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A PRELIMINARY STUDY OF THE NATURE OF FINALITY IN MELODY

RUTH UPDEGRAFF

According to a recognized definition, a melody is a succession of musical sounds which is felt to constitute a unity. The stipulation, sometimes made, that this unity must be aesthetic, is felt to be not only ambiguous, the aesthetic depending to some degree on individual taste, but restricting, in the sense that melodies termed aesthetic by common consent would be few in number. Unity implies, first, an interrelationship, and secondly, coherence and completeness as a whole; that is, relationship and finality. The melody problem is that of discovering how a series of tonal stimuli can excite a feeling of unity. Max Meyer,¹ writing in 1900, stated that related tones are only those tones related technically; that is, by their vibration rates: only those vibrations whose relations can be expressed or represented by the prime numbers 1, 2, 3, 5 and 7, and their composites, possess the property of stimulating a feeling of relationship. Music, he says, is made up not of intervals, but of notes. In a later study,² based upon three-note melodies, he claims that finality in melody depends upon a falling inflection and the power of 2; that is, the vibration rate of the final note must be represented by power of 2 in relation to the vibration rate of the tonic. "No hearer is satisfied if, after having heard once, or more often, the tonic α , he does not find α finally at the end of the melody."

Subsequent investigations substantiate the results which led Meyer to these statements, but disagree with him in the conclusions drawn. Bingham³ found a preference for falling inflection, for a return to the first tone (not always the tonic), for an expected ending, and for an end on one of the tones of the tonic chord. He concludes, however, that finality depends on the laws of consonance, on tonality, rather than on laws of melodic relationship.

¹ Meyer, Max, *Elements of a Psychological Theory of Melody*. *Psych. Rev.*, 1900, pp. 241-280.

² Meyer, Max, *Aesthetic Effects of Final Tones*. *Am. J. of Psychol.*, 1903, pp. 192-197.

³ Bingham, W. Van Dyke, *Studies in Melody*, *Psych. Rev. Mono.*, vol. xii, 3, Jan., 1910, whole no. 50.

Emerson ⁴ says that a feeling of end comes with a unity of meaning that is independent from any simple mathematical relation, but is learned and acquired. Farnsworth, ^{5 and 6} using three-note melodies whose notes bore to each other the relations 3, 5, and 7, attempted to determine the relative finality of these ratios, finding they were preferred in the proportions 41:34:25. Later, using these same ratios, he trained three different groups, each to its own ratio ending, and found that finality judgments thereafter were definitely influenced by the training.

We have, then, to determine whether feeling of finality, admittedly present with a tonic ending, is determined by the mathematical relationships of the vibrations *per se*, or by the tonal consonance to which the individual is accustomed. For instance: if we hear a melody beginning on Middle C and ending on the C one octave above, do we judge it final because we, by nature, react so to a tone caused by twice as many vibrations as the beginning tone, or because we are used to a tonal system that is divided into octaves, and to melodies that usually end on some part of the tonic chord? In other words, is the explanation physical or psychological, and to what extent?

In the present investigation it was thought advisable to use a longer melody length wherever possible, for a three-note melody is hardly worthy of the term. If we are to reckon with tonality as a factor in melody, we must assure ourselves of both melody and tonality. Three notes may readily result in harmony — in a triad — subjectively, if they are close together and constituents of a chord; thus we find that we are no longer testing melody; or, if the three tones do not make up a chord, they are insufficient in number to result in melodic unity. Accordingly, melodies in series 1 are four notes long, in series 2, six notes, and in series 3 and 4, nine notes. There is no rhythmic variation in series 1 and 2; in series 3 there is a variation according to definite plan.

Series 1 was presented to fifteen subjects, seven of whom had received more than three years of musical training and had studied musical theory for a year or more, and eight of whom had had little or no training and no theory. Twenty pairs of four-note melodies were presented with the object of seeing which was more influential in determining finality — a resolution of suggested harmony, or the power of 2 ending. The first three notes of each

⁴ Emerson, L. E., *The Feeling of Unmusical Tone Intervals*, Harvard Psych. Studies, 1906, pp. 269-274.

⁵ Farnsworth, Paul, *Atonic Endings in Melodies*, Am. J. of Psychol., July, 1925.

⁶ Farnsworth, Paul, *The Effect of Repetition on Ending Preference in Melodies*. Am. J. of Psychol., Jan., 1926.

pair were the same — the notes of a diminished seventh chord; the vibration rate of the last note of one of the two melodies was a power of 2 of that of the first note, and the last note of the other melody was the tonic resolution of the chord. The melodies were presented on the piano in double fatigue order and so planned that the last notes should be approached from above and below in an equal number of cases. The subjects were instructed to indicate whether the second melody left them with a more final feeling than did the first. Finality was explained as a feeling of rest. It was found that the resolution of the chord was slightly more final—50% of the judgments as against 44%, 6% being doubtful. There was a decided preponderance of judgment for the falling inflection—59% as against 34%. Resolution, even when a rising inflection, was preferred to a power-of-2 falling inflection in 55% of the cases. There were no discoverable differences which might have been laid at the door of musical training.

Series 2 presented, in double fatigue order, making twenty judgments in all, melodies six notes long. The first four notes of the melodies were the same, the last two varying the final tonality, and bearing the ratio to each other 3:4, 5:4, 4:3, 5:4, 4:3. The eight observers, two of whom were absolutely untrained, found the judgments hard to make, none of the melodies seeming very final. The only melody which ended on one of the notes of the suggested tonality, on the third, was judged more final 63% of the times it was presented. The least final melody, receiving only 25% of its judgments, was that ending on the keynote of the subdominant. As an experiment in obviating the training factor, this series was presented to twenty-nine of the children in the laboratories of the Iowa Child Welfare Research Station, those in this number being between the ages of four and six years. It was necessary to put the judgments on the affective basis, due to the extreme youth of the subjects. The results were equivocal, there being the slightest of preference for melody three, which ends on the dominant of the suggested tonality, and an absolute 50% judgment on the preferred melody of the adults. It is probable either that there was not a basis for distinction decided enough to be comprehensible to children, or that the judgments were made by chance. The children rated by the teacher as being the more musical were found to vary as much among themselves as did the others.

Series 3 has been presented to seven American students and five Chinese, five melodies nine notes long in the tempered scale and five in the Chinese, this with the purpose of factoring out the experiential element. There is also a theoretical distinction be-

tween the two, for, musically, we think vertically, harmonically, while the Chinese music is horizontal and non-harmonic. The piano-forte is, of course, a foreign instrument for the Oriental music, but the clang difference between it and the Chinese piano was thought to be a more serious obstacle to judgment than a variation in pitch, for small vibration differences have been found not to affect the finality feeling. Not only the positive instructions to judge on finality, but, as well, the negative one to avoid the affective reaction, were given. The rhythms of the melodies were alike: a quarter note, four eighth notes and four quarters. The results show that the Chinese students judged 52% of their own melodies final, and 44% of the American melodies, while the Americans thought only 34% of the Chinese melodies final and 64% of their own. There seems to be, then, a decided indication that there is an influential factor due to environment. It was interesting to note, however, that the Chinese melody judged most final by the Chinese was the most final Chinese melody to the Americans, and the Chinese and Americans agreed in their choice of the most final American melody.

Series 4 is to present pairs of nine-note melodies, the last three notes of which are to be the same, and the tonality of the first six varying the contour of the melody and the tonality. As a minor study in this series, observers will be asked to make three judgments, at different times: in the first case they will report on finality, in the second, on finality, and in the third, on the aesthetic effect or on the affective basis. Consistency of judgment and the influence of finality on an affective judgment will thus be studied.

Our results, so far, point against Meyer's conclusions that finality is based on a mathematical relationship. It is, rather, determined, in addition to the influence of the falling inflection, by the suggested tonality of the melody, and, therefore, by the experience of the observer.

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