing and reading)
- Prefers to stay in one place when working

## Ways of Deciding

This dimension deals with your preferences for balancing and emphasizing task concerns and personal or interpersonal needs when focusing your thinking and moving toward decisions and action. This dimension involves questions such as: What factors get first priority when I focus or decide? Where do I start? How do I make trade-offs? When making decisions during problem solving, you may prefer to consider the *People* or *Task* style as your first or primary emphasis. Everyone can consider both approaches, of course, and will often do so, but your style preferences describe the approach that you tend to emphasize initially, or to which you may often give greater weight or emphasis in decision-making. Possible scores range from 8 to 56, with a theoretical mean of 32. Results below the mean indicate a *People* style. Results above the mean indicate a *Task* style.



**People Style.** As your score moves closer to 8, you are likely to have a well-defined preference for the *People* style when making decisions. If you prefer the *People* style, you consider first the effect or impact of choices and decisions on people's feelings and support, and on the need for harmony and positive relationships. You may give the greatest weight to judgments about people and relationships when making decisions.



**Task Style.** As your score moves closer to 56, you are likely to have a well-defined preference for the *Task* style. If you prefer the *Task* style, you look first at choices and decisions that are logical, sensible, and that you can justify objectively. You "let the chips fall where they may" in the interest of standards and quality issues. You may give the greatest weight to results and outcomes when making decisions.

**Moderate Preferences.** Results closer to the mean indicate a moderate style preference. Lower scores indicate a moderate *People* preference. Higher scores indicate a moderate *Task* preference. People with moderate preferences may find it easy to "flex," or understand and see the value of the approach of the opposite preference, and may be more influenced by other factors (e.g., task, motivation, or situation).

Your Ways of Deciding preference score was  
Your group's average score was  
Your group's range of scores was from                      to

*People Focus* 8-----16-----24-----32-----40-----48-----56 *Task Focus*

#### Implications for the People Style

- Sets priorities based more a personal and caring kind of judgment
- Attends more to relationships and seeking harmony than to outcomes
- Prefers dim or darker environments
- May avoid conflicts or tense situations at the expense of one's own needs
- May skim over facts or information in order to maintain harmony
- Prefers communicating strong points about options

#### Implications for the Task Style

- Prefers well-reasoned conclusions and impersonal judgments
- Works persistently to achieve outcomes
- Prefers bright or more light in the environment
- May address conflicts or tense situations at the expense of others' feelings
- May focus solely on facts and information and ignore emotions
- Prefer communicating what is wrong or needs improvement about options

**Appendix C****VIEW: An Assessment of Problem Solving Style  
Instruction Page**

The publishers of VIEW do not permit replication of the actual VIEW instrument or any of its items. This sheet provides the instructions and a sample item to indicate how VIEW items are constructed. This sheet is printed with permission of the publishers.



## An Assessment of Problem Solving Style<sup>SM</sup>

**Please read these directions before you answer the questions on the other side of the page.**

There are 34 sets of statements that ask you about your preferences when you are solving problems. Read both sides of each line. Then, blacken one of the circles between the pair of statements. Blacken the circle closer to the left or right, so it will be nearer to the statement that best describes your personal preference. Your preference is the way you usually do things when you're solving problems. It is the way of working that is most comfortable and natural for you. Your preference or style is the way you are, *not* the way you might wish you could be, or the way others want you to be!

If *both* statements seem accurate to you, but at different times and to different degrees, blacken a circle on or near the center of the row that best describes how you prefer to balance the two. For each item, think about both phrases, at the left and right, before blackening the circle that describes you best; think carefully about the full range of circles when you are deciding where to mark your response.

**Example:** When I am solving problems, I am a person who prefers...

- |                                 |               |   |
|---------------------------------|---------------|---|
| 1. Working in the early morning | ○ ○ ○ ● ○ ○ ○ | 1. Working late at night                |
| 2. Working at the last minute   | ○ ○ ○ ○ ○ ●   | 2. Working well in advance of deadlines |
| 3. Working on a computer        | ○ ● ○ ○ ○ ○ ○ | 3. Working with pencil and paper        |
| 4. Working in bright light      | ○ ○ ○ ○ ● ○ ○ | 4. Working in soft or low light         |

Item #1 The person prefers balance between working in the morning and working late at night.

Item #2 The person *strongly* prefers to work with plenty of time, not waiting until the last minute.

Item #3 The person *usually* prefers working on a computer, rather than working with pencil and paper.

Item #4 The person *slightly* prefers to work in soft or low light rather than in bright light.

When you make your choice, blacken the circle completely. Please be sure to mark all 34 items. The statements on one side are not "better" than the statements on the other side, but one might be more accurate in describing your own style.

Be sure to enter your name and complete the other information at the bottom of the page. Once you are finished please return the completed page to the individual who sent it to you or where you were instructed to send it.

Thank you!

## Appendix D

Approval Letter From the Human Subjects Institutional Review Board

## WESTERN MICHIGAN UNIVERSITY



Human Subjects Institutional Review Board

Date: April 5, 2005

To: David Smith, Principal Investigator  
David Zmudka, Student Investigator for thesis

From: Mary Lagerwey, Ph.D., Chair

A handwritten signature in cursive script that reads "Mary Lagerwey".

Re: HSIRB Project Number 05-03-25

This letter will serve as confirmation that your research project entitled "The Relationship between Creative Style and Choice of Musical Career in College Music Majors" has been **approved** under the **exempt** category of review by the Human Subjects Institutional Review Board. The conditions and duration of this approval are specified in the Policies of Western Michigan University. You may now begin to implement the research as described in the application.

Please note that you may **only** conduct this research exactly in the form it was approved. You must seek specific board approval for any changes in this project. You must also seek reapproval if the project extends beyond the termination date noted below. In addition if there are any unanticipated adverse reactions or unanticipated events associated with the conduct of this research, you should immediately suspend the project and contact the Chair of the HSIRB for consultation.

The Board wishes you success in the pursuit of your research goals.

Approval Termination: April 5, 2006



Appendix E  
HSIRB Protocol

## Protocol Outline

### Project Description

The purpose of the study is to determine any possible relationships that exist between an individual's preference for a given creativity or problem solving style and their choice and/or preference for a given music major or musical endeavor. Participants in this study will fill out a short questionnaire in which they will indicate their declared music major, preference of musical endeavor, gender, age, and class level (junior, senior, graduate student). They will also complete a survey instrument entitled VIEW that will determine the participants' creativity/problem solving style. This research is to be a simple correlational study, although it may have some causal-comparative facets as well. Data for this study will be collected on campus at Western Michigan University's School of Music. Subjects will be School of Music junior, senior and graduate student volunteers found in instrumental performing ensemble classes offered by the School of Music. The number of subjects will be limited to the 90 available copies of the VIEW test instrument. We will attempt to have similar numbers of subjects for each area of study in music (i.e., education, therapy, performance, jazz studies, etc.). The questionnaire and VIEW test instrument will be administered at the School of Music the total time for briefing students, answering questions and filling out the forms should take less than 30 minutes of the subject's time. The results of this study will be disseminated by means of a Masters Degree Thesis and any use or publication by The Center for Creative Learning, the copyright owners and providers of the VIEW instrument used in this study.

### Method of Analysis

Standard correlational analysis will be made for each score relative to both the chosen and the preferred musical profession of each subject. In addition, appropriate graphical representations of the data collected will be made to aid in the analysis.

### Benefits of Research

If the correlation between creativity style and career choice is established it may provide an argument that music educators ensure that a variety of musical creativity projects at both the elementary and secondary levels are provided for students. This knowledge may help students understand what their preferred creativity style is, that creativity styles vary, that no one style is more valued than another, and how to vary their creativity style to fit a given situation. Music educators, if properly trained, should be able to judge creativity assignments, based on both style and quality (level) criteria, not on a quality criteria for one style alone (most creativity is judged against an innovator or explorer style criteria). This may allow educators to guide students to explore differing creative styles, compare and understand how one student's style

differs from another student's, as well as guide students towards musical careers suited to their creativity style preferences. Aside from these hypothetical benefits, subjects can expect no direct benefits from participation in this study.

### **Subject Selection**

Subjects will be contacted and recruited through instrumental performing ensemble classes, music therapy classes and music education seminars (instrumental) offered at the WMU School of Music, with the permission of the instructor for those classes. Instructors will be asked to leave the room before recruitment of volunteers begins. This arrangement will be made when I am securing permission to recruit from the instructor. Recruitment will begin (if approval is given early enough) before the end of the current semester, April 15, 2005 in these classes. Recruitment will continue into the Spring and Summer sessions in a selected music education seminar. Because there are only 90 VIEW Assessments available, recruitment may be limited only to those subjects recruited before April 15 if the number of participants leaves too few VIEW Assessments for further recruitment. The following script will be used to recruit subjects from these groups:

(We will assume an introduction by the ensemble director or instructor.) Thank you Dr. \_\_\_\_\_. As you said, I am working on my Master's Thesis, which is a research paper entitled "The relationship between creative style and choice of musical career in college music majors." We're all creative aren't we? If you are interested in how you prefer to exhibit your creativity, you may find this study of interest. The purpose of this study is to determine if creative style plays a part in our choice of music major. Part of this research is to collect and analyze data. In order to collect appropriate data, I am looking for majors in Music Education, Music Therapy, Performance and Jazz Majors. If you fall into one of these categories, I would like to invite you to participate in this study. To do so, all you will need to do is fill out two assessment forms. Before you fill them out, I will discuss the basic concepts of creative style, read the instructions for the assessment forms, and give you some information regarding your consent to participate in this study. It should take no more than half an hour to complete. Please understand that participation is strictly voluntary. If you are interested in continuing, please meet me at the front of the room after you have put away your instrument and we will proceed. Thank you.

Data collection will begin immediately after potential subjects have agreed to participate. Should a potential subject express a willingness to participate, but is unable to do so at that time, an alternate time and place will be suggested to accommodate their schedule.

**Risks to Subjects**

Because this is a relatively short (10 – 15 minute) paper and pencil measure, there should be no physical, psychological, or emotional risks for the subjects that agree to participate in the study. Total time required for introduction, reading of consent form and VIEW assessment instructions, and answering questions should not exceed 30 minutes or so. Because data collection for this study will be conducted out side of classes, there will be no risk of lost class time for student participants.

**Protections for Subjects**

At no time during recruitment of participants will any statements be made that may be interpreted by potential subjects that they “should” or “need” or “will want” to participate in this study. They will only be told they may find this study and the results that will be supplied to them “of interest.” Should any subject express discomfort with any of the questions asked in this study, they will be allowed to withdraw immediately. While recruitment will take place in classes, data collection and participation in the study will take place outside of these classes nor will they be under the supervision of any of the subjects instructors or professors.

**Confidentiality of Data**

Since this study will be administered anonymously, subjects will be instructed to not attach their name to any of the documents distributed for this study. Should a name be placed on a document, it will be removed. In addition, no personal information aside from major, musical endeavor preference, gender and class level will be collected..

**Instrumentation**

See attached VIEW instructions and assessment items and the Personal Information and Preference Form.

**Informed Consent Process**

A simple informed consent document will be included as a cover for each set of documents provided to each subject. Subjects will be advised to read the informed consent document as the student researcher (David Zmudka) reads it out loud, and review the test instrument before beginning to fill it out. The opportunity to refuse participation will be offered before instructing subjects to begin. The following script will be used for the informed consent process and reading of instructions for completion of the VIEW Assessment:

First, I would like to thank all of you for volunteering to participate. As I mentioned, this study concerns creativity and creative style and your choice of music major.

Before we begin, I would like to give you a little background information that will help you understand the substance of this study. If you have any questions at any time, please raise your hand and I will be happy to provide an answer. Earlier I posed the question "We're all creative aren't we?" Before I answer that question, I should quickly describe what creativity is. Creativity is about problem solving. It is a type of problem solving that involves the qualities of uniqueness, novelty, and usefulness. Not all problem solving can be judged to be creative, but all creativity is problem solving. As musicians, we encounter a number of "musical problems" including performance problems, expressive problems, theoretical problems, teaching problems, and so on. So once again, I ask the question: "Are we all creative?" The answer is absolutely! The next question I would ask is: "Are we all creative in the same way? The answer is absolutely not! Each of us will prefer to solve problems in different ways or styles. We will also have a preference for the kinds of problems we choose to solve based on that preference. One way to illustrate this is to look at different individual we could all consider to be creative., for instance Back, Mozart, Leonard Bernstein, Yo Yo Ma, Dr. Spradling, Dr. Jones, or Dr. Sheldon, or perhaps any of you. Perhaps the easiest difference to identify is one of level. We could all offer an opinion as to who is the most creative person on our list. But are all of these people creative in the same way? Every one of these people goes about their creative problem solving differently, or have a different styles of problem solving that they prefer to use. So what exactly is creative or problem solving style? Please refer to the first sheet I have handed out entitled "VIEW: An assessment of problem solving style". This sheet is a brief summary of what problem solving style is and what the VIEW Assessment measures. Please follow along as I read and explain some of the points on this sheet. (When finished reading.) The important point to remember is that your style is how you prefer to go about problem solving, even though you may not always be able to problem solve the way you would like!

I will now pass out the VIEW Assessment packets. Please, do not write on them until you are instructed to begin. (Pass out packets.) First, we will review the Survey Consent Notification Letter. Please read along with me. (After letter is read.) Does anyone have any questions about this consent letter? (Time will be allowed for students to ask any questions be continuing.) Now I will read the instructions for the VIEW Assessment. Please follow along. Now I would invite you to quickly look over the Major Preference Form and the VIEW Assessment. (When finished.) Are there any questions concerning these instructions or either of the assessments? Please remember that participation is strictly voluntary. If you do not wish to continue, you may remain in your seated until others have completed the assessment, or you may leave at any time, whichever you prefer. If you are not participating, please leave the VIEW assessment blank. (Any participants that get up to leave will be instructed to deposit the unfinished form in the box marked VIEW.) If you are ready, please begin. When you are finished, don't forget to keep your claim ticket and drop your completed form in the "VIEW" box. Thanks for your participation.

## **Other**

The publishers of VIEW require that feedback be provided to each respondent. The also require that the VIEW Assessment be scored by a certified VIEW user. (In this case, the certified VIEW user is the student researcher, David Zmudka.) In order to meet these requirements and maintain anonymity, each set of responses will be assigned a number. Each respondent will be given a ticket with that number and will be able to claim their VIEW scores and results, including a brief explanation of the results, on Individual Response Forms that I will provide, as described in the Informed consent Form. Subjects will be able to claim their results in the School of Music Office. The results provided should be self explanatory (please refer to sample results). Should the subjects have any questions concerning their results, they will be able to call me for further explanation, using the phone number provided.

## Appendix F

## HSIRB Informed Consent Notification Letter

WESTERN MICHIGAN UNIVERSITY

H. S. I. R. B.

Approved for use for one year from this date:

APR 05 2005

x *May Laguerre*  
HSIRB Chair

## Western Michigan University School Of Music

### Anonymous Survey Consent Notification

**Principle Investigator:** Dr. David Smith

**Student Investigator:** David Zmudka

As an upperclassman or graduate student enrolled in the School of Music, you are invited to participate in a research project entitled "The relationship between creativity style and the choice of musical career in college students". This study is part of David Zmudka's Master's Thesis.

You will be asked to provide some general information about yourself including your choice of music major, your preference of musical endeavor, as well as class level and gender. If you choose not to answer a question, simply leave it blank. In addition, you will complete a questionnaire called VIEW: An Assessment of Problem Solving Style. VIEW is a 34-item assessment tool that takes approximately 10 – 15 minutes to complete. Please remember that this is not a test, but an assessment of your creativity style, or how you prefer to solve problems. There are no "right" or "wrong" answers. Your response for each item should reflect what is most natural or comfortable for you, how you **prefer** to respond to each situation, not how you think or wish you could, or what you perceive others might expect of you. After you complete the assessment, please return it to me. It will take me approximately a week to complete, tabulate and analyze the scoring. Once I have scored the assessment, you will be provided with an Individual Report Form that will help you identify and understand your personal approach and preferences regarding change and problem solving. This information may help you to recognize and apply your creative strengths within your area of specialization, or in any situation requiring creativity or problem solving. You will be able to pick up your Individual Report Form at the School Of Music Office. VIEW, drawing on theory and research from learning style, creativity style, personal type, and cognitive style, builds on contemporary theory and research on creativity, innovation, change management and Creative Problem Solving. It is important to remember, there are no right or wrong answers to the questions you will answer in VIEW. You will simply record your preference for each item.



WESTERN MICHIGAN UNIVERSITY  
H. S. I. R. B.  
Approved for use for one year from this date

APR 05 2005

x *May Lagravy*  
HSIRB Chair

You will be given the opportunity to review the questionnaire and the VIEW Assessment before filling them out. Should you choose not to participate in this study, please return the blank documents to the box marked VIEW when we are finished. Should you choose to participate in this study, returning the completed documents indicates that you consent to the use of the answers you supplied in this study. Once you have completed the assessment, please place it in the box I have provided, marked "VIEW". Please detach this consent notification and the ticket stub so you can claim your results. Please do not detach the Major Preference Form from the VIEW assessment. If you have any questions or concerns regarding this study I will be happy to answer them, or you may contact any of the following: Dr. David Smith (269-387-4672), David Zmudka (616-459-0354), the Human Resource Institutional Review Board (269-387-8293) or the vice president for research (269-387-8298).

Do not place your name anywhere on these documents. It is intended that all participants in this study remain completely anonymous. All data collected will be kept completely confidential. In order to maintain anonymity, each document will have a numbered ticket attached to it. Please detach the ticket stub so you can pick up your results from the School Of Music office after April 12, 2005.

This consent document has been approved for use for one year by the Human Subject Institutional Review Board as indicated by the stamped date and signature of the board chair in the upper right corner. Do not participate in this study if the stamped date is more than one year old.