themselves. It might therefore be argued that the 61 colleges and universities of the sampling could be considered a fairly representative portion of the several hundred schools which prepare music educators.

Data were gathered on the nature of the examining jury employed for the music education piano proficiency examination. In 48% of the schools it was composed of piano faculty members alone, while 37% of the schools used the piano and music education faculties jointly. In 8% of the institutions the examination was given by the individual piano teacher or by the teacher of the piano class. The head of the music department and the piano faculty comprised the jury in 5% of the schools. Other minority arrangements reported included examination by the chairman of the piano department, by the head of the music education department, and by the whole music education faculty.

The nature of the examination was also explored. In 52% of the schools the piano proficiency examination was the same regardless of the area of teaching emphasis. A different and limited examination was given the instrumental music education majors in 25% of the institutions and 7% of the schools reported that instrumental majors were not required to take the test.

The greatest number of schools (30%) reported that their examination was based primarily on functional piano while another large group (21%) based their test on both functional piano and on solos and technique. Another 10% reported that their examination was based primarily on the performance of solos and demonstration of technique.

The most commonly mentioned basic requirements for piano proficiency examinations for all music education majors were as follows: (a) sight reading, (b) transposing, (c) improvising, (d) technical facility, (e) literature, (f) accompanying (with a soloist), (g) playing of assembly songs, and (h) playing of scales, chords, cadences, and progressions.

Only 25% of the schools reported that they provided a separate class or a definite plan of study in piano for music education majors.

In the light of these returns it must be emphasized once again that the ability to play scales, Beethoven Sonatas, Bach Inventions, and memorize an extensive repertoire, is not an assurance that the pianist is capable of harmonizing melodies, improvising, playing scores, playing accompaniments, playing by ear, and reading at sight. To meet the pianistic requirements of our present day music education majors, it is necessary to consider their needs and teach accordingly. "Education," says Will Earhart,[1] "has been defined as analysis of experience." Unless a person has had experience in improvising, playing by ear, harmonizing, playing accompaniments, reading scores, and sight reading, he is not sufficiently educated in piano performance to be a music educator.

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[1]Clifford V. Buttelman, editor, *Will Earhart, Teacher, Philosopher, Humanitarian* (Washington, D. C.: Music Educators National Conference, 1962), p. 119.

Programed Learning in Melodic Dictation

JAMES C. CARLSEN

WITH THE ADVENT of Pressey's automatic testing machine in the early 1920's,[1] and particularly since 1954 when Skinner's article on teaching machines appeared,[2] a phenomenal growth of activity has taken place in the field of machine teaching. Although the term, teaching machine, has proved to be a popular nomenclature, it does little to describe the underlying educational and psychological concept which is better called programed learning.

Programed learning, variously referred to as auto-instruction, machine teaching, self-instruction, programed instruction, or automated instruction, has three identifying characteristics:

1. Material to be learned is presented in a logical series of small steps (usually referred to as frames) which lead from the known to the unknown.

2. A response to each of the steps, or frames, is elicited from the student.

3. The student is provided with *immediate* knowledge of the accuracy or the inaccuracy of his response.

In addition, because programed learning is self-instructional, this teaching technique permits the student to set his own learning pace.

Finn and Perrin reported in 1962 that within a period of less than a decade (1954-1962), the situation had changed from one in which essentially no teaching machines or programed materials were commercially available to one in which over 80 teaching machines of varying sophistication and nearly 300 programs for educational curricula were available.[3]

The Problem

This accelerating expansion of a new teaching technique poses serious problems when so little is known about the programing process. Although investigations conducted by industry, the military, and institutions of higher learning have provided much needed information, the statement that the person writing a program ". . . must apply a good deal of art and not much science, at the present stage of knowledge"[4] is still valid at the time of this writing. As Stolurow has observed relative to the findings of these research studies, ". . . [they] are more provocative than definitive."[5]

[1] S. L. Pressey, "A Simple Apparatus Which Gives Tests and Scores—and Teaches," *Teaching Machines and Programmed Learning*, ed. A. A. Lumsdaine and Robert Glaser (Washington, D. C.: National Education Association, 1960), pp. 35-41. This volume will be cited hereafter as *TMPL*.

[2] B. F. Skinner, "The Science of Learning and the Art of Teaching," *TMPL*, pp. 99-113.

[3] James D. Finn and Donald G. Perrin, *Teaching Machines and Programmed Learning, 1962: A Survey of the Industry.* Occasional Paper No. 3. A report prepared for the Technological Development Project of the National Education Association, Washington, D. C., 1962, pp. 32-80.

[4] Robert M. Gagné and Robert C. Bolles, "A Review of Factors in Learning Efficiency," *Automatic Teaching: The State of the Art*, ed. Eugene Galanter (New York: John Wiley and Sons, 1959), pp. 45-46.

[5] Lawrence M. Stolurow, *Teaching by Machine* (Washington, D. C.: U. S. Government Printing Office, 1961), p. 103.

In addition to a lack of understanding how best to program, there is still much to be learned about what to program. The major portion of the research completed at the time of this study had been done in the area of mathematics. Some work had been done in other subject disciplines including music. These studies were nevertheless limited in number,[6] and a survey of them revealed that subject disciplines, or specific areas of a subject discipline, existed in which the effectiveness of this type of instruction had not been shown. While extrapolation is frequently permissible and occasionally necessary, the scientific approach demands investigation whenever possible. There is need in the subject discipline of music to more clearly ascertain the effectiveness of programed learning as a teaching method, particularly as it involves the non-verbal stimuli of sound.

There have been studies which have shown programed learning to be effective as a teaching method at varying age levels and with differing mental capacities. Information is now needed to resolve the question about any interaction which might exist between teaching method and aptitude level of the individual.

In an effort to contribute to a solution to the broad problem cited above, this investigation was undertaken to obtain information relating programed instruction to aural perception in music theory, and specifically to melodic dictation. Such a study would necessarily involve recorded materials designed for instructional purposes.

Related Research

One of the earliest experiments which utilized musical examples recorded on magnetic tape was conducted by Cookson at Northwestern University in 1949.[7] Although these materials were not programed in the sense that this study refers to programed instruction, the results of their use clearly indicated the potential of tape recorded musical material for self-drill purposes.

In 1959, Spohn conducted an investigation in the use of tape recorded musical materials to develop aural perception.[8] Although the material was presented in a series of small steps and did elicit student response, it provided somewhat delayed information concerning the accuracy of the response rather than immediate feedback. As such, Spohn's materials did not qualify as programed instruction as defined above. The results of the study did show the value of structured outside preparation over unstructured outside preparation, and the feasibility of providing this preparation by means of tape recorded material.

Work by Clough at Oberlin College[9] and Sherburn at Michigan State University[10] also suggested potential success of programing aural perception. Clough reported that students appeared to get higher grades as a result of using programed materials in music. Sherburn also felt that the use of such materials had a positive effect upon learning which was greater than that provided by the classroom situation.

Ihrke reported the development of a rhythm training device at the University of Connecticut. This device, which fulfills all the requisites of programed instruction, uses magnetic tape in its program.[11] As of the date of this writing, no empirical investigation of the device had been reported.[12]

None of the studies cited above conclusively supported the feasibility of using programed instruction as a means of developing aural comprehension, although the Spohn study and the Oberlin report provided sufficient information to hypothesize such a possibility.

The Experiment

During the 1961 Fall quarter, an experiment was conducted in the Northwestern University School of Music with the first year ear training class. The purpose of the experiment was to investigate certain variables which pertain to the development of melodic dictation ability by means of programed learning. Specifically, the investigation sought to answer these questions:

1. What is the comparative effectiveness of branching[13] and linear[14] programing techniques for programing melodic dictation?

2. How effective will programed learning be as a teaching method in melodic dictation?

3. What is the relationship of scholastic aptitude to achievement in melodic dictation?

4. What interaction is there between the teaching method used in melodic dictation and scholastic aptitude?

5. What is the relationship of individual learning rate to achievement in melodic dictation?

As a side effect, the investigation also sought to answer the question: "What is the effect of programed learning in melodic dictation upon sight singing achievement?" Due to problems of sample size and to insufficient training time, it was impossible to gather valid data to accurately investigate this question.

Preliminary results of the study added the relationship of concept difficulty to programed learning as another dimension for investigation.

Procedures

Because no programed course in melodic dictation was commercially available at the time of the experiment, it was necessary to write one. When the program had been written, it was tested in a pilot study, revised, retested in a second pilot study, and revised again. The second revision was print-

[6] Finn and Perrin report on page 1 of their previously cited *Teaching Machines* . . . that Harry Silberman had found approximately 100 research studies existing at the time of their writing which pertained to the various phases of programed learning and teaching machines. Of these, only about 10 per cent had been published at that time.

[7] Frank B. Cookson, *Recordings and Self Tutoring* (Cleveland: The Brush Development Company, 1949).

[8] Charles L. Spohn, Jr., "An Exploration in the Use of Recorded Teaching Material to Develop Aural Comprehension in College Music Classes," (unpublished Ph.D. Dissertation, Department of Education, Ohio State University, 1959). Reported in part in "Programming the Basic Materials of Music for Self-Instructional Development of Aural Skills," *Journal of Research in Music Education*, XI (Fall 1963), 91-98.

[9] John Clough and others, "Oberlin Teaching Machine Project 1959-60." A report submitted to the Ford Foundation, February, 1961, pp. 32-37. Also, see the review of John Clough's program on music fundamentals on page 183.

[10] Letter from Merrell L. Sherburn, Department of Music, Michigan State University, East Lansing, Michigan, December 22, 1961.

[11] Interview with Walter Ihrke, Department of Music, University of Connecticut, Storrs, Connecticut, March 20, 1962.

[12] Recently, Dr. Ihrke undertook a human simulation of the machine program. In a mimeographed report of the project, dated August 29, 1963, he indicated that student reaction was highly favorable to this type of learning. Although the report did not contain any measurement of learning which took place, it did state that "students made very few errors, and if an error was made, it was usually corrected in a single repetition."

[13] In a branching technique of programing, steps are presented in such a way that the nature of the response will determine the sequence of the steps.

[14] In a linear technique of programing, steps are presented in a fixed sequence.

ed in book form, and the melodies (played on a piano) were recorded on magnetic tape. The completed program used in the experiment contained 617 frames.

Subjects for the experiment were students in two sections of first year ear training.[15] One section was designated as the control group and the other as the experimental group. The experimental group was divided into two sub-groups. One sub-group was designated as the linear programing group and the other as the branching programing group.

A deficiency occurred in the sampling procedure due to registration and scheduling difficulties. When this deficiency proved critical to the results, analysis of covariance was used to test significance.

The control group was taught melodic dictation by a teacher in a teacher-classroom situation. The experimental group had no teacher, but learned melodic dictation by means of the programed learning materials. These materials consisted of the programed book and the recorded tapes which were played on a T-1616 stereo model Wollensak tape recorder having an automatic repeating action. Each student in the experimental group had his own book and worked by himself with the machine.

The course objectives were the same for both the control and experimental groups. Other controls were applied so that presumably only the specific melodies used and the teaching method differed.

In the experimental section, the linear programing group used every frame of the material. The branching group used only selected frames within each concept unless they made an error. In this event, the student "branched" for additional practice to a frame he would otherwise have omitted. This procedure is a forward branching technique similar to that used by Coulson and Silberman in one of their investigations.[16]

Two original criterion tests were devised and were given the following designations: *Melodic Dictation Test No. 1* and *Melodic Dictation Test No. 2*. The validity of each was verified by experts in the field of music theory. Reliability was examined by means of the Hoyt-Stunkard formula[17] and was found to be .856 for the first test and .705 for the second.

All subjects were given the *Melodic Dictation Test No. 1* as a pre-test prior to training. After ten 50-minute sessions of training, all subjects were given the same test as a post-test. After the initial ten sessions, programed learning subjects continued with the program and were given the *Melodic Dictation Test No. 2* after they had reached criterion level. Pre-test scores served as the control scores and post-test scores served as the criterion scores for analysis of covariance.

In order to analyze the data statistically, the questions being examined were stated in terms of the following null hypotheses:

1. There is no significant difference between melodic dictation scores of programed learning subjects as a function of programing technique.
2. There is no significant difference between melodic dictation scores of subjects as a function of method of teaching.
3. There is no significant difference between melodic dictation scores of subjects as a function of scholastic aptitude as measured by College Entrance Examination Board tests for verbal and mathematical aptitude.
4. There is no significant interaction between teaching method and scholastic aptitude.
5. There is no significant difference between melodic dictation scores of programed learning subjects as a function of the number of sessions required to reach criterion level.

The 5 per cent level of confidence was set for statistical significance. Analysis of covariance was used for null hypothesis 1. A three factor analysis of covariance was used for null hypotheses 2, 3, and 4. Null hypothesis 5 was tested by a t-test.

Results

To examine the effectiveness of linear and branching techniques of programing, scores of both groups on the second melodic dictation test were compared by means of analysis of covariance. Scores obtained on the first melodic dictation test were used as control scores.

TABLE 1
ADJUSTED CRITERION MEANS FOR MELODIC DICTATION TEST NO. 2 SCORES

Group	*Adjusted Mean*
Branching	31.615
Linear	30.082
Difference	1.533

The adjusted criterion means for *Melodic Dictation Test No. 2* are presented in Table 1. Table 2 presents a summary table of the analysis of covariance for this test. The results indicated no significant difference at the 5 per cent level of confidence, and null hypothesis 1 relating to programing technique was accepted. From this, it can be concluded that if achievement is to be the criterion, either of the techniques of programing investigated can be considered as effective as the other.

Hypotheses 2, 3 and 4 were tested by a three factor analysis of covariance. Two separate analyses were made: one involving high and low verbal aptitude, and the other involving high and low mathematical aptitude. The two other factors tested were (1) low, medium, and high test item difficulty, and (2) the comparison of the experimental and control groups.

Table 3 contains the control and criterion measures for the three factor analysis of covariance involving verbal aptitude. The adjusted criterion means for *Melodic Dictation Test No. 1* at

TABLE 2
SUMMARY TABLE OF THE ANALYSIS OF COVARIANCE FOR PROGRAMING TECHNIQUES

Source	*SS'y*	*df*	*MS'y*	*F*	*P*
Programing Technique	12.061	1	12.061	.087	NS
Withins	2772.520	20	138.626		
Total	2784.581	21			

[15] Actually, there were three sections in the original experiment. The third section was designated the sight singing treatment group and was intended to provide data to answer the question concerning the effect of programed learning in melodic dictation upon sight singing achievement. Because of the problems of sample and training referred to in connection with this question, this portion of the investigation will not be reported in this article.

[16] J. E. Coulson and H. F. Silberman, "Results of An Initial Experiment in Automated Teaching," *TMPL*, pp. 458-459.

[17] Cyril J. Hoyt and Clayton L. Stunkard, "Estimation of Test Reliability for Unrestricted Item Scoring Methods," *Educational and Psychological Measurement*, XII (1952), pp. 756-758.

TABLE 3

CONTROL (X) AND CRITERION (Y) MEASURES FOR A THREE FACTOR ANALYSIS OF COVARIANCE (TEACHING METHOD, BY VERBAL APTITUDE, BY LEVEL OF TEST ITEM DIFFICULTY)

	Experimental Group						Control Group					
	Test Item Difficulty						Test Item Difficulty					
	Low		Medium		High		Low		Medium		High	
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
High Verbal Aptitude	42	3	36	20	63	41	20	7	68	45	75	59
	52	21	71	56	87	82	6	4	21	15	55	55
	15	0	22	4	65	5	9	0	29	34*	57	56
	1	0	57	41	74	63	59	31	60	40	74	79*
	2	0	46	18	61	28	5	4	63	7	75	45
	5	0	48	13	64	19	57	8	57	25	84	80
	65	57	80	65	87	82	20	1	60	17	62	47
	44	24	73	28	76	54	29	14	46	22	86	78
	24	5	50	34	83	42	28	7	46	26	56	54
	13	11	16	11	29	8	20	12	16	32*	66	56
Low Verbal Aptitude	54	32	79	52	78	55	21	1	43	27	79	76
	28	4	52	28	68	56	1	2*	38	19	70	26
	6	1	57	34	71	54	16	9	53	30	62	68*
	29	19	50	36	85	65	19	9	65	39	78	65
	24	0	54	20	67	50	20	25*	27	23	58	58
	55	34	77	43	81	62	5	0	51	7	58	26
	14	0	26	17	35	30	16	9	49	39	69	69
	25	4	46	18	70	34	41	28	71	48	80	60
	29	0	45	17	77	50	24	8	58	41	87	67
	7	0	20	10	24	17	15	0	31	21	60	14

*An asterisk indicates regression.

the three dimensions are given in Tables 4, 5, and 6. Table 7 presents a summary table for this test.

TABLE 4

ADJUSTED CRITERION MEANS FOR MELODIC DICTATION TEST NO. 1 FOR TEACHING METHODS

Group	Adjusted Mean
Experimental	27.352
Control	31.831
Difference	4.479

TABLE 5

ADJUSTED CRITERION MEANS FOR MELODIC DICTATION TEST NO. 1 FOR VERBAL APTITUDE

Group	Adjusted Mean
High Verbal	29.590
Low Verbal	29.604
Difference	.014

The results of this test indicated a significant difference at the 5 per cent level between melodic dictation scores as a function of teaching method, and null hypothesis 2 was rejected. It can be concluded that in situations comparable to the experimental one, melodic dictation can be more effectively taught by programed instruction than by the traditional teacher-classroom

TABLE 6

ADJUSTED CRITERION MEANS FOR MELODIC DICTATION TEST NO. 1 FOR LEVELS OF TEST ITEM DIFFICULTY

Group	Adjusted Mean
Low Difficulty	24.862
Medium Difficulty	26.893
High Difficulty	37.020
Difference (Low-Medium)	2.031
Difference (Low-High)	12.158
Difference (Medium-High)	10.127

TABLE 7

SUMMARY TABLE OF THE THREE FACTOR ANALYSIS OF COVARIANCE (TEACHING METHOD, BY VERBAL APTITUDE, BY LEVEL OF TEST ITEM DIFFICULTY)

Source	SS'y	df	MS'y	F	P
Teaching Method (A)	599.705	1	599.705	4.120	.05
Verbal Aptitude (B)	.498	1	.498	.003	NS
Test Item Difficulty (C)	1862.928	2	931.464	6.399	.005
AB Interaction	10.833	1	10.833	.074	NS
AC Interaction	549.211	2	274.606	1.886	NS
BC Interaction	16.635	2	8.318	.057	NS
ABC Interaction	819.018	2	409.509	2.813	NS
Withins	15576.159	107	145.572		
Total	19434.987	118			

approach. Of particular interest is the fact that tests for critical differences revealed that the differences occurred with complex concepts, and only with the control group. This would indicate that melodic dictation taught by programed instruction is almost as effective with complex aural perception concepts as it is with basic ones, whereas a definite lack of effectiveness (significant beyond the 1 per cent level) is observed in the teaching of complex concepts by the teacher.

There was no significant difference between melodic dictation scores as a function of verbal aptitude, and null

TABLE 8

CONTROL (X) AND CRITERION (Y) MEASURES FOR A THREE FACTOR ANALYSIS OF COVARIANCE (TEACHING METHOD, BY MATHEMATICAL APTITUDE, BY LEVEL OF TEST ITEM DIFFICULTY)

	Experimental Group						Control Group					
	Test Item Difficulty						Test Item Difficulty					
	Low		Medium		High		Low		Medium		High	
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
High Mathematical Aptitude	5	0	48	13	64	19	6	4	21	15	55	55
	54	32	79	52	78	55	20	1	60	17	62	47
	42	3	36	20	63	41	20	7	68	45	75	59
	15	0	22	4	65	5	9	0	29	34*	57	56
	29	0	45	17	77	50	57	8	57	25	84	80
	25	4	46	18	70	34	5	0	51	7	58	26
	1	0	57	41	74	63	29	14	46	22	86	78
	24	0	54	20	67	50	5	4	63	7	75	45
	2	0	46	18	61	28	28	7	46	26	56	54
	55	34	77	43	81	62	20	12	16	32*	66	56
Low Mathematical Aptitude	29	19	50	36	85	65	20	25*	27	23	58	58
	52	21	71	56	87	82	41	28	71	48	80	60
	44	24	73	28	76	54	1	2*	38	19	70	26
	28	4	52	28	68	56	21	1	43	27	79	76
	65	57	80	65	87	82	19	9	65	39	78	65
	6	1	57	34	71	54	59	31	60	40	74	79*
	13	11	16	11	29	8	24	8	58	41	87	67
	24	5	50	34	83	42	16	9	49	39	69	69
	7	0	20	10	24	17	16	9	53	30	62	68*
	14	0	26	17	35	30	15	0	31	21	60	14

*An asterisk indicates regression.

hypothesis 3, as it related to verbal aptitude, was accepted. There was no significant interaction between teaching method and verbal aptitude, and null hypothesis 4, as it related to verbal aptitude, was accepted.

In terms of the added dimension of concept difficulty, the results indicated a highly significant difference between scores at the various levels of test item difficulty.

Table 8 is a redistribution of the scores found in Table 3 in order to examine the factor of mathematical aptitude. The adjusted criterion means for mathematical aptitude are found in Table 9. Table 10 presents a summary table for this test.

TABLE 9
ADJUSTED CRITERION MEANS FOR MELODIC DICTATION TEST NO. 1 FOR MATHEMATICAL APTITUDE

Group	*Adjusted Mean*
High Mathematical Aptitude	26.547
Low Mathematical Aptitude	32.636
Difference	6.089

There was no significant interaction between teaching method and mathematical aptitude, and null hypothesis 4, as it related to mathematical aptitude, was accepted. The results indicated a significant difference at the 1 per cent level between melodic dictation scores as a function of mathematical aptitude, and null hypothesis 3, as it related to mathematical aptitude, was rejected. A test for critical difference indicated that the significance in relation to mathematical aptitude occurred only with the programed learning subjects and not with subjects in the teacher-classroom group. This would suggest that the person with high mathematical aptitude is penalized when taught melodic dictation in the teacher-classroom situation.

Null hypothesis 5 was tested by a t-test. Linear and branching subjects were analyzed separately. The criterion measure was the error score obtained by these subjects on *Melodic Dictation Test No. 2*. Both linear and branching groups were divided into two levels determined by the number of sessions required to reach criterion level.

Table 11 presents the scores for the sub-groups of branching subjects. The comparable information for linear subjects is found in Table 12.

For branching subjects, the results indicated $t = 2.962$, which at 12 degrees of freedom was significant beyond the 2 per cent level. For linear subjects, $t = 2.485$, which at 6 degrees of freedom was significant at the 5 per cent level. On this basis, null hypothesis 5 was rejected. This would indicate that, as a group, fast learners will make the superior scores in melodic dictation taught by programed instruction. Assuming the programed material used in this experiment to be an illustration of valid programing, the conclusion cited above would negate the assumption that programed learning provides the means to equalize achievement, at least for the subject area of melodic dictation.

TABLE 10
SUMMARY TABLE OF THE THREE FACTOR ANALYSIS OF COVARIANCE (TEACHING METHOD, BY MATHEMATICAL APTITUDE, BY LEVEL OF TEST ITEM DIFFICULTY)

Source	*SS'y*	*df*	*MS'y*	*F*	*P*
Teaching Method (A)	595.877	1	595.877	4.280	.05
Math. Aptitude (B)	1110.790	1	1110.790	7.978	.01
Test Item Difficulty (C)	1935.839	2	967.920	6.952	.005
AB Interaction	153.535	1	153.535	1.103	NS
AC Interaction	554.997	2	277.499	1.993	NS
BC Interaction	48.610	2	24.305	.175	NS
ABC Interaction	208.997	2	104.499	.751	NS
Withins	14897.653	107	139.230		
Total	19506.298	118			

TABLE 11
CRITERION MEASURES OF BRANCHING SUBJECTS WITH THE LEAST NUMBER OF SESSIONS TO CRITERION LEVEL COMPARED WITH THOSE WITH THE GREATEST NUMBER OF SESSIONS TO CRITERION LEVEL

	11-15 Sessions	*20-31 Sessions*
	18	23
	19	24
	19	32
	25	41
	26	49
	28	66
	29	66
ΣX	164	301
X̄	23.429	43.0

TABLE 12
CRITERION MEASURES OF LINEAR SUBJECTS WITH THE LEAST NUMBER OF SESSIONS TO CRITERION LEVEL COMPARED WITH THOSE WITH THE GREATEST NUMBER OF SESSIONS TO CRITERION LEVEL

	15-17 Sessions	*23-31 Sessions*
	6	22
	19	31
	22	56
	23	56
ΣX	70	165
X̄	17.5	41.25

Conclusions

While this study revealed one programing technique to be as effective as the other in aural perception training, this information should not be construed to mean that there might not be still another or even a combination of several techniques which would provide much superior results.

The evidence that differences in effectiveness of teaching method lay in the direction of more complex aural perception concepts and specifically with students of high mathematical aptitude would seem to indicate two needed pursuits. First, there should be an attempt to determine the effect of classroom teaching of complex aural perception concepts in which the material being used has been carefully sequenced and the size of steps of information has been optimally paced, such as one expects to find in programed instructional materials. Second, there is a need to more clearly ascertain the nature of the relationship which exists between mathematical aptitude and musical ability.

The results of this experiment clearly indicated the value of programed tape recorded material in teaching melodic dictation. Lest we be misled, it should be pointed out that few if any psychologists or educators contend that programed learning will solve all our educational problems.

This study was concerned primarily with evaluating programed learning *in lieu of* a teacher. In practical application, there is much to indicate that programed instruction's greatest efficiency will be found only when it is not restricted to being the sole educative source in a given discipline. One of its potentials is as outside preparation material. Other possibilities might be remedial, enrichment, or diagnostic, to name a few. The total effectiveness of this educational technique would seem to be limited only by the imagination of the teacher utilizing such materials.

The potential of programed instruction for music, particularly aural perception, appears to be great. Such implementation would release the teacher for tasks which only the teacher could do. Contrary to the notion that the teaching machine will replace the teacher, the utilization of programed materials may well increase the shortage of good teachers. Instead of teaching *a class of 30 students*, the teacher using programed instruction will be involved in teaching *30 individuals* with attention to their individual needs.

Further research is certain to reveal inadequacies as well as attributes of programed instruction as a teaching technique in aural perception. More important than this it would seem, is the certainty that such research will provide a better understanding of what constitutes the teaching process in music theory.[18]

University of Connecticut

[18] This article summarizes findings reported in the author's unpublished Ph.D. dissertation of the same title (Northwestern University, 1962). The dissertation is available on microfilm from University Microfilms, Inc. (No. 63-1274).

The Function of Sociability in the Sociology of Music and Music Education

JOHANNES RIEDEL

Sociability

MUSIC is, as Sir Jack Westrup puts it,[1] not something which comes out of the blue; it is man-made. It is a conscious social phenomenon created by man to fulfill an individual and collective need. Man is considered here as a social being whose music is a form of social behavior that enables him to identify himself both as a culturally motivated individual and as a collective member whose characteristic is socio-cultural interaction with other members of his cultural community.

The basic assumption, then, is that music is a form of social behavior that gives rise to various types of sociability.[2] For the purpose of this paper, sociability is divided into three categories: (a) that which embraces the feeling of belonging to a group—a family, a community, or a nation; (b) that which embraces the feeling of togetherness through the performance of music, be it religious, classical, popular, or folk; and (c) that which promotes the formation of interest groups, of organizations, and of societies. These three types refer to all persons engaged in any way with music: as listeners, as performers, as teachers, as commentators, and as composers.

The first type of sociability is group awareness. These groups are not fixed and static. Indeed, fluidity—dynamic fluidity—created by the social context within which the group develops, gives rise to the size, structure and function of the socio-musical group. Groups may be small and membership restricted by the cultural concept the small group membership has of itself. Or, a group may be of tremendous size, with more comprehensive social orientation, leading ultimately to the mass audience.

In addition to groups formed on the basis of a community of interests in the social interaction of music activity, we find group-concepts developing musical identifications on the following levels: local, regional, national, international, religious, ethnic, historical periods of musical excellence in the past, or the historical developments of contemporary music.

Perhaps a few examples will clarify this position. The Burgundian chanson composer of the fifteenth century created the delightfully intimate three-part miniature chanson solely to identify himself with the leisure ideal of the self-contained feudal class: the adoration of woman. The composition of chansons was the culturally accepted medium through which he made himself attractive in the eyes of woman. The American Moravian composer of the eighteenth and nineteenth century, for example, identified himself with a select group whose purpose was to resist amalgamation with the American community for fear the members of the immigrant group would lose their identity. Music, in this case,

[1] Sir Jack Westrup, ***An Introduction to Musical History*** (London: Hutchinson House, 1955), p. 66.

[2] For a discussion on sociability and music in general, see Alphons Silbermann, ***Wovon lebt die Musik*** (Regensburg: Gustav Bosse, 1957), p. 42ff.