

MUSIC, IMAGERY, AND EMOTION: AN EXAMINATION OF IMAGERY  
AND EMOTION RESPONSES TO MUSIC

by

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Music, Imagery, and Emotion: An Examination of Imagery  
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## ABSTRACT

Art, especially music, has long been thought to express emotion; its ability to evoke that emotion in the viewer/listener is often a criterion of its success. However, little psychological research has been done to determine whether the common impression that art conveys emotional meaning and that the listener or viewer understands and/or feels that emotion is valid. Most theories of emotion do not discuss the communication of emotion through non-verbal artistic media.

In the Gestalt-based Experiential theory, emotional experience is a function of patterns of imagery, plus basic affect qualities such as pleasant-unpleasant, which can arise either from the structural characteristics of the external stimulus, or from internal stimuli such as imagery and thought.

Thus, when music is presented, the emotional experience would be a function of the structural characteristics of the music, which would give rise to common patterns of imagery and affect. There would be definite emotions expressed by the music, and evoked in the listener, and common patterns of imagery, which would be similar in theme rather than in concrete content.

The present research studied the imagery and emotion (both recognized and felt) reported by 60 subjects in response to music stimuli of six widely differing music styles. ANOVA analysis for repeated measures revealed that there were common patterns of both imagery and emotion. The imagery was coded for references to people, places, objects, activities, time, and

descriptive adjectives, and for qualities such as simple vs complex, and stimulus bound vs incidental. A significant difference was found in responses to the different music stimuli in almost every referent and quality. Emotion responses were also shown to be significantly different for the music stimuli. A phenomenological analysis of characteristic themes was also conducted.

It was concluded that music does convey expressions of emotions which can be recognized and felt by subjects. Contrary to C. Valentine's view, common patterns of imagery were reported that differed for the different music stimuli. These common patterns of emotion and imagery were related to the characteristic theme of the imagery reports, indicating that these patterns of imagery and emotion appear to convey an overall theme or meaning, which may be related to the theme or meaning inherent in or associated with the stimuli. These findings are consistent with the hypotheses of the Experiential theory of emotion.

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## A. Introduction

Art, including painting, poetry, sculpture, dance, theatre and music, has long been thought to be an expression of the heart, of the emotions (Arnheim, 1969). Of all expressions of communication, artistic expressions have been deemed to be a universal language. Art would not be successful if it did not convey the artist's intention to the viewer, reader and listener. As Bell (Arnheim, 1969) notes, art both expresses and requires emotion. Arnheim sees the judgement of meaning, necessitated by the indirect and often irrational nature of art, as accomplished by emotion. It is the heart which understands art; logic cannot.

The message conveyed by art is not conveyed directly, through language or logic. Even poetry uses obscure imagery and seemingly irrational associations to convey its meaning or sense. Music, the most non-representational artistic medium, both non-verbal and non-visual, has often been thought to be the oldest, most universal, and the most accurately understood medium. Certainly it underscores emotional experience, and has even been used for that purpose by other mediums, such as film, poetry, dance and theatre.

Yet this relationship between art and emotion has been infrequently investigated by psychology, and has even been disputed by some researchers (Valentine, 1963). Philosophers,

art critics, and artists themselves have long asserted that one of the principle purposes of art is to express an emotion, to convey the artist's, writer's or musician's insight into the emotional realm (Lawrence and O'Connor, 1967). Further, artists have also long asserted that vivid imagery is involved in the creation of art (Vernon, 1970). But, although the psychology of the aesthetic experience was extensively examined through the use of introspection in the 1920's, since then and until relatively recently, the question of the role of emotion and imagery in the aesthetic experience has been largely an unexplored field.

Currently, the study of conscious experience through introspective methods has recently begun to be re-accepted (Pope & Singer, 1978), especially in the study of those aspects of human experience, such as aesthetics, that only an introspective method can adequately examine. Psychology has again taken up its study of aesthetics. Yet questions concerning the role of emotion and imagery in the aesthetic experience remain where they have been posed by philosophers. Little psychological research has been done to determine if the common impression that art conveys meaning, especially emotional meaning, which would result in the universal experience, or at least understanding, of that meaning, is in fact valid. An important step in the study of the aesthetic experience would be to establish whether art, with its indirect and symbolic language, can convey more or less universally understood meanings,

especially emotional meanings.

Once it has been established that art does evoke common experiences, it remains to be determined how art accomplishes this communication of emotion. Many theories of the psychology of emotion do not examine this seemingly universal and cross-cultural artistic communication of emotion (Plutchik, 1980). The psychological theory or group of theories that do relate art and emotion are the Gestalt, Existential, or Phenomenological theories. Hogg (1969) chose Arnheim's (1949) Gestalt theory of emotion expression in art for his review of the Psychology of Aesthetics, and Krietler and Krietler (1972), also relied upon Gestalt theory to help understand the phenomena of emotion expression in the arts. Unlike other theories of emotion, which rarely address the question of the communication of emotion, apart from facial expression, the Gestalt viewpoint can accommodate the puzzling phenomena of the apparently successful communication of human subjective experience through often non-verbal, even non-representational mediums. A specific Gestalt theory of emotion, the Experiential theory (Lyman, 1982) may be a particularly apt theory of the relation between emotion and art.

There are several unanswered questions in the examination of the role of emotion in the aesthetic experience. First, it must be determined whether there is emotional meaning conveyed by art. Then, if there are emotions intended by the artist, it should be determined if they are successfully and universally

conveyed to the audience. Finally, it remains to be seen how this communication of emotional meaning can be accomplished by an indirect and nonlogical medium such as art, and whether the Gestalt or Experiential theories can account for this phenomenon.

## **B. Historical Background**

## I. Philosophical Views of the Aesthetic Experience

Philosophers have preceded psychologists in realizing that an experience can best be understood by reflecting on the subjective description of the experience. Philosophical discussions of the aesthetic experiences often begin with an intense, thorough and deeply reflective description of the experience. Before an examination of the role of emotion in aesthetic experience, it is necessary to discuss what is meant by the understanding and experience of emotional meaning in art, as well as whether it does indeed occur in the aesthetic experience. Philosophical speculation regarding the operation of this emotion understanding in art should also be discussed.

A preliminary review of the quality and aspects of the aesthetic experience reveal recurring references to the emotional component of the experience. Bell (Arnheim, 1969) asserted that the starting point for all aesthetics is the personal experience of an aesthetic emotion. Art expresses and requires emotion. Arnheim (1969) thinks that "art presents sensory patterns, images and thoughts not for their own sake, but as forms transmitting something else", that is, emotions. Fry (Arnheim, 1969) called art "an expression of emotions regarded as ends in themselves", and implied that it is the particular visible or audible feature of the art that determine the reactions of the observer.

Arnheim (1969) sees art as having effects on several dimensions; 1) there is a perceptual, direct impression of relation or tension that is immediately perceived. 2) There is a judgement of correctness or harmony that may involve cognitive faculties, and a sort of intuitive judgement of right and wrong that he notes seems to be below conscious awareness. 3) Since painting is representational, it requires judgement of meaning, which seems to be accomplished by emotion. Art not only conveys information, it makes the observer feel these states personally.

Langer (1967) quotes Campbell-Fisher that "art invariably has...expression. All sense materials and their organization are intrinsically expressive." Emotion import can be perceived directly. Dessoir (1970) notes that the beginning of the aesthetic experience is an immediate emotional reaction. Without reflection, one knows at once if something is pleasing; there is an immediate emotional reaction of pleasure or harmony evoked by the sensations of the aesthetic object, the form of the object, and the symbolism of the form. This latter attribute then gives rise to additional images, concepts and feelings. The art object, such as music, will arouse feelings in the listener with its formal qualities such as volume and harmony, as well as through the ideas and images aroused by the music.

Berleant (1970) notes that "emotionalist" theories of art are widely held, and that it is hard to dispute that an emotional component can be discerned in the experience of art.



However, although the philosophy of aesthetics tends to agree that art evokes emotion, there does appear to be a variety of definitions of emotion in question. It is therefore necessary to clearly state which type of emotional reaction to the aesthetic object is to be discussed.

Even though one may conclude that there is an emotional component to the aesthetic experience, it is important to note that the emotion can be of several different sorts. When an observer or listener encounters an aesthetic object, as when he encounters any object, he may have several emotional reactions: a) He may not recognize any feeling, either in the object or in himself. b) He may recognize a feeling as being expressed by the object, but not feel it personally. c) He may feel it somewhat, but with some detachment or distance that allows an accompanying aesthetic pleasure that would not be possible in real life (Arnheim, 1969; Dessoir, 1970; Tilghman, 1970). d) He may be totally flooded by the emotion, so that he loses awareness of self and of surroundings (Arnheim, 1969; Lawrence and O'Connor, 1967). e) In addition to the feelings that may be aroused in the observer that are congruent with the feelings expressed by the art object, there may be other, accompanying emotions. There may be feelings aroused in reaction to the art object, as though the art were a person with whom one has a relationship (Dessoir, 1970; Langer, 1967). Thus, the observer may understand and empathize with Othello or King Lear, yet feel impatience or disgust towards them. f) In addition to these feelings, there may

be, and it can be argued, usually are, aesthetic emotions of pleasure in the form and/or content of the art (Dessoir, 1970; Lawrence and O'Connor, 1967). Quite apart from the emotion expressed by the art, there may be an enjoyment of the way in which the art expresses the emotion or ideas. This "aesthetic emotion" differentiates the aesthetic experience from the experience of other expressive objects. That is, not only does art evoke emotion, ideas and images, as does any other object encountered in the world, but it also evokes an aesthetic emotion of pleasure or displeasure with its form.

For the purposes of this examination, however, the emotion expressed by the art object, and in turn evoked in the individual, is the only emotion response to be discussed. The definition of emotion in art, in this case, will be limited to that of the emotion expressed by the art, and either understood by, or both recognized and felt by the experiencer.

Since the parameters of the discussion have been demarcated, philosophical theories concerning the operation of this emotion expression and understanding in the aesthetic experience can be discussed. Arnheim (1969) notes that aestheticians in general see emotional meaning or understanding as attributable to an inborn cognitive faculty in the organism, rather than to association or learning. Lawrence and O'Connor (1967) agree with the "projection" theory of emotion in art. The art object is engaged with, as if it were a person, and the observer or listener adds or projects onto the object those

emotions it would have if it were another person. Once projected onto the object, there then arise similar feelings in the observer. The observer poses and gives reality to the art object, as though it were a person with whom he had a relationship, projects onto the object those emotions he would feel, and then feels similar emotions himself, as he would in a relationship.

Langer's theory (1967), congruent with Gestalt theory, proposes that art expresses emotion directly and intrinsically. The art object must be taken as a whole, and as a whole it presents a single symbol, the artist's theme. Referential meaning, formal organization, and emotional expression are all aspects of the theme. As a symbol, art is constructed by the artist in the imagic mode, but Langer sees the image as arising spontaneously from the emotion. The imagination "reflects the forms of feeling from which it springs". Thus, the work of art, as a creation of the imagic mode, is like a metaphor; it can be immediately understood, without translation. Imagery arises from emotions, and art, as the constructed symbol that is a realization of the mental image, immediately, and directly conveys its emotional expression.

Dessoir (1970) traces the emotional effect of art to the operation of empathy, which may be bodily mediated, associative, and/or direct. Dessoir thinks that the important type of empathy is direct; for example, the impression made by music should be attributed to the direct empathy. Without any previous

associations, sad music makes one sad, and gay music makes one gay. However, Dessoir thinks that there are also some individual associative factors involved, since empathy is not cross-culturally invariable.

Feelings are also aroused in the listener "not only by the music itself, but also by the concrete image" (Dessoir, 1970,p.289). A composer may intend to express the idea of a storm; the listener may hear it as a storm, or as human anger, or war. But no listener would take the storm to be a dance of maidens, or a peaceful country scene. There may be concrete differences between the ideas expressed and those associated by the individual listener, but the music does indeed define an area of idea. The music relies on emotional effects connected with these ideas to enhance the expressive value. Thus, in Dessoir's view, imagery and ideas associated to the music will tend to be essentially similar to the composer's intended meaning, and contribute to the overall empathic emotion.

Dessoir (1970,p.295) argues that the meanings conveyed by music are largely unlearned; the listener understands and enjoys the process empathically. "Since we have an innate ability to express emotions in sounds", (for example, through tone of voice and rhythm of speech), "we re-feel what appears in many pieces of music". The form, the pattern and the unity express a general concept, a theme of an idea and feeling, which may be concretely different among listeners, but is essentially or thematically the same.

Tilghman (1970) radically disagrees with these suggestions. He thinks that, if emotion does occur in reaction to an art object, it is caused by a fusion of physical sensations, evoked by the physical object, with memories and associations. He subscribes to the James-Lange view of emotion and sees emotion as largely a physical sensation caused by a physical object. The emotion expressed in art is understood and interpreted through memories and associations of emotion experience in everyday life.

This brief review of philosophical views of the role of emotion in the aesthetic experience indicates that emotion does seem to be expressed by music and art. Some theories that have been proposed to explain the operation of the expression and understanding of emotion include direct perception, empathy, projection of the observer's feelings onto the art object, or through associations of images, ideas and feelings from past experience.

## II. Previous Research

Previous research of the emotions expressed and evoked by art, specifically music, generally consists of three types of investigations. One style of research has tended to study the emotion effects of single tones, or of simple sequences of meaningless notes. Another examines the emotions evoked by each of the elements of musical form, such as rhythm, melody, and consonance. A third style, popular with the introspection studies of the 1920's, uses meaningful, composed musical selections as stimuli. These three types of investigations, which have yielded different information, are discussed below.

### Emotional Effects of Simple Sound Sequences

Schoen (1927) found that single notes evoked consistent judgements of pleasant or unpleasant, with major 3rd as most pleasant and minor 2nd as most unpleasant. He concluded that there were definite physiologically based sensory feeling tones that will influence responses to music, although past experience does seem to influence these judgements somewhat - unpleasant notes can become less unpleasant with experience.

Chandler (1934), like most other researchers, emphasized the whole melody rather than the parts. However he found some

pleasant/unpleasant effects of single tones. The intensity of tone was found to affect expressive judgements. The softest tones evoked indifference or unpleasant judgements; the medium tones were pleasant; and the loud tones were unpleasant. The sequence - contrasts, increases, and decreases in intensity effects - was also found to influence intensity effects.

Chandler discusses the musical convention that the major mode is "bright, clear and joyful", and the minor mode is "dark, sad, and yearning". He thinks that this convention is possibly due to tradition and past experience, since the Greek interpretation was the reverse. The Lydian or major mode was thought to be voluptuous and orgiastic or sad, and the Dorian or minor mode was seen as dignified and military. Heinlein (1928) found that most subjects considered high pitches to be bright and happy, and low pitches to be gloomy and sad, and that major and minor modes don't divide clearly into these two emotional classes. Loudness and pitch could reverse the emotion (a loud chord is rarely soothing, while a soft chord frequently is soothing), and there was little correspondence when a composition, rather than a single note, was used as the stimulus.

Chandler also notes that a single note can signify an emotion by its timbre and force. Different instruments can also suggest different moods. Meyer (Chandler, 1934) has suggested that rising intervals suggest strain, and falling intervals suggest relaxation; Chandler suggests rising as indicating

"wandering" and falling as return. The speed of the sequence of notes can also have emotional significance.

Valentine (1962) also found a pleasant and unpleasant list of intervals similar but not the same as that found by Schoen. He also found the major 3rd to be the most pleasing, and the minor 2nd the most disliked. On the whole, he found that consonant intervals were more pleasing than dissonant. Major 3rd and Major 6th were described as sad twice as often as minor 3rd and minor 6th, contradicting the convention that the minor chords produce sadness.

Kreitler and Kreitler (1972) note that loud and high-pitched music seems happy, exciting, or triumphant. Dissonances and complexity in harmony suggest sadness. Traditionally, the major modes are associated with strength, joy, and brightness, and the minor modes with gloom and sadness.

Berlyne (1974), using single note sequences which were totally constructed and unmeaningful, studied familiar and unfamiliar sequences and dissonant and consonant sequences in terms of pleasantness, beauty and melodiousness. His studies showed that a moderate degree of "uncertainty" was most pleasing and most beautiful. In terms of judgements of melodiousness, there was found to be an inverted U shaped function: as uncertainty level went up, melodiousness increased to about the middle, then decreased as the uncertainty level continued to rise. He also found that "incongruous" sequences were termed more ugly, bad and awful, still, passive, heavy, sensuous and less



pleasing. Uncertainty again showed an inverted U shaped function, with "good" judgements in the middle range of uncertainty.

When the researchers then looked at behaviour, in terms of choice of music sequence, they found that choice increased with level of uncertainty, to a point, at which it leveled. There was a tendency to choose a congruous (67%) sound rather than an incongruous one. The researchers concluded that there is a tendency to choose both a more pleasant sequence, and a more complex one; the probability of selection depends on both pleasingness and activity or complexity. Individuals differ in the degree to which their choices depend on these factors, but subjects tend to shun incongruous sequences.

Parham (Alloway et al, 1972) found a close association between listening time and pleasingness, and a lack of a firm connection between these two and complexity or interestingness (unlike visual forms). Judgements of pleasingness seemed to depend mainly on pitch and consonance. Parham notes that these results may have to do with his use of single sounds.

When Crozier (Alloway et al, 1972) studied sequences, he found a generally U shaped curve of pleasingness, beauty, listening time, and choice for uncertainty. Interestingness and complexity, unlike single tones, affected listening time. A sequence tended to be termed interesting if it was uncertain at first, with later organization.

Many researchers into the emotional effects of music began with this elementistic approach, reasoning as does Berlyne (1974) that this sort of elementary analysis is necessary if knowledge is to be gained in each of the thousands of formal aspects that compose a work of art (Alloway et al, 1972). Other researchers (Chandler, 1934) examined the effects of the formal structures of which music is composed, including rhythm and melody, since the effects of each note is often modified or changed by the notes that precede or follow it. Many of the formal characteristics of music, such as harmony, rhythm, and especially melody, can only be experienced when presented as a meaningful sequence of sounds, not as a single sound or random sequence.

### Emotional Effects of Musical Structures

Qualitative attributes of music include such qualities as rhythm, intensity, pitch, tone, speed, shape, and orderliness (Ostwald, 1963), and such musical structures as melody and harmony. The different instruments used would also contribute to the quality of the music.

#### A. Rhythm

Ostwald (1963) defines rhythm as a regular and predictably recurrent temporal pattern. Rhythm is not experienced if sounds

are not divided by time (pauses, etc) or by accent (Dessoir, 1970). Given a division by time, the Gestalt laws of organization suggest that the hearer will himself provide accents. Chandler (1934) terms rhythm "an organization of time relations". Rhythm is organized into meters, a rhythmic line of enclosure or frame. Kreidler and Kreidler (1972) note that the basic meter is the basic framework which facilitates perception of music and lends it unity; it is immediately and spontaneously grasped.

Many researchers (Chandler, 1934; Valentine, 1962) note that listeners have images of movement, or impulses to move or dance to music. This may be related to rhythm. Vernon (Valentine, 1962) thought these motor responses are capable of evoking the emotion they characteristically accompany. Clyne (1980) also found small muscular finger twitches characteristically associated with different emotions. Perhaps the emotion effects of music may be related to these rhythm induced impulses to movement.

Hevner (1935) found more direct emotion effects of rhythm. "Firm" rhythms are vigorous and dignified, and "flowing" rhythms are happy, graceful, dreamy and tender. Rhythm did not seem to determine excitement, satisfaction or serenity.

A study of Amerind songs (Gundlach, 1932) found that the degree of rhythmic staccato or punctuation was related to excitement. Healing songs have only 19% "rough" rhythms, love songs have 25% and war songs have 48%.

Gatewood (Valentine, 1962) found that rhythm was the most outstanding factor in four of the compositions she used, and melody the most outstanding in another four. The emotions associated with the rhythm selections were "happy" or "excited", while melody selections had emotions of "serious" or "rest". Gatewood also found a direct relationship between rhythm and feelings of movement (Schoen, 1927).

Kreitler and Kreitler (1972) note that fast paced rhythms are exciting, stirring, agitated and could be unpleasant, or joyful, and triumphant. Slow rhythms may "disenergize", as monotonous beats can hypnotize. Moderately slow rhythms are experienced as sad, calm or dignified. Kreitler and Kreitler also related rhythm to kinaesthetic motor impulses, similar to Clyne's (1978) sentics.

Dessoir (1970) notes that speech has inherent accents and rhythms which have significance for the expression and understanding of emotion, and thinks that rhythm is the first operative medium of expression in music.

## B. Harmony

A single sound is composed of definite tones, which may be, but usually are not distinguished in consciousness (Dessoir, 1970). Simultaneous sounds combine to form a unity. If they wholly fuse, as in the octave, there is perfect consonance; if they strongly resist fusion, they are termed dissonant.

Congruent with the Gestalt laws of perception, tones close to one another are easier to combine subjectively than either tones that are very distant or tones from different scales. Chandler (1934) notes that whether a sequence is harmonious depends on whether the listener can fuse two tones into one, or hear them blending or smooth, if still separate. The quality of consonance and dissonance implies a pleasant aspect to the first, and an unpleasant to the latter. Dependent as it is on the listener's perceptual organization, it has been found to change with time, practice and familiarity. With experience discords become less displeasing with some subjects (Valentine, 1962).

Gatewood (Schoen, 1927) found that a harmonic effect correlated with a feeling of sensual satisfaction and ideational effect. Kreidler and Kreidler (1972) found that, apart from the pleasant and unpleasant aspects to consonance and dissonance, dissonances and complexity in harmony suggest sadness. Hevner (Valentine, 1962) concluded that complex, dissonant harmonies are exciting, agitating, vigorous, and inclined, paradoxically, to sadness, and simple, consonant harmonies are happy, graceful, serene, and lyrical.

### C. Tempo

Chandler (1934) defines tempo as the rate at which tones succeed each other - what Oswald (1963) calls "speed". Chandler notes that rapid tempos contribute to the expression of gaiety,

agitation, threat or flight, and slow tempos to majesty, reverie or despair, although he adds that tempo must be considered in association with other factors. Valentine (1962) also notes that fast tempo makes the music seem happy, while slow tempo or movement is solemn. Rigg (1940, 1964) also notes the emotion effects of tempo; in his view, tempo is an important determiner of mood.

#### D. Instruments

Both Chandler (1934) and Gatewood (Schoen, 1927) note that different instruments suggest different moods. Gundlach (1935) found that certain judgements tended to occur more frequently with some instruments than with others, although the music as a whole had more influence than the specific instrument used. Brass seemed triumphant or grotesque, woodwinds seemed mournful, awkward and uneasy. The piano seemed delicate, tranquil, sentimental or brilliant, and strings seemed glad.

#### E. Melody

Chandler (1934) defines melody as a wholistic structure effect, and notes that it coheres when there are no violent changes of tempo or rhythm, force, timbre, or pitch, and no intervals longer than an octave. Small and consonant intervals

favor coherence, as does a sense of finality, of an ending that seems complete and finished. Schoen (1927) found that melodic perception depends on 1) sameness or difference in pitch, 2) change in direction of notes, 3) the first and last, highest and lowest notes, 4) extent of change of notes, 5) subdivisions of tonal fragments, 6) pitch proximity, 7) association of the melody with a familiar fragment. Particular notes are not important in conveying the melody, as a sense of melody remains the same, irrespective of the particular notes chosen, as long as the relationship between the notes remains the same (Chandler, 1934; Valentine, 1962).

Kreitler and Kreitler (1972) also note that a melody is more than a sum of its elements. Perception of melody, like perception of form, depends on the Gestalt principles of good organization, such as proximity, size of intervals, continuity, and set. Pitch and intensity or loudness provide figure/ground perceptions. The central organizer of the melody is the musical theme; changes in the melody keep the theme constant.

Washburn (Kreitler and Kreitler, 1972) found that melody was most frequently cited as a source of pleasure, then rhythm, then harmony, design and tone colour. Kreitler (Kreitler and Kreitler, 1972) found that subjects noted a change in melody as disturbing or disagreeable, and attributed this to his theory that melody is the chief source of emotional meaning, although he notes that it could also mean that melody attracts more attention, or is easier to grasp as a gestalt.

Ostwald (1963) reviews early theories of the emotional states evoked by melody, and quotes Marpurg's 18th century survey of music and emotion, some of which follows. Marpurg found sorrow was evoked by a slow, languid melody, and dissonant harmony, while happiness was associated with fast movement, an "animated" melody, warm tone colour, and more consonant melody. Contentment had a more "steady and tranquil" melody than happiness. Repentance had elements of sorrow, with a more "turbulent, lamenting" melody. Fear was evoked by tumbling, downward progressions, in a lower register, and laughter was depicted by drawn out, languid tones. Love had a consonant harmony, and a soft melody in broad movements. Hate had a "rough" harmony and melody. Compassion was associated with soft, smooth melody, slow movements, and repeated figures in brass. Jealousy began with a soft, wavering tone, then an intense, scolding tone, then a moving, sighing tone; with alternating quick and slow movements. Wrath used "hate" music, with running notes, frequent sudden changes in bass, sharp, violent movements, and shrieking dissonance. Impatience was associated with rapidly changing, annoying modulations.

Gatewood (Schoen, 1927) notes that some theorists have ridiculed the idea that melody by itself can produce an affect - that one melody can make one sad, and another can make one happy, or that a song without words can have meaning. But she found that melody, as a musical element, contributes to the affects of "serious" and "rest", and a prominent melody is



associated with slow rhythm. She also found effects of rhythm and harmony as elements, but notes that no effect depends on a single element; each effect is dependent on a combination of these elements.

Shrimp (1940) looked at the feeling state labels associated with 50 known melodies and 50 unknown constructed melodies, with 100 subjects. The emotion classifications of cheerful and tender were more consistently chosen to label melodies than other emotion labels, and agitating and powerful were consistently not chosen. Since Shrimp thought that previous association was responsible for emotion judgements, he explained these results as a tendency to check preferred words. He found that cheerful was the most reliable judgement, in terms of retest consistency, and that the melodies judged to be cheerful by many subjects were relatively fast melodies with few if any sustained notes. Both known and unknown fast melodies were classed as cheerful, so Shrimp concluded that pitch and previous association were not determining factors in this judgement, while tempo may have had considerable influence.

Like Gatewood, Valentine (1962) notes that one can't isolate any one factor in the effects of music; the composition as a whole must be judged. Kreitler and Kreitler (1972) point out that, experientially, no one element of the music is attended to more than another; the listener is "carried away as by a wave" (p.280); there is an impression of a whole. The various elements are not attended to one at a time, with their

single emotional effects; the whole contributes to the impression. Thus, research into the emotion effects of meaningful musical selections is closer to what occurs outside the laboratory when listeners are listening to music and understanding and feeling the emotions expressed by the music.

### Emotional Effects of Meaningful Music Stimuli

Early studies of the emotional effects of meaningful musical compositions tend to support earlier theory (Ostwald, 1963) that music has universal emotional effects. Gatewood (Schoen, 1927) studied the feelings aroused by 600 different musical selections, in three observers, and not only found common emotional responses, but also patterns of emotions that tended to occur together. For example, rest and joy never occurred together, but stirring and joy did 33% of the time. Joy and sadness sometimes occurred together. Of the 600 selections, 148 had no consistent emotional effect. One hundred and seventy-two selections evoked some reports which showed the presence of at least one emotional effect, but the degree or quantity of this quality was scored below average. Sixty-six selections evoked reports with an average amount of agreement regarding an emotion. One hundred and six selections evoked reports with more than an average amount of agreement. Even in the selections with one pronounced effect, other emotions were also present. The music that aroused many feelings seemed to be

more effective in its dominant quality. The halo of other feelings added intensity to the dominant feeling. Gatewood (Schoen, 1927) attributes the above differences to individual differences in musical training, temperament (emotionality), logical thought, and the enjoyment of the music. But despite individual differences, most selections producing any definite affect at all, aroused the same affect in many listeners. She concluded that there is a dominant feeling tone to music, often more than one, and these feeling tones depend almost solely on the music, not on the individual listener.

Washburn and Dickinson (Schoen, 1927) studied the emotions accompanying music, and found that the emotions evoked were actually more like moods, in that the intensity was low, and there was a lack of a definite object. The unpleasant moods mentioned were in particular very slight. The researchers attributed this finding to the influence of an accompanying aesthetic enjoyment, which reduced an incompatible unpleasant affect.

Schoen and Gatewood (Schoen, 1927) also studied the emotions evoked by music and concluded from their research that, in general, a musical composition can produce a change in the existing affective state of the listener, and that this effect on the majority of listeners is uniform, regardless of training, experience, age, interests or condition. They found that the music in every instance either produced a change in mood, or intensified an existing mood, if it matched the music. More

interestingly, they found that the degree of uniformity of mood induced by the same selection in all listeners was high. In addition, most listeners reported the same mood the second time they heard the selection, in nine of the ten selections used. Over 50% of the subjects checked the same moods as on the first occasion, and in some selections, over 75% did so. If different moods were checked, they were found to be the same in tone; e.g. rest didn't change to active. The researchers concluded that music seems to arouse a definite affect that will be the same the second time the music is heard and that is uniform across listeners. Some music selections were more definite in aroused affect than others, and most of the selections also called up secondary moods that were more variable.

Schoen and Gatewood (Schoen, 1927) then studied which emotions tended to be aroused by music, since they had noted some emotions, such as anger, were not frequently mentioned. Gatewood's previous study, using 600 different musical selections, was analyzed, and eleven affects were derived. Sadness was checked in 45% of the selections, Joy in 41%, Rest in 39%, Love in 35%, Longing in 30%, Stirring in 28%, Dignity in 20%, Reverence in 14%, Amusement in 12%, Irritation in 8%, and Disgust in 2% of the selections. It appears that, in the broad range of pre-1927 music used in Gatewood's study, sadness, joy, rest and love are frequently expressed, and reverence, amusement, irritation and disgust are not.

However, the pattern of the consistency with which each of these emotions was conveyed to the listeners is somewhat different. Joy had a consistency of .5 (of 1), amusement, though it had a low occurrence rate, had a consistency of .48, sadness had a consistency of .44, stirring of .42, rest of .4, love of .38, reverence of .37, longing of .29, dignity of .15, and disgust and irritation of 0.

Gundlach (1935), using a few bars from 40 different musical selections, and 112 subjects, found that a few pieces "obtained a very substantial agreement of character among his listeners" (Valentine, 1962, p.296). Seventeen selections of the 40 had 50 or more subjects agreeing that the piece expressed a certain "character". Although Valentine (1962) notes that in none of the selections was there unanimity, and in some pieces there were contradictory reports, Gundlach had concluded that his results showed a substantial agreement of character.

Pickford (1948) asked subjects to rate 16 music selections for various aesthetic qualities. He found a common factor in all the judgements which he identified with "genuine emotional expression". Rigg (1937) played music to 71 subjects and asked them to report if it was sad or joyful, with subheadings for each category. 73% of the subjects labelled all the "sad" pieces as sad, and the others joyful. In some of the musics, the proportion of correct judgements was higher; a funeral march had 68 of 71 sad judgements. In some cases it was lower. Although 73% correct seems to indicate a strong relationship, Valentine

(1962) points out that 27% of the subjects must have gotten the opposite impression.

Campbell (1942) divided emotion adjectives into seven categories, and told 40 subjects there would be a music selection matching each category. Agreement for the "assertion" category was 93%; for gaiety it was 92%, with 6% calling it "joy"; for joy the agreement was 85%, with 7% calling it gaiety; for tenderness it was 61%, with 24% calling it calm. Differences in impressions showed that calm, agreed to by 53% of the subjects, was called sorrow by 12.8%, and joy by 2.1%. Assertion, agreed to by 93% of the subjects, was called sorrow or yearning by 1.3%, and joy or gaiety by 5.5%.

Watson (1942), using 57 music selections, each played only one half to one and a quarter minutes, found that a reliable discrimination could be made between 15 of the 18 adjective groups concerning musical meaning.

Sopchak (1955), using 3 styles of music, 12 main categories of emotion with 4 adjectives each, and 553 subjects, found no universal agreement that any composition expressed a particular emotion. One piece, the water music suite by Handel, resulted in 221 calm judgements, 210 solemn, 170 joy, 122 sorrow, 25 rage, and 142 assertion - obviously a wide range of contradictory emotions. No one piece had universal agreement, and near agreement occurred only with popular music with lyrics, probably because of cues provided by the words.

Semeonoff (1940) picked as stimuli 10 pieces of music in which the composer's intention was known and he was thought to have succeeded. A questionnaire, with four choices of meaning or emotion in which the composer's was included, was given to 199 psychology students and 23 music students. In some of the pieces the resulting choices showed a majority had chosen the composer's intended meaning. In other pieces the majority was in another category altogether. Semeonoff concluded that individuals differed in ability to interpret the composer's intention.

Hampton (1945) also selected 10 compositions about which the composer had revealed his intention. Fifty-eight subjects were given a list of 30 descriptive words, and asked to check both the expressions the composer tried to convey and the experience the selection evoked in them. Merry Wives of Windsor showed a 72% agreement for joy, Beethoven's Funeral March a 65% agreement for despair, and 72% for sadness. Beethoven's Symphony #5 showed a 63% agreement with determination, and 60% for triumph.

Higher agreement rates were found when similar feelings were grouped. Beethoven's Funeral March resulted in 93% agreement with the despair/grief/sadness group, and the 5th Symphony resulted in 84% agreement with the determination/triumph group. However, 17% found longing in the music, 22% found joy, 12% found love, 13% despair, and 17% sadness. Again, although an overall majority tended to agree

that a particular musical selection expressed a certain emotion, a small minority found a contrasting or contradictory mood.

These early results, based largely on meaningful stimuli and introspective methods, have not gone undisputed. Valentine (1962) notes that "music has long been called the language of the emotions, and the meaning of music has sometimes been interpreted as consisting in the emotions expressed" (p.283). But Valentine questions whether music does in fact express something, an idea or an emotion, other than its form. Valentine, and Gurney (Valentine, 1962) seem to think that, while music may have a romantic or passionate expression, that is not the ground on which it can be judged. Valentine's theory of aesthetics states that there are four types of characteristic responses or judgement of musical stimuli: objective, subjective, character, and associative. He considers only the subjective, and some of the character types of judgements to be of an emotional nature. These types of judgements were thought to occur in the musically untrained and uneducated, and were in a sense inferior judgements that interfered with musical appreciation.

Valentine (1962) concludes that previous research supports his view that "one cannot rely on many compositions providing similar feelings in everybody, or even in a majority of listeners" (p.313), since, even when a large majority of listeners do agree that a composition expresses certain feelings, there always seems to be a minority who check



differing, and sometimes contradictory emotion adjectives. Although some compositions evoke fairly high agreement on one or more emotions, others are low in agreement, and in most cases, some individuals check contradictory moods. It appears that, to Valentine, agreement should be at or near 100% to support the contention that definite and universal emotional meanings are conveyed by music and understood and felt by the listener. Since Valentine sees imagery, emotions and other associations as detracting from the pure experience of music appreciation, his view of emotion effects would support his theory.

However, apart from this interpretation, one seems able to conclude that research supports the view that there is general agreement which in some selections is remarkably high. With other selections, as well as with some individuals, there may be low agreement or even contradictory understandings. Since no human experience can be expected to be completely the same in all experiencers, some variability may be expected. Further, since some of the elements of musical composition are subjective and subject to change through experience and training, (i.e. consonance), past experience, culture, and training may affect these judgements. The communication and empathic understanding of emotion in other mediums is also not completely perfect. Cognitive factors, past experience and current concerns can decrease or increase empathy. However, one may conclude that apart from these factors, the evidence is more for than against the idea that music does convey commonly understood emotional

meanings.

### Imagery Responses to Music

Although Dessoir (1970) thought that part of the emotional effects of music are due to the concrete images generated by music, theorists are divided in their opinions whether common images are evoked by music. Even those theorists who agree that emotions tend to be recognized by, and evoked in the listener, disagree that the composer's intended meaning or idea may be conveyed accurately through music.

Gilman (1892) asked 30 subjects to report any image suggested by the music of a concert, as well as character qualities and dramatic suggestion. He found very little agreement between the subjects in the ideas expressed by the music, and the ideas were sometimes opposing in tone.

Vernon (1930) studied visual images evoked by musical selections and found two types of visualization: a) a wandering imagery, without reference to the music, which was characteristic of the musically uneducated, and likened to non-fused, incidental imagery, and b) a "true" visualization, which Vernon maintains is an emotional response, a consequence of emotion. Lee (Valentine, 1962) found that, in fact, a large number of subjects, including the most musical, had visual images to music. Valentine (1962) himself found that visual imagery occurred in reports of the experience of listening to

music, but he asserts that these images interfere with musical appreciation, and only the musically untrained indulge in imagery, or the musically trained when the music is dull.

Weld (Valentine, 1962) used a deliberately descriptive musical selection, supposed to depict a hunt in the Black Forest. The introspective reports revealed great variations; there were only a few elements in common. However, this conclusion may be a function of interpretation, since one subject did in fact think of hunting, and others of similar themes such as battle or melodrama.

Valentine (1962), with two modern music selections and 12 subjects, found a great range of contradictory ideas to one piece, but the same type of impressions to the second piece. In another study, using three music selections and 12 subjects, he found marked similarities among the reports, but each piece, he notes, also revealed marked differences.

Chandler (1934) agrees that music may depict moods, but he argues that specific concrete associations differ. This may be a problem of definition, since, in the example he uses, the specific concrete associations differ, but the essential theme of the associations was the same. Although the associations to Beethoven's 7th were specifically different, all the images were of a great event, an important festival. Rigg (1964) concluded that research indicates that though there are mood effects of music, "ideas" or images are not commonly evoked in the listener.

However, Dessoir (1970) notes that, though there may be differences in the concrete image, the music does define an area of the idea or feeling. The music expresses a general concept, a communality of concept, expressed concretely in individual ways, but similar in theme.

Thus, though there may be individual concrete content to the imagery occurring with the experience of listening to music, there may be generally understood themes in terms of meaning.

### III. Theoretical Review

Philosophical observations and previous research concerning the role of emotion in the aesthetic experience have been discussed. Several theories or approaches in the psychology of emotion, applied to the expression of emotion in music, will also be reviewed. Many of these theories, apart from ideological boundaries, follow the philosophical hypotheses of the process of emotion understanding. There are several conceptual categories of these theories, as well as the Gestalt approach, and the Gestalt-based Experiential theory of emotion, both of which directly address the question of the communication of emotion through art and music.

In general, few theories of emotion or of aesthetics, with the exception of the Gestalt theories, directly deal with the communication of emotion through art. Implications of the theories to this question will have to be drawn in some cases.

#### 1. Unconscious Operations

Freud thought that art, like humor, resulted from unconscious conflicts (Hogg, 1969). He related emotion to instinctual drives. Affects were primarily a form of energy that required expression (Plutchik, 1980). Conflicts were thought to be involved in all emotions. Freud thought that emotions were

largely unconscious, so they could not be inferred from verbal report, but they could be inferred from certain behaviours. Ehrenzweig thought that art was not only created, but was also grasped at an unconscious level (Hogg, 1969). Jung disagreed that art was a disease or disorder, as Freud had implied; he thought that great art related to the "unconscious activation of an archtypal image" which is elaborated and shaped into the finished work. In these theories, in general, emotion in art is related to unconscious conflicts or archetypes, expressed through art, and recognized by the unccnscious.

## 2.Past Experience

An emphasis on the role of past experience in emotion would suggest that the aesthetic stimulus suggests or triggers associations from past experience, which suggest or have been associated with emotional experience. Thus, one has learned from past experience that soft music is associated with gentle, and loud music with aggressive emotions, so one can recognize the expressed emotion that is intended by the music. In this view, training and experience greatly increase the ability to understand the meaning in music. A major problem with this theory is that the question of how the emotion experience of, for example, relaxation, is originally associated with the stimuli, unless it was evoked by innate associations between the emotion and the music at some point. Hargreaves et al (1980)

found emotion effects consistent with both familiar and unfamiliar melodies. Past experience did not seem to be as important a factor as the structural characteristics of the melody itself.

### 3. Instinctual

Darwin (Plutchik, 1980) thought that expressive behaviour is largely, though not totally instinctual. It is built in or innate to express, for example, anger through baring the teeth, and also to recognize these signals when expressed by another. Although he was discussing the expressive behaviour in humans and animals, not the expressive qualities of inanimate objects such as art, we may extend his view to note that, since it is innate to recognize certain expressive behaviours that express basic emotions, they should still be recognized when translated into an art form. This may be most applicable in art forms such as literature, drama, and film; and possibly less so with music. As Dessoir (1970) notes, rhythm, accent, and tone of voice may be one of the innate vehicles of expression and also may be the vehicle of emotion expression in music.

#### 4. Empathy

Stotland (Kreitler and Kreitler, 1972) theorized that we share other people's feelings. An observer reacts emotionally because he perceives another is experiencing or is about to experience an emotion. He distinguishes this from predictive empathy in which the observer doesn't have to experience the emotion he is perceiving to know what it is. This theory would apply to art in that we invest the aesthetic stimulus with human attributes, interact with it as though it were another person, then empathize with the emotion it is expressing. Stotland's theory could also account for what he terms predictive empathy, i.e. the aesthetic problem or how it is that one can recognize but not feel the emotion expressed by the art.

Kreitler and Kreitler (1972) note that empathy is a general ability to apprehend another's experience. An observer reacts emotionally because he perceives that another is experiencing or about to experience an emotion. Empathic observation of another's emotion is a long established emotional stimulus. Kreitler and Kreitler hypothesize that empathy is a function either of association, or of Lipp's "feeling-into". That is, empathy results from a primary tendency to imitate movements and postures, and one's feeling of kinaesthetic movement leads to the experience of the emotion associated with the movements.



## 5.Kinaesthetic Feedback

In this view, emotion is aroused from feedback from facial and other muscles (Izard, 1971). According to this theory, one could see an actor expressing emotion, mirror the emotion one sees, and this arouses the emotion in the observer. This theory may account for art forms such as film, or even art, but could not account for literature or much of music, apart from a possible general tension/relaxation muscle response. However, as noted in the Previous Research section, movement and impulses to move, or images of movement, are common responses to music. This may be the vehicle by which the emotion is felt.

## 6.Sentics

Clyne's (1978) theory of Sentics and emotion was based on the Gestalt principle of isomorphism, that brain patterns are associated both with emotion experience and with behaviour. In the Sentic theory, this behaviour is subtle finger movements. Since the experience and behaviour are isomorphically associated, evoking one evokes the other. Clyne showed that several different emotions have characteristic expressive 'shapes' of finger movements. There are precise dynamic forms called "essentic" forms which are characteristic of each emotion.

Thus, music evokes sentimentally charged finger movements characteristic of certain emotions, and, according to the principle of isomorphism, the emotion is experienced simultaneously. The aesthetic feeling of "rightness" is evoked when the tones one is led to expect, through a sense of essential form and inner pulse are confirmed, or even exceed our expectations. If a strongly contrasted essential form occurs, one may feel surprise, awe or wonder.

Valentine (1962) noted the tendency of listeners to move to music; this movement may be a tapping foot or finger, or it may be less overt than this - an impulse to move or images of movement. Clyne (1978) notes that "meaning in expressive music arises from the essential forms of its idiomatic elements" (p.75). He notes that semantics can explain how music communicates emotion, through the function and stability of the essential forms. In western music, Clyne notes a special beat, an inner pulse which he calls sentimentally charged. It is an internally conducted beat. It varies from composer to composer, and is, he thinks, the key to the empathy we experience with a composer. There is also a wide range of essential forms in the phrases, harmonics, rhythms, tone colour, etc.

Kreitler and Kreitler (1972) note, however, that movement isn't enough to explain empathy and the identification of emotion in others. Cognitive factors such as cues to the situation, and to the "whole behaviour pattern" are also necessary. However, music does seem to evoke kinaesthetic

responses, both in terms of sentic movements, and impulses or images of movement, and also can denote movement, through rhythm, tone difference, and rising or falling pitches.

### 7. Information Theory

Berlyne (1974) terms his theory of emotion expression in art an information theory. Art is viewed as a collection of elements which transmit semantic, expressive, cultural and syntactic information. Art is differentiated from other communications in that how something is communicated is more important than what is communicated. The form itself has properties which give it an intrinsic value, depending on its ability to increase or decrease arousal.

Berlyne thinks that individuals have a preferred optimal level of stimulus variation. A moderate degree of variation, complexity or unfamiliarity is preferable. His research is mainly concerned with the aesthetic emotion of pleasure in the form rather than with the emotion expressed by music, but in general, expressive information is thought to be conveyed, along with other sorts of information, through such qualities as the complexity, familiarity, and congruity of the music.

## 8. Hemisphere Laterality and Emotion

Some recent research on the differences between right and left brain hemisphere functions have shown some indications that musical processing in the musically untrained, imagery, and emotional understanding are all characteristic of right hemisphere functioning (Pope and Singer, 1978; Springer and Deutsch, 1981). The right hemisphere has been associated with non-verbal, non-logical, intuitive understanding, which includes imagery, emotion, and music. If these three functions are processed together, it is not surprising that they would be associated in experience. Music, as a non-verbal and non-logical method of communication, would easily be translated into and represented by the imagic mode. In addition, studies have shown that the rhythms and accents of speech, which are possibly congruent with the rhythms, pitch and movements of music, are associated both with the expression of emotion, and with right hemisphere functioning (Springer and Deutsch, 1981). Patients with brain damage to the right hemisphere have been found to speak in a monotone, without the accents and emphases of normal rhythmic speech which have been associated with the communication of emotion.

## 9. Gestalt

Of all the theories reviewed, Gestalt theory may be the most appropriate for a study of the role of emotion in art. In any review of the psychology of aesthetics, one repeatedly encounters the importance of Gestalt theory. Kreitler & Kreitler (1972), and Arnheim (Hogg, 1969) both use Gestalt theory specifically to help understand the phenomena of emotion expression in the arts.

The Gestalt theory of expression and emotional meaning is that they are an integral part of the perceptual process - immediate, unmediated, and uninterpreted (Kreitler and Kreitler, 1972). Hogg (1969) also notes that to the Gestalt theorist, experience and meaning arise directly from musical events, rather than with a concern for referential associated data, or unconscious symbolism. Arnheim (Hogg, 1969) notes that neither past experience nor logical conclusions are needed for an understanding of the elementary expressive features. "Their meaning is perceived at least as directly and spontaneously as the shape and colour of an object" (p.261). Association, learning or cognitive interpretations are not necessary. The "dynamic characteristics" of, say, timidity, are identical isomorphically (in form) to "timid" music. A dance is mournful, Arnheim notes, not because we have seen sad persons behave this way, but because the dynamic features of mourning are also present in the dance and are directly perceived and understood

as mournful.

Arnheim (Hogg, 1969) notes that, in Gestalt theory, emotion expression is a quality of inanimate objects as well as people. "Sensory data contains a core of expression that is perceptually self-evident" (p.264). Quite apart from association and learning, there are factors whose meaning can be understood directly from their perceptual qualities (ie "soothing" rain, "aggressive" lightning). This immediate revelation of emotional meaning is based on isomorphism - "processes in different media may be similar in their structural organization". And the perception of expression is an "integral part of the elementary perceptual process" (Hogg, 1969, p.271). If perception is the means by which the organism obtains information about the environment, expression seems to be the primary content of perception as an inherent characteristic of perceptual objects whether animate or inanimate. In terms of adaptation and the importance of environmental information, it seems it would be at least as important to know a bear is a threat, as to know a bear is a bear.

Emotion does not differ from perception in Arnheim's (1969) view. We perceive not only hue, shape or pitch, but also the tensions conveyed by these stimuli. Art requires judgement of meaning, which he notes seems to be accomplished by emotion, making us feel the state personally. Music exhibits patterns of forces it shares with the mind and thus builds isomorphic connections between the two alien "media" - external sound and

internal understanding.

## 10. Experiential Theory of Emotion

The Gestalt Theory of Meaning views meaning, including emotional meaning, as inherent in the structure of the stimulus pattern and not provided by the past experience of the experiencer. There is an isomorphic correspondence between the structure of the stimulus pattern, and the structure of the experience; and the meaning of the experience is inherent in the structure. A circle does not have to be learned in order to be differentiated from the background, and nails scratching on a blackboard are experienced universally as unpleasant. Wundt (Murphy and Kovach, 1972) hypothesized that emotion is a function of the pattern of sensation, from which he thought images were derived.

In essence, the experiential theory of emotion (Lyman, 1982) states that the experience that is labelled as an emotion, is a function of the pattern of images, sensations, and affect (pleasant/unpleasant, excited/depressed, tense/relaxed, or similar basic affective dimensions). These patterns are themselves a function of the stimulus, which may be external or internal.

Thus, there is an implication of universality. Given the same internal or external stimulus, there should be the same experience. There is a tendency or innate disposition to

perceive in a certain way. There are universal human structures in perception that result in certain inherent meanings (i.e. that 0 is different from \*). There is also a disposition to characteristically experience a certain feeling in a given situation, possibly because of the adaptive functions of the emotions - for example, to feel afraid when in danger, or to feel nervous in crowds. These tendencies to perceive and feel influence tendencies to behave. For example, one would feel an impulse to escape from danger, or to get away from crowds. These are tendencies or dispositions, not determining factors. Past experience, projection of future consequences, and other cognitive factors may override these tendencies. However, there would be a basic, common, impulse or urge to behave evoked by the emotion, even though it may be over-ridden by other factors.

"Patterns" of imagery refers to four aspects of the imagery, as follows:

1) Classic attributes. These include intensity, duration, clarity and extensity.

2) Concrete aspects. These include the referents - what the images are referring to in concrete terms. That is, an image of a girl running across a meadow at dawn with a dog, includes references to a) people, b) nature, c) animal, d) time, e) activity. These concrete referents could also be sub-categorized into more specific referents. The experience can then be coded and tallied in concrete, operational terms.



3) Quality aspects. These include such aspects as  
a) simple/complex, b) stimulus bound/stimulus  
irrelevant/sequential, c) respondent/directed,  
d) realistic/fantasy, e) memory/original, f) static/ dynamic.

4) Pattern of the imagery. A pattern, in Gestalt terms,  
refers to a relationship between parts or components. A  
collection of components could be identical in composition, but  
if the relationship between the components differs, the  
experience will be qualitatively different. (An example would be  
the collections of components of notes in a melody). This  
patterning relationship includes such aspects as a) timing,  
b) spatial distance, c) sequence or order, and d) degree to which  
it is focal or peripheral in attention.

5) Theme of the imagery. This refers to the essential  
characteristics of the pattern and is similar in concept to the  
Platonic ideal. The abstraction of the theme or essence of the  
experience is the main task of phenomenological investigations.  
Individual experiences, of loneliness for example, may have  
differences in concrete terms; however, most humans can share a  
common understanding of the essential aspects of the experience.  
The specific thoughts, images or sensations may differ in each  
experiencer, but all have a common theme of feeling that one is  
alone, and one doesn't want to be alone.

Applied to the question of the expression of emotion in  
music, the Experiential theory of emotion would hypothesize that  
the emotion effects are a function of the pattern of imagery and

affect that correspond in structure and theme to the pattern of the stimulus. This effect would be immediate and inherent, and would lead to fairly common emotion experiences, in terms of patterns, evoked by the music, with some individual differences as a function of the Gestalt principles of set and expectation. Although the specific concrete images may differ among individuals, there would be communalities in the pattern qualities of attributes, referents, quality, relationship and theme.

Since the emotion effects are a function of the pattern of imagery and affect, the Experiential theory can account for the aesthetic problem; that is, how emotion is sometimes recognized in art and music, at other times is recognized and felt, but with an aesthetic distance that allows pleasure in the form of the art, and at other times the emotion may be completely felt, without reservation. The pattern of imagery and affect are themselves a function of both internal and external stimuli. Previous images and ideas, as well as the sensation of the music, can give rise to patterns of imagery and emotion experience. The experience associated with a musical stimulus can vary according to whether current patterns of internal experience contradict the external stimulus, or match the external stimulus. If the external stimulus contradicts current patterns of internal experience, this may result in the ability to recognize the emotion, but not to feel it personally. Schoen (1927) found that mood effects of music are most effective if

the music matches the previous mood. Or, awareness of other external or internal factors, such as the pleasingness of the form of the music, can modify the experience to that of a "feeling with aesthetic distance". Or, if the experience and patterns of imagery previous to the artistic or musical stimulus are congruent with the emotion expressed by the music, one may be flooded with the emotion. Internal factors, as well as the structure of the external stimulus, are also involved in the experience.

In terms of its function as a theory of emotion, the Experiential theory does have some empirical support. The role of imagery in emotion has been noted by theorists such as Izard (1965), and Arnold (1960). Pope and Singer (1978) note that, as the pattern of presentation of information will evoke certain emotions. Thoughts and images can also generate specific affective states. Starker (Pope and Singer, 1978) sees the imagic mode as an essential and continuous synthesizing mode of data processing, which enables the expression and retention of meanings in terms of overall patterns of relations. Block (1981) also sees imagery as bearing semantic relations to things, as representing objects, relationships and states of affairs in an interpretative way, that picks out important characteristics to the imager. Since, as Solomon (1971) points out, emotions are often judgements in terms of value to the self, imagery would have a vital role in this understanding. Recent evidence (Pope and Singer, 1978; Springer and Deutsch, 1981) that the right

hemisphere is involved in imagery, emotion and music also supports this view.

Lyman et al (1980) found that the frequency of imagery was significantly greater in an emotional experience than in a non-emotional experience. The pattern of imagery referents was also significantly different. In the emotion experience, images with references to the past or future were significantly more frequent than images with references to the present; and activity referents were significantly more frequent than event or thing referents. Self referents were significantly less frequent than other people referents, in the emotion condition. A recent study has found that there are more incidental images in pleasant emotions, and more stimulus bound thoughts in unpleasant emotions (Lyman, 1982).

Certain basic structural form patterns, angular and rounded, have been found to be definitely associated with certain emotions, as well as with abstract concepts such as eternity (Lyman, 1979). In many cases, over 90% of the subjects agreed in designating an emotion or concept to a form. Thus, as the pattern of sensation can be associated with an emotion, the Experiential theory of emotion hypothesizes that patterns of subjective "sensation", that is, images, can also be associated with an emotion.

Previous research would seem to indicate that emotions can be understood and often are felt by a majority of listeners to music stimuli. Although there have been differences in

interpretation (Valentine, 1962), there is some evidence that music can evoke ideas or images that share common themes, if not concrete subjects. But there are few theories that can account for the ability of individuals to feel the emotion conveyed by music. The Gestalt and Experiential theories seem to be able to account both for the experience and for the anomalies in the experience such as the aesthetic problem. If the Experiential approach, in particular, is a valid one, there are certain implications for the experience of listening to music that one might expect to find. Thus, the purpose of this study is to re-examine imagery and emotion - two aspects of the experience of listening to an artistic medium of expression, in this case, music. If the Experiential theory is valid, there should not only be common emotions and patterns of emotions, recognized or felt by the listener, but also common patterns of imagery. This latter finding would also contradict Valentine (1962) and Chandler's (1934) hypothesis that imagery is idiosyncratic, individual, and may in fact interfere with the experience of listening to music rather than contribute to it. It would support Dessoir's (1970) and Lyman's theory that images, common in theme or meaning, if not in concrete content, contribute to the emotion experience.

## C. Present Study

## I. Research Hypothesis

The Experiential theory of emotion sees the emotional experience to be a function of the pattern of imagery, sensation, and affect. According to this theory, the aesthetic experience of listening to music would consist of patterns of imagery that go with the structure of the stimulus, and these patterns of imagery and affect can be seen as an emotion experience. These emotion experiences would be largely universal. Although such factors as past experience, current concerns, and future expectations can affect the experience, in terms of the concrete content, there will be a disposition for all humans to have similar experiences, in terms of theme and pattern. One would expect listeners almost universally to be able to identify the emotional meaning of a piece of music, and less so, to tend to feel the emotion.

Thus, this study proposes to use meaningful pieces of music, to investigate whether music can, in fact, relay common impressions of meaning, particularly emotional meaning, and if so, if this ability can be explained by the Experiential theory of Emotion. If the Experiential theory is valid, there will be different and characteristic patterns of imagery associated with each piece of music. These patterns will differ among the different pieces of music. These patterns will manifest as concrete referents, abstract themes, quality and type of

imagery, and pattern or relationship between components of the imagery.

Since the emotion experience is deemed to be a function of the imagery pattern, there should be common reports of the emotion experienced and expressed in response to each piece of music. These emotion reports should differ among the pieces of music.

If a study of a non-verbal, non-visual stimulus experience does result in common patterns of imagery and common emotion reports, which can be shown to differ across music stimuli of different structural characteristics, this would certainly demonstrate empirical support for the Experiential theory of Emotion. It would be difficult, otherwise, to account for the similar patterns of imagery, although other emotion theories could account for the similar emotion reports. In any case, the demonstration of common reports in response to music stimuli would show that art does in fact yield similar impressions of meaning in the experiencers. A demonstration that these impressions or experiences are similar in pattern across experiencers, specifically in terms of imagery, would give some indication of how music manages to evoke similar emotional meanings, and in addition, lend support to the Experiential theory of Emotion.



## II. Method

### Materials I: Music Stimuli Selection

Music was selected as the artistic stimulus. As the most non-verbal, non-representational art, there was thought to be less possibility of suggestion of meaning given by the physical attributes of the stimulus itself, as could be the case with art or literature. A picture of a vase of flowers could be assumed to evoke images of similar concrete content. Music was chosen to lessen such obvious suggestion effects.

Since meaning is assumed to be an imperative aspect of the stimulus in Gestalt theory, selections were chosen from coherently composed musical selections, rather than from randomly determined notes.

The Encyclopeadia of Music was consulted to determine the major music styles of post Middle-Ages Western music. Fairly modern and familiar styles were chosen to lessen the possible factor of unfamiliarity with the basic style of music, which might have occurred with pre-Modern or Eastern music.

The Encyclopedea of Music has detailed 12 styles of music considered to be distinct and different from each other. These are:

- 1) Medieval: including church music and madrigals.
- 2) Classic: including a) Bach and Handel, and b) Hayden and Mozart.
- 3) Romantic: including a) Beethoven and Schubert, b) Berlioz and Liszt, and c) Wagner and Verdi.
- 4) Neoclassical: Brahms.
- 5) (Neo) Romantic: including Tchaikovsky, Saint-Saens, and Mahler.
- 6) Folk: including Mussorgsky, Rimski-Korsakoff, Dvorak, Bartok, Holst, and Williams.
- 7) Post Romantic: Strauss.
- 8) Impressionist: including Debussy, Ravel, and Satie.
- 9) Atonal: Schoenberg
- 10) 20th Century Classic/NeoRomantic: Stravinsky.
- 11) American Folk: including Jazz and Black Spirituals. a) Foster, b) Berlin, Gershwin, and Copland, c) Rhythm and Blues, d) Rock.
- 12) Electronic or Computer music.

The following criteria were used for music selection.

1) One selection each from six of the major music styles of Western, post-Middle-Ages music, as detailed by the Encyclopedia of Music.

2) The music must have been from an important or characteristic musician of the style, but be itself a fairly unfamiliar piece (that is, it has not been used to underscore a

popular movie, or in some similar way be overly familiar to the uneducated musical listener).

3) All selections must be instrumental, to minimize suggestion effects of lyrics, that may indicate intended emotional meaning.

4) A variety of instruments were chosen, since different instruments were often characteristic of the music style (i.e. the guitar in rock music). The instrument sound - the structure of the music evoked by the instruments used - has been found to contribute to the meaning intended to be conveyed (Gundlach, 1935).

5) Since meaning was thought to be an important theoretical point in Gestalt theory, selections were also chosen according to whether there had been an established, intended meaning given for that selection, either by the composer or by later critics. The patterns of experience, and the emotional meaning detected by the listeners could then be evaluated against the meaning intended by the composer.

6) In general, a variety of tempos was looked for among the selections. Although the experimenter did not deliberately choose selections for their emotional meaning, an effort was made to ensure that not all of the selections were fast, slow, loud or quiet.

7) A meaningful musical phrase of approximately two minutes was recorded from the selection. This phrase may have occurred at any point in the composition. The two minute phrases were

selected to be representative excerpts which were complete, and meaningful and not chopped off, but were stopped at a natural break in the melody, at a pause, or instrument end.

The musical selections used as stimuli were (in historical order):

1) Classical: Mozart; Rondo in D major, K.485, first 2 minutes. Piano (unaccompanied).

2) Romantic: Beethoven; Symphony #7, last 2 minutes of First Movement. Orchestra: Strings.

3) Folk: Respighi; Fini di Roma, Pines of the Appian Way, (Tempo di Marcia). Orchestra: Wind.

4) Impressionist: Debussy; Danses Sacree et Profane, first 2 minutes of First Movement. Harp.

5) American Folk: Jazz: G'over Washington; Winelight, Winelight. Horn.

6) American Folk: Rock: Jimi Hendrix; War Heroes, Midnight, first 2 minutes. Electric guitar.

### Materials II: The Questionnaire

A questionnaire was used to collect the introspective reports of the imagery and emotion experience. The Questionnaire included:

1. A release form, with spaces for age and sex data.

2. Instructions, which were as follows:

"This is a study of the imagery and emotions involved in the experience of listening to music. I am going to play several short pieces of music of different kinds, and I'd like you to relax, listen to the music, and write down the images that occur to you as you listen. Don't force the images, just let them come naturally. Above all, DON'T EDIT THEM. Record every spontaneous image that comes to you. After the music is over, and you have finished writing down your images, please check off the moods you felt when listening to the music, and the moods you think the composer was expressing, and record the intensity of the moods using a scale of 1 to 5 with 1 the least intense. In the space provided at the end, add any moods or emotions you may have felt that aren't included in the list. Take as long as you need. There is no time limit, and no right answer - the music is supposed to mean whatever it means to you. There will be a practice piece first, to make sure you have no unanswered questions about the procedure. So for the practice piece, just relax, listen to the music, and let your imagination go."

3. Imagery: Separate blank sheets were provided for the introspective report of the imagery evoked by the musical stimuli, to leave more than enough space for the imagery.

4. Imagery Questionnaire: as follows:

Question #1. "Did the imagery come too fast to get it all down? If so, what % of your imagery do you think you got down? If you didn't get it all down, what determined what you put in or left out?"

Some of Klinger's research in the normal flow of consciousness has demonstrated that not all of the contents of the flow of consciousness can be completely recorded, even by introspective verbal report (Pope and Singer, 1978). This question was designed to get some self-reported estimation of the % of imagery recorded, and why the respondents thought some may have been omitted in the report.

Question #2. "To what extent do you think the images were tied to or related to the music, as opposed to being "flights of fancy"? (rating from 1 to 5)."

Since it is impossible for the experimenter to judge whether the respondents' imagery was actually suggested by the music, rather than some other stimulus, like memory images, emotional moods previous to the situation, or current concerns, the respondents were asked to estimate the degree to which the images were tied to or related to the music, rather than being "flights of fancy" (incidental or stimulus irrelevant).

Question #3. "What was the 'theme' or essence of the imagery produced by this piece of music?"

Although the experimenter would also estimate the theme of the imagery, the respondents were asked to report what they thought the theme or essence of the music could be.

Question #4. "To what extent did you like this music? (rating from 1 to 5)."

Question #5. "To what extent do you think your opinion of the music might have affected your report? (rating from 1 to

5)."

It was thought that personal taste might have been a factor influencing the imagery or the estimation of the emotions expressed/felt, so this question was asked as a precaution. It was, however, assumed that factors such as these would be random, and not systematic, and so should have no systematic effect on the results.

In addition to individual taste effects, there may have been differences in the extent to which the respondents as a whole liked a particular piece of music. If one piece were not liked by most of the respondents, this could affect the imagery reports and yield differences in imagery between that selection and other selections.

Question #5 was asked in order to determine if the respondents themselves thought their taste affected their report. One can not assume a necessary connection. A respondent who might not ordinarily like a music style may still be willing to participate or go along with it for the sake of the experiment. In addition, if the hypothesis is correct, one could argue that respondents ought to be able to estimate the emotions expressed regardless of personal taste, although personal taste may affect whether the expressed emotion is felt by the listener.

5. Mood Checklist: The Mood Checklist was compiled from two sources; a) Lorr, Daston and Smith's Mood Factors (Plutchik,

1980), which consists of 52 Emotions, which can be categorized into 8 basic mood factors.

b) Some additional mood adjectives suggested by a pretest, which were not included in Lorr et al's list, were added to the Mood Checklist. The result was a total of 65 mood adjectives.

The respondents were asked to tick ( ) off the Emotions Felt and the Emotions Expressed, and were reminded that they could tick off both or either, whatever was applicable. They were also asked to estimate the intensity of the emotions felt and experienced, from 1 to 5, with 1 as low and 5 as high, and to record this rating in the appropriate space.

6. The respondents were also told that if there were other emotions or moods not on the list, that they wished to add, to detail these on the page provided at the end. This was done to try to minimize the suggestion effects of checklists in general, whose main disadvantage is that the respondents are limited to the emotions listed, even if they feel them to be not very appropriate. wise have reported.

7. Background Questionnaire: A one-page set of general questions at the end of the Questionnaire was designed primarily to gather information that theoretically could have an effect on the results. Although, as with the factor of personal taste, these factors were assumed to be individual differences randomly distributed through the sample and unlikely to have any



systematic effect on the results obtained, the questionnaire was administered as a precaution.

Question #1: "When I am face to face with someone, and that person asks me a question, as I begin to think of an answer, I turn my eyes (or head) to: a) the right, b) the left, c) either way, d) I don't know."

This question was asked in order to ascertain whether there were any hemispheric laterality factors. Bakan (Pope & Singer, 1978) theorizes that the right hemisphere is dominant in the functions of musical processing, imagery production and emotional understanding. If so, an individual with a right hemisphere relative dominance may be more practiced with and familiar with these experiences, and this may have an effect on the results.

Since the influence of hemisphere laterality factors was not a major question for this study, an elaborate questionnaire was not considered appropriate. However, some unpublished studies indicate that to some extent, individuals are aware of their own tendencies to look in one direction or another, and this can therefore be estimated by a simple, direct question.

Question #2: "To what extent have you had any musical training? a) none at all, b) number of years. What kind of musical training have you had?"

Question #3: "Have you ever played a musical instrument? (Whether or not you have had formal training)."

a) never, b) sometimes, c) frequently."

Another, possible major individual difference that might influence the results was thought to be musical experience and training. Some evidence indicates that trained musicians process music in the left hemisphere (Springer & Deutsch, 1981). There may therefore be something very different about the experience of listening to music, in the trained musician. These questions were therefore designed to ensure that there were no systematic effects of musical training.

Question #4: "What kind of music do you like generally? That is, what kind do you usually prefer to listen to? Rank order your preference, with 1 as most liked. a) Classical, b) modern classical, c) rock, d) jazz, e) country, f) other (please specify), g) no real order to my preferences, h) I rarely listen to or have little interest in music."

This question was designed to get at personal taste, in general. The respondents may like the style represented by the music selections, but not have liked the particular piece chosen. This question was a more general estimation of the effects of personal taste.

## Respondents

The respondents were 25 males and 35 females, between the ages of 19 and 55, with a mean age of 25. The respondents were college students, enrolled in courses which intensively discussed phenomenological and introspective methods, and who therefore had experience and were familiar with introspection and the introspective report method.

The study was an assignment in the courses, but the respondents were not required to allow their responses to be used for the study. Only one person did not volunteer his response. The 60 respondents comprised 4 tutorial groups consisting of 17 (Group A), 13 (Group B), 15 (Group C), and 15 (Group D) persons respectively.

### III. Procedure

The music stimuli were recorded on cassette tapes and were presented in the following orders, derived from a table of random numbers:

#### A Group:

- Music #1 - Stimulus #3:Folk
- Music #2 - Stimulus #5:Jazz
- Music #3 - Stimulus #2:Beethoven
- Music #4 - Stimulus #4:Debussy
- Music #5 - Stimulus #6:Rock
- Music #6 - Stimulus #1:Mozart

#### B Group:

- Music #1 - Stimulus #5:Jazz
- Music #2 - Stimulus #1:Mozart
- Music #3 - Stimulus #2:Beethoven
- Music #4 - Stimulus #4:Debussy
- Music #4 - Stimulus #6:Rock
- Music #6 - Stimulus #3:Folk

#### C Group:

- Music #1 - Stimulus #4:Debussy
- Music #2 - Stimulus #5:Jazz
- Music #3 - Stimulus #1:Mozart
- Music #4 - Stimulus #6:Rock
- Music #5 - Stimulus #3:Folk

Music #6 - Stimulus #2:Beethoven

D Group:

Music #1 - Stimulus #2:Beethoven

Music #1 - Stimulus #6:Rock

Music #3 - Stimulus #4:Debussy

Music #4 - Stimulus #3:Folk

Music #5 - Stimulus #1:Mozart

Music #6 - Stimulus #5:Jazz

Each group of respondents was seated in a quiet room, and given the questionnaire instructions to read. They were encouraged to ask any question they had regarding the procedure.

In order to familiarize the respondents with the procedure, a practice piece was presented first. Two minutes of Sibelius' "The Swan of Tuonela" was used - a quiet, rather sad tune. When all the respondents were satisfied as to procedure, the stimulus music was presented. The respondents recorded their imagery as they listened and then filled out the imagery questionnaire. They then checked off the emotions they felt, and/or thought the composer was expressing. No time limit was imposed, and enough time was allowed between the stimulus presentations for all respondents to finish.

## IV. Data Analysis

### A. Imagery Coding

The imagery reported was coded for quality and referents. The criteria for the categories follow.

#### 1. Number of Images

There was generally no problem determining the number of images when the images were simple and non-sequential. For example, the protocol of Respondent A-1, Image #1: 1."Knights in armour", 2."Symphony", 3."Grand presentation of royalty"; 4."Introduction to a movie"; 5.Curtains up"; 6."Horses galloping through flames". In this example there were six distinct images; even though #5 probably followed from #4, it is clearly a distinct image.

Any descriptive adjective referring to a main element in the image was not counted as a separate image. In the example above, the first image, knights in armour, was counted as one image. The fact that the knight was in armour is an intrinsic aspect of the image of the knight, not a sequential image of armour by itself.

When the images were complex and/or sequential, the criteria were not so easily determined. Generally, each element, object, place, or action in a complex image, was counted as a separate, sequential image, if it was complete enough to be an image in itself. For example, the protocol of Respondent D-1, Music #3, image #1:"I'm in a field of yellow flowers"; 2.The bees are buzzing around, it's a gorgeous day"; 3."The mountains are near"; 4."The ocean is blue and sparkling"; 5."The white puffy clouds are passing overhead".

This image was coded as number of images = 5, and as one complex image, with one stimulus bound image (#1) and four sequential(#2 to #5). Each element was coded as a separate image, because, although part of the same scene, they were attended to separately, and were not intrinsic elements of the whole scene. That is, having white clouds in the scene is a separate image from the rest of the scene, while the fact that the clouds are white is an intrinsic element.

## 2. Image Referents

a) People - The number of people present and specifically mentioned in the imagery was counted. When no individual or number of individuals was mentioned, groups of people were counted as one per group.

The "People" category included four mutually exclusive sub-categories;

1) Human people - This category included the number of persons or groups of people specifically mentioned in the imagery, who were not musicians, fantasy figures, or the respondent himself.

2) Musicians - This category included the number of persons or groups of people who were playing an instrument in the imagery. These were counted as a separate category because the characteristics of the musical stimulus may have suggested the presence of musicians in the imagery.

3) Fantasy - The number of fantasy figures or groups of fantasy figures who appeared in the imagery. This category included such figures as fairies, cartoon figures, figures from the past, or fictional people. (That is, any person the respondent could not have encountered in reality).

4) Self - All references to the respondent himself were counted as a separate category, including both responsive and objective references (that is, the respondent could be either participating in the imagery, or observing himself objectively). Although the respondent may have been implicitly participating, by the fact of observing the image, (ie "a beach"), this category was only coded if specific reference was made to the self (ie. "I was walking..."); or if this reference was indirect, but clearly implying the first person (ie. "walking along the beach...").



b) Places - This category included the number of places in which the image occurs, if specifically mentioned in the imagery. The "Places" category included three mutually exclusive sub-categories;

1) Manmade - This category included cities, rooms, bridges, etc.; all manmade settings that are not fantasy.

2) Natural - All natural settings, such as the beach, woods, fields, etc., that are not fanciful.

3) Fantasy - This category would include all fantasy settings, that the respondent could not have experienced; ie the bridge of a starship, or a landing on the moon.

c) Objects - This category included the number of distinct, specifically mentioned manmade and natural objects in the image. This category included;

1) Manmade - All manmade objects of any sort, including buildings, clothes, vehicles, weapons, etc.; but excluding musical and instrumental objects.

2) Musical - All objects of a musical nature that are not actually played as an instrument. This would include stages, music sheets, batons, etc.

3) Instruments - All objects used as instruments of music.

4) Natural - All inanimate natural objects, including rocks, water, sky, mountains, clouds, sand, etc. Animate natural "objects" were detailed under:

5) Plants - All plants, whether mentioned specifically or generally; for example, grass, trees, woods, flowers.

6) Animals - As a general category, including fish and birds.

d) Events - This category included the number of events specifically mentioned in the image, including three sub-categories:

1) Human events - all human events that are not fictional, including parties, dances, concerts, picnics, wars or battles.

2) Natural events were detailed separately, for example storms, earthquakes, eruptions, fires.

3) Fictional - When an event, ie. a war, was fictional, it was detailed separately; ie. star wars, etc.

e) Movement or Activity - Actions or movements in the image, that were specifically mentioned. This category included four sub-categories:

1) Musical - As in the "objects" category, because of the demand characteristics of the stimuli, musical movement was listed as a separate category. This would include playing an instrument, a conductor conducting, a singer singing, etc.

2) Dancing - Movement to music, including musicians swaying to music, dancers dancing, etc.

3) Other - All other movement or activity that is not musical, dancing, or natural, for example, walking, smiling,

etc.

4) Natural - All natural movement or activity, including such movements as waves (since waves are necessarily dynamic), animals running, or even "sun shining".

f) Time - All time references, either specifically mentioned, or implied by the nature of the references, were included in this category. Four sub-categories were coded;

1) Past - All references to the past were tallied, including references to past figures or events, for example, ancient Rome, Viking warriors, or the respondent's childhood.

2) Present - Since one can assume most imagery will be in the present tense, this category was coded only if it was specifically mentioned, ie. I am now walking on the beach.

3) Future - As in the "past" category, all references to the future, including future figures or events; for example, an image of the respondent graduating next year.

4) Other - All other time references, not specifically in the past, present or future, including season and time of day.

g) Colour - This category included the number of colour references, (ie. "blue sky", "white clouds"), specifically mentioned in the image. Although an image of the sky may seem to imply that it is intrinsically blue or grey, this category was not tallied unless the respondent specifically mentioned colour.

h) Body Parts - This category included the number of references to parts of the body, including hair, teeth, arms, etc.

i) Descriptive Adjectives - All descriptive adjectives, adverbs, and phrases, that refer to, qualify, or describe the object, figure, or place of the image were included in this category, including colour, time, etc. All descriptions (each coherent whole coded as one) were included in this category. For example, in the image "a knight in black armour, long ago"; there would be four descriptive adjectives: 1) "knight", qualifying the figure, 2) "in", placing the armour on the knight, 3) "black", describing the colour, 4) "armour", describing what the knight is wearing, 5) "long ago", placing the knight in time.

### 3. Quality of the Image

#### a) Stimulus Bound/Concrete/Sequential:

1) Stimulus Bound - Since, due to the nature of the stimulus, it is impossible to know how much an image that doesn't specifically refer to musicians playing the music has been suggested by the music stimulus, the category "stimulus bound" (meaning, directly concerned with or inspired by the stimulus) included all images that are not concrete or sequentially following from another image. That is, it was

assumed that the images were basically inspired by the music, since that was the instruction given before the study.

2) Concrete Stimulus Bound - The number of images (images as defined in "Number of Images" category) that refer to the actual stimulus situation of music being played or listened to. This category included not only the concrete situation of the study, but also the extrapolated image of hearing the music in more normal settings.

3) Sequential - All images which followed from, or were, as nearly as one could tell, suggested by the one previous to it. In the case of a complex image, it includes the images in the same scene that followed from the first, as though the respondent were looking around the scene of his image, one component at a time.

b) Modality - This category included the number of references to sensory modes. Since it was found that almost every one of the images was visual, even when another sensory mode was also mentioned, it was assumed that the images were visual, and the references to other sensory modes were tallied as they occurred.

c) Observing/Participating - It was found that most of the images were "observing", and this was indicated on the coding sheet by "obs". When "participating" images occurred, the number of "participating" images was tallied. An example of a

participating image reflects its correlation with the presence of "self" in the image; for example, "I walked on the beach".

d) Simple/Complex - The number of scenes or overall images was noted; if a complex image consisted of ten sequential images, it was counted as one complex image, while ten disconnected simple images were counted as ten simple images.

Simple images were defined as such if they were generally consisting of a single undetailed element (Pope and Singer, 1978). Complex images were defined as such if they were complex, well-detailed single scenes. Examples of each of these categories were given in the description of the "Number of Images" category.

e) Realistic/Fantasy - Using the number of images as the number of simple or complex, a complex image counted as one in this categorization. It was found that usually the images tended to be realistic; the "fantasy" category was tallied if the scene was unfamiliar, strange, unlikely to have occurred to the respondent (ie Viking warriors, or a landing on the moon), or impossible in reality (Pope and Singer, 1978).

## B. Imagery Analyses

### 1. ANOVA

Once the imagery was coded, for each of the six music stimuli, the tallies were totalled and each category was statistically analyzed for the overall ANOVA F, using an (AxS) design for single factor repeated measure designs. The results are shown in Table 1. Few of the categories failed to show a significant difference; most showed an overall significant difference of greater than .001. Only 4 categories showed no significant overall differences; the number of references to humans, colour, body parts, and the number of simple images. The rest of the 35 categories were found to show significant differences of scores between the six musical stimuli.

Table 1

#### OVERALL ANOVA OF IMAGERY REFERENTS AND QUALITIES

<u>Imagery Referent</u>	<u>F</u>	<u>Sig</u>
1. Number of Images	6.42	.00
2.A. People: 1. Human	1.95	.086
2. Musician	6.13	.00
3. Fantasy	4.45	.0006
4. Self	4.79	.0003
B. Places: 1. Manmade	15.30	.0
2. Natural	8.98	.00
3. Fantasy	3.85	.0022

C.Objects:1.Manmade	8.4	.0
2.Musical	5.9	.00
3.Instrumental	5.73	.00
4.Natural	13.37	.0
5.Plants	5.71	.00
6.Animals	14.72	.00
D.Events:1.Human	14.63	.00
2.Natural	2.49	.0312
3.Fictional	6.8	.00
E.Movement:1.Musical	3.56	.0038
2.Dancing	8.05	.00
3.Other	9.31	.00
4.Natural	10.21	.00
F.Time:1.Past	15.27	.00
2.Other	3.41	.0052
G.Colour	.94	.4565
H.Body Parts	1.42	.2156
I.Descriptive Adjectives	4.83	.0003
3.A.1.#of Stimulus Bound	7.27	.0
2.#of Concrete S.B.	10.14	.00
3.#of Sequential	2.65	.0231
B.Modality:Auditory	3.46	.0047
C.1.Participant Images	3.97	.0017
2.Simple Images	1.56	.1717
Complex Images	3.14	.0088
3.Realistic Images	8.33	.00



## 2. Multiple Comparisons

The imagery categories found to be significantly different between the stimuli were then analyzed by post-hoc multiple comparisons, using a comparison  $\times$  respondent error term, rather than the overall MSaxs, as advised by Keppel (1973). Dunn's test was used to evaluate the significance of each set of comparisons (Keppel, 1973). The results of the multiple comparisons are detailed in Table 2.

Table 2

IMAGERY REFERENTS AND QUALITIES: MULTIPLE COMPARISONS OF  
SIGNIFICANT OVERALL F CATEGORIES

<u>Imagery Comparisons</u>	<u>Dunn's F</u>	<u>Sig</u>
<u>1. Number of Images:</u>		
Music #1 & 2	11.415	.05
Music #1 & 3	20.455	.01
Music #1 & 5	10.723	.05
Music #2 & 4	7.359	-
Music #2 & 6	9.89	.05
Music #3 & 4	9.09	.05
Music #3 & 6	7.89	-
Music #2, 3, 5 vs #1, 4, 6	31.08	.01
<u>2. Number of People: Musicians</u>		
Music #1 & 3	8.3	-

Music #1 & 4	13.865	.01
Music #2 & 3	9.97	.05
Music #2 & 4	13.124	.01
Music #3 & 6	10.163	.05
Music #4 & 6	12.28	.01
Music #5 & 6	11.238	.05
Music #1,2,6 vs #3,4,5	30.2	.01
Music #1,2,3,6 vs #4,5	17.6	.01

### 3. People: Fantasy Figures

Music #3 & 5	10.37	.05
Music #3 & 6	20.6	.01
Music #4 & 6	10.94	.05
Music #3 vs #1,2,4,5,6	7.968	-
Music #6 vs #1,2,3,4,5	26.315	.01

### 4. People: Self

Music #1 & 5	12.189	.01
Music #3 & 5	7.2775	-
Music #4 & 5	12.9567	.01
Music #4 & 6	8.365	.05
Music #1,2,3,4 vs #5,6	16.1138	.01
Music #1,4 vs #5,6	21.164	.01

### 5. Place: Manmade

Music #1 & 5	30.75	.01
Music #1 & 6	15.55	.01
Music #2 & 5	20.293	.01
Music #3 & 5	33.625	.01

Music #3 & 6	22.736	.01
Music #4 & 5	29.138	.01
Music #4 & 6	15.265	.01
Music #1,2,3,4 vs #5,6	41.24	.01
<u>6.Place:Natural</u>		
Music #1 & 2	15.6367	.01
Music #1 & 3	11.391	.05
Music #1 & 4	14.438	.01
Music #2 & 5	10.083	.05
Music #2 & 6	21.699	.01
Music #3 & 5	8.326	-
Music #3 & 6	16.906	.01
Music #4 & 5	9.294	.05
Music #4 & 6	23.498	.01
Music #2,3,4 vs #1,5,6	34.355	.01
<u>7.Place:Fantasy</u>		
Music #1 & 3	6.27	-
Music #3 & 6	8.054	.05
<u>8.Objects:Manmade</u>		
Music #1 & 5	15.261	.01
Music #2 & 5	38.001	.01
Music #3 & 5	12.12	.01
Music #4 & 5	45.358	.01
Music #6 & 5	11.073	.05
Music #4 & 6	8.94	.05
Music #3 & 4	7.51	-

Music #1,2,4 vs #3,5,6	26.158	.01
Music #1,2,3,4,6 vs 5	35.999	.01
<u>9.Objects:Musical References</u>		
Music #1 & 3	8.676	.05
Music #1 & 4	16.465	.01
Music #3 & 6	14.432	.01
Music #4 & 6	26.69	.01
Music #5 & 6	11.8	.01
Music #3,4,5 vs #1,2,6	19.24	.01
<u>10.Objects:Musical Instruments</u>		
Music #1 & 2	32.73	.01
Music #1 & 3	13.54	.01
Music #1 & 5	13.19	.01
Music #1,4 vs #2,3,5,6	33.66	.01
<u>11.Objects:Natural</u>		
Music #1 & 2	14.82	.01
Music #1 & 3	21.015	.01
Music #1 & 4	20.31	.01
Music #2 & 6	30.087	.01
Music #3 & 5	10.778	.05
Music #3 & 6	33.897	.01
Music #4 & 5	11.128	.05
Music #4 & 6	38.85	.01
Music #5 & 6	8.356	-
Music #1,5,6 vs #2,3,4	43.681	.01
<u>12.Objects:Natural-Flants</u>		

Music #2 & 3	8.396	.05
Music #2 & 6	17.16	.01
Music #3 & 4	13.36	.01
Music #4 & 5	10.412	.05
Music #4 & 6	21.214	.01
Music #2,4 vs #3,5,6	13.505	.01

### 13. Objects: Natural-Animals

Music #1 & 2	12.925	.01
Music #1 & 3	9.3775	.05
Music #1 & 6	8.762	-
Music #2 & 4	12.434	.05
Music #2 & 5	24.677	.01
Music #2 & 6	35.62	.01
Music #3 & 4	11.263	.05
Music #3 & 5	19.769	.01
Music #3 & 6	34.265	.01
Music #4 & 6	14.193	.01
Music #2,3 vs #1,4,5,6	32.27	.01
Music #1,4 vs #5,6	9.699	.05

### 14. Events: Human

Music #1 & 3	19.389	.01
Music #1 & 5	14.39	.01
Music #1 & 6	13.564	.01
Music #2 & 5	25.41	.01
Music #3 & 4	26.33	.01
Music #3 & 5	52.203	.01

Music #4 & 6	15.55	.01
Music #5 & 6	41.628	.01
Music #2,3,6 vs #1,4,5	61.525	.01

15. Events:Natural

Music #2 & 6	8.25	.05
Music #3 & 6	7.94	.05
Music #2,3 vs #1,4,5,6	7.314	.05

16. Events:Fictional

Music #1 & 3	9.6	.05
Music #2 & 3	16.466	.01
Music #3 & 6	25.033	.01
Music #4 & 6	10.854	.05
Music #3 vs #1,2,4,5,6	13.895	.01
Music #6 vs #1,2,3,4,5	32.564	.01

17. Movement:Musical

Music #1 & 4	17.95	.01
Music #1 & 5	13.56	.01
Music #1 & 2	7.03	-
Music #1,6 vs #2,3,4,5	21.001	.01

18. Movement:Dancing

Music #1 & 3	16.984	.01
Music #1 & 4	15.	.01
Music #1 & 6	8.533	-
Music #2 & 3	11.894	.05
Music #3 & 5	21.532	.01
Music #3 & 6	21.822	.01

Music #4 & 5	10.47	.05
Music #1 vs #2,3,4,5,6	9.22	-
Music #2,5 vs #3,4,6	18.269	.01

19. Movement:Other

Music #1 & 3	43.855	.01
Music #1 & 5	19.207	.01
Music #1 & 6	13.5075	.01
Music #2 & 3	11.157	.05
Music #3 & 4	25.925	.01
Music #4 & 5	13.418	.01
Music #4 & 6	12.6286	.01
Music #1,4 vs #2,3,5,6	47.488	.01

20. Movement:Natural

Music #1 & 2	17.679	.01
Music #2 & 3	8.0076	-
Music #2 & 5	21.262	.01
Music #2 & 6	33.4726	.01
Music #3 & 6	14.54	.01
Music #4 & 6	16.584	.01
Music #1,5,6 vs #2,3,4	41.12	.01

21. Time:Past

Music #1 & 3	22.822	.01
Music #2 & 3	14.419	.01
Music #2 & 5	12.95	.01
Music #3 & 4	23.252	.01
Music #3 & 5	33.577	.01

Music #3 & 6	13.598	.01
Music #4 & 5	14.75	.01
Music #5 & 6	15.445	.01
Music #3 vs #1,2,4,5,6	23.573	.01

22. Time: Other

Music #1 & 5	11.516	.01
Music #5 & 6	10.926	.01
Music #4,5 vs #1,2,3,6	19.004	.01
Music #3 & 5	7.4915	.05

23. Number of Descriptive Adjectives

Music #2 & 4	10.534	.05
Music #3 & 4	20.352	.01
Music #4 & 5	17.855	.01
Music #4 vs #1,2,3,5,6	18.647	.01
Music #2,3,5 vs #1,4,6	22.984	.01

24. Number of Stimulus Bound Images

Music #1 & 2	8.583	.05
Music #1 & 3	18.395	.01
Music #1 & 4	13.561	.01
Music #1 & 5	20.16	.01
Music #3 & 6	9.896	.05
Music #5 & 6	14.87	.01
Music #1 vs #2,3,4,5,6	16.8167	.01
Music #3,5 vs #1,2,4,6	20.8516	.01

25. Number of Concrete Stimulus Bound Images

Music #1 & 3	20.113	.01
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Music #1 & 4	21.629	.01
Music #2 & 3	12.1233	.01
Music #2 & 4	10.491	.05
Music #3 & 6	27.843	.01
Music #4 & 6	25.437	.01
Music #5 & 6	19.0227	.01
Music #3,4,5 vs #1,2,6	38.472	.01
<u>26. Number of Sequential Images</u>		
Music #1 & 3	10.425	.01
Music #3 & 4	11.842	.01
<u>27. Number of Auditory Images</u>		
Music #4 & 6	10.268	.01
Music #6 vs #1,2,3,4,5	6.8365	.05
Music #2 & 6	7.2246	.05
<u>28. Number of Participant Images</u>		
Music #1 & 5	7.3195	-
Music #2 & 5	7.1081	-
Music #3 & 5	11.7425	.01
Music #4 & 5	13.9124	.01
Music #5,6 vs #1,2,3,4	13.11	.01
<u>29. Number of Complex Images</u>		
Music #1 & 2	13.193	.01
Music #1 & 3	12.258	.01
Music #1 & 4	7.1435	.05
Music #1 & 6	8.795	.05
<u>30. Number of Realistic Images</u>		

Music #1 & 5	15.737	.01
Music #2 & 3	12.27	.01
Music #3 & 5	27.883	.01
Music #3 & 6	13.784	.01
Music #4 & 5	19.835	.01
Music #1,3,4 vs #2,5,6	26.679	.01

### 31. Number of Fantasy Images

Music #1 & 3	26.4032	.01
Music #2 & 3	16.353	.01
Music #2 & 5	11.331	.05
Music #2 & 6	11.988	.01
Music #3 & 4	16.708	.01
Music #3 & 5	45.465	.01
Music #3 & 6	45.465	.01
Music #4 & 5	16.584	.01
Music #4 & 6	12.948	.01
Music #1,5,6 vs #2,4	21.5122	.01

### 3. Multiple Correlations

The imagery data was analyzed within each music selections for the correlations between the imagery variables. A correlation matrix was generated for each music selection, detailing the correlations of each variable with every other variable.

### C. Imagery Themes

Phenomenological or introspective reports are analyzed in several ways; A) Concrete aspects, including 1. Referents, 2. Pattern, 3. Quality, and B) Abstract aspects. The concrete aspects were coded and analyzed as noted previously. The abstract meaning, essence or theme of the imagery evoked by the musical stimuli were abstracted according to the phenomenological method (Vallee & King, 1978).

The phenomenological method attempts to abstract an underlying theme or meaning for various reports of the same phenomena. In this case, the protocols or imagery reports were read, and a list of themes of the imagery evoked by the music was abstracted, from ideas or themes that recurred throughout the respondents' imagery protocols.

The imagery protocols strongly impressed the researcher as being markedly 1) similar to other respondents' protocols of imagery evoked by the same music stimuli, and 2) completely and obviously different to other imagery protocols by the same and/or other respondents, from different music stimuli. The theme or general sense or meaning of the imagery was very different according to the music stimuli, and irrespective of individual respondent's specific concrete associations; so much so that the researcher, after abstracting themes, could accurately identify to which music stimuli an individual imagery report belonged.

Once the list of recurring themes was abstracted, the protocols were reread, and the themes were checked off if references to them occurred in the protocol, or in the respondent's own report of theme (Imagery question #3). The reports are detailed in Table 3.

Table 3

Imagery Themes

<u>Themes</u>	<u>Reports with Theme</u>	<u>% of Total Subjects</u>
<u>Music #1</u>		
a) Piano	40	67%
b) Ballet	22	37%
c) Other Dancing	9	15%
d) Children	31	52%
e) Fantasy Figure	12	20%
f) Elegance	21	35%
g) Nature	18	30%
<u>Music #2</u>		
a) Symphony	29	48%
b) Fantasy	15	25%
c) Dancing	14	23%
d) Ballet	9	15%
e) Happy	20	33%
f) Active	43	72%
g) Nature	40	67%
h) Suspense	8	13%
i) Horse/Deer Running	17	28%

### Music #3

a) Important Events	23	38%
Parades	19	32%
Battles	13	22%
b) Armies	23	38%
c) Past	31	52%
d) Romans	7	12%
e) Knights	12	20%
f) Royalty	17	28%
g) Space	13	22%
h) Ocean, ships	21	35%
i) Mountains	13	22%
j) Other Natural Grandeur	10	17%
k) Movies	16	27%
l) Symphony	8	13%

### Music #4

a) Harp	18	30%
b) Oriental	21	35%
c) Relaxed	8	13%
d) Peaceful	30	50%
e) Fantasy	20	33%
f) Nature	34	57%
g) Sad associations	17	28%
h) Water	29	48%
i) White	9	15%
j) Scary/Danger	6	10%

Music #5

a) Saxophone	11	18%
b) Urban, city	28	47%
c) Jazzy	13	22%
d) Relaxed, mellow	24	40%
e) Nightclub	18	30%
f) Dancing	22	37%
g) Beach	13	22%
h) Sunshine	20	33%
i) Driving	16	27%
j) Sophistication	10	17%
k) Blacks	12	20%

Music #6

a) Guitar	16	27%
b) Rock concert assoc.	42	70%
c) Hippies	18	30%
d) Young people	13	22%
e) 60's era	6	10%
f) Parties	8	13%
Dances	15	25%
g) Crowds	23	38%
h) Aggression	21	35%

## D.Emotion Analyses

### 1.Emotion-Differences between Music Stimuli

The respondents were asked to check each emotion or mood they thought was applicable to 1) their own feelings and 2) the mood they thought the composer was expressing. The resulting tallies of emotions checked were analyzed both between music stimuli and within each music stimulus.

Since the tallies constituted a simple pass/fail score, Cochran's Q test (Daniel, 1978) was used to test the overall differences between the music selections in each emotion/mood category. The results are shown in Table 4. As with the imagery results, few emotions failed to show significant differences between the musical stimuli. Only 14 of the 65 emotions were not significantly different. Both the emotions felt, and the emotions expressed by the composer were analyzed.

Table 4

<u>Emotion</u>	<u>Q Felt</u>	<u>Sig</u>	<u>Q Expressed</u>	<u>Sig</u>
1.Active	51.947	.001	70.959	.001
2.Affectionate	26.176	.001	36.14	.001
3.Afraid	5.172	--	6.36	--
4.Alert	22.08	.001	38.03	.001
5.Amused	10.65	--	24.88	-
6.Angry	31.09	.001	25.07	.001

7. Annoyed	33.64	.001	21.11	.001
8. Anxious	26.46	.001	17.09	.01
9. Apathetic	5.48	--	11.52	.05
10. At Ease	86.27	.001	65.59	.001
11. Bad Tempered	14.42	.02	12.	.05
12. Blue	18.8	.01	27.74	.001
13. Calm	110.83	.001	101.22	.001
14. Carefree	63.43	.001	87.95	.001
15. Composed	15.62	.01	15.85	.01
16. Contemplative	42.62	.001	25.18	.001
17. Cheerful	37.21	.001	54.38	.001
18. Dignified	37.09	.001	54.53	.001
19. Earnest	10.	--	8.81	-
20. Elated	22.76	.001	21.41	.001
21. Energetic	34.23	.001	69.112	.001
22. Enthusiatic	22.06	.001	39.4	.001
23. Excited	42.57	.001	47.63	.001
24. Furious	5.86	--	11.	-
25. Grouchy	9.54	--	--	-
26. Happy	41.69	.001	64.38	.001
27. Helpless	17.78	.01	8.	-
28. Hopeless	6.08	--	12.86	.05
29. Indifferent	8.68	--	3.84	-
30. Interested	.87	--	3.57	-
31. Introspective	27.21	.001	33.57	.001
32. Jittery	20.4	.01	9.88	-



33. Joyful	14.	.02	45.79	.001
34. Languid	17.52	.01	33.92	.001
35. Lazy	14.77	.02	14.04	.02
36. Lighthearted	49.47	.001	92.2	.001
37. Listless	9.58	--	15.84	.01
38. Lively	30.55	.001	42.05	.001
39. Lonely	27.57	.001	54.45	.001
40. Longing	11.15	.05	41.54	.001
41. Loving	18.02	.01	30.63	.001
42. Nervous	6.06	--	8.	-
43. Nonchalant	15.15	.01	17.83	.01
44. On Edge	36.24	.001	46.21	.001
45. Optimistic	11.93	.05	18.65	.01
46. Preoccupied	10.68	--	2.97	-
47. Pretty Good	18.35	.01	27.17	.001
48. Proud	37.14	.001	66.16	.001
49. Relaxed	67.97	.001	62.24	.001
50. Reverent	13.91	.02	30.61	.001
51. Resentful	12.38	.05	15.	.02
52. Sad	29.32	.001	39.47	.001
53. Serene	89.76	.001	105.85	.001
54. Serious	12.75	.05	21.87	.001
55. Shaky	15.41	.01	15.	.02
56. Sluggish	5.36	--	5.57	-
57. Spiteful	9.85	--	25.01	.001
58. Tense	31.54	.001	40.85	.001

59. Tired	16.04	.01	11.66	.05
60. Thoughtful	27.25	.001	11.67	.05
61. Unhappy	10.87	--	10.99	-
62. Vigorous	25.34	.001	42.3	.001
63. Weary	21.04	.001	12.21	.05
64. Worried	6.14	--	5.85	-
65. Worthless	10.53	--	8.2	-

## 2. Emotion-Differences within Music Stimuli

The tallies were also analyzed within each music selection by means of the Cochran Q test to determine if there were overall differences within each music group in the pattern of emotions chosen. Both the Emotions Felt and the Emotions Expressed were analyzed. The results are shown in Table 5. Each music selection showed a greater than .001 overall significant difference within each music, in the pattern of emotion, both felt and expressed.

Table 5

### EMOTION-DIFFERENCES WITHIN MUSIC SELECTIONS IN ADJECTIVES

#### CHECKED

<u>Total Adjectives</u>	<u>Overall Q Score</u>			
<u>Music #</u>	<u>Q Felt</u>	<u>Sig</u>	<u>Q Expressed</u>	<u>Sig</u>
#1. Mozart	442.133	.001	938.04	.001
#2. Beethoven	620.605	.001	999.37	.001
#3. Folk	396.878	.001	932.627	.001

#4. Debussy	723.363	.001	758.009	.001
#5. Jazz	743.488	.001	927.476	.001
#6. Rock	314.604	.001	544.469	.001

### 3. Emotion-Differences between Emotion Groups, within Music Stimuli

The Mood list, from Lorr, Daston, and Smith's (Plutchik, 1980) mood factors, was grouped into 10 factors, and the average of the total number of emotions checked within each group, per number of emotions in each group, was analyzed by Chi-squared to determine if there were overall differences within each music selection in group or factor (as well as individual emotions). Both emotion felt and emotion expressed were analyzed. All the music stimuli were found to have significant overall different averages in the groups of emotions checked.

#### Table 6

#### EMOTION - DIFFERENCES WITHIN MUSIC SELECTION IN EMOTION GROUPS

#### CHECKED

<u>Averaged Group Checked</u>	<u>Overall Q Score</u>			
<u>Music #</u>	<u>Q Felt</u>	<u>Sig</u>	<u>Q Expressed</u>	<u>Sig</u>
#1. Mozart	27.982	.001	54.364	.001
#2. Beethoven	54.93	.001	97.548	.001
#3. Folk	49.466	.001	114.38	.001
#4. Debussy	49.55	.001	50.67	.001

#5. Jazz	49.581	.001	66.132	.001
#6. Rock	23.431	.001	40.959	.001

#### 4. Emotion-Correlation between Mood Felt and Mood Expressed

The total tallies of emotions checked for each separate music selection for Emotion Felt and Emotion Expressed were analyzed to determine the overall correlation between emotion felt and emotion expressed (Ferguson, 1976). The results are shown in Table 7. In every music selection, the total number of adjectives checked for emotion felt and emotion expressed was correlated with a significance level of greater than .001. Music #6, the rock music selection, showed the lowest correlation with an  $r=.75$ . All other music stimuli showed correlations of above  $r=.9$ .

#### Table 7

#### EMOTION - CORRELATION BETWEEN MOOD FELT AND MOOD EXPRESSED, IN TOTAL SCORES ON ADJECTIVES CHECKED PER MUSIC

<u>Music #</u>	<u>Correlation (r)</u>	<u>Sig</u>
Music#1.Mozart	.909	.001
Music#2.Beethoven	.927	.001
Music#3.Folk	.917	.001
Music#4.Debussy	.947	.001
Music#5.Jazz	.94	.001
Music#6.Rock	.748	.001

## E. Miscellaneous Analyses

The questionnaire items were also variously analyzed and summarized, according to the factors they were designed to examine or control.

### Imagery Questionnaire Item

1. What percentage of the imagery do you think you recorded, and what determined what was omitted or included.

The data from this question was read and noted by the researcher. Most of the reports noted that all, or nearly all (over 80%) of the imagery was recorded. Since there was no time limit on the questionnaire, this was perhaps to be expected. In a few instances the imagery was not fully recorded (70% or less). Respondents noted reasons such as the omission of images they thought to be completely unconnected to the music.

2. To what extent do you think the images were tied to or related to the music, rated from 1 to 5.

This question was asked to determine whether the images tended to be related to the music (stimulus bound), or were respondentively thought to be irrelevant. The images tended to be respondentively evaluated as related; the means for each music stimulus were calculated and an analysis of variance was conducted. The overall mean for all of the musics was 3.8. An ANOVA for repeated measures was done, and there was found to be

no difference between the means of the different musics.

4. Degree to which the music was liked, rated from 1 to 5.

This question was asked to determine how much the music was personally liked by the respondent, since taste may affect the imagery report. The results were averaged and analyzed by ANOVA for repeated measures. The overall mean for all of the musics was 3.18, and there was found to be a significant difference between the musics in the degree to which they were liked.

(Inspection of the data would indicate that the music #5, the Jazz, was liked the most, and the music #6, the rock music, was liked the least. The means of the other music selections were all in the middle range of 3 out of 5.

5. Degree to which the opinion of the music may have affected the imagery report.

This question was asked to determine whether the respondent thought his opinion of the music affected the imagery report. The results were averaged and analyzed by ANOVA for repeated measures. The overall mean was 3.0, and there was no significant difference between the musics.

## Personal Data Questionnaire

### 1. Hemisphere Laterality/Eye Movement

It was found that 25 respondents were self-reported right lookers, 12 were left-lookers, 12 were either way, and 11 didn't know. This distribution is not reflective of Bakan's discoveries

concerning the distribution of right and left lookers in a general population (Pope & Singer, 1978), which may cast doubt on the validity of such self-report measures of estimating eye direction/hemisphere laterality.

An ANOVA analysis was conducted on the imagery scores of the members of each of the four response groups, with the imagery scores as a general measure of ability to image. There was found to be no overall difference between the groups in ability to image.

### 2.Years of Musical Training

The range of musical training was from 0 to 15 years, with a mean of 2 years. However, 39 respondents had 2 years of training or less, with 24 respondents who had no training at all; the distribution was sharply J-shaped and skewed.

An ANOVA analysis was conducted on the imagery scores of the members of each of 5 training groups, consisting of 1) No training, 2) 1 to 3 years, 3) 4 to 7 years, 4) 8 to 11 years, 5) 12-15 years, and there was found to be no overall difference in imagery scores among the groups.

### 3.Musical Experience

This question, concerning experience playing an instrument, included three categories; 14 respondents had never played an instrument, 27 had sometimes played, and 19 frequently played an instrument. An ANOVA analysis was conducted on the imagery scores of the members of these groups, and there was found to be no overall difference between the groups in ability to image.

#### 4. Sex Differences in Ability to Image

There were 35 females and 25 male respondents. A t-test for differences in means was conducted on their imagery scores to see if there were any sex differences in ability to image. The t was 2.58, and there was found to be a significant difference between the groups at a .02 significance level, with females tending to have higher scores than males.



## V. Results and Discussion

### A. Imagery

As noted in the Analysis and Results section, most of the imagery categories showed overall significant differences. Multiple comparisons conducted on these overall differences revealed more specific tendencies which will be discussed specifically and generally for each category and for overall conclusions.

#### 1. Number of Images

One seems able to conclude that there are more images evoked by music #2 (Beethoven), #3 (Folk), and #5 (Jazz), than by #1 (Mozart), #4 (Debussy), and #6 (Rock). These music selections also have been shown to have more descriptive adjectives, which may simply be a function of their greater number of images overall.

#### 2. References to Musicians

It would appear that #1, #2, and #6 evoked significantly more references to musicians than #3, #4, or #5. It will be noted that #1, #2, and #6 also evoked more concrete stimulus bound images, references to musical objects, and to musical

movement. These selections tended to suggest music concerts at which music is played. Theme analysis also showed that in the imagery reports of music #1, 67% of the respondents referred to the piano, in #2, 48% of the respondents referred to the symphony, and in #6, 70% of the respondents referred to rock concerts.

### 3. References to Fantasy Figures

Music #3 has more references to fantasy figures, and #6 significantly less. Music #3, the Folk piece with its intended theme of Roman soldiers, did indeed appear to evoke images similar in theme to its intended meaning. Theme analysis in which references to the past, to space, or to movies figured prominently, would also support this view. Music #6 tended to evoke very specific concrete images associated with the event of the music being played. Fantasy figures rarely occurred.

### 4. References to Self

The modern, popular musics, #5 and #6, had more references to self in the imagery than the older, classical pieces #1, #2, #3 or #4. The analysis of participation in the images also revealed more participating images in #5 than in #3 or #4, and in #5 and #6 than in the average of the rest. This finding may be associated with the stronger familiarity of modern music and the likelihood that normal experience of modern music includes active participation such as dancing, or less active involvement

such as listening to this sort of music while driving or at home. Classical music may normally be encountered at classical concerts only.

#### 5. References to Manmade Places

Similar to the pattern for references to self, there are more references to manmade places in the modern popular music #5 and #6 than in the classical #1, #2, #3, or #4. This may be a function of the congruence of these two pieces with every day experience, which for these respondents would usually be urban. The era and the themes of these pieces would also be more contemporary and thus urban than those of the other pieces.

#### 6. Natural Places

Music #2, #3, and #4 had significantly more references to natural places than #1, #5, or #6. This pattern matches the pattern of references to natural objects. In the case of #2, and #4, in the Romantic and Impressionistic style of classical music which was intended to suggest nature, this pattern would be very appropriate. In the case of #3, the intended theme of the music was Roman soldiers marching along the "Pines of the Appian Way". It would appear to have succeeded in suggesting an outdoor setting congruent with its intended meaning.

#### 7. Fantasy Places

Music #3 was found to have significantly more references to fantasy places than #6, but not significantly more than the rest. This pattern is also reflected in the greater occurrence of fantasy figures in music #3, congruent with the intended theme.

#### 8. Manmade Objects

Music #5 has significantly more references to manmade objects than each of the other music selections. Also, #6 has more than #4, and #3, #5, and #6 together have more than #1, #2, and #4 together. In terms of totals, #5 had most, and #4 the least. This pattern could be related to the pattern of manmade places, and reflect a tendency towards manmade imagery themes and away from natural themes.

#### 9. Musical Objects

The pattern for musical objects is the same as that for number of musicians, musical movement, and concrete stimulus bound images. Music #1, #2, and #6 have significantly more references to musical objects than music #3, #4, or #5.

#### 10. Musical Instruments

It was found that music #1 had more references to musical instruments than #2, #3, or #5, and that #1 and #4 together had more than #2, #3, #5 and #6 together. This pattern parallels the theme analysis which showed that 67% of the respondents referred

to the main stimulus instrument, the piano, in music #1, and 30% of the respondents referred to the harp in music #4. In these pieces the main instrument was either unaccompanied, or most prominent, reflecting the influence of the structural qualities or properties of the stimulus.

### 11. Natural Objects

In this category, #2, #3, and #4 had significantly more references to natural objects than music #1, #5, or #6. This pattern is the same as the one for the number of references to natural places.

### 12. Natural Objects - Plants

Music #2 and #4 have significantly more references to plants than #3, #5, or #6. This is similar to the pattern for natural objects. The romantic selections can be seen to refer to plants more than do the Folk or modern pieces. This pattern differs from that of natural places and objects in that music #3 in this case has fewer references to plants than #2 and #4; plants are not as common an image in the Folk piece as the other natural references.

### 13. Natural Objects - Animals

There are two patterns evident in this category. Music #2 and #3 have the most references to animals, more than #1, #4, #5, and #6, taken both separately and combined. Music #1 and #4

have significantly more references to animals than the modern pieces #5, and #6. So #2 and #3 have the most references, #1 and #4 a moderate amount, and #5 and #6 have the fewest references. Theme analysis shows that horses and running deer were themes that were referred to by 28% of the imagery reports of #2. The themes of armies or battles from music #3 may have been responsible for the increased number of references to animals (probably horses) as well. Congruent with the theory that the themes associated with the modern music are those associated with every-day experience, one would expect animals to occur rarely if at all in the themes of these selections.

#### 14. Human Events

Music #2, #3, and #6 have more references to human events than #1, #4, or #5. Theme analysis revealed that #2 referred to events such as symphonies and ballets, and #3 had numerous references to battles, armies, and parades; a major theme (38%) was important events. Seventy percent of the respondents referred to rock concert associations, and other events such as parties and dances were major themes for music #6.

In the case of music #3, the theme of the music was intended by the composer to convey the idea of armies marching, so the occurrence of more references to events is appropriate. In the cases of #2 and #6, this result would match the findings that these music selections evoked more concrete stimulus bound images, and more references to musicians and musical objects,

since these references are associated with the "human event" of the symphony or concert at which the music is heard.

### 15. Natural Events

None of the scores was very high, but there were significantly more references to natural events in #2, and #3 than in #6, and #2 and #3 together have more than #1, #4, #5, and #6 together. This pattern is similar to that of natural places and events. Theme analysis shows that #3 tended to evoke themes about events in general, human, natural and fictional.

### 16. Fictional Events

Again, reflecting the theme of events in general, #3 had significantly more references to fictional events than #1, #2, #6, and of the average of the rest of the music selections. Music #6 had significantly fewer references to fictional events than #3 or #4, and of the average of the rest. Since it could be hypothesized that fictional events are related to fantasy, this pattern can perhaps be related to the pattern of results for fantasy figures and places. Music #3 shows more, and #6 shows less, consist with the fantasy or imagined past army theme of #3, and the concrete memory of a specific occasion theme of #6.

### 17. Musical Movement

Music #1 and #6 had more references to musical movement, that is references to playing musical instruments, than #2, #3,

#4, or #5. This pattern is similar to that of the number of references to musicians and is consistent with the theme analysis.

#### 18. Dancing Movement

Music #1 had a greater number of references to dancing than #3 and #4, and #1, #2, #5, and #6 together have a greater number than #3, #4, and #6. The theme analysis of #1 revealed that 52% of the respondents referred to ballet (37%) and other (15%) dancing, more than the other music themes of dancing. In Beethoven, #2, 38% of the respondents referred to dancing, 37% in #5, and dancing did not occur as a frequent theme for #3 or #4.

Thus, images of dancing, especially ballet, seems to have been evoked by music #1, and #2, the oldest pieces. Dancing (probably in a participating manner) was also evoked by the Jazz piece #5, while the other music stimuli were not greatly suggestive of dancing.

#### 19. Other Movement

In this category, #3, #5, and #6 had significantly more references to other movement than #1, or #4, and #3 had more than #2. In the case of #3, the other movement score possibly reflects the strong theme of armies and parades marching and fighting. In the case of #5, theme analysis revealed that 27% of the respondents referred to driving in a car. Walking on the



beach was also a frequent theme.

## 20. Natural Movement

It was found that music #2 had more references to natural movement than #1, #5, or #6, and that #6 had fewer than #2, #3, or #4. The average of #1, #5, #6 together is less than #2, #3, and #4 together. Theme analysis of #2 indicates that 72% of the respondents referred to an active, moving theme. A single theme of a horse or large animal running appeared in 28% of the reports. Since 67% of the reports referred to nature, natural movement would be consistent with an overall active and natural theme. This would also account for the results for #6. With few references to nature in the imagery evoked by #6, natural movement was also infrequent. Music #4 and #3, which also evoked more natural images, tended to have more natural movement than the other music stimuli.

## 21. Past References

Music #3 had significantly more references to the past than each of the others, separately and together; and #5 had fewer than #3, #2, #4, or #6. The results for #3 reflect the theme, both intended and abstracted, of Roman armies marching. If the images did not always specifically refer to Romans, as they did in 12% of the reports, they tended to refer to other warrior figures from the past - knights (20%), or vikings. The Jazz piece #5 was the most contemporary piece and did not attempt to

suggest the past in theme. It evoked the fewest associations to the past. The other modern piece, the Rock piece #6, was in fact composed ten years ago. Any references to the past were congruent with the time in which it would have been experienced.

## 22. Other Time References

While #5 had the fewest references to the past, it evoked the most references to other time associations, significantly more than #1 or #6. An average of #4 and #5 had more than the average of #1, #2, #3, and #6. The theme analysis of #5 showed that 33% of the reports referred to sunshine, and 22% to the beach. The themes of this piece tended to place the scenes of the images in a time of the day, frequently sunset. The imagery evoked by #4, though not significant on its own, was also sometimes placed in time of day, mainly at night.

## 23. Descriptive Adjectives

Music #4 evoked significantly fewer descriptive adjectives than #2, #3, or #5, and fewer than the rest taken together. In general, #2, #3, and #5 together have more descriptive adjectives than #1, #4, and #6 taken together. Considering the reputation of impressionist music for evoking flights of fancy, these results are rather surprising, and also reflect the fewer sequential images in the imagery reports of music #4 than in the others. Theme analysis suggests vague, almost abstract imaginative images, which is consistent with the impressionist

style. The images associated with the Debussy piece #4 were not clear memory images. The images to the other pieces, even the fantasy piece #3, can be seen as memory images. The descriptions of the imagery were more suggestive of vague impressions of an image, a Platonic essence or idea, rather than of a concrete memory. This would account for the fewer descriptive adjectives, since the images seemed more abstract and less descriptive in concrete terms.

Music #2, #3, and #5 seemed to evoke the most descriptive adjectives, possibly reflecting a more vivid or clear image or series of images. This pattern is the same as the pattern for number of images. It may be that the greater number of images included more descriptive adjectives, or that that which led to more imagery also influenced how detailed, complete and vivid the images were.

#### 24. Number of Stimulus Bound Images

It was found that #1 had fewer than #2, #3, #4, or #5 stimulus bound images, and fewer than the average of the other selections. Music #3 and #5 together had more than the average of the others. Thus, the Folk and Jazz pieces together had more stimulus bound images than the rest, and the Mozart piece had less.

#### 25. Number of Concrete Stimulus Bound Images

Similar to the pattern of references to instrumental objects and musical movement, it was found that #1, #2, and #6 evoked more concrete stimulus bound images, that is, images about musicians playing music. Since an image of a musician would by definition be a concrete stimulus bound image, the same phenomena would be reflected in this result.

#### 26. Number of Sequential Images

Music #3, which also evoked more images and descriptive adjectives, evoked more sequential images than #1 and #4. Since a sequential image was either directly related to/evoked by the previous image or was a further elaboration of the same image (as though the person was looking around at a scene), it would appear that #3 tended to evoke not only more fantasy references but also more imagery "flights", sequential to original images.

#### 27. Number of Auditory Images

The Rock music #6 was found to evoke more auditory images than #4 (Debussy), or #2 (Beethoven). For all of the selections auditory imagery was low, and imagery in the other modalities was very infrequent. Considering the nature of the stimulus, which was an auditory one, this may be an interesting finding. The descriptions of the auditory images of music #6 were often that it sounded loud, although the decibel measurement did not show any physical difference between the loudness of that piece and that of the others. The nature of the stimulus pattern of

Rock music and the usual occasion of its occurrence could be seen to suggest auditory images of "loud" music.

### 28. Participant Images

The pattern of this category is similar to the pattern for images of the self. Music #5 had more participant images than #3, and #4, #5, and #6 together have more than the average of #1, #2, #3, and #4. So the modern music appears to yield not only more images of self and of manmade places and objects such as the respondent would usually encounter, but also of participation in the image.

### 29. Complex Images

Although the number of simple images failed to show any significant difference, and may be an indicator of individual differences rather than of differences between the stimuli, the complex images showed that #1 evoked significantly fewer complex images than #2, #3, #4, or #6.

### 30. Realistic Images

Consistent with the tendency towards memory images of manmade objects and of the participating self, #5 evoked more realistic images than #1, #3, and #6. Music #2 and #6 evoked more realistic images than #3, which had the least number of realistic (and the most fantasy). Also, #2, #5 and #6 together had more than #1, #3, and #4 together. These results do fit the

overall themes of these pieces: #2 as active nature, #5 as participating urban, and #6 as rock concert associations - all probably based on memory images.

### 31. Fantasy Images

As one would have suspected from the realistic image results, #3 (Folk) evoked more fantasy images than #1, #2, #4, #5, or #6. The theme of this piece, of Roman or other past soldiers, fits this result. The definition of Fantasy included any image that could not have been experienced in reality by the respondent, such as Roman or Medieval soldiers. Music #2 and #4 evoked more fantasy images than #5 or #6. The modern pieces were lowest in number of fantasy images, which fits the pattern of manmade, urban, familiar experiences and associations.

### B. Multiple Correlation Results

The pattern of multiple correlation results reflects the fact that each referent is interdependent and not independent of other referents. An image consists of a scene in which several interdependent components can be discerned. That is, an image referent of a musician may occur in an image scene of an orchestra playing. There will be referents to musical objects, instruments, musical movements, and manmade places. In addition, some of the referents were not exclusive categories. For example, the descriptive adjective category included colour

referents. The number of descriptive adjectives contributed to a judgement of complex, since simple scenes tended to be undetailed. Self referents and participating images were found to be highly correlated, since participating images necessarily referred to the Self.

The pattern of correlations differs between the different music stimuli in most cases, since the scenes of which these correlated referents are composed tend to differ. The scenes follow the characteristic themes of the imagery reports for the different music stimuli. Thus, in Music #3, the number of humans is correlated with natural objects ( $r=.41$ ) and with manmade events ( $r=.44$ ). These two referents are not correlated with number of humans for any other music stimuli. But, since the characteristic theme of Music #3 was armies, on parade or in battle, or natural grandeur such as mountains, the pattern of correlation matches the theme.

Thus, as with the pattern of imagery referents and the pattern of emotions checked the pattern of correlated referents reflects both the fact that the referents occur in a scene composed of several different referents and the influence of the overall theme or meaning, as well as the relationship between categories in terms of concept.

### C. Themes

The imagery was first coded for referents and quality. The content itself was not attended to at this point. After the imagery was coded it was reread to abstract themes. It soon became evident that there were marked differences in tone between the imagery for each music. After reading some number of protocols, the coder could accurately classify the imagery into the correct music stimulus category on the basis of content alone. For example, the imagery that was evoked by the Folk music was of grand presentations, marches or parades, or of natural grandeur. There was a sense of great events in all the imagery, and this sense did not occur in the imagery evoked by the other stimuli. A brief discussion of the themes of each of the imagery responses follows.

1) Mozart: Children were a major theme in the imagery evoked by this stimulus. The major instrument of the stimulus, the piano, was also a frequent theme, often in a scene with children giving piano recitals. Ballet (37% of the respondents) and other (15%) dancing was also a frequent theme, giving a light and active sense, and the presence of children (52%) and fantasy figures (20%) provided a whimsical, light theme. There was also a sense of elegance (35%). The piano recitals were often in elegant, ornate interiors, or nature (30%).

2) Beethoven: There was a marked emphasis on nature and natural themes (67% of the respondents) in the imagery evoked by



this stimulus. Fantasy (25%), dancing (38%), active (72%) and happy (33%) themes also occurred in these protocols, especially active nature. Running horses or deer were specifically referred to by 28% of the respondents. Like the Mozart piece, the major instrumental influence, the symphony, was also a major theme (48%). There was an overall sense of nature and active movement in most of the protocols.

3) Folk: As noted above, important events, armies or parades, or natural grandeur were major themes. Congruent with the composers intended meaning of Roman soldiers on the Appian Way, the armies or soldiers referred to in the imagery were also from the past: either Roman (12%), Viking, or Medieval knights (20%). When the theme was nature, it conveyed a sense of grandeur and importance - the ocean (35%) or mountains (22%). In this imagery, the instrumental influence was not evident. Reference to the symphony occurred as a theme in only 13% of the reports. There was an overall sense of important human or natural events or scenes, of larger than life themes congruent with the composers meaning.

4) Debussy: Nature (57%) was also a major theme of the imagery evoked by the Debussy piece. In this imagery, the underlying sense was of peace (50%) and relaxation (13%). The major instrument, the harp, was a theme for 30% of the respondents. Water was also a major theme, and an Oriental sense was often referred to; perhaps these were associations suggestive of peace. Fantasy was another important theme (33%).

For some respondents the imagery was either scary (10%) or sad (28%), but for most the imagery evoked a quiet, peaceful sense. A typical image would be of a girl playing a harp, beside a pond in a Japanese garden.

5) Jazz: There was an urban, nightclub sophistication about the imagery evoked by the Jazz selection. It was a relaxed sophistication, a mellow sense, when dancing was referred to it was a slow and romantic dancing. Sunshine and the beach were also common themes, as well as driving in a car. The major instruments, horns, were not an important theme, referred to by only 18% of the respondents. The overall sense was of urban, relaxed good times, a relaxed happiness associated with city activities such as nightclubs and driving. (The beach imagery does not contradict this sense, in this case, since the beach in Vancouver is close to downtown).

6) Rock: Human events associated with rock music, such as rock concerts (70%), parties (13%), and dances (25%) were the major themes of the imagery evoked by the rock music. Other associations common to the popular music and its setting were also frequent themes: "hippies" and young people, crowds (38%) and aggression (35%). The principle instrument, the guitar, was referred to by 27% of the respondents. This stimuli seemed to evoke concrete, memory associations of the place and setting of the original composition. This may be the result of the fact that this type of selection, of all the pieces, can be assumed to be in the past experience of all or most of the respondents.

Thus, memories associated with the occasion of listening to the music would predominate in the imagery.

#### D. Emotion

##### 1. Differences Between Music Selections in Each Emotion

###### a. Emotion Felt

Analysis showed that almost every one of the 65 emotions or moods were significantly different overall among the music selections. Most of these significant differences were at the .001 level of significance. The only emotions that failed to show significant differences in emotion felt were 1) Afraid, 2) Amused, 3) Apathetic, 4) Earnest, 5) Furious, 6) Grouchy, 7) Hopeless, 8) Indifferent, 9) Interested, 10) Listless, 11) Nervous, 12) Preoccupied, 13) Sluggish, 14) Spiteful, 15) Unhappy, 16) Worried, 17) Worthless. Although there were a few responses in these categories, there was found to be no difference between the music stimuli in these emotions, in emotion felt.

###### b. Emotion Expressed

The results for "emotion expressed by the music" were similar to those for emotion felt. Most of the emotions showed overall significance at the .001 level. Only 1) Afraid, 2) Earnest, 3) Furious, 4) Grouchy, 5) Helpless, 6) Indifferent, 7) Interested, 8) Jittery, 9) Nervous, 10) Preoccupied, 11) Sluggish, 12) Unhappy, 13) Worried, and 14) Worthless showed no difference

between the music stimuli in emotion expressed by the music. The other 51 emotions showed significant overall differences between the musics and the pattern is similar to the emotion felt category.

## 2.Differences Within Music in Emotions

Each music stimuli showed an overall significant difference of .001 within each music selection in emotions checked for emotions felt and for emotions thought to be expressed by the music. That is, within each music selection some emotions were consistently checked rather than others in both emotion felt and in emotion expressed.

When the emotions were separated into groups of qualities, based on the findings of Lorr et al(Plutchik, 1980), these 10 groups were also found to show significant differences of .001 within each music piece in both emotion felt and emotion expressed.

One can therefore conclude that the different pieces of music evoked or were associated with different patterns of emotion responses, and that these pattern differed between music selections and were consistent across respondents within each individual music selection.

## 3.Correlation between Emotion Felt and Emotion Expressed

The emotion felt and emotion expressed total scores (that is, the total number of respondents who checked each adjective)

were correlated within each music selection. The correlations were found to be high and at the .001 level for each piece. One can conclude therefore that respondents tended overall to feel the emotion, as well as to think that the composer expressed it. This result would certainly support a theory that music not only can be understood in terms of emotional meaning, but also can evoke similar emotions in the listener, consistently and universally.

#### Summary and Discussion of Emotion Results

The results would definitely support the theory that music, a non-representational stimuli, can convey emotional meanings that can not only be understood consistently and universally but will also tend to be felt. A review of some of the most frequently checked emotions (above 25% of the respondents checked) reveals that, like the imagery results, the emotion results markedly follow the themes of the imagery evoked by the music.

#### Table 8

##### Percentage of Subjects above 25% Who Checked Emotion

<u>Emotions</u>	<u>Felt</u>	<u>Expressed</u>
<u>Music #1</u>		
Active	30%	43%
Carefree	37%	43%
Dignified	-	25%

Happy	37%	53%
Joyful	-	42%
Lighthearted	37%	60%
Lively	25%	43%

Music #2

Active	58%	70%
Alert	28%	32%
Cheerful	-	27%
Dignified	-	27%
Energetic	40%	65%
Enthusiastic	25%	38%
Excited	32%	37%
Lively	38%	52%
Vigorous	-	33%

Music #3

Active	40%	63%
Alert	32%	38%
Dignified	32%	52%
Energetic	-	45%
Enthusiastic	-	37%
Excited	-	42%
Lively	-	35%
Proud	28%	40%
Serious	-	28%
Vigorous	-	32%

Music #4

At Ease	47%	38%
Calm	68%	62%
Contemplative	37%	28%
Introspective	25%	
Lonely	-	25%
Relaxed	43%	33%
Serene	57%	55%
Thoughtful	28%	

Music #5

Active	43%	50%
At Ease	55%	40%
Calm	37%	
Carefree	60%	65%
Cheerful	30%	32%
Energetic	27%	33%
Happy	40%	33%
Joyful	-	28%
Lighthearted	42%	37%
Lively	30%	47%
Pretty Good	-	25%
Relaxed	38%	38%

Music #6

Active	27%	42%
Annoyed	28%	
Energetic	28%	48%
Excited	-	28%

Lively	-	28%
On Edge	32%	28%
Tense	25%	25%
Vigorous	-	25%

Music #1, the Mozart Rondo, was checked by over 25% of the respondents as (both felt and expressed) 1) Active, 2) Carefree, 3) Cheerful, 4) Happy, 5) Lighthearted, 6) Lively, and as expressing in addition 7) Dignified, and 8) Joyful. The theme analysis of the Mozart piece was also active in that dancing was a frequent theme, and it was also lighthearted and happy with children and fantasy figures prominent themes. The tone of the emotions most frequently checked reflect the air of happy, whimsical, activity, and also reflect in emotions expressed the frequent theme of elegance that also occurred in the imagery.

Music #2, the Beethoven symphony, was checked by over 25% of the respondents as (both felt and expressed) 1) Active, 2) Alert, 3) Energetic, 4) Enthusiatic, 5) Excited, 6) Lively, and expressed as 7) Cheerful, 8) Dignified, and 9) Vigorous. The theme analysis of the Beethoven piece reflects this air of energetic activity indicated by the tendency for the emotion adjectives to be in the Active group or factor. There was an overall sense to the Beethoven imagery of much activity and movement, and it was a theme for 72% of the respondents. Active, as an adjective, was checked as felt by 58% of the respondents and expressed by the music by 70% of the respondents. Energetic was checked as felt by 40% and expressed by 65%.



Music #3, the Folk or Respighi piece, was checked by over 25% of the respondents as (both felt and expressed) 1) Active, 2) Alert, 3) Dignified, 4) Proud, and expressed (though not felt by over 25%) as 5) Energetic, 6) Enthusiatic, 7) Excited, 8) Lively, 9) Serious, 10) Vigorous. The theme analysis of music #3 reflects these active and proud emotion groups. The proud, serious and dignified adjectives reflect the theme of important events, marches and parades. These themes were also active; the soldiers were marching or fighting and this active theme is reflected in the emotion adjectives.

Music #4, the Debussy, was checked by over 25% of the respondents as (both felt and expressed) 1) At Ease, 2) Calm, 3) Contemplative, 4) Relaxed, 5) Serene, by respondents as felt 6) Thoughtful, and as expressed as 7) Lonely. The general tone differs markedly from the active tone of the previous three music stimuli, reflecting the peaceful (50% of the respondents) and relaxed (13%) themes of the imagery evoked by this stimulus. All of the adjectives checked by over 25% of the respondents are in the "calm" and "thoughtful" groups, with both felt and expressed emotions in the calm group, felt emotions in the thoughtful group, and one expressed emotion in the lonely group.

Music #5, the Jazz piece, was checked by over 25% of the respondents as (both felt and expressed) 1) Active, 2) At Ease, 3) Carefree, 4) Cheerful, 5) Energetic, 6) Happy, 7) Lighthearted, 8) Lively, and 9) Relaxed, as felt 10) Calm, and as expressed 11) Joyful, and 12) Pretty Good. Sixty percent of the respondents

felt carefree and 65% thought the music expressed carefree. Matching the theme of the imagery, the tone of the adjectives most frequently checked is relaxed or at ease, and happy or carefree. It is a relaxed happiness that is somewhat active. This is reflected in the activities of the themes of dancing (37%) and driving in a car (27%); these activities are slow and unhurried. The tone of both the theme and the emotions reflects quite accurately the tone of the style of this type of Jazz.

Music #6, the Rock music, was checked by over 25% of the respondents as (both felt and expressed) 1) Active, 2) Energetic, 3) On Edge, 4) Tense, and as felt as 5) Annoyed, and expressed as 6) Excited, 7) Lively, and 8) Vigorous. The tone of the adjectives was of a tense sort of energy, suiting the rock music style. The annoyed, on edge and tense adjectives also reflect the aggressive (35% of the respondents) theme of the imagery evoked by the rock music. As was the case with the Jazz music, the tone of the adjectives checked matches the tone of Rock music in general since it is often seen as energetic and somewhat aggressive.

#### E. Discussion of Questionnaire Results

The analysis of the questionnaire revealed only a few notable results. The respondents thought that they had recorded most of their imagery, and tended to evaluate the images as related to the music rather than as being flights of fancy.

Ratings of the degree to which the music was liked did show that there were differences between the music stimuli, with the mean rating of the Jazz music, #5, as the highest, and that of music #6, the Rock music, as the lowest. The respondents thought that their opinion of the music affected the imagery report a moderate (3 out of 5) amount, and there was no significant difference between the music stimuli in this factor.

There were found to be no laterality, musical training, or musical experience influences on the imagery scores. There was found to be sex differences in the amount of imagery, with females tending to have higher scores than males. There may be two explanations of this finding. a) Females may have reported more imagery as part of a tendency to try to please the experimenter (Gough & Heilbrun, 1965). Studies have shown females have higher scores on affiliative and socially conventional scales. b) Some evidence has shown (Springer & Deutsch, 1981) that females may be less lateralized than males. This may perhaps allow them to produce more imagery without necessarily being dominated by the right hemisphere.

The lack of laterality differences where they may be expected may have been a result of the question, which may not be an accurate test of laterality. There may in fact be differences which are not showing up. Or, possibly, the sample is small enough to obscure real differences. In any case, as with the results showing sex differences in imagery ability, it may be argued that these factors will not have a consistent or

systematic effect on the imagery and emotion results of interest in this study.

Although there was a difference among the music stimuli in the degree to which they were liked by the respondents, there was no difference among the music stimuli in the degree to which the respondents thought that their opinion of the music would effect their imagery report. One may conclude that this factor may not have resulted in any systematic differences. However, one influence may be discerned in the fact that the lowest mean in degree liked, that of the Rock music, indicated that the Rock was liked the least overall. This music also showed the lowest correlation between the totals for emotions felt and emotions expressed. Although it was a high correlation ( $r=.7$ ), it was lower than the correlations for the other music stimuli, which were all around  $r=.9$ . The fact that the rock music was liked the least may have been a factor that interfered with the degree to which the respondents would feel the emotion, as well as recognize and identify it. This finding may help understand the "aesthetic problem" noted in the Introduction - how it can be that one can sometimes feel the emotion conveyed by music, art, or by others, while at other times one can identify it without actually feeling it.

## F. Implications of Imagery and Emotion Results

The imagery and emotion results have several possible implications for therapy. If music can make one feel different emotions, such as relaxed, happy, or energetic, clinicians may find that the use of music therapy is a useful tool in the therapeutic environment. The use of music which evokes calm and relaxation could be helpful in combatting anxiety and help induce an atmosphere conducive to therapeutic interaction. In fact, music therapy has become a therapeutic tool. The results of this study would indicate that music therapy can be effective, and perhaps should be practised more frequently.

Other medical environments, such as medical doctor and dentist's offices, may find (as some already do) that relaxing music may be useful to calm anxiety. In fact, any environment in which negative emotions such as anxiety or depression would interfere could use music to evoke the contradictory positive emotion. As a therapeutic technique, it is simple and easily practised. A client can at any time play energetic music to counter depression or soothing music to control anxiety.

The images evoked by music could also be a useful therapeutic tool. Guided imagery has recently come to the fore as a therapeutic technique, both as a means of inducing relaxation and countering anxiety, and as a means of voyaging to the inner self. The findings of this study that music evokes characteristic images that will generally be common across

individuals indicate that music can be used as an adjunct to guided imagery in therapy, to encourage, amplify, and underscore the imagery. Again, there are implications for the control of imagery and emotion in this association between imagery, emotion and music. The client or the therapist can attempt to induce the required mood and image through the use of musical stimuli.

Other uses of these findings are already popular. Supermarkets and office environments frequently use "musak" to attempt to induce the mood suited to the situation. However, Berlyne's (1974) findings that subjects prefer somewhat interesting and complex music to overly familiar and harmonious melodies could be an indication that the uninteresting and boring harmonies of "musak" type music are counteracting the mood effects the operators are attempting to induce. In addition, the use of radically different music, depending on the situation and the mood required, would seem to be indicated. "Musak" type music tends to be uniform and not adapted to the individual situation.

There are also implications for these findings for the training of musicians, and for the development of music appreciation. Training young musicians to be consciously aware of the images evoked by music and of the emotions with which they are associated could help them become more adept at conveying emotion through music. In terms of music appreciation, encouraging attention to the images and emotions evoked by music may increase appreciation, as well as critical judgement of the

ability of the composer to convey his intended meaning. Far from interfering with music appreciation, as Valentine (1962) has argued is the case, attention to the images evoked by music could appreciably increase enjoyment and understanding of it.

## VI. Summary and Conclusions

It is interesting to note that every respondent was able to produce at least some imagery in response to music when requested, even those respondents who protested at the start of the study that they imaged little. The imagery questionnaire revealed that the respondents themselves felt that they were able to record most of the imagery present in consciousness in the imagery report.

One cannot, however, conclude that one therefore usually images when listening to music. Because imagery can be produced doesn't necessarily imply that it usually is. The demand characteristics of the situation required the production of imagery. Gatewood (Schoen, 1927) found that, when asked, respondents could produce states or assign categories to previously unassociated phenomena. For example, they could rate the quality of tallness to a sound. In fact, imagery may always be present when listening to music; however, unless asked, one may not verbalize these images to oneself or even pay conscious attention to them. They may be in the background of consciousness on a pre-verbal level.

Similarly, although it appears one can conclude positively that music evokes certain specific and universal emotions or moods that can be not only commonly recognized and identified but can also be actually felt by the listener, the demand



characteristics of the study and its necessarily reflective nature must be considered. The checklist may suggest and label certain emotions or moods the respondent may not otherwise be fully aware of feeling. In a more ordinary situation, listening to music may not be the sort of exercise one does with full awareness of one's conscious experience. The focus of attention is the music, not the experience. In a normal situation, the music may be background, and other concerns may fill the focus of attention, submerging the influence of the musical stimulus so that one does not always feel the emotion one can identify in the stimulus. The fact that the study is asking respondents to report their experience may be altering or magnifying the experience somewhat.

However, allowing for the caution one must exercise in the interpretation of data of any sort, there are some conclusions which may be drawn. These concern both the specific experience of listening to music and its relationship with imagery and emotion, and the general Experiential or Gestalt theory of emotion for which this study may demonstrate support.

1. In general, contradicting Valentine (1962), and in support of the Gestalt and Experiential theory, there do appear to be obvious and significant differences in the pattern of image referents and quality between the different pieces of music. That is, there were common patterns of referent and quality among the respondents in the imagery evoked by each piece of music, and these patterns differed among the different

pieces of music.

The specific image referents were not independent of each other. The type of referent was dependent on the whole scene of the image, as demonstrated by the multiple correlation results. Thus, music #3, with its theme of armies marching, showed typical image referents of armies from the past, marching, mounted, and in a natural setting. This increased the frequencies of references to the past, fantasy figures, movement, animals, and nature when compared with the imagery evoked by the other music stimuli.

Thus, congruent with Gestalt principles, one would not say that specific image referents were evoked by each music stimulus. Rather, a pattern of images, reflected in referent, quality and theme, tended to be evoked by the stimuli.

2. Similarly, the mood or emotion checklist revealed evident significant differences in the emotions or moods checked for the different pieces of music. There were common patterns of emotions checked, both actually felt and thought to be expressed by the music. These both differentiated among emotions within each music piece and were also unique, that is, dissimilar to the other music stimulus patterns. This finding occurred both in emotions felt, and in emotions expressed, which were highly correlated. Frequently there were emotions that were checked by over 25% of the respondents in the expressed category, and not by over 25% in the felt category, indicating that although respondents may not always have felt every emotion the music was

expressing (particularly the stronger ones), they could quite accurately identify them.

3. Both the patterns of images and the patterns of emotions can be related to the characteristic theme or essence of the imagery reports which itself often reflected either 1) the intended theme of the music (i.e. Music #1, and Music #3), 2) the style or type of music (i.e. Music #5, and Music #6), or 3) the style of the composer (i.e. Music #2, and Music #4). These imagery themes were common among the respondents to a good degree and unique to each music stimulus. That is, though perhaps a specific concrete content of the image was related to the individual respondent's past experience and personality (and this would result in the discrepancy Valentine (1962) has noted between individual imagery reports to music), there were common themes or meanings in the imagery considered as a whole. The pattern of imagery referents and quality and even the pattern of most frequently checked emotions related to these themes. It would seem that one can say that there was an underlying meaning in the experience which it would be reasonable to associate with the theme or meaning inherent in the music, and which is expressed through two aspects of the aesthetic experience: the imagery and the emotions or moods.

4. Therefore, one may conclude that there are common patterns of images and emotions evoked by non-representational musical stimuli. These patterns of both imagery and emotion appear to convey an overall theme or meaning which may be

related to the theme or meaning inherent in, or associated with, the stimulus.

The finding that music evokes characteristic emotions may be a demonstration of Clyne's (1978) Sentic theory of emotion. In Clyne's view, music evokes sentically charged finger movements characteristic of certain emotions. Since behaviour and experience are isomorphically associated, evoking the finger movements evokes the emotion. Although this study did not examine the sentic movements Clyne thinks are characteristic of emotion, it did demonstrate that music does evoke common experiences of emotion or mood in the listener. Clyne's (1978) theory can explain how music accomplishes this association.

Valentine (1962) noted that listeners tend to move to music, either physically or through images of movement. This tendency to move to music or to have impulses to move or images of movement could explain the subtle finger movements Clyne has found. This study found images of movement were evoked by all of the music stimuli. Images of movement, whether musical, dancing, natural, or other kinds of movement, occurred to all of the music stimuli. It would be interesting to compare this finding to imagery reports evoked by static stimuli, to determine whether the sense of movement conveyed by the music stimuli significantly increased the number of references to movement in the reports, or whether the images of movement were an indication of Clyne's sentic finger movements.

As noted in the Introduction, Gestalt theory postulates that emotional meaning is immediate, unmediated, and uninterpreted; the meaning is perceived as directly and spontaneously as the physical characteristics of the stimulus (Hogg, 1969). It would be a difficult task to determine the dynamic or structural characteristics of the stimulus which correspond isomorphically with the experience of an emotion and the pattern of the imagery. However, if the theory is valid, a study of the images and emotions evoked by a musical stimulus should reveal common patterns of images and emotions that differ among the music stimuli.

More specifically, the Experiential theory of emotion hypothesizes that the experience of emotion or mood evoked by stimuli such as music is a function of the pattern of images, sensation and affect, which are themselves a function of the characteristics of the stimulus. If this theory is valid there should be common patterns of imagery associated with the different pieces of music, arising from the structural characteristics of the stimulus, through the Gestalt principles of perception. The listeners will tend to have similar patterns of imagery for each music, and these patterns will differ between the musics. There should also be common reports of emotion and emotion type in response to the different pieces of music.

This study has demonstrated that common patterns of imagery and emotion are different among the music stimuli. The

respondents showed common patterns of imagery in terms of referents and themes; even some of the concrete specific content was the same. The respondents often felt the emotions they thought the composer was expressing; but even for those emotions not strongly or commonly felt, the composer's intended meaning was certainly identifiable. All types of music showed these results, both classical and modern, liked and disliked. In general, this would support a view that art, and specifically music, does in fact yield similar experiences or impressions of meaning in the experiencer. More specifically, these results are also consistent with the Gestalt or Experiential approach to emotion and the aesthetic experience.

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