Proceedings of the Iowa Academy of Science

Volume 43 | Annual Issue Article 116

1936

A Genetic Study of the Vibrato

Alan D. Grinsted
State University of Iowa

A GENETIC STUDY OF THE VIBRATO

ALAN D. GRINSTED

The question of whether or not the vibrato, which is found in the singing voice of all vocal artists and of some untrained adults, and occasionally in the speaking voice, is learned, or is due to some inborn physiological characteristic is one which has been the subject of considerable speculation. Upon this question rest the answers to such questions as these: Will there come a day when voices with vibrato will not be considered beautiful? Should the vibrato be expected to appear automatically when a student of singing learns to vocalize properly or is there a special technique to be acquired?

The object of the study reported here was to throw some light upon this fundamental question by discovering whether there is any vibrato to be found in the crying voice of the human infant before any learning process could have a chance to enter in as a factor, and whether there is any similar pulsation to be found in the voice of animals of other species. For this purpose phonograph records were made of the cry of several infants none of whom was more than nine days old, and a similar record was made of the voice of a dog. Five of the recordings of the baby voices were selected merely because they contained the most sustained tones, and a graphic record of the pitch and intensity fluctuations in the five infant voices as well as that of the dog was obtained by means of the strobophotographic camera.

In the case of the infants' voices, both pitch and intensity vibratos were found in every one studied, although in some instances it was found more often than in others. The average rate per second of the pitch vibrato for all these voices was 7.1 cycles, with an average extent of .2 of a tone. The rate for the intensity vibrato was found to be 7.6 cycles per second, with an average extent of 3.4 decibels.

The voice of the dog studied also showed the presence of both a pitch and an intensity vibrato. That of pitch had an average rate of 6.2 per second and an average extent of .25 of a tone. The intensity vibrato averaged 7.8 cycles per second and showed an average extent of 3.2 decibels.

The rates of the pitch and intensity vibratos in the cry of the babies studied are almost the same as the average for artistic singers as reported by Tiffin and H. Seashore in Volume I of the *University of Iowa Studies in Psychology of Music*. However,

the similarity does not hold in the matter of extent, the voices of the infants showing a much narrower pitch vibrato than that of the artists, and a much broader intensity vibrato.

The vibrato in the voice of the dog showed essentially the same characteristics as were found in the vibrato in the infants' voices in every significant respect. The fact that the vibrato has been found to be present in the dog's voice seems especially important in view of the possibilities it presents for the study of the phenomenon through vivisection, which, of course, has not been possible with humans.

Results of the study as a whole would seem to indicate that the vibrato is due to some native physiological characteristic which is not even peculiar to mankind; and new questions are raised as to why some adult singing voices have been found without vibrato, and as to how the vibrato may be related to other bodily rhythms such as tremors.

Research has been begun upon this latter problem with records of brain waves taken at the time a tone was being sung, with measurement of surface vibrations around the throat region, and with other attempts to discover periodicities which might be related to the vibrato. Perhaps the most interesting development so far along this line occurred when phonophotographic records were made of both the vibrato in the singing voice and of the periodicity of the laughter of the same subject. The intensity pulsations in the laughter records in this case were found to have the same rate as the intensity and pitch vibrato in the sung tone. Too little has been done here, however, to afford any opportunity for generalization.

DEPARTMENT OF PSYCHOLOGY,
STATE UNIVERSITY OF IOWA,
IOWA CITY, IOWA.

THE DAMPING CONSTANT OF TUNING FORKS

SCOTT N. REGER

The differences in the damping constants of tuning forks while testing hearing by both air and bone conduction are discussed. New methods of obtaining the damping constant are described.

DEPARTMENT OF PSYCHOLOGY,
STATE UNIVERSITY OF IOWA,
IOWA CITY, IOWA.