

## THE RELATION OF MOOD AND MELODIC PATTERN IN FOLK SONGS

This study was concerned, not with performance characteristics, such as tempo and volume, but only with characteristics which remain similar in all performances, such as modality, melodic pattern and rhythmic structure, and which serve to determine the identity of a particular folk song.

The study had three aims:

1. To establish whether specific characteristics of melodic pattern are related to specific mood.
2. To discover some of the characteristics related to certain moods.
3. To determine whether or not these relationships of specific characteristics to mood are the same or different in different cultures.

The musical material consisted of folk songs of four cultures -- German, French, English, and Southern Appalachian -- approximately 100 of each. The words of each song were submitted, separate from the musical score, to judges, three for each culture, who judged the mood of each song and recorded it on two mood scales of ten steps each, one ranging from "gay" to "sad", and the other from "energetic" to "quiet". Approximately the extreme third of the songs of each end of each mood scale were used for musical analysis and comparison.

The musical analysis consisted primarily of determining the incidence of a number of musical characteristics, most of which are quite quantitative.

Four methods of detection of modal differences were used. The first was based only on the final tone; the second, on whether the third of the key was major or minor; the third, on the percentage of phrases ending on each scale tone; and the fourth, on the functional importance of each scale tone, determined by frequency and importance of position.

Melodic characteristics considered were: size of intervals, direction of final cadence, direction of phrase endings, and pitch range.

Rhythmic characteristics considered were: basic rhythmic pattern, number of direction changes of melody, number of changes of tonality, numbers of beats and notes.

Where appropriate, data were changed into percentages and averaged or totaled to arrive at a figure representative of the group of songs of a certain mood.

## Results and Conclusions

Conclusions related to the first aim of the study were based upon 163 significance tests (Chi square) which were made on various data from opposing mood groups.

Twenty-five of these tests resulted in a p of .001 or better, forty in a p of .01 or better, and sixty-six in a p of .05 or better. It was concluded that melodic pattern is functional in the determining of mood expressed in the songs.

Results related to the second aim, that of discovering some of the specific relationships of musical pattern to mood, were numerous. Only those common to all cultures involved in the study were considered. The most important are: the scale tone Do tends to be associated with gay songs, Re and La with sad; the third of the scale is more frequently major in gay than in sad songs; Do is more frequently and La less frequently found on phrase endings in gay than in sad songs; more melodic unisons and fewer seconds and thirds are found in gay than in sad songs.

The third aim, that of discovering intercultural differences in the relation of mood to melodic pattern was satisfied by abundant data. Most notable are a distinct mood function of mode found in the German songs, but not in those of the other cultures; and an apparent relationship in French and Appalachian songs of triple rhythm to sad mood, and in German to gay.

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## CHAPTER I

### INTRODUCTION AND PROBLEM

It is generally believed that music can express different moods. In nearly all cultures, there are varying types of music which are deemed appropriate for the moods of different situations. Love songs, religious music, dance music, war songs, lullabies - the very existence of these types of music, traditionally differing for different situations, shows that the variety of effects that music can produce has long been well known.

From ancient times to the present philosophers have developed theories of what a work of art does to the observer or listener. But only in relatively recent times has there been experimental investigation of the effects of music on the listener, and of how these effects are achieved. A part of this field of investigation is the study of those characteristics in music which are the causes of various mood effects in the listener. This is the general subject of the present study.

A single song or other piece of music may be performed in many different ways and yet preserve its identity, and in this sense may be thought of as having an existence apart from the individual performance. Likewise, the musical

characteristics that result in specific musical effects or moods may be thought of as belonging to one of two categories.

First, there are the musical characteristics that can be controlled by the performer, such as tempo, volume, accent, vibrato, and tessitura.

Second, there are those characteristics which determine the identity of a particular piece of music, and which remain essentially similar in all performances, such as general rhythmic structure, form, melodic contour, tonality, and where it is present, chord or harmonic pattern.

There have been attempts to investigate the mood effects of nearly all these characteristics. The results have been more conclusive in the first category. Several experiments show, for example, that tempo and volume have far more to do with determining mood than anything else.<sup>1</sup> In the second category, investigation has been rather meager, and for the most part, inconclusive.

One might conclude from this that only performance characteristics affect mood. But this is difficult to accept. Certain compositions are usually in themselves considered as having a particular mood, such as gaiety, sadness or nostalgia. It is difficult to believe that the piece of music is in itself really meaningless, and only a vehicle for the conveyance of the mood of the performer.

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<sup>1</sup> M. G. Rigg. "The Expression of Meanings and Emotions in Music." in Philosophical Essays in Honor of Edgar Arthur Singer, Jr. F. P. Clarke and M. C. Nahm, editors. University of Pennsylvania Press, Philadelphia, 1942. pp. 297-294.

The present study is an attempt to discover whether or not a piece of music apart from the performance aspects, i.e., the musical pattern per se, does have characteristics which function in the determination of mood.

The pattern of a melody may differ from that of another in many ways. It may have a different sort of basic rhythm, it may have a wider or narrower range, it may have more or fewer repeated tones, it may be made up of different sizes of intervals, or these intervals may be arranged in a different sort of contour. These are some of the characteristics of a melodic pattern that give it its identity, that make it different from other melodies, and which seem to a musician to convey a meaning or mood. But whether, by differing in various of these characteristics of pattern, different melodies can express different moods is not well established. Nor have the relationships of specific characteristics to particular moods been thoroughly investigated.

This study is an attempt to establish, first of all, whether specific characteristics of melodic pattern are related to specific mood; second, if this be established, to discover some of the relationships of specific characteristics to certain moods; and third, to determine whether or not these relationships of specific characteristics to mood are the same or different in different cultures.



## CHAPTER II

### LITERATURE ON THE RELATION OF MUSIC AND MOOD

#### Introduction

Writings on the relation of music and mood may be placed into three categories: (1) general theories advanced by aestheticians or psychologists, for the most part dealing with general relationships, (2) theories which deal not with the general relationship of music and mood, but with the relation of specific musical characteristics and specific mood, and (3) reports of experiments that deal with specific relationships.

It is exceedingly difficult to relate and collate a number of aesthetic studies. One reason for this is that most of the terms used by aestheticians are not standard in meaning. Another reason may be that the aestheticians do not approach a problem to refute or to support previous theories, but rather to present new viewpoints. A prominent composer has stated that he has seldom read a statement about music that did not seem to have some basis in truth.<sup>1</sup> It seems possible that aestheticians differ only in the emphasis of different aspects.

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<sup>1</sup> Aaron Copland. Music and Imagination. Harvard University Press, Cambridge, Massachusetts, 1952.p11.

The term "meaning" as applied to a work of art may be used in several senses. It may refer to the message which is communicated. It may refer to an explanation of the importance of this message. Or it may be used to indicate the means by which an art work achieves its effects on the observer or listener. Most writers of works on aesthetics express a belief that this meaning, message, communication or response is in some way associated with an emotional experience. However, there is a great deal of variety in the language used to indicate this experience. Mood, emotion, feelings, affect and other terms are variously preferred by different authors. In most cases, the authors use one of these terms without defining it in contradistinction to the other possible terms; and in order to compare their conclusions, it must be for the most part assumed that the terms used to indicate emotion are synonymous.

### General Theories

While nearly all aestheticians seem to agree in their belief that music can express emotion or emotional qualities; they differ in their ideas of whether or not this is the essence of musical response, in the manner of how this message is communicated, and in the nature of the emotional communication.

## Emotion Unessential Theory

One of the most influential works on the aesthetics of music is that of Hanslick,<sup>1</sup> the 19th century music critic. Although he believes that music can express emotion, and particularly that the performer can express emotion, Hanslick does not consider the expression of emotion to be the essence of the aesthetic in music, nor the experiencing of emotion by the listener to be the essence of musical response. The groups of sounds themselves are both the content and form of a piece of music.

Hanslick's book is a deep and many-sided discussion of the problem of emotion in music, and it is impossible to sum up his ideas adequately in a few sentences. Hanslick's fundamental ideas are probably best expressed by the following quotations. "Definite feelings and emotions are unsusceptible of being embodied in music."<sup>2</sup> "The ideas which a composer expresses are mainly and primarily of a purely musical nature."<sup>3</sup>

A similar theory is put forth by Schoen,<sup>4</sup> who, after reviewing the work of Hanslick, and those of a number of

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<sup>1</sup> Eduard Hanslick. The Beautiful in Music. Novello and Co. Ltd., London, 1891.

<sup>2</sup> Hanslick. op. cit. p. 33.

<sup>3</sup> Hanslick. op. cit. p. 36.

<sup>4</sup> Max Schoen. The Psychology of Music. Ronald Press, New York, 1940.

other theorists and experimenters, concludes:

These speculative and experimental studies just surveyed point to the conclusion that the beautiful in music lies in "listening to music", and not in "hearing music"; not in associations, images, reflections or emotions that it may arouse, as secondary or derived effects, but in experiencing the "thing itself", the musical form.<sup>1</sup>

### Emotion Essential Theory

The statement that "music is the language of the emotions" is almost commonplace, and expresses perfunctorily what is probably the most widely held aesthetic theory of music. Such a theory is typically stated without elaboration by writers in fields outside art, whose general subject matter requires that they advance some aesthetic theory, but not a full exploration of it. However, among the more penetrating writers there are several types of theories in which emotions are considered essential to aesthetic response.

Emotions of Everyday Life. It is implicit, but not usually so stated, in the writings of a number of rather important theorists that music expresses the same sort of emotions that one experiences in the events of everyday life.

Schopenhauer<sup>2</sup> developed one of the most important and complete theories of this type. In music, according to Schopenhauer, are expressed the "strivings of the will"

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<sup>1</sup> Max Schoen. The Psychology of Music. Ronald Press, New York, 1940. p. 134.

<sup>2</sup> Arthur Schopenhauer. The World as Will and Idea. Degan Paul, Trench, Trubner & Co. Ltd. London. 1909.

which must almost inevitably be construed as corresponding to what would now be called drives or emotions. He made, however, an important qualification in stating that these strivings of the will are expressed in pure form, without any indication of the circumstances or events with which they might be associated in real life. It is clear, however, that he did not consider that these emotions or drives differed in themselves from those of everyday life.<sup>1</sup>

Helmholtz advances almost exactly the same theory in his statement of the function of music as opposed to the other arts.

Hence it arrogates to itself by right the representation of states of mind, which the other arts can only indirectly touch by shewing the situations which caused the emotion, or by giving the resulting words, acts, or outward appearance of the body.<sup>2</sup>

Dewey has expressed a similar idea with what is perhaps greater psychological insight.

Apart from the emotional effect of formal relations, the plastic arts arouse emotion through what they express. Sounds have the power of direct emotional expression. A sound is itself threatening, whining, soothing, depressing, fierce, tender, soporific, in its own quality.<sup>3</sup>

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<sup>1</sup> Schopenhauer. op. cit., vol. III, p. 235.

<sup>2</sup> H. L. F. Helmholtz. On the Sensations of Tone. Sixth edition. Peter Smith, New York, 1948. p. 251.

<sup>3</sup> John Dewey. Art as Experience. Minton, Balch and Co., New York, 1934. p. 237.

It is clear that the emotions he is concerned with are those of everyday life when he says:

Music, having sound as its medium, thus necessarily expresses in a concentrated way the shocks and instabilities, the conflicts and resolutions, that are the dramatic changes enacted upon the more enduring background of nature and human life. The tension and the struggle has its gatherings of energy, its discharges, its attacks and defenses, its mighty warrings and its peaceful meetings, its resistances and resolutions, and out of these things music weaves its web.<sup>1</sup>

Mursell has given an opinion which is in almost direct opposition to those of Hanslick and Schoen. Mursell recognizes the formal elements in music, but does not consider it an art of pure design.

A great work of music is not great because it is a superb solution to a problem of tonal arrangement, any more than Hamlet is a great play because of skill of its dramatic plan. A fine musical performance is not fine because of its formal, chiseled perfection, but because of what it conveys.<sup>2</sup>

Numerous other passages in Mursell's works make it clear that he believes strongly that the message of music is primarily emotional, and while he recognizes that the emotions of music have no objects, he otherwise seems to consider them as identical with those of non-aesthetic experience.<sup>3</sup>

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1 Dewey. op. cit. p 236.

2 James Mursell. Education for Musical Growth. Ginn & Co. Boston, 1948. p. 25.

3 Mursell. op. cit. p. 33.

Ferguson has attempted a complete explanation of the role of emotion in music. He clearly believes that music expresses emotion, and that these emotions do not differ from those of everyday life.

It will be shown not only that music is an intelligibly expressive art, but that its method of expression is essentially that of the other arts - a method of representation. Musical representation (except in the largely negligible instance of program music) is not, of course, a delineation of physical objects or conditions. It is a delineation of what ordinary men, unperplexed by aesthetic theory, have always supposed music to present - the emotions, born of human experience, without which experience itself would have no interest.<sup>1</sup>

Ferguson also offers an explanation of the mechanics of this expression of music, which will be discussed later in this chapter under "Special Theories".

Perhaps the most clear and precise proponent of the idea that the essence of music is found in the expression of life emotions is Santayana. He recognizes that in the form of expression, music can have an intellectual appeal; but he emphasizes the emotional content of music.

There is perhaps no emotion incident to human life that music cannot render in its abstract medium by suggesting the pang of it; though of course music cannot describe the complex situation which lends earthly passions their specific colour. . . . But music has its own substitute for conceptual distinctness. It makes feeling specific, nay, more delicate and precise than association with things could make it, by uniting it with musical form.

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<sup>1</sup> Donald Ferguson. On the Elements of Expression in Music. University of Minnesota, Minneapolis, Minnesota, 1949. p. 1.

We may say that besides suggesting abstractly all ordinary passions, music creates a new realm of form far more subtly impassioned than is vulgar experience.<sup>1</sup>

Santayana is quite explicit in attributing to music a therapeutic function, which constitutes the main pleasure and value of music. His explanations of this, while not in technically psychological language, are nevertheless rather complete and quite clear.

Music brings its sympathetic ministry only to emotional moments; there it merges with common existence, and is a welcome substitute for descriptive ideas, since it co-operates with us and helps to deliver us from dumb subjection to influences which we should not know how to meet otherwise.

At such a moment music is a blessed resource. Without attempting to remove a mood that is perhaps inevitable, it gives it a congruous filling. Thus the mood is justified by an illustration or expression which seems to offer some objective and ideal ground for its existence; and the mood is at the same time relieved by absorption in that impersonal object. So entertained, the feeling settles. The passion to which at first we succumbed is now tamed and appropriated. We have digested the foreign substance in giving it a rational form: its energies are merged in that strength by which we freely operate.

In this way the most abstract of arts serves the dumbest emotions.<sup>2</sup>

Santayana explains that man yearns for objects that will explain, embody and focus his feelings, and that if art

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<sup>1</sup> George Santayana. Reason in Art. Vol. IV of The Life of Reason. George Santayana. Charles Scribner's Sons, New York, 1937. p. 54.

<sup>2</sup> Santayana. op. cit. p. 57.



can supply these objects, it can "relieve and glorify those feelings in the act of expressing them. Catharsis is nothing more."<sup>1</sup>

Emotions of Special Quality or Form. A number of writers have indicated that while music expresses something very much like the emotions one experiences outside art, that these differ in quality or form from everyday emotions.

One of the earlier writers to indicate something unique about the emotional experiences of art is Bullough, who established an aesthetic principle on what he called "psychic distance." Recognizing that sad music does not affect the listener by making him unhappy, he postulates a psychic distance between the self and the emotions. "Distance . . . is obtained by separating the object and its appeal from one's own self, by putting it out of gear with practical needs and ends."<sup>2</sup>

Langer, also, has indicated something unique in the emotions of music. "Music is not the cause or the cure of feelings, but their logical expression."<sup>3</sup> She specifically expresses agreement with Bullough's principle of "psychic

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<sup>1</sup> Santayana. op. cit. p. 64.

<sup>2</sup> Edward Bullough. "Psychical Distance as a Factor in Art and an Aesthetic Principle." British Journal of Psychology, 5 (June, 1912) pp. 87-118.

<sup>3</sup> S. K. Langer. Philosophy in a New Key. Harvard University Press, Cambridge, 1951. p. 218.

distance," but reinterprets this in terms of her own philosophy. While clearly stating that the content of music is emotional, Langer considers that it is expressed in a special form which makes it much more meaningful and personal to the listener.<sup>1</sup> "The content has been symbolized for us, and what it invites is not emotional response, but insight."<sup>2</sup>

Pratt, who has over a long period of time been very much concerned with the problem of the meaning of music, has summed up his ideas in a recent definitive work.<sup>3</sup> He concludes that music expresses emotion, but that real emotions are not experienced by the listeners. "Tonal forms therefore seem to have emotional qualities, but these qualities must not be confused with real emotions. The latter exist only in a bodily sense."<sup>4</sup> And he ends with the statement: "Music sounds the way emotions feel."<sup>5</sup>

Croce is quite clear on this point, and makes what may be considered a summing up of the foregoing statements.

It has been remarked that artistic representations arouse pleasure and pain in their infinite shades of variety. We tremble with

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<sup>1</sup> Langer. op. cit. p. 222.

<sup>2</sup> Langer. op. cit. p. 223.

<sup>3</sup> C. C. Pratt. Music as the Language of Emotion. Library of Congress, Washington, 1952.

<sup>4</sup> Pratt. op. cit. p. 25.

<sup>5</sup> Pratt. op. cit. p. 26.

anxiety, we rejoice, we fear, we laugh, we weep, we desire, with the personages of a drama or of a romance, with the figures in a picture and with the melody of music. But these feelings are not such as would be aroused by the real fact outside art; rather they are the same in quality, but are quantitatively an attenuation of real things."<sup>1</sup>

### Psychoanalytic Theory

Along with its contributions to psychology and psychiatry, psychoanalysis has made important contributions to aesthetic theory, most important among which are the concept of the unconscious and the place of the unconscious emotional attitudes in art.<sup>2</sup>

Since Freud's original contributions, students of psychoanalysis have developed, elaborated and extended his theories in a number of directions. Rather atypical are the theories of Sterba,<sup>3</sup> who considers the motion of music to be unconsciously related by the hearer to one's feelings of having been carried as an infant; and of Kohnt and Levarie<sup>4</sup> who hold that the enjoyment of music arises from successful

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<sup>1</sup> Benedetto Croce. Aesthetic. The Noonday Press, New York, 1953. p. 80.

<sup>2</sup> Harry B. Lee. "Order and Vitality in Art." in Psychoanalysis and the Social Sciences. Geza Roheim, ed. International Universities Press, 1950.

<sup>3</sup> R. Sterba. "Toward the Problem of the Musical Process." Psychoanalytic Review, 33, (January, 1946) pp. 37-43.

<sup>4</sup> H. Kohnt and S. Levarie. "On the Enjoyment of Listening to Music." Psychoanalytic Quarterly, 19 (January, 1950) pp. 64-87.

mastery by the ego of the originally disturbing effects of frightening auditory experiences during the preverbal stages of development.

Psychoanalytic aesthetic theory is stated in a more typical form by Brown.

The artist projects his internal conflicts into the art product in somewhat distorted form and hence reduces them. The audience introjects the distorted form or identifies himself with the protagonists and resolves in this way similar conflicts of his own. The universality of art is the universality of conflict. Art appreciation thus makes life more bearable and enriches it.<sup>1</sup>

According to this theory, it is neither the emotions, nor the situation which gives rise to them that is expressed in music, but rather a conflict between the basic parts of the personality, for example, between the id and the superego. Emotion is considered as "the conscious concomitant of conflict."<sup>2</sup> It might be presumed that emotions could arise in the listener as a result of the communication of these conflicts; but according to this theory it is the conflict and not the emotions which are expressed.

Alexander appears to agree essentially with Brown. He also makes a distinction of interest which may explain some of the differences of opinion between certain of the

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<sup>1</sup> J. F. Brown. The Psychodynamics of Abnormal Behavior. McGraw-Hill Book Co., Inc., New York, 1940. p. 422.

<sup>2</sup> Brown. op. cit. p. 125.

aestheticians. "Obviously it is not the emotion itself, expressed through art or literature, but rather the form of its expression which produces aesthetic experience."<sup>1</sup>

### Special Theories

Regarding the relation of music and mood, there are many general theories and much empirical information, but very few writers have tried to show a relationship between the two, i.e., to show just how a particular general theory can operate in practice. Following are some studies which deal with the specific relationship of melodic pattern to a particular mood.

Montani,<sup>2</sup> elaborating on psychoanalytic theory, has advanced a theory concerning the minor mode in music. According to Montani, the minor mode, and especially the diminished third, its chief characteristic, does give rise to a mood unpleasant in quality. This, he explains, is caused through an association with feelings of suffering, chastisement, and pain which characterize reactions to the castration complex. He does not make clear just how or why this association is formed.

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<sup>1</sup> Franz Alexander. Fundamentals of Psychoanalysis. W. W. Norton & Co., Inc., New York, 1948. p. 186.

<sup>2</sup> A. Montani. "Psychoanalysis of Music." Psychoanalytic Review, 32 (April, 1945) pp. 225-227.

Hanson<sup>1</sup> has written an article dealing with dissonance, and its relation to mood. The absence of dissonance he considers to be related to feelings of purity, calmness, serenity, and the absence of human passion.

The expression of personal feeling in music seems inevitably to be associated with the use of dissonance. Indeed, the expression of emotion in music seems to be bound up in the contrast between dissonance and consonance, the former producing a sense of tension and conflict to be either heightened by progression to a sonority of still greater tension or resolved by a succeeding consonance.<sup>2</sup>

According to Hanson, this effect of dissonance can occur not only in the dissonance of simultaneous tones, but also in sequential tones, by juxtaposition.

An article by Mull<sup>3</sup> deals with only one emotion in music - that of humor. She concludes that this is caused by what she calls "volte-face", that is, by abrupt and surprising changes in the melodic or harmonic pattern.

Ferguson,<sup>4</sup> whose general aesthetic theory was discussed earlier in this chapter, also has given an explanation

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1 Howard Hanson. "Emotional Expression in Music." in Music and Medicine. D.M. Schullian and M. Schoen, ed. Henry Schuman, Inc. New York, 1948. p. 244-265.

2 Ibid. p. 248.

3 Helen K. Mull. "A Study of Humor in Music", American Journal of Psychology, 62 (October, 1949) pp. 560-566.

4 Donald N. Ferguson. On the Elements of Expression in Music. University of Minnesota, Minneapolis, Minnesota, 1949.

of the means by which mood is expressed by melodic pattern.

According to Ferguson, there are two elemental emotional conditions which he refers to as "nerve-stress" and "motor impulse". These are expressed or represented in music respectively by "tone-stress" and "ideal motion". There are three types of tone relation capable of stress suggestion. These are: (1) relative height and depth, (2) the relation of melodic tones to an implied tonic, and (3) harmonic relations of consonance and dissonance.

Ferguson recognizes the importance of a number of other factors in the expression of mood, but considers them secondary. His explanations are lengthy, detailed, and involved; and seem to cover all the aspects of the relation of music to mood.

According to a psychoanalytic theory, described in the foregoing section, it is proposed that music expresses not emotions but conflicts. This poses the problem of how a piece of music can at the same time express two opposing aspects of the personality; for example, the drive of the id and the inhibition of the superego. An example of how this can occur is given by Gaston in an article on the relation of mood and dynamic elements in music.

In his article, Gaston offers a special theory that is quite in accord with the psychoanalytic theory, and which seems to be a logical and appropriate extension of it.

Rhythm is the primitive, dynamic driving factor in music. It stimulates muscular action. It induces bodily movement. It becomes particularly stimulating when it consists of short notes.<sup>1</sup>

Legato, according to Gaston, gives rise to reactions which are "more intellectual, more contemplative." He then gives an example of a dance in which a legato, sustained melody is accompanied by an extremely detached, rhythmic figure. The rhythm expresses a basic drive while the legato melody says in effect: "Be careful, you must use restraint; you are a civilized person."<sup>2</sup>

#### Experiments on the Relation of Music and Mood

In Chapter I, a distinction was made between the characteristics of a melodic pattern which remain constant from performance to performance, and those characteristics which are determined by the individual performer. There have been many experiments made that involve the relation between mood and music; but comparatively few which deal with the relation of mood to melodic characteristics of the first category, i.e., those characteristics of a melody which remain constant in various performances.

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<sup>1</sup> E. Thayer Gaston, "Dynamic Music Factors in Mood Change", Music Educators Journal, 37 (February-March 1951)

<sup>2</sup> Gaston. op. cit. p. 42.



One of the earliest experiments is that of Gilman<sup>1</sup> who, at a concert, gave to some thirty subjects written questions concerning the mood of the music performed, and requested relatively free, written responses.

The results were interesting in several respects, first of all, in the great variety of the responses. In general, there was unanimity of mood among the subjects, but this was expressed by a great variety of words, which would have required rather excessive subjective interpretation to render them statistically useable. Where the subjects described circumstances that might have given rise to those moods, there was practically no unanimity at all, but an almost chaotic variety. As would be expected, it was impossible to reach any very definite conclusions.

Washburn and Dickinson<sup>2</sup> were primarily concerned with the sources of musical pleasure in musical listening, but they also tried to find some relation of affective reaction to the five elements of melody, rhythm, harmony, design, and tone-color. They, too, used free responses of their subjects, and because of the great variety found it necessary

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<sup>1</sup> Benjamin Ives Gilman. "Report on an Experimental Test of Musical Expressiveness." American Journal of Psychology, 4 (1892) pp. 558-576 and 5 (October 1892) pp. 42-73.

<sup>2</sup> M. F. Washburn and G. L. Dickinson. "The Sources and Nature of the Affective Reaction to Instrumental Music," in Effects of Music, Max Schoen, ed. Harcourt, Brace & Co. Inc. New York. 1927.

to make a rather involved classification of the results which must have involved a great deal of subjective judgment on the part of the experimenters. They found that melody was most often mentioned as the source of pleasure in music, and next in order were: rhythm, harmony, design, and tone-color. The order, however, differed for different composers.

A study by Gatewood,<sup>1</sup> somewhat similar to that above was primarily an attempt to find which of the several elements of rhythm, melody, harmony, and timbre was most important in musical enjoyment. The experimenter tried also to find which of these four elements was most important, according to the subjects' judgment, in the determination of mood. To determine mood, she used a list made up of the words "sad, serious, devotional, rested, amused, sentimental, happy, and excited-stirred." In general, rhythm and melody were judged important in the morstimulatory moods, and harmony, timbre, and melody were judged more important in the more sedative moods; however, the results are made less interesting by the fact that she did not attempt to find what characteristics of melody, what kind of melody, harmony or timbre were actually related to each mood.

In a study of major and minor chords, Heinlein<sup>2</sup> was interested only in whether or not the traditional concepts

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<sup>1</sup> Esther L. Gatewood. "An Experimental Study of the Nature of Musical Enjoyment." in Effects of Music, Max Schoen, ed., Harcourt, Brace & Co., Inc., New York. 1927.

<sup>2</sup> C. P. Heinlein. "The Affective Characters of the Major and Minor Modes in Music." Journal of Comparative Psychology, 8 (April 1928) pp.101-142.

of major and minor are a result of inherent effects. He asked thirty subjects to select from a list the words those that best described the feeling value of each of a large number of chords performed. From both musically trained and musically untrained subjects, he got such a large percentage of responses contrary to the traditional concept that he concluded that the "sadness" of minor mode and the "gladness" of major mode are not inherent effects at all. The greatest weakness of this study is that the chords were isolated, not in a musical context. Since some were played high, and some low, and since tessitura is possibly more important than mode in determining mood, this study rather misses the possibility that mode may have a definite if weaker effect.

An interesting and comprehensive approach to the problem is that of Sorantin,<sup>1</sup> who analysed a large number of pieces by great composers in which the mood intended by the composer was made clear by the words, title, or some other indication.

He found that unpleasant feelings were characterized by minor tonality and strong dissonances; crescendo-diminuendo dynamic figure, legato phrasing and slow tempo. He concluded also that unpleasant feelings were symbolized by certain types of melodic and harmonic figures.

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<sup>1</sup> Erich Sorantin. The Problem of Musical Expression. Marshal, Bruce and Co., Nashville, Tennessee, 1932.

The pleasant feelings he found to be expressed by major tonality, forte dynamics, staccato phrasing and accelerated tempo. The pleasant feelings were also symbolized by special musical figures such as the upward leap of a fourth and the trill.

Sorantin's method appears to be a sound one, capable of producing relatively definite and reliable results. However, as described in his report, the study seems to have several weaknesses.

First, there is in his report no description of any method of selecting the musical passages for analysis. If it was merely subjective judgment, there is no way to be certain that passages which were not included in the study may not have been equally important in yielding contrary results.

Second, Sorantin's method of musical analysis is likewise not described. It is impossible to know whether or not he gave equal consideration to all musical characteristics that may be related to a given mood. In any case, it would be difficult to be certain that one had reached, by analysis, the truly important characteristics in a complicated orchestral score.

Third, his shares with many studies, the weakness of poor definition and choice of moods. Two of his terms, "lamentation" and "joy" are possibly adequate for indicating extremes of emotion. However, others like "longing" and "love" are extremely vague, are possibly not expressible in

music, and perhaps are not moods at all. So, while his method seems most promising, the weaknesses of the study make any results rather untrustworthy.

In two studies, Gundlach<sup>1</sup> has investigated the relation of musical characteristics to mood. In the first, he studied a group of American Indian songs and for comparison, also a small group of European songs. For an indication of mood, he used only a functional classification of each song, such as "victory song, love song, war song," and others. Gundlach then examined the songs to determine the number of intervals in each of three categories, and whether the rhythm was even, uneven or rough.

In the second study, Gundlach<sup>2</sup> used for musical material the first phrases of forty works by well known composers. The mood of these was judged by 112 subjects with the use of a list of seventeen words descriptive of mood. These seventeen words, according to Gundlach, describe moods in three categories: "energy or dynamical," "mood tone or mood characteristic," and a third which he does not define, but which includes a number of descriptive words of diverse character. He then analysed the music for the same characteristics as in the first study: number of intervals in each of three categories, even, uneven or rough rhythm; and in

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<sup>1</sup> Ralph H. Gundlach. "A Quantitative Analysis of Indian Music". American Journal of Psychology. 44 (January 1932) pp. 130-135.

<sup>2</sup> Ralph H. Gundlach. "Factors Determining the Characterization of Musical Phrases." American Journal of Psychology. 47 (October 1935) pp. 103-118.

addition, tempo, melodic range, range of orchestral accompaniment, and mean pitch.

He found that pieces containing many unisons and thirds were most often described as "uneasy, mournful, and awkward," that pieces containing many fourths were most often described as "triumphant"; and that pieces containing many large intervals were most often described as "Glad, exalted, delicate." He arrived at similar results regarding rhythm, pieces containing many rough rhythms being described as "grotesque, uneasy"; those containing many uneven rhythms as "delicate, sentimental, dignified, exalted, and sombre"; and those containing many smooth rhythms as "brilliant, animated, flippant and glad."

A study by Lurje<sup>1</sup> was an attempt to decide whether music has an expressive quality apart from tradition, and which is identical for all listeners. His method was to ask twenty-one music students to classify the melodies of forty-two folk songs of different nations into categories such as "war songs, love songs, lullabies, etc." The subjects gave so large a preponderance of wrong judgments that Lurje concluded that music has no universal and inherent expressive quality.

Lurje's conclusion is perhaps more definite than is warranted by his method. The social or individual function

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<sup>1</sup> Walter Lurje, "Wohnt der Musik ein bestimmter Ethos inne?", Archiv für die Gesamte Psychologie, 87 (March 1933)pp. 351-362.

is a rather crude basis for judging expressive quality. It seems possible that subtle universal characteristics might have been covered up by large and obvious cultural differences.

Hevner,<sup>1</sup> like Heinlein, conducted an experiment which was an attempt only to determine the effects of major and minor modes. Short melodies were played for 205 subjects, in both a major and minor form. The subjects chose their responses from a very large word list. Hevner concluded that all the historically affirmed characteristics of the two modes were confirmed. The validity of this conclusion is dependent upon the accuracy with which the words were categorized as being descriptive of either major or minor as historically conceived. If Hevner's categorization of the descriptive words may be considered as accurate, the study may be accepted as fairly conclusive within the narrow field with which it deals.

A most extensive and thorough investigation of the relation of mood to musical pattern is that of Rigg.<sup>2</sup> His first experiments were attempts to verify and check the conclusions

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<sup>1</sup> Kate Hevner, "The Affective Character of Major and Minor Chords". American Journal of Psychology, 47 (January 1935) pp. 103-118.

<sup>2</sup> Melvin G. Rigg. "Musical Expression: an Investigation of the Theories of Erich Sorantin." Journal of Experimental Psychology, 21 (October 1937) pp. 442-455.

of Sorantin. In one experiment, Rigg used short musical phrases, some of which were selected from those studied by Sorantin, while others were made to order by Rigg to include characteristics which, according to Sorantin, expressed certain moods. These were performed for eighty-four auditors who recorded their mood impressions. Rigg concluded that Sorantin's theories for "lamentation" and "joy" were well substantiated, while those for the other categories were not valid.

In a series of other experiments, Rigg<sup>1</sup> used a number of phrases containing certain musical characteristics. These were performed for auditors who judged mood. First, they judged the mood as being in one of two categories: serious-sad or pleasant-happy. Then they selected one of five or six descriptive words within that category. It is notable that the mood indication is much clearer in the gross than in the fine categories.

Most of his conclusions are quite definite and seem valid. Some of them, those on tempo, and staccato-legato, for example, are related to performance characteristics and hence are not in the field of the present study. Within the present field, however, Rigg found that mode is influential in determining mood, minor tending to result in sadness and major in gladness.

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<sup>1</sup> Melvin G. Rigg. "The Expression of Meanings and Emotion in Music." in Philosophical Essays in Honor of Edgar Arthur Singer, Jr. F. P. Clarke and M. C. Nahm, ed. University of Pennsylvania Press, Philadelphia, 1942. pp. 279-294.



As a whole, Rigg's work seriously questions the validity of Sorantin's study in that many of Sorantin's definite conclusions were unconfirmed.

Campbell<sup>1</sup> conducted an experiment to determine what emotions can be expressed in music. Twenty-one pieces of music were performed on the piano for a group of forty students who judged the mood of the pieces by selecting words from a list. Campbell's list was made up of "gayety, joy, yearning, sorrow, calm (pastoral or meditative), assertion (martial or heroic), and tenderness." She found very high agreement on "gayety, joy and assertion." In a later performance of a similar experiment with sixty-three subjects, Campbell found high agreement on "gayety, sorrow, assertion and joy."

An experiment by Hampton<sup>2</sup> was an attempt to find how much agreement there is among listeners in their identifications of the moods intended by composers. Ten phonograph records were played to fifty-eight college students who reported the emotion they thought the composer intended to express, and the emotional experience which they thought the music had induced in them.

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<sup>1</sup> Ivy G. Campbell. "Basal Emotional Patterns Expressible in Music." American Journal of Psychology, 55 (1942) pp. 1-17.

<sup>2</sup> P. J. Hampton. "The Emotional Element in Music." Journal of General Psychology, 33 (October 1945) pp. 237-250.

Hampton's conclusions are:

1. Mental attitudes like triumph, determination and defiance are easier to identify than purely emotional expressions like rage and fear.
2. Emotional expressions characterized by unpleasant feeling tones are easier to identify than pleasant.
3. Both pleasant and unpleasant emotional expressions are easier to identify than subdued expressions like praise and resignation.
4. The general feeling tone is pleasant regardless of the specific emotional content.

#### Summary

In this chapter are reviews of important literature on the subject of the relation of mood to melodic pattern.

Two writers who consider that the expression of emotion is not the essence of the function of music are Hanslick and Schoen. Both of them consider form more important.

A greater number of writers consider the expression of emotion to be the essence of music. Of these, Schopenhauer, Helmholtz, Dewey, Mursell, Ferguson, and Santayana make little or no distinction between the emotions expressed in music, and those experienced in everyday life. Bullough, Pratt, Langer, and Croce consider the emotions expressed in music to have some special quality. To Bullough, this quality is "psychic distance." According to Langer, the

emotion is symbolically expressed. Both Pratt and Croce consider that the emotional quality, but not emotion itself is expressed.

Two atypical psychoanalytic theories were mentioned. The typical psychoanalytic theory, as expressed by Brown, explains the effects of music in terms of expressed conflicts. Emotions are the conscious concomitant of conflict. Alexander distinguishes between the emotional content of art, and the manner of its presentation, the latter being what makes a work art.

Five special theories of music and mood relationships were discussed. Montani proposed a psychoanalytic explanation of the effects of minor mode. Hanson dealt with the relation of dissonance and mood. Mull offered a theory of humor in music. Ferguson advanced an involved and complete theory of music and mood. A theory by Gaston offered explanations of the mood effects of dynamic elements in music.

The experiments reported offer little positive information regarding the relation of mood to melodic pattern. The following offered definite results in the present field: Heinlein found that the traditional concepts of major and minor mode are not the results of inherent effects; but Hevner, in a better designed study, found to the contrary, that the historically affirmed characteristics of the two modes were confirmed. Gundlach in his analysis of music arrived at results, but his moods were described by what

seemed to be merely an odd assortment of descriptive words, and his conclusions sound like interesting but unimportant observations.

Sorantin conducted an investigation of classical music in which there was clearly defined mood intent. The design of his study seemed promising, but contained a number of defects among which were the use of music of excessive complexity, and poor choice and definition of mood categories. Rigg conducted a series of experiments which tested Sorantin's findings. He reached some worthwhile conclusions on several performance characteristics, but on the characteristics of melodic pattern arrived only at results which tend to support the conventional ideas of the effects of major and minor mode.

## CHAPTER III

### MATERIALS AND METHOD

#### Introduction

The choice of materials and choice of method are so interrelated that a brief and general description of method must precede the discussion of materials.

The aims of the present study are:

1. To determine whether the melodic pattern of a piece of music, apart from the performance characteristics, is functional in determining the mood expressed.
2. To discover some of the characteristics of a melodic pattern that express mood.
3. To discover whether characteristics of a melodic pattern that express mood differ in different cultures.

The general method of the study was to select a large number of suitable pieces of music, representing a number of relatively discrete cultures, obtain judgment of the mood of the pieces, and then to analyse the music to reveal any relationship of musical characteristics to mood.

#### The Musical Material

It may be observed that in previous studies, the use of the jury method of establishing mood had always at least one of two disadvantages. Either the responses resulting

from the mood judging were so varied and diffused that it was impossible to group them accurately, or there was a poor choice of categories in which judgments could be made, and as a result there could be no certainty that the moods were accurately judged.

In the present study, it was believed that the use of folk songs as musical material would make it possible to avoid to a degree the disadvantages of the jury method by making available the judging of the mood of the music from the words of the text.

Being passed from person to person only by being performed, and practically never in any written form, a folk song almost inevitably is altered by each person who uses it. The folk singer feels relatively free to change either the words, or the music, or both. It would be expected that in his sincere attempts at artistic expression (and all writers agree on this sincerity), the folk singer would make such changes as seemed to him to result in a more effective performance, clearer or stronger or more appropriate mood, and very likely, greater unity of mood between words and music.

When a folk song, words and music, has been passed from person to person many times, and by each singer sung both to himself and to an audience - when it has been altered to fit what the singers consider important artistic requirements - it may be said that the mood of the words fits the mood of the music in the judgment of many persons, who, though unlettered, are certainly sincere and, at times, capable

artists. The mood of a folk song may then be said to have been carefully judged, in terms of an accompanying story or poem.

Music alone is always abstract. It seems to express the essence of a mood; but never any of the conditions contextual to the mood. While there are many ways to express mood in words, probably the clearest is by a statement of these very contextual conditions. "Occasions define feelings; we can convey a delicate emotion only by delicately describing the situation which brings it on."<sup>1</sup> If this description of situation, or statement of contextual conditions, is an accurate statement of mood; then it follows that the text of a song, which serves precisely the function of describing the situation which gives rise to the emotion, can serve as an accurate indication of the mood of the song.

In the present study, the mood of the songs was judged from the mood of the words, and it was assumed that the two were the same. It was thought that small or occasional disunity of mood of words and music would not be damaging to results provided a large number of songs were used.

The use of the words as an indication of mood has the advantage of not placing the actual judging in a laboratory situation (i.e., the original judgment, the choosing of the words of the song, has already taken place in a real life

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<sup>1</sup> George Santayana. Reason in Art. Vol. IV of The Life of Reason. George Santayana. Charles Scribner's Sons, New York, 1937. p. 54.

musical situation), and of eliminating the dependency for the judging upon one performance or one performer.

Another advantage in the use of folk songs as musical material is that in folk songs is found music which represents the taste of many persons, and not merely the taste of one composer, who, if popular, would certainly have some qualities representative of a large group of people, but who might nevertheless use many musical characteristics which represent only his own taste or that of a particular school.

Folk songs also provide short concise melodies which lend themselves readily to musical analysis. Orchestral music, or even moderately simple, accompanied, vocal music presents such a large number of items for analysis that the task of anything beyond a superficial analysis would be unfeasible. Only in folk songs can one find very brief melodies, which are seriously and artistically intended, and which in practice are repeated often enough so that the expression of the right mood is of great importance.

To summarize, folk songs were used as musical material in this study for the following reasons:

1. It makes possible the use of the words as an indication of the mood, which should afford an accurate method of judging mood.
2. By making possible the use of words as an indication of mood, this takes the music judging out of the laboratory, and also eliminates the dependence upon one performer or one performance.
3. Folk songs are musical material which can be considered as representing the musical practices and understanding of large groups of people.



4. Folk songs have short, concise melodies that lend themselves well to musical analysis.

### Selection of the Cultures

The reasons for the use of songs of various cultures were, first, so that the results in general would represent as large a culture group as possible so that the conclusions would have some significance for general application; and second, to give some indication of the degree of universality or variance between cultures of the means of expressing mood musically.

Language barriers and the lack of reliably recorded written collections of folk songs made the use of oriental music impractical. These difficulties also eliminated most occidental cultures.

In order to investigate the mood differences between culture groups, it was desirable to choose cultures that were as pure and isolated as practicable. Culture groups that live close to others, or which have recently been influenced by invasion or other intermingling would have been less suitable. On this basis, most of the cultures of the new world were necessarily eliminated.

On the basis of availability of folk song collections, language, purity of culture, and importance to the main stream of occidental civilization; four cultures were selected: French, German, English, and Anglo-American

(Southern Appalachian). While none of these perfectly satisfied the above requirements, they seemed to do so better than any others.

The peoples of Germany and France have each invaded the other's territory several times in the last one hundred and fifty years. As a result, a certain amount of diffusion of culture traits might be expected. Nevertheless, to the occidental, they do seem to have relatively distinct cultures. If differences of means of expressing mood do exist, they might be expected to appear in the songs of these two countries.

England has had no important invasion for over eight hundred years; and while a certain amount of borrowing of culture traits has taken place in the rather extensive travels of English sailors and colonials, it seems reasonable to assume that the country people who kept the folk songs alive were not much affected by this. Certainly the English songs have a quality quite different from those of France and Germany.

The Anglo-American culture has remained relatively unchanged since its establishment. The English culture of the Southern Appalachians remained almost completely isolated since its coming to this continent. Retaining very many of the culture traits of the English of two centuries ago, they remained almost untouched by the changes and developments of American culture.<sup>1</sup>

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<sup>1</sup> Cecil J. Sharp. Folk Songs from the Southern Appalachians. Oxford University Press, London, 1952. p. xxii.

## Selection of the Songs

In the selection of the songs, it was necessary that the songs be truly representative of the particular country or culture group, and that they not be selected with any bias that would affect the inclusion or exclusion of songs of particular mood.

For these requirements, a degree of dependence upon the original collector or compiler was unavoidable. The collections selected for use in this study were all made by men of outstanding prominence in their fields. In most of the collections, the circumstances of the original recording of the songs is noted, in others it is not; but in no case is there any reason to suspect mood bias in the selection of the songs, and in each case the prominence and authority of the collectors should serve as a guarantee of the accuracy of the recording.

The following collections were selected for use in this study:

1. Joseph Canteloube. Anthologie des Chants Populaires Francais. Durand and Cie., Paris, 1951.
2. Ludwig Erk and Franz Böhme. Deutscher Liederhort. Breitkopf and Härtel, Leipzig, 1925.
3. Cecil J. Sharp. Folk Songs from the Southern Appalachians. Oxford University Press, London, 1951.
4. Cecil J. Sharp. One Hundred English Folksongs. Oliver Ditson Co., New York, 1916.

In order to have enough songs for significance in the statistical analysis, it was desirable to have approximately one hundred songs in each culture group. To select this number of songs without mood bias, the method used was to select first a representative and authentic collection, and then to reduce this to the desired number through the use of various objective procedures.

In all the collections, all songs were eliminated which were of questionable authenticity, and all songs in which the music was not accompanied by the original words. A few of the English songs were omitted because of excessively familiar texts. To reduce the task asked of the judges, songs which contained more than approximately ten four line verses were omitted.

The English collection contained one hundred songs originally. After eliminating those of doubtful authenticity, of substituted texts, and of excessive length or familiarity, eighty-one were left. It was considered better to accept the slightly decreased statistical usefulness of the lesser number than to alter the unity of this group by adding to it from another collection.

The four volumes of the French collection contain more than a thousand songs, grouped according to province. It was decided to reduce this by selecting only the songs of the oil provinces, thus increasing the cultural unity of the group. The oil provinces roughly constitute northwest France, with the exception of Flanders and Brittany, where

non-Romance languages are spoken. The songs of the provinces of this area are contained in Vol. IV of the French collection, and it was this volume, minus the sections on Brittany and Flanders, which served as the basic collection of French songs. This group was then reduced by the elimination of songs of doubtful authenticity, songs of substituted texts, and of songs having the same melody as others already chosen. The longer songs were then taken out until there remained a group of ninety-nine songs.

The German collection of three volumes also contained more than a thousand songs. The songs of this collection were grouped according to the subject of the verse. To reduce this to a group of the desired size, the first step was to omit categories of relatively neutral moods. This was done to increase the mood differences obtained in the mood judgments, since the greater the mood differences between songs of different moods, the more likely it would be that existing mood-melody relationships would become apparent. The songs of this collection for the most part fall into two categories: songs found in very old, often medieval collections, and songs collected and recorded since 1800. Only those in the second category were used. When this group was further reduced by the elimination of those of doubtful authenticity, of substituted texts, of excessive length, and those in languages other than German; a group of 101 songs

remained. In many cases, a number of variants of each song were grouped together, and in these cases the most recent song of each such group was used.

The songs of the Appalachian collection were divided by the collector into "ballads" and "songs". The "songs" are generally more lyric and less narrative than the "ballads". Preliminary tests with the songs of this collection indicated that there were probably greater mood differences among the "songs" than among the "ballads"; so only the "songs" (which comprised Vol. II) were used. Where there were a number of variants, only the first song of each group was used. Elimination of those songs of excessive length left a group of one hundred songs.

### The Method

#### General Description

A group of about one hundred folk songs were selected from each of four culture groups. The original language text of each group of one hundred songs was submitted to a jury of three persons who were qualified by having wide experience in the language. The jury was asked to judge and grade the mood of the songs on two mood scales, one ranging from "gay" to "sad", and the other ranging from "energetic" to "quiet". To make for the greatest possible consistency of judgment between juries representing different languages, a carefully worded description and definition of the extremes of the moods was given to the juries.

Then from each extreme of each mood scale, a group of songs was selected to be analysed and compared with the songs of the opposite extreme. The aim of the musical analysis was to isolate and describe quantitatively musical characteristics so that such comparisons could be objective. Significance tests were used to help determine the meaning of these comparisons.

### Determining the Mood

The Judging. The essential process of this study was one of taking something which is subjective, affective and vague by nature, and analysing this to arrive at something objective, factual and specific. In order to analyse music to discover relationship of musical elements to mood, it was first necessary to find the mood of the music; and this could be done only by human judgment.

To judge the mood of the songs, three groups of judges were used, one for each language involved. Each group was made up of three judges. All the judges were persons of considerable education and ability, who were thoroughly familiar with the language involved, and who were thought to have good literary judgment.

Each judge was furnished with the typewritten text of each song he was to judge. He was also furnished with mimeographed sheets containing, after an identification for each song, the two scales, each divided into ten parts and labeled "sad" and "gay", or "quiet" and "energetic". (See Appendix p. 135.)

Numbers were used on the sheets to identify the songs, since the titles, as they appear in the collections are not properly a part of the song, and could, in some cases, adversely affect the judgment of mood.

Each judge was also furnished with a sheet upon which were definitions of each of the moods, made up specifically to help make for more consistency of judgment by the various judges. (See Appendix p.134)

The Mood Scales. A consideration of the weaknesses of the previous studies shows that the method of determining mood is crucial in experiments of this type. The use of free responses by a group of judges results in so much variety that these responses must then be categorized in order to make the results useable. As this categorization must be highly subjective, much inaccuracy is likely to result. The use of long and extensive word lists can result in the same difficulty.

Some studies have used short, concise word lists to cover a wide range of different kinds of moods. While this method permits greater accuracy in the statistical handling, it makes for less accuracy in the judging of mood. Some, or perhaps most moods will simply not be found to be adequately described by any one of the words.

Several of the described studies in Chapter II show the difficulty of making definite conclusions where the categories of judgment were not chosen for contrast. The results are more likely to be useful if the study deals with



polarities of mood rather than specific moods. To know that a particular musical characteristic, such as wide melodic leaps, is found frequently with a particular mood is quite meaningless unless one knows whether that characteristic is found with less or with even more frequency with a contrasting mood.

The primary aim of this study was to discover whether or not there are differences of melodic pattern which function in the determination of the mood expressed. Consequently, the first requirement was to select categories of mood which would be most likely to differentiate the songs, i.e., categories representing differences of mood which are expressed in the songs.

If it could be found that psychologists agree on the existence of a few basic moods or emotions, it would be reasonable to base the mood scale of this study on these. However, there is no such agreement. The numerous lists that have been made agree neither in length nor content.<sup>1</sup>

Since it was deemed impossible to select moods according to the criteria of what are truly basic, it was decided to try to use paired moods that are so extreme in their differences that one could have assurance that they would differentiate the songs.

Obviously, the smaller the number of categories used, the greater the differences that may exist between them.

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<sup>1</sup> Flanders Dunbar. Emotions and Bodily Changes. Columbia University Press. New York, 1946. p. 240 fn.

For this study, the categories selected were those which seemed most likely to reveal differences in the songs.

The songs were judged on two scales, one ranging from "sad" at one extreme to "gay" at the other; and a second which ranged from "quiet" at one extreme to "energetic" at the other.\* Each song was judged and graded separately on each scale.

Selection of the Extremes. After the mood judgment had been made by each judge, the judgments, which ranged from one to ten on the mood scales, were summed for each song, thus giving a composite judgment. The next step was to select from each extreme of each mood group a number of songs for musical analysis. It was originally planned to select about thirty songs from each extreme. But in practice, this plan could not be consistently carried out, because in many cases a group of thirty songs would have included songs that were judged to be neutral rather than extreme. Consequently, most of the mood groups contained less than thirty songs.

In spite of this reduction in the numbers of songs in some groups, some difficulty was still encountered. So few French songs were judged to be extremely quiet that even a group of fifteen included some songs judged to be relatively neutral. This flaw is hardly serious, however, since the

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\* Hereafter the terms "gay", "sad", "energetic", and "quiet" will be used only to refer to the qualities so judged in this study.

quality measured in this case is quite relative and continuous.

### The Musical Analysis

The aim of the musical analysis was to discover and measure differences in musical pattern that might exist between melodies which express different moods. Analysis according to conventional musical theory was considered unsuitable for this purpose because it is usually at least partly subjective, and because the results of such analyses are generally not quantitative enough for accurate comparisons. The objection to subjective analysis is, of course, that one can never be certain of the criteria; for example, in making subjective judgments of mode, tonality, or rhythm, one can never be certain that the decisions are not influenced by characteristics other than the one in question.

Preliminary studies and investigation resulted in a list of characteristics of melodic pattern which could be determined quite objectively for the most part, and which could be stated in statistically useable terms. As the aim of the study was to reveal only mood differences in melodic pattern, only those characteristics which seemed likely to be related to mood were retained. The list finally arrived at was composed of characteristics which for convenience are placed into three categories: modal, melodic and rhythmic.

Modal Characteristics. Of all the characteristics of a melodic pattern considered in this study, mode is probably the most difficult to define and determine. The usual methods of determining mode were thought to be inadequate for this study. Where a piece of music is harmonized, it is of course easy to determine the tonic and hence the mode; but this clue is not available in unaccompanied folk songs. It is customary to determine the mode in old ecclesiastical music by reference to the final or last tone, and to the modal dominant. Most folk songs contain nothing that could with certainty be designated a modal dominant. Determining mode through reference to the final tone is possible but does not seem entirely adequate; first, because the mode often seems well established before the last tone is heard; and second, because this method contains an obvious theoretical inaccuracy: a piece could be transposed to a new mode either by transposing the entire piece or by changing only the final tone. Obviously, the musical effect would be quite different, although according to this method, the modal designation would be the same.

For the present purposes, it was not so much necessary to determine mode as to detect modal differences. Several approaches to this problem were tried, some experimental or exploratory, others obvious and conventional.

First, the mode was determined by reference to the final tone. For each song, the final tone was identified

with reference to the half steps of the diatonic scale. For this purpose, the syllables "Do-Re-Mi", etc., were used in their conventional application. The few songs found in minor were not used for this part of the analysis since they are not in the same diatonic scale. The Appalachian songs were also not used because over half of them make use of "gapped" scales in which no mode can be designated with certainty as corresponding with any one diatonic mode.

Second, it seems possible, especially in light of our modern major-minor concept, that a primary distinction between modes (at least with reference to mood expressing qualities) is in whether the scale tone a third above the tonic constitutes a major or minor third. Hence, for each song, except those in which this particular scale tone <sup>was missing, the third</sup> above the tonic was noted, the final being used as a tonic.

From another viewpoint, mode is sometimes considered to be based on the relative functional importance of the various tones of the scale. Thus it is implied that some tones of the scale are, in a certain mode, more important than others; and that this importance is manifested by greater frequency of the important tones, and by the appearance of these tones in important positions in the song. The third and, more particularly, the fourth methods are based on this viewpoint.

In the third method, it was assumed that the last tone of each phrase is modally more important than other tones.

So for each song, the number of phrases which end on each tone of the scale was noted, and to eliminate the influence of length of song, transformed into percentage.

In the fourth method, which is also based on the above viewpoint, the following procedure was used for each song: for each appearance in a song, each tone of the scale was given a value of one, which was multiplied by the number of beats it contained, and to which one point was added if it was found on a down beat. Deciding the value of a beat, and determining the number of down beats in a measure unavoidably involved a certain subjectivity of judgment, but there seemed to be no other way in which to bring into the analysis these factors which appeared to be important. After these points for each scale tone were summed in a given song, the values were changed to percentages so as to eliminate the influence of length of song. In the following chapters, this characteristic is referred to as "the functional importance of scale tones."

Melodic Characteristics. Because it seems possible that songs of a given mood will tend to have larger or smaller intervals than those of a contrasting mood, the analysis of the songs included a tabulation of the sizes of intervals. To make this somewhat simpler, all intervals of a given name, such as a third, sixth, etc., were included in one classification regardless of whether they were minor or

major. For each song, the numbers of intervals of each size were transformed into percentages to eliminate influence of length of song.

Another melodic characteristic included in the analysis was the direction of the final cadence. For this, it was merely noted whether the last tone was higher or lower than the tone before it. There is, of course, a certain inaccuracy in this, in that the general direction of the end of the last phrase may be contradicted by the direction of the last two notes, and it is possible that this general direction is much more important than the direction of the last two tones. Nevertheless, to keep the analysis objective, only the last two pitches of each song were considered, and it was thought likely that when a number of songs were considered, the errors would be averaged out.

The direction of the ending of each phrase, i.e., the direction indicated by the last two pitches in each phrase, was also noted. The numbers each of ascending and descending phrase endings were recorded and were changed into a percentage for each song to avoid influence of length of song.

The pitch range for each song was also noted, accurate to the nearest simple interval value. Whether the interval of the range was major or minor was not considered, and the intervals were classed only as seventh, octave, ninth, etc.

Rhythmic Characteristics. It seemed very probable that the basic rhythmic pattern, which underlies the song

would be functional in the expression of mood. While the actual rhythms in a song vary from measure to measure, there is nearly always an underlying rhythmic pattern which is so clearly expressed that it can with fair certainty be identified and described. These patterns correspond very closely to the various time signatures used in music. Consequently, as an indication of this basic rhythmic pattern, the time signature was noted for each song. The accuracy of this method is dependent upon the original collector who notated the song, and while some inaccuracies may be present, it seems most unlikely that these inaccuracies would be related to mood differences, and hence they should not appreciably affect the results.

The following basic rhythmic patterns were found:

$3/2$ ,  $6/4$ ,  $4/4$ ,  $2/4$ ,  $3/4$ ,  $6/8$ ,  $3/8$ ,  $12/8$  and a special category which has been called "mixed". In this last category were placed the few songs in which more than one type of rhythm was found, and a few songs in which no particular pattern was apparent or indicated.

Many songs contained a rhythmic pattern that might have been described in several ways: for example, some songs could have been either  $6/8$  or  $3/8$ , others either  $4/4$  or  $2/4$ . The only way to use such songs in the comparisons was to group the rhythmic patterns with similar characteristics into one category. This was done in two different ways which are described in the next chapter.



The following characteristics are not exclusively rhythmic, but are included here because their primary implications for this study are rhythmic.

It is not unreasonable to expect that in the songs of one mood, the melody may make more changes of direction than those of contrasting mood. The number of changes of direction for each song was noted, and this data combined with the number of notes. The result is a ratio of number of notes per change in direction, which value serves as an indication of rate of direction change.

It is also reasonable to expect that songs of one mood may have more or fewer changes of implied tonality than those of a contrasting mood. The determination of the tonality implied by a few notes required, in some cases, a degree of subjective judgment. The principles used, however, in this judgment, are common and probably generally agreed on. In general, an interval was considered to express the tonality of the triadic chord in which that interval would be found. Stepwise scale tones were not considered to change the tonality except where there was a change of direction or a repetition or sustaining of one tone. In most cases, tonality was clear; and even where several tonalities were possible, the changes in tonality were usually indisputable. To give an indication of the rate or frequency of tonality change, the data were combined with data on the number of notes to give a ratio of notes per changes of tonality.

For use in equating other data, a value for the length of each song was arrived at by counting the number of notes and the number of beats in each song. Counting the beats first required that a duration value be given to the beat. For songs in  $6/8$ ,  $3/8$  and  $12/8$ , the dotted quarter value was ascribed to the beat; for all other rhythms, the quarter value was used. These data were also used in combination with each other to give a value for the number of beats per note.

### The Comparisons of the Song Groups

The main aim of the study was to compare, in the incidence of various musical characteristics, groups of songs of opposing mood. Consequently, the primary comparisons which were made were: gay songs compared to sad songs, and energetic songs compared to quiet songs.

Before these comparisons could be made, it was necessary to equate the data to eliminate various undesirable differences they contained: length of song and the number of songs in a group. In most cases, this was accomplished by changing the raw data into percentages for each song, and by then averaging all the percentages in a mood group. The few exceptions were noted in the discussion of the particular analysis. By taking the mean average after the data were converted into percentages, songs of different length were made to have an equal influence on the final values.

In comparing the results of the analyses of the songs of opposing mood groups, differences of various sizes appeared. These differences constituted the primary findings of this study. In order to draw conclusions from these differences, it was most desirable to first use some test of their significance. The differences in all the primary comparisons were tested by use of the chi square test. The formula used is the common one:

$$\chi^2 = \sum \left[ \frac{(f_o - f_e)^2}{f_e} \right]$$

where  $f_o$  represents observed frequencies and  $f_e$  the expected frequencies.<sup>1</sup>

The data on three of the characteristics - scale tones on phrase endings, functional importance of scale tones, and size of interval - were summarized only in percentage form. In these cases, the same formula was used and the chi square value multiplied by  $N$  to arrive at the correct chi square.<sup>2</sup>

In most cases, the expected frequencies were arrived at by applying to the total numbers in each mood group the ratios of frequencies found in the combination of both mood groups. The expected frequencies then represented the frequencies that would be expected if both groups were drawn

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<sup>1</sup> Henry E. Garret. Statistics in Psychology and Education. Longmans, Green and Co., New York, 1947.

<sup>2</sup> Ibid., p. 250.

from the same population. The chi square table is entered with the chi square value, and a "p" or probability arrived at. This represents the number of times in a hundred that the observed frequencies would differ this much from the expected frequencies by chance alone.

In the characteristics of the number of changes of tonality, of direction changes, and of beats per note, the expected frequency was arrived at by applying to the totals of each mood group, the ratio of frequencies found in the number of notes for those mood groups. Thus the expected frequency represented the frequencies that would be expected if the characteristic in question was always distributed in proportion to the length of song as indicated by the number of notes.

In the characteristic, functional importance of scale tones, the chi square test is not strictly applicable in that the values did not represent pure frequencies, since the values of each note were weighted for importance. Nevertheless, since the N used was that for the true number of notes, the significance is probably not higher than it would be if only the note frequencies had been used throughout, unless the significance was raised by the weighting of the notes. Since this was a quality intended to be measured, such a result would not be objectionable.

## CHAPTER IV

### RESULTS AND INTERPRETATION

#### Introduction

The data that comprise the results of this study are presented in this chapter primarily in the form of tables. All the data which is pertinent to the aims of the study consist of the results of musical analyses made on songs which had previously been placed into mood groups. These data are in the form of numerical representation of the incidence of certain musical characteristics in songs of given mood. For each musical characteristic, the results are given for the four mood extremes in each culture, and also for the four mood extremes with all the songs considered as a whole.

The interpretation of the data for each musical characteristic is given in three parts: one for each of the aims of the study.

The first aim of the study - that of showing whether specific characteristics of melodic pattern are related to specific mood - is approached primarily in the results of the significance tests. Where a test shows that an obtained difference in the musical pattern of song of different mood is probably not due to chance or sampling error, a relationship of mood to musical pattern may be presumed to exist. It

should be recognized that a causal relationship is not hereby demonstrated, but only a tendency to coincidence.

The figures under "p" in the tables are referred to in the text as significance figures or "significance of difference". These figures indicate the probability that the differences between the adjacent distributions could have occurred by chance. For example, a p of .001 indicates that only once in a thousand times would the differences in the distribution of the data occur by chance alone; a p of .05 indicates five times in a hundred. Where the probability of a difference occurring by chance is very low, one is reasonably safe in assuming that the differences manifest are indications of true conditions.

Where the total numbers involved are very high, as they are in the fourth test of modal difference, or in the data on the size of intervals, where hundreds of notes or intervals are involved; it is logical to expect that small differences would be more significant, and the tests of significance are arranged so that the total size of the sample has an important influence on the final significance figures. Thus in these data wherein each song contributes large numbers of notes or intervals to the calculations, rather subtle differences may serve to effect very significant results.

It is customary in using tests of hypotheses to select in advance certain levels of significance at which one will decide to accept or reject the hypotheses. It does not

appear that this procedure would be of value in the present study: first, because the hypotheses cannot here be accepted or rejected on the basis of any one significance test, and second, because under various conditions, different levels of significance might be acceptable. For example, where similar results are obtained in each of four cultures, a lower level of significance in each of the cultures would be as convincing as a higher level in only one of them.

It should perhaps be noted that a low level of significance cannot definitely lead to a conclusion of no relationship. Lack of statistical significance may be the result of choice of songs, poor mood definition or categorization, inaccurate mood judgment, and in some cases, faulty methods of musical analysis.

The second aim of the study is to discover some of the musical characteristics related to certain moods. This aim may be said to have been accomplished wherever a significant relationship can be shown to exist, provided that both the musical characteristic and the mood can be adequately identified. The comparisons in this study that satisfy these conditions are so numerous, incidental, and in some cases, contradictory, that generally only those musical characteristics which are universally related to given moods are considered as answering this aim. The term "universal", used here and later, in this connection, is not intended to have an absolute meaning, but only to suggest that the

characteristic in question is common to the cultures involved in this study, and that the data do not contradict the possibility of genuine universality.

The third aim of the study is to determine whether or not relationships of specific musical characteristics to mood are different in different cultures. Generally this aim may be considered to be satisfied where two cultures show an opposite tendency regarding the function of a musical characteristic. A mere difference of degree is hardly enough for this purpose, considering the impossibility of careful control in the various steps of the study, particularly in the selection of the songs and the judging of the mood.

It might have been preferable to have based conclusions regarding the second and third aims of the study only on relationships that were significant at high levels. However, the purpose here was not to accept or reject an hypothesis, but to discover trends. To have ignored differences which were not significant at high levels would have been to ignore what might be valuable information. For example, where a significance level of .1 or .2 has been obtained, the data is worthy of consideration for it can still be said that probably the difference is representative and not accidental.



## Modal Characteristics

### Final Tone

The most conventional method of determining the mode of a piece of music is through reference to its final tone. This method is based upon the sometimes dubious assumption that the final tone is the tonic. This and other weaknesses discussed in Chapter III seem to limit the value of the method. However, for the purposes of the present study, its value is determined by the degree to which it differentiates mood groups of songs. The present aim is not so much to determine mode as to detect modal differences. The syllables "Do-Re-Mi", etc., were used in their conventional application to designate the tones of the diatonic scale relative to the position of the half-steps.

It was impossible to include the Appalachian songs in most of the studies of mode because of the very large number of songs using pentatonic or hexatonic scales. There is no way to assign one of the diatonic modes to a piece of music using one of the so-called "gapped" scales without arbitrarily deciding what the "missing" tones would be if they were present. Such decisions would be unreasonable and probably unreliable.

The results are presented in Tables 1 and 2. The tones Fa and Ti are omitted from the tables because none of the songs studied ended on either of these syllables.

Table 1

## Distribution of Final Tones

Mood Groups	Do	Re	Mi	Sol	La	p
French Songs						
27 Gay	22			1	4	).10
24 Sad	14	2	1	1	6	
25 Energetic	20				5	).50
15 Quiet	10	1			4	
German Songs						
20 Gay	16		3	1		).20
30 Sad	18		11	1		
27 Energetic	23		4			).10
23 Quiet	15		8			
English Songs						
26 Gay	13	3		4	6	).30
24 Sad	10	5		2	7	
28 Energetic	11	5		4	8	).70
22 Quiet	13	3		1	5	
All Songs						
73 Gay	51	3	3	6	10	).20
78 Sad	42	7	12	4	13	
80 Energetic	54	5	4	4	13	).50
60 Quiet	38	4	8	1	9	

Table 2

## Distribution of Percentages of Final Tones

Mood Groups	Do	Re	Mi	Sol	La
French Songs					
27 Gay	80.5			3.7	14.8
24 Sad	58.3	8.3	4.2	4.2	25.0
25 Energetic	80.0				20.0
15 Quiet	66.7	6.7			26.7
German Songs					
20 Gay	80.0		15.0	5.0	
30 Sad	60.0		36.7	3.3	
27 Energetic	85.2		14.8		
23 Quiet	65.2		34.8		
English Songs					
26 Gay	50.0	11.5		15.4	23.1
24 Sad	41.7	20.8		8.3	29.2
28 Energetic	39.3	17.8		14.3	28.6
22 Quiet	59.1	13.7		4.5	22.7
All Songs					
73 Gay	69.9	14.1	4.1	8.2	13.7
78 Sad	53.9	8.9	15.4	5.1	16.7
80 Energetic	67.5	6.2	5.0	5.0	16.3
60 Quiet	63.3	6.7	13.3	1.7	15.0

The results may be interpreted as follows:

1. There is an indication that this characteristic is related to expression of mood. The indication is not very strong, the best level of significance being only .1. However, since there is only one final tone per song, the total number of final tones was relatively low. It is not unreasonable to expect that a larger number of songs considered would raise the level of significance. This especially must be taken into consideration in comparing this method of determining mode with others in which the total numbers involved were much larger.

2. Some of the differences between cultures are consistent enough to indicate a relatively universal relation of this characteristic to expression of mood. In the gay-sad comparison in all three cultures, Do is a more frequent final tone in gay than in sad songs; and Re and La are more frequent in sad than in gay songs.

3. Differences between cultures in the function of this characteristic are not much in evidence. The English songs showed tendencies quite contrary to those shown in the French and German songs, but the level of significance on these characteristics in the English songs was so low (.7 and .3) that no very certain generalizations can be drawn from these differences.

The one rather notable difference between cultures is that the German songs seem to use the Mi ending where the

other cultures use the La. To what degree this cultural difference is related to mood is perhaps uncertain, since the use of the Mi ending rather than the La occurs in German songs of all moods. It is clear, however, that the German songs make a much greater use of the Mi ending in sad and in quiet songs than in gay and energetic songs.

### The Third above the Final

For reasons given in Chapter III, it might be expected that the best differentiation of mode according to mood would be by reference to whether the third scale tone above the final was at an interval of a major or minor third. In some songs, especially among the Appalachian songs, this particular tone of the scale was not used, and this is indicated in the tables as "missing".

The results for this characteristic are presented in Table 3 and may be interpreted as follows:

1. While some of the differences between moods are not very significant for this characteristic; some, especially those for all the songs as a whole, are significant enough (.05) to evidence that this characteristic is related to the expression of mood.

2. It seems to be indicated that the third above the final is more likely to be major in gay and in energetic moods than in sad or quiet moods. In each comparison, one of the four cultures shows a contrary tendency, but with so

Table 3

Number and Percentage of Major, Minor or  
Missing Thirds above the Final Tone

Mood Group	Major	Minor	Missing	p
French Songs				
28 Gay	24 85.7%	4 14.3%	0 0%	) .05
26 Sad	16 61.5	10 38.5	0 0	
26 Energetic	21 80.8	5 19.2	0 0	) .10
18 Quiet	10 55.6	8 44.4	0 0	
German Songs				
20 Gay	16 80.0	3 15.0	1 5.0	) .20
30 Sad	19 63.3	11 36.7	0 0	
27 Energetic	23 85.2	4 14.8	0 0	) .10
24 Quiet	15 62.5	9 37.5	0 0	
English Songs				
27 Gay	17 63.0	10 37.0	0 0	) .40
24 Sad	12 50.0	12 50.0	0 0	
28 Energetic	14 50.0	14 50.0	0 0	) .50
22 Quiet	13 59.1	9 40.9	0 0	
Appalachian Songs				
24 Gay	12 50.0	6 25.0	6 25.0	) .30
23 Sad	13 56.5	5 21.7	5 21.7	
21 Energetic	13 61.9	3 14.3	5 23.8	) .20
21 Quiet	8 38.1	6 28.6	7 33.3	
All Songs				
99 Gay	69 69.70	23 23.23	7 7.07	) .05
103 Sad	60 58.25	38 36.89	5 4.85	
102 Energetic	71 69.60	26 25.49	5 4.90	) .05
85 Quiet	46 54.12	32 37.65	7 8.24	

low a level of significance (.5 and .3) that the contradiction may be assumed to be accidental. That this expressive function of the modality of the third is a relatively universal characteristic is also suggested by the fact that the level of significance is much higher for the songs as a whole than for any individual culture.

3. There is no evidence of difference between cultures in the function of this characteristic.

### Scale Tones on Phrase Endings

The possibility that the tones of the scale on which the phrases of the songs end might serve as a means to modally differentiate the songs according to mood was discussed in Chapter III. The results are presented in Table 4 and may be interpreted as follows:

1. There is strong evidence that mode as indicated by the incidence of various scale tones on phrase endings is related to the expression of mood. With all the songs taken together, the differences in the distribution of the scale tones were significant at the .001 level in the gay-sad comparison, and at the .01 level in the energetic-quiet comparison. In the individual cultures, the French and German sad-gay comparisons and the German energetic-quiet comparison are marked by fairly significant differences.

2. There is some indication of universality in the function of this characteristic. In all three cultures,

Table 4

Mean Percentage of Phrase Endings on  
Each Scale Tone

Mood Groups	Do	Re	Mi	Fa	Sol	La	Ti	p
French Songs								
27 Gay	42.4	15.6	10.2	0	19.5	8.9	3.4	).03
24 Sad	36.8	9.4	9.9	0	22.0	15.7	5.2	
25 Energetic	43.2	21.9	9.4	1.0	14.2	7.4	2.6	).50
15 Quiet	45.4	13.0	9.3	0	12.9	14.0	5.0	
German Songs								
20 Gay	48.6	8.1	17.9	1.9	21.4	.9	1.0	).05
30 Sad	34.5	23.4	22.2	1.3	16.1	2.4	0	
27 Energetic	45.3	10.1	16.1	1.4	25.6	.6	.7	).01
23 Quiet	24.0	18.3	24.2	10.0	20.3	2.5	.7	
English Songs								
25 Gay	25.2	14.8	10.9	1.7	28.2	17.2	2.0	).50
24 Sad	19.1	21.4	11.2	3.7	22.2	21.6	.8	
28 Energetic	24.2	20.1	13.4	.9	21.5	18.1	1.8	).70
22 Quiet	21.1	18.4	8.4	4.2	26.6	20.1	1.1	
All Songs								
72 Gay	38.1	13.2	12.6	1.1	23.0	8.8	1.9	).001
78 Sad	28.2	17.3	16.9	3.3	19.9	12.2	1.8	
80 Energetic	37.2	17.3	13.1	1.1	20.6	8.8	1.7	).01
59 Quiet	28.8	17.3	14.9	5.5	21.1	12.0	1.7	



Do is more frequent on phrase endings in gay than in sad songs. In all three cultures, La is more frequent in sad and quiet songs than in gay and energetic songs. No other scale tones are shown to have a function common to all three cultures.

3. There is strong evidence of differences between cultures in the relation of this characteristic to mood. On all the scale tones except the ones indicated above as having relatively universal function, there are marked differences between cultures in the relation of the incidence of that particular scale tone to mood. There is no way to know which of these differences are meaningful, but some of them are too large to ignore.

#### Functional Importance of Scale Tones

The above title is used to indicate a method of detecting modal differences described in Chapter III. It is a method using all the tones of each song giving consideration to their length and importance. The data on this characteristic are presented in Table 5. The results may be interpreted as follows:

1. Differences obtained were large and significant in the French and German gay-sad and energetic-quiet comparisons. Differences were also significant in the English gay-sad comparison. It may be assumed that this characteristic of melodic pattern is functional in the expression of mood. The very high level of significance does not

Table 5

Functional Importance of Each Scale Tone  
(See text, p. 68)

Mood Groups	Do	Re	Mi	Fa	Sol	La	Ti	p
French Songs								
27 Gay	26.5	23.1	17.3	5.8	13.8	8.1	6.5	).001
24 Sad	23.4	17.6	25.0	4.2	12.3	13.0	6.4	
25 Energetic	25.1	19.0	23.0	5.7	16.4	7.3	5.6	).001
15 Quiet	29.9	21.7	20.9	4.1	8.1	7.6	7.5	
German Songs								
20 Gay	20.3	18.0	20.7	7.8	17.2	7.7	6.4	).001
30 Sad	16.6	14.5	22.3	11.2	24.9	6.6	3.9	
27 Energetic	23.7	15.4	19.2	8.6	19.8	7.3	6.1	).001
23 Quiet	15.0	14.6	23.1	11.7	25.0	7.5	3.0	
English Songs								
26 Gay	22.7	15.3	13.5	8.1	20.0	15.5	4.8	).05
24 Sad	22.2	15.8	14.4	7.2	16.8	17.8	5.9	
28 Energetic	20.5	16.9	14.1	8.2	17.9	17.1	5.3	).30
22 Quiet	22.1	14.6	15.5	7.5	20.3	14.9	4.9	
All Songs								
73 Gay	23.8	18.9	16.8	7.1	16.8	10.6	5.8	).001
78 Sad	20.4	15.8	20.7	7.9	18.6	11.9	5.3	
80 Energetic	23.2	17.2	18.2	7.6	18.3	10.8	5.7	).05
59 Quiet	21.3	16.4	19.8	8.3	19.1	10.2	4.8	

necessarily indicate that this method of determining mode is better than the previous methods. For while the significance level probably indicates a real and meaningful difference in the distributions, it is possibly the very large total number of tones involved which makes these significance figures higher than in the others.

2. The differences between cultures in the relationship of this characteristic to mood are so great that no universal function of mode is indicated. In both French and German songs, there is a predominance of Do and Re in the gay songs, and of Mi in the sad songs. No other strong tendencies are common to even two cultures.

3. There is a strong indication that the expressive function of mode as indicated by the functional importance of scale tones is different in different cultures.

Important differences between cultures are indicated by the following tendencies which are strong in one culture, but not in others: (1) the great importance of Mi and La in French sad songs, (2) the great importance of Sol in German sad songs, (3) the importance of Sol in French energetic songs, (4) the importance of Mi, Fa and Sol in German quiet songs, and (5) the smaller importance of mode in general in the English songs as compared to the greater importance in the French and German songs.

## Melodic Characteristics

### Size of Intervals

For each song, the number of intervals of each size were tabulated and, to eliminate the influence of the length of song, converted into percentages. Since the aim was only to determine whether intervals tend to be larger or smaller in songs of different moods, no differentiation was made between major and minor, or perfect, or diminished intervals. The results are presented in Table 6 and may be interpreted as follows:

1. The significance tests seem to show that the incidence of intervals of various sizes is related to the expression of mood. Significance is generally of a very high level. The differences in the distribution of intervals among the various sizes is significant at least at the .05 level except in the French and Appalachian energetic-quiet comparisons. For all the songs taken together, both distributions are significant at the .001 level.

Because the number of repeated tones can have especial interest, the ratio of the number of primes to the number of all the other intervals taken together was compared. The differences in this distribution are significant at least at the .05 level except in the French and Appalachian energetic-quiet distributions, and in the French gay-sad distribution.

Table 6

## Mean Percentage of Intervals of Each Size

Mood Groups	Pr.*	2nds	3rds	4ths	5ths	6ths	7ths	8aves	p
French Songs									
28 Gay	22.2	56.8	10.8	6.9	2.8	.3	0	.3	).05
26 Sad	20.7	55.8	13.1	7.0	3.0	.5	0	0.7	
26 Energ.	25.7	50.7	12.9	7.4	2.7	.4	0	.3	).50
18 Quiet	25.8	49.7	13.5	6.6	3.6	.9	0	0	
German Songs									
20 Gay	27.5	44.2	18.0	5.6	2.9	1.7	0	.1	).01
30 Sad	19.6	46.1	22.7	5.7	3.2	2.5	.1	.2	
27 Energ.	25.4	43.4	20.8	5.5	3.2	1.7	0	.1	).001
24 Quiet	16.3	52.8	19.2	6.3	3.1	1.4	.4	.5	
English Songs									
27 Gay	19.1	53.9	15.4	6.8	3.0	1.1	.5	.3	).01
24 Sad	13.0	60.4	16.2	6.8	2.2	.8	.6	.2	
28 Energ.	19.4	51.1	17.4	7.5	3.1	.7	.3	.5	).05
22 Quiet	15.3	57.3	15.7	7.8	2.5	1.0	.2	.2	
Appalachian Songs									
24 Gay	29.2	38.2	21.5	6.9	3.1	.9	0	.2	).001
23 Sad	19.3	40.1	27.4	7.9	3.6	1.1	.2	.4	
21 Energ.	22.0	38.8	25.7	9.4	2.9	.9	.2	.1	).30
21 Quiet	17.3	42.3	28.4	7.7	2.8	.9	.3	.2	
All Songs									
99 Gay	24.5	48.3	16.4	6.5	3.0	1.0	.1	.2	).001
103 Sad	18.2	50.6	19.9	6.8	3.0	1.2	.2	.2	
102 Energ.	23.1	46.0	19.2	7.5	3.0	.9	.2	.2	).001
85 Quiet	18.7	50.5	19.2	7.1	3.0	1.1	.2	.2	

\* Pr. = Prime

2. The primary characteristic that stands out is that in every case the gay and the energetic songs make use of many more primes than do the sad and quiet songs. The differences in this are large except in the French comparisons. With these exceptions there are more seconds among the sad and the quiet than among the gay and energetic. Except in the English comparison, there are more thirds among the sad than among the gay songs. The total numbers of intervals larger than the third are too small to justify any generalizations.

3. Cultural differences in the function of size of interval as related to mood expression are not great. As noted above, there is a common function of the prime and only minor disagreement on seconds and thirds. The present evidence does not contradict the possibility of complete universality in the function of this characteristic.

#### Direction of Final Cadence

The results on the direction of final cadence are presented in Table 7 in the form of percentage of ascending cadences. In every case, the percentage of descending cadences may be ascertained by subtracting the percentage given from one hundred. The results may be interpreted as follows:

1. There is some evidence of relation of this characteristic to the expression of mood, but it is not strong.

Table 7

Numbers and Mean Percentages of Ascending  
Final Cadences

Mood Groups	Number	Percent	p
<b>French Songs</b>			
28 Gay	12	42.9%	) .70
26 Sad	9	34.5	
26 Energetic	10	38.5	) .80
18 Quiet	6	33.3	
<b>German Songs</b>			
20 Gay	9	45.0	) .20
30 Sad	7	23.3	
26 Energetic	11	40.7	) .10
24 Quiet	5	20.8	
<b>English Songs</b>			
27 Gay	9	33.3	) .30
24 Sad	12	50.0	
28 Energetic	8	28.6	) .04
22 Quiet	12	54.6	
<b>Appalachian Songs</b>			
24 Gay	6	25.0	) .05
23 Sad	13	56.5	
21 Energetic	11	52.4	) .98
21 Quiet	10	47.6	
<b>All Songs</b>			
99 Gay	36	36.5	) .70
103 Sad	41	39.8	
102 Energetic	40	39.2	) .99
85 Quiet	33	38.8	

In only two of the eight comparisons, is there a good degree of significance.

2. Because of the slight amount of significant data, not much can be concluded regarding specific relationships of pattern to mood. The two significant data indicate that ascending final cadence is more likely to be related to sad and quiet songs than to gay or energetic. However, the tendency of the German songs, based on differences which are almost as significant, is just the opposite.

3. There is suggestion of intercultural difference, but the low significance of the differences does not permit worthwhile generalizations.

#### Direction of Phrase Endings

In Table 8 may be found the data on the direction of the phrase endings, in the form of percentages of ascending cadences. These results may be interpreted as follows:

1. There is some evidence that this characteristic is related to the expression of mood. Three of the comparisons were significant at the .05 level or better.

2. If differences with significance levels lower than .05 are disregarded, there is an indication that gay songs are more likely to make use of ascending phrase endings than are sad songs. However, conflicting tendencies between cultures make any decisive generalizations impossible.



Table 8

## Mean Percentages of Ascending Phrase Endings

Mood Groups	Percent	p
French Songs		
28 Gay	39.5	) .05
26 Sad	27.4	
26 Energetic	31.6	) .30
18 Quiet	24.2	
German Songs		
20 Gay	36.9	) .01
30 Sad	18.6	
27 Energetic	34.1	) .10
24 Quiet	22.7	
English Songs		
27 Gay	30.4	) .10
24 Sad	41.7	
28 Energetic	29.6	) .05
22 Quiet	43.6	
Appalachian Songs		
24 Gay	42.6	) .50
23 Sad	48.9	
21 Energetic	49.1	) .50
21 Quiet	41.4	
All Songs		
99 Gay	37.3	) .70
103 Sad	32.8	
102 Energetic	35.3	) .80
85 Quiet	33.0	

3. There is evidence of intercultural difference in the relation of this characteristic to the expression of mood, but the evidence is not strong because of the low levels of significance.

### Pitch Range

The pitch range of each song was noted and recorded. The ranges were averaged for each mood group. Major and minor intervals were recorded without distinction. These pitch ranges were then averaged for each mood group. The resulting data are indicated in Table 9 with whole numbers and decimals. While musically this method of indication is not accurate, it should serve accurately to indicate the difference in the average size of intervals in each mood group. The whole number indicates the size of interval. The numbers to the right of the decimal point indicate the percent of a whole tone which should be added to the whole number to indicate the average size of interval. By this method the number 8.50 indicates an octave plus a half-step.

The results may be interpreted as follows:

1. There is no indication that this characteristic is related to mood. The highest level of significance obtained was .95.

2. and 3. With this very low level of significance, no generalizations of the relation of this characteristic to mood are possible from this data.

Table 9

## Pitch Range

Mood Groups	Mean Interval
French Songs	
28 Gay	7.46
26 Sad	7.73
26 Energetic	7.46
18 Quiet	7.17
German Songs	
20 Gay	8.20
30 Sad	8.34
27 Energetic	8.37
24 Quiet	8.58
English Songs	
27 Gay	9.41
24 Sad	9.17
28 Energetic	9.29
22 Quiet	9.27
Appalachian Songs	
24 Gay	8.71
23 Sad	9.26
21 Energetic	9.81
21 Quiet	8.62
All Songs	
99 Gay	8.44
103 Sad	8.58
102 Energetic	8.69
85 Quiet	8.47

## Rhythmic Characteristics

### Basic Rhythmic Pattern

The basic rhythmic pattern of the songs may be found in Tables 10, 11, 12 and 13. The rhythm patterns are expressed by the appropriate time signature. It was nearly impossible to compare cultures or even mood groups in the same culture using these basic data in which there are nine categories of basic rhythmic structure. One difficulty is that there are too few songs in some of the categories for practical use of any test of significance. The primary difficulty is the tendency for each culture to use some rhythmic patterns not used by all the other cultures so that comparison is impossible. To avoid these difficulties, it was necessary to group the categories.

One method of grouping, which seemed promising, was to put together those rhythmic patterns which have similar primary and secondary rhythms. According to this method, there seem to be four possible types of rhythm: duple groups of duple rhythm ( $4/4$ ,  $2/4$ ), duple groups of triple rhythm ( $6/8$ ,  $6/4$ ,  $12/8$ ), triple groups of duple rhythm ( $3/4$ ,  $3/2$ ), and triple groups of triple rhythm ( $9/8$ ).

Placing songs in these categories was sometimes difficult. If a song in  $3/4$  containing no eighth notes, or a song in  $3/8$  containing no sixteenth notes is organized with even

Table 10

## Numbers of Songs in Each Basic Rhythmic Pattern

Mood Groups	3/2	6/4	4/4	3/4	2/4	6/8	12/8	3/8	Mixed
French Songs									
28 Gay					19	7		1	1
26 Sad				1	6	15	1		3
26 Energ.					13	11			2
18 Quiet				1	6	8			3
German Songs									
20 Gay			2	6	4	4		4	
30 Sad			8	11	2	7		2	
27 Energ.			2	10	4	6		5	
24 Quiet			6	9	4	3		2	
English Songs									
27 Gay			10	5		10			2
24 Sad	2		9	8	1	2			2
28 Energ.	1		13	5		8			1
22 Quiet	1		6	9		4			2
Appalachian Songs									
24 Gay	1		13	3	1	3			3
23 Sad	11		6	2		1			3
21 Energ.	4		8	1		2			6
21 Quiet	9	1	7	3					1
All Songs									
99 Gay	1		25	14	24	24		5	6
103 Sad	13		23	22	9	25	1	2	8
102 Energ.	5		23	16	17	27		5	9
85 Quiet	10	1	19	22	10	15		2	6

Table 11

## Percentages of Songs in Each Basic Rhythmic Pattern

Mood Groups	3/2	6/4	4/4	3/4	2/4	6/8	12/8	3/8	Mixed
French Songs									
28 Gay					67.8	25.0		3.6	3.6
26 Sad				3.8	23.1	57.8	3.8		11.5
26 Energ.					50.0	42.3			7.7
18 Quiet				5.6	33.3	44.5			16.6
German Songs									
20 Gay			10.0	30.0	20.0	20.0		20.0	
30 Sad			26.7	36.6	6.7	23.3		6.7	
27 Energ.			7.4	37.0	14.8	22.2		18.5	
24 Quiet			25.0	37.5	16.7	12.5		8.3	
English Songs									
27 Gay			37.0	18.5		37.0			7.4
24 Sad	8.3		37.5	33.3	4.2	8.3			8.3
28 Energ.	3.6		46.6	17.9		28.6			3.6
22 Quiet	4.5		27.3	40.9		18.2			9.1
Appalachian Songs									
24 Gay	4.2		54.1	12.5	4.2	12.5			12.5
23 Sad	47.8		26.1	8.7		4.4			13.0
21 Energ.	19.0		38.1	4.8		9.5			28.6
21 Quiet	42.8	4.8	33.3	14.3					4.8
All Songs									
99 Gay	1.0		25.3	14.1	24.2	24.2		5.1	6.1
103 Sad	12.6		22.3	21.3	8.7	24.3	1.0	1.9	7.8
102 Energ.	4.9		22.6	15.7	16.6	26.5		4.9	8.8
85 Quiet	11.8	1.2	22.3	25.8	11.8	17.6		2.4	7.1

Table 12

Numbers and Percentages of Songs  
in Three Categories of Rhythmic Pattern\*

Mood Groups	Numbers			p	Percentages		
	4/4 2/4	6/8 6/4	3/4 3/2		4/4 2/4	6/8 6/4	3/4 3/2
French Songs							
26 Gay	19	7	0	).05	73%	27%	0%
22 Sad	6	15	1		27	67	5
24 Energetic	13	11	0	).30	54	46	0
15 Quiet	6	8	1		40	53	7
German Songs							
16 Gay	6	4	6	).90	37	25	37
28 Sad	10	7	11		36	25	39
22 Energetic	6	6	10	).50	27	27	46
22 Quiet	10	3	9		45	14	41
English Songs							
25 Gay	10	10	5	).05	40	40	20
22 Sad	10	2	10		45	9	45
27 Energetic	13	8	6	).20	48	30	22
20 Quiet	6	4	10		30	20	50
Appalachian Songs							
21 Gay	14	3	4	).01	67	14	19
20 Sad	6	1	13		30	5	65
15 Energetic	8	2	5	).30	53	13	33
20 Quiet	7	1	12		35	5	60
All Songs							
88 Gay	49	24	15	).01	55.7	27.3	17.0
93 Sad	32	26	35		34.4	27.9	37.7
88 Energetic	40	27	21	).05	45.5	30.7	23.8
77 Quiet	29	16	32		37.6	20.8	41.6

\* All 3/8 rhythms, and all irregular and mixed rhythms were excluded from these computations.

Table 13

Numbers and Percentages of Songs  
with Triple and with Duple Rhythmic Pattern\*

Mood Groups	Numbers in Duple	numbers in Triple	p	Percent in Duple	Percent in Triple
French Songs					
26 Gay	19	7	).01	73%- 26	27% 74
23 Sad	6	17			
24 Energetic	13	11	).50	54 40	46 60
15 Quiet	6	9			
German Songs					
20 Gay	6	14	).02	30 33	70 67
20 Sad	10	20			
27 Energetic	6	21	).20	22 42	78 58
24 Quiet	10	14			
English Songs					
25 Gay	10	15	).80	40 45	60 55
22 Sad	10	12			
27 Energetic	13	14	).30	48 30	52 70
20 Quiet	6	14			
Appalachian Songs					
21 Gay	14	7	).02	67 30	33 70
20 Sad	6	14			
15 Energ.	8	7	).30	47 35	53 65
20 Quiet	7	13			
All Songs					
93 Gay	49	44	).01	52.7 33.7	47.3 66.3
95 Sad	32	63			
93 Energetic	40	53	).50	43.0 36.7	57.0 63.3
79 Quiet	29	50			

\*Songs with mixed or irregular rhythmic pattern were omitted.



numbers of measures, it can be classed in the second category with  $6/8$ , etc. But if the song contains shorter notes in any number, it would be necessary to class it with the  $3/4$  and  $3/2$ .

In Table 12, the basic rhythmic patterns are grouped according to the above method. Because of the difficulty mentioned, all songs in  $3/8$  were omitted. Except for one song written in  $3/8$ , no songs were found which could have been placed in the last category - triple groups of triple rhythm.

The very low numbers in some of the categories make the value of some of these significance figures somewhat dubious.

The only very definite method by which to categorize the rhythms was according to whether or not the song contained some form of triple rhythm. Those in the  $2/4$  or  $4/4$  do not contain any triple rhythm in any form, but all the other rhythms do contain triple rhythm in some form. The rhythms categorized by this method may be found in Table 13.

The results may be interpreted as follows:

1. A few differences shown to be significant indicate that there may be a relation of the basic rhythmic pattern to the expression of mood. Nearly all the significant data are found in the gay-sad comparisons, which seem to indicate that the basic rhythmic pattern is more likely to be related to the gay-sad mood distinction than to the energetic-quiet.

2. Lack of conformity between cultures makes it difficult to accept with certainty a universal relationship of rhythmic pattern to mood. The data on the songs of all the cultures considered together show triple rhythm to be more frequent in the sad songs than in the gay. But definite contradictions to this tendency in individual cultures makes it impossible to accept this as a universal relationship.

3. Definite intercultural differences in the function of rhythmic pattern are indicated. While the French and Appalachian songs show triple rhythm to be significantly associated with sad mood; the German songs, with equal significance, show triple rhythm to be associated with gay mood. In the French group, the  $6/8 - 6/4$  rhythm is shown to be associated with the sad songs, while in the English and Appalachian, this rhythm is associated with the gay songs.

### Changes in Direction

The number of changes in direction was tabulated and summed for each mood group. The chi square test was used to compare the distributions of the direction changes between the contrasting moods with the distributions that would be expected if these changes were always proportional to the number of notes. To serve as a direct indication of the tendency of songs to have more or fewer changes of directions, the number of notes in each mood group was divided by the

number of direction changes, thus giving the figure indicated in Table 14 as "Number of notes per change of direction".

The results may be interpreted as follows:

1. There is almost no evidence that this characteristic is related to the expression of mood. Only one comparison, the Appalachian gay-sad, was significant at an acceptable level.

2. No universal function is indicated. The lack of significant data and the conflicting tendencies of the different cultures make generalizations impossible.

3. Differences between cultures are definitely indicated by the data, but the very low level of significance does not permit generalization.

### Changes in Tonality

A description of the method of determining changes of tonality may be found in Chapter III. The chi square test was used to compare the distributions of the changes in tonality between the contrasting moods with the distributions that would be expected if these changes were always proportional to the number of notes. To serve as a direct indication of the tendency of the songs to have more or fewer changes of tonality, the number of notes in each mood group was divided by the number of changes of tonality, thus giving the figure indicated in Table 15 as "Number of notes per change of tonality".

Table 14

## Changes in Direction

Mood Groups	Number of changes of direction	p	Number of notes per change of direction
French Songs			
28 Gay	494	).90	2.70
26 Sad	408		2.74
26 Energetic	453	).70	2.59
18 Quiet	285		2.67
German Songs			
20 Gay	367	).50	2.78
30 Sad	491		2.62
27 Energetic	473	).50	2.58
24 Quiet	388		2.70
English Songs			
27 Gay	563	).10	2.60
24 Sad	403		2.91
28 Energetic	576	).30	2.62
22 Quiet	380		2.84
Appalachian Songs			
24 Gay	355	).05	3.08
23 Sad	385		2.64
21 Energetic	339	).95	2.82
21 Quiet	318		2.80
All Songs			
99 Gay	1779	).70	2.65
103 Sad	1687		2.73
102 Energetic	1841	).30	2.65
85 Quiet	1371		2.75

Table 15

## Changes in Tonality

Mood Groups	Number of changes of tonality	p	Number of notes per change of tonality
French Songs			
28 Gay	214	).80	6.23
26 Sad	173		6.46
26 Energetic	171	).30	6.85
18 Quiet	128		5.94
German Songs			
20 Gay	181	).60	5.63
30 Sad	242		5.40
27 Energetic	227	).90	5.37
24 Quiet	198		5.29
English Songs			
27 Gay	236	).30	6.20
24 Sad	208		5.63
28 Energetic	244	).20	6.18
22 Quiet	198		5.45
All Songs			
75 Gay	631	).80	5.73
80 Sad	623		5.77
81 Energetic	642	).70	6.07
64 Quiet	524		5.51

Appalachian songs were excluded because of the great number of songs employing scales that are basically pentatonic. Although pentatonic songs can be harmonized with changes in tonality, there is little feeling of tonality change in the unaccompanied song.

The results may be interpreted as follows:

1. There is no indication that the number of changes of tonality, when compared with the number of notes, is related to expression of mood. The levels of significance range from .20 to .90, so it seems almost probable that the differences could have resulted from chance.

2. It is perhaps noteworthy that in all three cultures there are more notes per change of tonality in the energetic songs than in the quiet. However, considering the very low levels of significance, no generalization based on this data can have much validity.

3. There is almost nothing in the data to indicate intercultural differences in the function of this characteristic, but the low level of significance must make any generalization of little value.

#### Numbers of Notes and Beats

To determine the number of notes per song was a matter of simple counting and was quite objective. The data on the number of beats are less objective and reliable, but nevertheless useable, since there is no reason to suspect mood bias.

In songs notated in 6/8, 3/8 or 12/8 rhythm, the dotted quarter beats were counted, in all others, quarter beats. The value of this method is dependent on the judgment of the original collector who notated the songs. However, it seems most improbable that the collectors used different methods of notation for songs of different moods; particularly so when it is realized that mood differences, as discussed in this study, were not matters of concern to these collectors.

The data on number of beats and notes per song, and on the number of beats per note are presented in Tables 16 and 17. These results may be interpreted as follows:

1. There is some reason to believe that numbers of notes per song, beats per song, and notes per beat are related to the expression of mood. In all three of these characteristics, there may be found differences significant at a high level.

2. The significant data show the number of notes per song to be greater among the gay and energetic songs than among the sad or quiet songs. There is only one exception which is at the .20 level of significance.

The significant data on the number of beats per song show contrary tendencies between cultures so that no universal tendency is indicated.

The significant data on the number of beats per note are quite consistent. In each case where the data are significant, the number of beats per note is higher among the

Table 16

Numbers of Notes in Each Mood Group  
and Average Numbers of Notes per Song

Mood Group	Total number of notes	p	Notes per song
French Songs			
28 Gay	1134	).20	40.50
26 Sad	1118		43.00
26 Energetic	1172	).20	45.08
18 Quiet	760		42.22
German Songs			
20 Gay	1019	).001	50.95
30 Sad	1308		43.60
27 Energetic	1219	).50	45.15
24 Quiet	1048		43.25
English Songs			
27 Gay	1464	).01	54.22
24 Sad	1171		48.79
28 Energetic	1507	).02	53.82
22 Quiet	1079		49.05
Appalachian Songs			
24 Gay	1094	).70	45.58
23 Sad	1020		44.35
21 Energetic	957	).20	45.57
21 Quiet	889		42.33
All Songs			
99 Gay	4711	).01	47.59
103 Sad	4617		44.83
102 Energetic	4855	).001	47.60
85 Quiet	3776		44.42



Table 17

Numbers of Beats in Each Mood Group, Average  
Numbers of Beats per Song, and Average Number of  
Beats per Note

Mood Group	Total number of beats	Beats per song	p <sup>1</sup>	Beats per note	p <sup>2</sup>
French Songs					
28 Gay	756	27.00	).05	.567	).90
26 Sad	629	24.90		.563	
26 Energetic	681	26.19	).20	.581	).70
18 Quiet	429	23.83		.564	
German Songs					
20 Gay	627	31.35	).30	.615	).001
30 Sad	992	33.07		.753	
27 Energetic	798	29.56	).01	.655	).001
24 Quiet	812	33.83		.775	
English Songs					
27 Gay	1026	38.00	).01	.701	).001
24 Sad	1032	43.00		.881	
28 Energetic	1278	45.64	).05	.848	).95
22 Quiet	910	41.36		.843	
Appalachian Songs					
24 Gay	1026	42.75	).001	.938	).001
23 Sad	1150	50.00		1.127	
21 Energetic	993	47.29	).20	1.038	).01
21 Quiet	1053	50.14		1.184	
All Songs					
99 Gay	3435	34.70	).02	.729	).001
103 Sad	3810	36.99		.823	
102 Energetic	3750	36.76	).50	.772	).001
85 Quiet	3204	37.69		.849	

1 Chi square computed from total numbers of beats with expected frequencies derived from proportions of number of songs in groups.

2 Chi square computed from total numbers of beats with expected frequencies derived from proportions of number of notes in groups.

sad and quiet songs than among the gay or energetic. This means that the gay and energetic songs tend to have more notes in each beat than the sad and quiet.

3. Of the three characteristics, only the data on the number of beats per song show intercultural differences.

## CHAPTER V

### DISCUSSION AND OBSERVATIONS

In this chapter is a discussion of the degree to which each aim of the study is satisfied by the findings, together with some additional observations and deductions which may be drawn from the data.

The following deductions and interpretations are made with due consideration of the limitations of the method. Data which are significant and which do seem to indicate relationship must be interpreted only as demonstrating a tendency for a characteristic of melodic pattern to be associated with or to co-occur with certain moods. Causal relationship may seem probable and may be assumed, but it cannot be proven by this kind of data.

Consequently, while it may be said that the present findings are evidence of relationships of melodic pattern to mood, they cannot be considered as proof that such relationships do exist.

Generally, deductions were not made from data not indicating a relationship, or from data of very low significance. Neither of these kinds of data can be considered as positive evidence of the absence of relationship. Possible weaknesses in the study, in the selection of songs, in the

mood judging, or in the methods of musical analysis might have resulted in not discovering relationships which actually exist.

### Findings Relevant to the Aims of the Study

The first aim of the study was to determine whether or not specific characteristics of melodic pattern are related to specific mood. The data found in this study which best satisfy this aim are the results of the significance tests which show, within the scope and limitations of such tests, how significant may be the differences between different groups of data. In this study, such tests were applied to the data resulting from the musical analyses of songs of different mood groups. These test results range in levels of probability from .001 to 1.0. Where the level of significance is high enough, it may be assumed that, to the extent possible with the methods of the present study, there is indication of relation of specific musical characteristic to specific mood.

There were 163 significance tests made for this study. Some of these were tests of different kinds of comparisons made on the same data, so that the actual number of tests mustered in response to this aim should be slightly lower. Of these 163 tests, twenty-five resulted in a p of .001 or better, forty resulted in a p of .01 or better, sixty-six resulted in a p of .05 or better, and seventy-six resulted in a p of .1 or better.

To the degree that mood was judged accurately by the judges, these results indicate a tendency to coincidence of specific characteristics of melodic pattern to specific moods expressed. It would not be illogical to assume a causal relationship.

In general, significance in the gay-sad comparisons appears to be greater than in the energetic-quiet comparisons. This may be due merely to weaknesses in the study which prevented the detection of significant differences in these comparisons. For example, most of the judges complained that it was more difficult to make energetic-quiet mood distinctions than the gay-sad. This could have resulted in less accuracy in the mood distinctions in this category. On the other hand, the greater significance in the gay-sad comparisons may mean precisely that the musical characteristics investigated were more closely related to the gay-sad mood difference than to the energetic-quiet.

The second aim of the study was to discover some of the specific relationships of musical pattern to mood expressed.

Where a musical characteristic occurs with a given mood, but not with the opposite mood, a specific relationship is indicated. How strong this indication is, depends, of course, on how significant the differences are in the incidence of the characteristic in the two moods. Because the satisfaction of this second aim depends on the discernment

of trends rather than on the acceptance or rejection of an hypothesis, some data were considered which are somewhat lower in significance than the level usually demanded. It should be recognized, however, that at significance levels between .50 and .05, there is still a probability that the differences are representative.

There were a large number of diverse trends indicated. To restrict these to a practical number, only those which show a high degree of universality or commonness to the cultures involved, are discussed in this section. The variation between cultures will be discussed in answer to the third aim. Except in relation to a study of intercultural differences, only relatively universal relationships can be of interest, in any case.

Below are summarized the specific relationships of musical pattern to expressed mood which were found in this study, and which were common to the cultures involved.

The following tendencies existed among the gay songs, as opposed to contrary tendencies observed among the sad songs.

#### Modal tendencies

1. Do more frequently a final tone, and Re and La less frequently a final tone.
2. The third above the final tone more likely to be major.
3. Do more frequent and La less frequent on phrase endings.

### Melodic tendencies

4. More repeated tones, and with only minor exceptions, fewer melodic seconds and thirds.

### Rhythmic tendencies

5. Fewer notes per beat.
6. More notes per song.

The following tendencies existed among the energetic songs, as opposed to contrary tendencies observed among the quiet songs.

### Modal tendencies

1. The third above the final more likely to be major.
2. La less frequent on phrase endings.

### Melodic tendencies.

3. More repeated tones, and with only minor exceptions, fewer melodic seconds.

### Rhythmic tendencies

4. Fewer notes per beat.
5. More notes per song.

The third aim of the study was to determine whether there are intercultural differences in the expressive function of characteristics of melodic pattern.

The data of the study seem to show that such differences do exist. Where significant data show that in one culture a characteristic tends to be associated with a given mood, and in another culture the same characteristic tends to be associated with a contrasting mood, intercultural

differences in the expressive function of this characteristic may be assumed to exist.

In all characteristics, at least small intercultural differences occur in the data. Most of these, however, are unimportant. Where the characteristic is associated in different cultures with the same mood, but in different degree, a meaningful difference generally cannot be said to exist. Generally, small differences, even if opposite tendencies are involved, cannot be considered meaningful. Consequently, only differences which are large, which are in opposite direction, and which occur in fairly significant data, are considered as answering the requirements of the third aim of the study.

Below are the intercultural differences which seem to support an affirmative answer to the question implied by the third aim of the study:

Where, in the French and English songs, there is a tendency to use La as a final tone in the expression of sadness, there is in the German songs a tendency to use Mi.

A number of functional differences appear between cultures in the incidence of scale tones on phrase endings. However, only on the tone Re are the above requirements for this data satisfied.

In the "functional importance of scale tones", the following tendencies which occur in the culture named are opposed by contrary tendencies in other cultures:

- a) in French songs, much more La in sad than in gay.
- b) in German songs, much more Sol in sad than in gay.



- c) in French songs, more Sol in energetic than in quiet.
- d) in German songs, more Mi, Fa and Sol in quiet than in energetic.

It is perhaps notable also in this characteristic that mode seems to be less important in the English songs than in the French and German.

Differences in the function of the basic rhythmic pattern are fairly pronounced. In the French and Appalachian songs, there is a strong tendency for the gay songs to be in duple rhythm and the sad songs in triple. In the German songs, the opposite tendency is manifested. With the rhythmic patterns placed into three categories, as in Table 12, several intercultural functional differences may be observed.

The average number of beats per song is greater in the French gay than in the French sad; but in the other three cultures, the opposite tendency is shown.

In the French and English songs, there are more beats per note among the energetic than among the quiet songs; whereas in the German and Appalachian songs, the opposite tendency is shown.

It is possible that there are other important functional differences between the cultures which for some reason were not shown by the present methods to be important.

While it is notable, perhaps, that the data which show intercultural differences are not so significant as those which show universality of function, nevertheless, the above data are evidence, almost as decisive as the scope and method of the present study could produce, of differences between cultures in the mood-expressing function of melodic pattern.

### Incidental Deductions

All the results of this study which bear directly and positively on the aims of the study are summarized in the foregoing sections. There are, however, some interpretations which may be elicited from the data which bear not at all or only indirectly on the present aims, but which are nevertheless of interest.

### Modal Characteristics

The four tests of modal difference which were used in this study produced results which varied greatly in the degree, the kind, and the significance of the differences between mood groups.

The test using only the third scale tone above the final tone produced results which were the most definite, the most consistent, and easiest to interpret. The results of the test using the final tone were fairly definite, consistent and easy to interpret. The results of the test using the scale tones on phrase endings were meaningful, and much more significant than the previous two, but less consistent between cultures. The test called "functional importance of scale tones" was undoubtedly the most subtle and sensitive test of all. The significance was high, but it was most difficult to interpret. Apparently, as the test becomes more sensitive, it seems to pick up cultural differences, and to hide the cultural similarities.

The results of the test using the scale tones on phrase endings, where consistent, are superficially quite meaningful. One would expect more phrases to end on Do in gay songs, and on La in sad songs.

It is possible to carry the interpretation a bit further, however. It was first thought that the final tones of phrases would be, by virtue of their position, merely important tones, and that by their importance they would be useful indicators of mode. However, the results of this analysis differ so drastically from those of "the functional importance of scale tones" that it is clear that it cannot be merely important tones that are measured here. It is clear that the final tone of the phrase has a special function.

In the case of the final tone of the song, there is the possibility, or even probability, that the final tone is not merely important as a scale tone itself, but that it is important as a tonic, in which function it serves to qualify the meaning of all the other tones of the scale. It is also possible that the phrase endings function to a lesser degree in the same way. The data seem to indicate that phrase endings do function in this way, at least in the German and French songs, and with some consistency of function. While *mood differences, it seems to be even more closely related to* this characteristic seems to be related to <sup>^</sup> culture differences; for the culture groups differ much more than do the mood groups.

The test of modality according to the final tone produced results that were not highly significant, but which were fairly consistent between cultures.

It is notable that no songs analysed in this study ended on either Fa or Ti. There are two interpretations that may be derived from this. One is that neither Fa nor Ti is restful enough in dynamic quality to be a suitable final tone. The other interpretation is that Fa and Ti are unsuitable as a tonic. The final tone of a song tends, perhaps, to function as a tonic. In this function, its greatest importance is in the meaning it gives to all the other tones of the scale. It seems quite possible that Fa and Ti are unacceptable as a tonic because of the importance of the fourth and fifth tones of the key. With Fa or Ti as a tonic, either the fourth or the fifth must be augmented or diminished, which creates a tri-tone above the tonic.

The present data seem to indicate that any scale tone except Fa or Ti can serve adequately as a final tone. With the final tone considered as a tonic, it is notable that the second, third, sixth or seventh above the tonic may acceptably be either major or minor. Except for the second, this is quite understandable. In our modern major-minor system, the third, sixth and seventh may be either major or minor. However, in this same music the second is always major. The question is whether this fairly recent occidental folk music differs so greatly from conventional sophisticated music.

The answer is found, perhaps, in the fact that all but one of these songs ending on Mi (where the second above the final would be minor) were German songs. These German songs which end on Mi, and which often contain no Do at all, sound like conventional major mode, but with an ending on the third instead of the tonic. Perhaps these songs, at their source were always sung with an accompaniment or in harmony. Certainly they sound conventionally and typically German. The one French song which ended on Mi also sounds very German, and could possibly have been borrowed.

Very little concerning tonality or modality was possible with the Appalachian songs. Over half the songs were hexatonic or pentatonic. This created two difficulties. First, there is no way to correlate a "gapped scale" mode with any one of the diatonic modes. Second, the songs in pentatonic have very little feeling of tonality or of tonality change at all. Passages which in other songs sound chordal, and hence suggestive of a tonality, often sound merely scale-like in pentatonic, and hence suggest nothing.

The final tone as an indicator of mode seemed less important in the English songs than in the French or German. A possible reason for this may be the strongly pentatonic character that many of the English songs had, without actually using "gapped" scales. Some of these English songs used the scale tones quite in the fashion of a pentatonic song, but someplace in the song the "gaps" would be filled in so that the diatonic mode was determinable.

Another possible reason for the relative reliability of the final tone as a determiner of mode is the possibility that the final tone may tend to be closely associated with the tonality at the beginning of the song. In practically all folk songs, the music consists of one stanza which is repeated over and over for each verse of the poem. The last tone is thus associated almost as closely with the beginning of the song as with the ending. A brief study of the French, German and English songs has shown that this explanation may be correct. The following percentages of each group of songs ended on final tones which were the same as the beginning tonality. (The judging of the latter was in some cases slightly subjective.)

French gay	89 %
French sad	80 %
German gay	72 %
German sad	53 %
English gay	85 %
English sad	83 %

The low percentage in the German sad category is probably related to the fact that many German songs ended on Mi. Thirty-three percent of the German songs began on Do tonality, and ended on Mi, so that even here a close relation between beginning tonality and final tone is shown.

#### Melodic Characteristics

It might have been expected that the data would show size of intervals to be more closely related to the

energetic-quiet mood distinction than to the sad-gay. The data does not bear this out, and there is a suggestion in the slightly better significance levels that the size of intervals is more closely related to the gay-sad distinction.

It is notable that over half the intervals are seconds, so that usually the greater part of the motion of a song is step-wise.

With very few exceptions, it may be seen that intervals of a fourth and larger vary very little according to mood or to culture. This is probably because the total number of larger intervals is so small that the differences could not be great, however, it seems possible that these larger intervals function for purposes of variety and form - aesthetic requirements which may be constant regardless of mood or culture.

While one would perhaps not expect the direction of the final cadence or even the direction of the phrase endings to be important factors in the expression of mood, there is the rather obvious logical expectation that the descending cadence would be expressive of sadness and the ascending of gaiety. And if this logical, psychological deduction is valid, then one would expect it to be universal.

That it is not universal is precisely what the present data show. In the German and French songs, both phrase and song endings tend to be ascending in gay and energetic songs, as expected. But, in the English songs, and to a degree in the Appalachian, the opposite tendency is indicated.

So it must be concluded that this characteristic is not based on the above psychological, logical deduction. Still, there is apparently something in the melodic pattern of some of the songs which has been partially measured in determining the direction of the cadences. Possibly the direction of the last two tones is merely the end of a pattern which in its entirety has significance. It was hoped, at the beginning of this study, that some investigation could be made of the melodic profile; but no suitable method was found wherein the profile could be categorized or classified so that generalizations and conclusions could be made.

There is perhaps little reason to expect that the pitch range would be related to the expression of mood. It is, nevertheless, completely surprising to find the pitch ranges so neatly categorized by culture. It is hard to account for the French songs having the narrowest range, the Germans the next, and the English the widest range, while there are almost no mood differences at all. Do the English have greater strength, higher spirits, more ambition, or just stronger vocal chords?

Omitting the Appalachian songs which seem less decided on a particular pitch range, it is found that the particular order of cultures represented above is also found in the length of song as represented by the number of notes or of beats. Thus it appears possible that the pitch range may be



slightly related to the length of song, so that the longer a song is, the more necessary it is to use a wide range to avoid monotony or to achieve variety.

### Rhythm and Tempo

Of all the characteristics studied, it would seem that the basic rhythmic pattern is the one which might most have been expected to show universal relationships to mood. Rhythm is often compared to bodily action, or to deeply seated psychological factors which should be common to all peoples.

Nevertheless, the one thing that the data on the basic rhythmic pattern show is that the cultures differ in the function of this characteristic. Enough of the data are significant so that the opposite conclusion is impossible without further investigation. It is remarkable, however, ignoring the English gay-sad difference which is quite insignificant, that only among the German songs are the gay and energetic more likely to be triple than the sad and quiet. Thus it appears that for some unfathomable reason, perhaps connected with the development of the ländler and the waltz, in the German speaking countries a type of triple rhythm was born which expressed gaiety or energy, or conversely, a special attitude toward triple rhythms developed.

There is another unexpected indication from these data. It would be reasonable to expect the basic rhythmic pattern to be more closely related to the energetic-quiet mood

distinction than to the gay-sad. The significance figures indicate a closer relation, however, of this characteristic to the gay-sad distinction.

It is possible that these data mean just what they seem to: rhythmic pattern is more important in expression of the qualitative mood than of the pace and energy level. It may be primarily the tempo of beats and notes which express energy or quiescence. However, it should be considered that, as mentioned earlier, low levels of significance could be the result of weaknesses of the study.

It was impossible in this study to make any guess as to the tempo of the songs. As a performance characteristic, it was, in any case, not one of the subjects of the present study. It is clear, nevertheless, that tempo must be involved in any consideration of certain of the characteristics studied. The number of changes of tonality and the number of changes in direction, both compared to the number of notes, and the number of notes per beat are, along with the speed of the beats themselves, probably the important determiners of tempo feeling.

It might have been guessed that there would be more notes per beat in the gay and energetic songs as an element contributing to liveliness and speed, or that the slower beats of the sad and quiet song would make time for more notes per beat without an actual increase in the rate of notes. The present data indicate quite consistently and

significantly that there are more notes per beat in the gay and energetic songs. This leads one to conclude that the pace of the notes is more important to mood, and perhaps to tempo, than the pace of the beats. This also permits the possibility that two songs could show a great difference in the expressed liveliness, gaiety or energy, and still be beaten at a similar tempo.

It might have been expected that the numbers of notes, beats, and changes of tonality and direction would be more functional in the energetic-quiet mood distinctions, and less so in the gay-sad. While the present evidence is not strong enough to lead to a definite conclusion, it is worth noting that all of these characteristics seem to function about equally in both mood distinctions.

The mood differences in the data on the number of changes in direction and of changes in tonality when compared with the number of notes, are relatively insignificant. It must be assumed that the numbers of changes in direction and in tonality are nearly the same for songs of different moods. Since it seems somewhat probable that these characteristics would contribute at least to the energy level of the songs, it is surprising to find no significant differences here.

It is possible to interpret the data in another way, however. If sad and quiet songs tend to be sung slower than gay and energetic songs, as seems probable, and if the number of notes per change in direction or tonality is similar for

songs of different moods; then it follows that in sad or quiet songs, the rate of change of tonality or direction would be slower than in gay or energetic songs. This is precisely what might have been expected, that faster tempo means an increase in speed of tonal and melodic changes as well as in speed of beats or notes.

### The Significance Figures

There are many more high significance figures among the gay-sad comparisons than among the energetic-quiet. There are several possible interpretations of this. It may be that many more of the musical characteristics studied are expressive of gaiety or sadness than of energy or quiet. It may be that the songs selected tend to be more expressive of the extremes of gaiety or sadness than of energy or quiet. It may even be that the judges did not possess as clear a concept of energy level as of the other mood distinctions, or that energy level may not be as easily judged from the words as may the other mood distinction. It may be possible that the words "energetic" and "quiet" are not accurately expressive of the concept. Perhaps the concept is itself not valid.

While any of these explanations are possible, and may be true to a degree; the most probable explanation seems to be the first. It seems likely that performance characteristics such as tempo, volume, staccato-legato, tone quality

and the use of accents and climaxes express the degree of energy or quiet. It is possible that none of the characteristics considered in this study are at all related to energy level, but that the significant figures that were obtained in this category arose because of the numbers of sad songs among the quiet and the gay songs among the energetic.

## CHAPTER VI

### SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

#### Summary

The characteristics of a piece of music which are possibly related to mood may be thought of as belonging to two categories: (1) those which can be controlled by the performer, such as tempo, volume or accent, and (2) those which remain essentially similar in all performances, such as modality, melodic pattern, or rhythmic structure, and which serve to determine the identity of a particular piece of music. It is the latter category of characteristics and their relation to mood, that constitute the core of the present problem.

This study has three aims:

1. To establish whether specific characteristics of melodic pattern are related to specific mood.
2. If this be established, to discover some of the characteristics related to certain moods.
3. To determine whether or not these relationships of specific characteristics to mood are the same or different in different cultures.

The literature on the relation of music and mood may be divided into three categories: (1) general theories, (2) theories of specific relationships, and (3) reports of experiments.

Regarding the general theories, it may be found that writers generally agree that music can express emotions, but that some do not consider emotion to be essential to or important in the aesthetic process.

A greater number of writers consider the expression of emotion to be essential in the musical experience. By some, these emotions are described as having special quality or form, but the majority of writers consider that the emotions expressed in music are identical with those of everyday life.

A review of the experimental studies on the relation of musical pattern to mood reveals varying results. An attempt to compare and evaluate these results makes evident the importance of mood categorization in studies of this type.

Roughly, the present study is an attempt to discover differences in melodic pattern which are related to mood differences. The method, in brief, was to present the words of several groups of folk songs, representing several cultures, to judges who judged and recorded the mood. The melodies of those songs judged to be in the extremes of given moods were then analysed to find whether the same musical characteristics tended to occur in songs of the same mood.

Folk songs were chosen as the musical material for the study for several reasons: (1) the words offer a convenient and probably valid indication of the mood, (2) by using the words as an indication of mood, the judgment is

not dependent upon an individual performer, (3) folk songs may be considered to be culturally representative of large groups of people, and (4) melodies of folk songs are particularly suitable for musical analysis.

Songs used were those of four cultures - German, French, English and Southern Appalachian - chosen on the basis of the availability of song collections, relative discretion of the cultures, and their importance to the main stream of western culture.

Approximately one hundred songs from each culture were selected, the texts submitted to judges, three for each culture, who judged the mood of each song and recorded it on two mood scales of ten steps each, one scale ranging from "gay" to "sad", and the other from "energetic" to "quiet". A group of songs, varying in number, was chosen from those of each extreme of each mood scale, to be used for the musical analysis.

The melodies of the songs were analysed to reveal the incidence of a number of characteristics, which were classified as being modal, melodic or rhythmic.

Four methods of detection of modal differences were used. The first involved merely the recording of the tone of the diatonic scale on which each song ended. The second involved ascertaining whether the third scale tone above the final tone of the song was at an interval of a major or minor third. In the third method, the percentage in each song of



phrases ending on each tone of the scale was recorded. In the fourth method, a value was determined for the functional importance of each scale tone. Each appearance of a scale tone was given a value of one, multiplied by its value in number of beats, plus one where the note occurred on a down beat. The value thus arrived at for each tone of the scale was changed to a percentage for each song.

The melodic characteristics for which the songs were analysed were : (1) size of intervals, in which the percentage of intervals of each of eight sizes, from prime to octave, was determined for each song, (2) the direction of the final cadence of each song, based on the last two pitches, (3) the direction of the endings of each phrase, also based on the last two pitches, and (4) the pitch range of each song.

The rhythmic characteristics were : (1) the basic rhythmic pattern, corresponding generally to the time signature, (2) the number of changes of direction in each song, (3) the number of changes of tonality in each song, and (4) the numbers of notes and of beats in each song, and the number of notes per beat.

Where appropriate, the data were changed into percentages to avoid influence of length of song; and in all cases, the data were averaged or totalled to arrive at a figure representative of the group of songs of a certain mood. The data were compared and the significance of the

differences between the data of contrasting mood groups, i.e., gay vs. sad, and energetic vs. quiet, was tested with the use of the chi square test.

The findings of this study were many and diverse. The principal results are summarized below as they relate to the three aims of the study.

### The First Aim

The first aim was to determine whether or not characteristics of melodic pattern are related to the expression of mood.

Where, in the melodies of contrasting mood groups, there are significant differences in the incidence of a characteristic, relationship is evidenced within the limitations of this study. Out of 163 significance tests made, the following numbers of tests resulted in these various levels of significance:

1. Twenty-five tests resulted in a p of .001 or better.
2. Forty tests resulted in a p of .01 or better.
3. Sixty-six tests resulted in a p of .05 or better.

### The Second Aim

The second aim of the study was to discover some of the specific relationships of characteristics of musical pattern to mood. The most important differences occurred in the gay-sad comparisons. The following tendencies existed

among the gay songs, as opposed to contrary tendencies observed among the sad songs.

#### Modal Tendencies

1. In gay songs, Do was more frequent a final tone, and Re and La were less frequent final tones.
2. In gay songs, the third above the final tone was more likely to be major.
3. In gay songs, Do was found more frequently and La less frequently on phrase endings.

#### Melodic Tendencies

4. In gay songs, there were more unisons, and generally fewer seconds and thirds.

#### Rhythmic tendencies

5. In gay songs, there were fewer notes per beat.
6. In gay songs there were more notes per song.

Some but not all of the above differences appeared in the energetic-quiet comparisons, where they are possibly due to the presence of gay songs among the energetic and of sad songs among the quiet.

#### The Third Aim

The third aim was to determine whether there are intercultural differences in the expressive functions of melodic pattern.

A large number of intercultural differences in the expressive function of melodic pattern were evident, the

most important of which were found among the following characteristics:

1. The function of the final tones.
2. Certain of the tones on phrase endings.
3. Functional importance of scale tones.
4. The basic rhythmic pattern.
5. Number of beats per song.
6. Number of beats per note.

#### Incidental Tendencies

Incidental to the three aims of the study, the results indicate a number of tendencies of interest.

The more refined tests of modal difference, such as the "functional importance of scale tones" and the scale tones on phrase endings, revealed intercultural differences whereas the cruder tests, using the final tone and the third above the final, seemed to indicate cultural similarities.

Scale tones on phrase endings, not being shown to be the same as functional importance of scale tones, may be assumed to have a special function.

It appears that the final tone may be any tone which does not place either the fourth or the fifth steps of the

scale at a tritone above the tonic; i.e., any tone except Fa or Ti.

The relative reliability of the final tone, in the detection of expressive modal differences, may be due to its being often identical with the opening tonality of the song.

The frequency of the notes, and of the changes in tonality and direction occur more rapidly in fast songs than in slow songs, and hence are as important as, or more important than, the speed of the beats in determining tempo.

The greater number of significant differences occurring among the gay-sad comparisons, compared with the energetic-quiet, possibly indicate that the characteristics of melodic pattern, as opposed to performance characteristics, are more important in expressing the sad-gay distinctions.

## Conclusions

On the basis of the findings of this study, the following conclusions may be made:

1. The melodic pattern is functional in determining the mood expressed by a piece of music.
2. There is a relationship of modal characteristics to expressed mood, which is indicated by:
  - a. A greater tendency for gay songs to end on the scale tone Do, and for sad songs to end on Re and La.
  - b. A tendency greater in gay than in sad songs for the third above the final tone to be at an interval of a major rather than a minor third.
  - c. A more frequent occurrence of Do on phrase endings in gay songs, and of La on sad songs.
3. There is a relationship of melodic characteristics to expressed mood which is indicated by a tendency for gay and energetic songs to contain more repeated tones and fewer melodic seconds and thirds than sad and quiet songs.
4. There are marked intercultural differences in the expressive function of melodic pattern, particularly in the function of mode and of the basic rhythmic pattern.
5. Changes in tonality and direction occur more rapidly in fast songs than in slow songs.
6. The characteristics of musical pattern tend to be more functional in the expression of the gay-sad mood differences than of the energetic-quiet.

### Recommendations for Future Study

There are two weaknesses which previous studies of this type have shown which have not been entirely eliminated in the present study. The first lies in the problem of mood categories. Because the words used to describe emotion are vague and often ambiguous, and perhaps because our concepts themselves are not clear and specific, it is most difficult to set up mood categories for the judging. It still appears that it is most useful to use extreme and opposing categories. The chief weakness of the mood categories of the present study lie in the energetic-quiet terminology. It is possible that this could be eliminated, or that a better approach to energy level can be found. Or it is possible that a careful study which includes both performance and pattern characteristics may show this concept to be useful and valuable by determining which musical characteristics, both of performance and of musical pattern, are related to which kind of mood distinction.

The weaknesses of the musical analysis of the present study appear to be not so much in the general approach as in details. Other approaches to the detection of modal differences may be found. It might be useful to note that mere determination of mode is too crude a device for the investigation of the subtle differences that seem to be expressed by modal differences. Possibly each phrase should be

considered as having its own tonic...certainly a melody repeated a tone or more higher in the scale is felt to have a different modal feeling. This sort of difference often occurs in a song from phrase to phrase. New concepts are needed. Traditional definitions and concept of mode have very little useful application either in the field of folk songs or of the study of expressive qualities in musical pattern.

The study of intervals in the present study certainly might have been improved. The aim in this study was to consider the relation of size of interval to mood. It is possible that a study of the relation of the quality of interval to mood might have been more useful. The present study does not tell whether or not a sad song tends to have more minor intervals than a gay song.

Strenuous efforts should be made to find some means of studying melodic profile. The problem is of extreme difficulty for the subtleties possible in a melody are countless, and the varying importance of each practically indeterminable. Nevertheless, a series of studies with cumulative improvements of method might end in a method that would give results of tremendous musicological significance.

There is no particular reason to restrict investigation to the musical characteristics studied here, or to these particular methods of analysis. There are certainly many other characteristics that might be thought to be related to mood, and other approaches to the study of the present characteristics are possible.



As is nearly always the case in studies of this type, it would be very desirable to have a greater number of songs. It is likely that many small differences which were insignificant in the present study would have proven significant with a greater number of songs. While musical analysis is a laborious process, improved efficiency in the tabulation, recording, sorting and categorizing of data can make it less so. A large scale study would permit the introduction of efficient methods that are impractical in a small study.

The present study has found suggestions of some of the musical characteristics that give musical unity to western culture, and also some of those that give individual flavor to various of our western cultures. A more penetrating investigation into these phenomena would be of greatest interest to musicologists, ethnologists, folklore students and aestheticians.

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## APPENDIX

## Definitions of Mood for the Judges

Sad - songs in which the singer or most important person is involved in a serious conflict or loss. The conflict or loss in the extreme cases is irresolvable or irrecoverable, and represents a complete frustration of a very deeply felt desire. In the less extreme cases, the frustration may be less complete or may be the frustration of a less deeply felt desire.

Gay - in the extreme, this will refer to songs in which there is no conflict or loss, especially none involving the singer or principal person.

The extremes of the second scale are defined as "energetic" and "quiet", which terms are meant to refer to the degree or amount of activity and energy expressed in the song. The judges are asked to make the decisions on the basis of general feeling, recognizing that energy may be expressed by action described in the song, by the pace of events in the songs, by the style of verse, or by connotation of words.

E 1      Sad    ' ' ' ' ' ' ' ' ' ' ' '    Gay  
          Quiet   ' ' ' ' ' ' ' ' ' ' ' '    Energetic

E 2      Sad    ' ' ' ' ' ' ' ' ' ' ' '    Gay  
          Quiet   ' ' ' ' ' ' ' ' ' ' ' '    Energetic

E 3      Sad    ' ' ' ' ' ' ' ' ' ' ' '    Gay  
          Quiet   ' ' ' ' ' ' ' ' ' ' ' '    Energetic

E 4      Sad    ' ' ' ' ' ' ' ' ' ' ' '    Gay  
          Quiet   ' ' ' ' ' ' ' ' ' ' ' '    Energetic

E 5      Sad    ' ' ' ' ' ' ' ' ' ' ' '    Gay  
          Quiet   ' ' ' ' ' ' ' ' ' ' ' '    Energetic

E 6      Sad    ' ' ' ' ' ' ' ' ' ' ' '    Gay  
          Quiet   ' ' ' ' ' ' ' ' ' ' ' '    Energetic