Since the investigator taught both the Richards and the Gordon experimental classes and did not teach the control classes, perhaps the teacher-effect rather than the approach-effect may account for some of the variance in student achievement. Independent observers, including the school principals, music specialists, parents, classroom teachers, and college music education students, stated that the investigator presented the Gordon and the Richards instructional programs with equal enthusiasm and expertise. The observers also felt that the students involved in both approaches were equally responsive and enthusiastic. The students involved in this study maintained their enthusiasm throughout the entire five-month instructional period. The "Hawthorne effect" may well have been in operation in this study. The fact that the children's enthusiasm was maintained for a long and intense instructional program, however, is significant. This observation indicates that children can enjoy music classes while learning to read music notation.

■ Florida Technological University
Orlando, Florida

EFFECTS OF AUTHORITY FIGURE BIASES ON CHANGING JUDGMENTS OF MUSICAL EVENTS

Rudolf E. Radocy

Undergraduate music students listened to and rated identical performances of compositions under differing bias conditions, structured by authoritatively providing varying amounts of bogus information about alleged performers or composers and hypothetical prior listeners. The students tended to express their performance judgments in accordance with bias produced by the researcher, although bias interacted with performance media and order. Bias influences on expressions of preference for members of similar composition pairs were obtained, but they were less clearcut than the influences on performance, and there was considerable interaction with style period and order. Bias tended to make a greater difference when directed toward the first members of paired examples. Evidence suggests that music educators should consider the extent to which students are influenced by appearance rather than structure.

Key Words: attitudes, audiovisual ability, aural discrimination, music students, teachers, testing, tests.

Musical conformity and the influence and authority figures on musical preferences or performance evaluations may effect the formation of musical taste and concept development.[1] A perceived need to agree with instructors may influence strongly what an undergraduate music student states publicly regarding musical judgments. Who says or does something may be more important to a student than what is said or done. Even bogus information may be accepted with little question if it is presented in a pseudolegitimate manner. Acceptance of authority, of course, varies with the immediacy of the

[1] This study was supported by a grant from The University of Kansas General Research Fund.

phenomenon toward which authority is directed, closeness of the authority, and the authority figure's background and reputation.[2]

In an investigation of performance judgments, Duerksen asked undergraduate students to evaluate two tape recordings of an identical piano performance.[3] A control group was requested to rate two performances, labelled simply as "performance one" and "performance two." An experimental group also was requested to rate the two performances, labeled as a "professional" and a "student" performance. Half of the experimental group heard the "professional" performance first; half heard the "student" performance first. Control subjects consistently rated "performance two" better; experimental subjects, biased by the authoritative labelling, consistently rated the "professional" performance better, in technical as well as musical characteristics. Expectancy was such that a "professional" performance was supposed to be better; so, to the listeners, it was better.

Radocy applied the Asch paradigm to a study of peer pressures on expressed judgments of pitch and loudness matches among simple tonal stimuli.[4] On approximately 30 percent of the pitch trials and 50 percent of the loudness trials the subjects, who were all trained student musicians, conformed to erroneous group responses rather than deny the authoritative peers.

Can expressed judgments of musical events vary with what the student judges are told prior to listening? Can Duerksen's "student-professional" effect be shown with various media? Can relatively obscure compositions vary in elicitation of preference as a result of who the alleged composer is? Can systematic variances in judgments be obtained as a result of different degrees and directions of bias applied to similar groups of undergraduate students? The studies described below sought answers to such questions.

Procedures

Two experiments were conducted. One was based on differential bogus information regarding identical performances. The other was based on differential information regarding alleged composers and imaginary prior listeners' judgments of paired examples from four style periods.

Examples for the performance experiment included (1) the beginning section of the second movement of Beethoven's *Sonata No. 8 in C Minor,*

[2] S. Milgram, "Some Conditions of Obedience and Disobedience to Authority," *Human Relations,* Vol. 18 (1965), pp. 57-75.

[3] G. L. Duerksen, "Some Effects of Expectation on Evaluation of Recorded Musical Performances," *Journal of Research in Music Education,* Vol. 20 (Summer 1972), pp. 268-272.

[4] Rudolf E. Radocy, "A Naive Minority of One and Deliberate Majority Mismatches of Tonal Stimuli," *Journal of Research in Music Education,* Vol. 23 (Summer 1975), pp. 120-133; S. E. Asch, "Studies of Independence and Conformity: I. A Minority of One Against a Unanimous Majority," *Psychological Monographs,* Vol. 70, No. 9 (1956), Whole No. 416.

opus 13, performed by Rudolf Serkin; (2) Brahms' *Academic Festival,* performed by Bruno Walter and the Columbia Symphony Orchestra; and (3) a cornet arrangement of "Sarabande" from Corelli's *Sonata VIII,* performed by Leonard Smith. Each phonograph recording was duplicated on tape twice with identical equipment. The paired examples were ordered randomly as the trumpet piece (in reality played on the cornet), the orchestra piece, and the piano piece.

For the preference experiment, Baroque examples were G. H. Stoelzel's "Allegro" from *Trio Sonata in C Minor for Two Oboes, Bassoon, and Harpsichord* and J. J. Quantz's "Allegro" from *Trio Sonata in C Minor for Flute, Oboe, Bassoon, and Harpsichord,* both performed by the Eichendorff Wind Group. Classical examples were the fourth movement of Mozart's *Symphony in A Major,* KV201, and the first movement of J. C. Bach's *Symphony in B Major,* opus 18, no. 2, both performed by Karl Richter and Das Munchener Bach-Orchester. The opening of the ballet suite *Coppelia* by Delibes, performed by Eugene Ormandy and the Philadelphia Orchestra, and the ending of the "Overture" to *Zampa* by Herold, performed by Leonard Bernstein and the New York Philharmonic, were Romantic examples. Twentieth-century examples were Khachaturian's "Dance of the Kurds" from *Gayne Ballet Music,* performed by Antal Dorati and the London Symphony, and Gould's "Cotillion" from the ballet suite *Fall River Legend,* performed by Howard Hanson and the Eastman-Rochester Symphony Orchestra. The paired examples were ordered randomly as Baroque, Twentieth-century, Classical, and Romantic.

Intentionally ambiguous checklists were prepared to serve as alleged experimental test forms. For each of seven listed criteria—stylistic nuance, dynamic contrast, phrasing, tempo, technical precision, intonation, and overall effect—the performance subjects indicated whether performance one or two was better in accordance with that criterion. Preference subjects indicated the better composition in accordance with nine listed criteria—stylistic unity, stylistic variety, melodic interest, harmonic interest, rhythmic interest, formal interest, tone color interest, resemblance to other compositions I enjoy, and overall interest. Space was provided for written comments.

The "tests" were administered to 20 intact groups of undergraduate music majors at ten institutions in Kansas, Missouri, and Nebraska. Group size ranged from 15 to 47. Half of the groups were performance subjects; the other half were preference subjects. Within each experiment, half heard the paired examples in the originally recorded order. The other half heard the examples in reverse order. Each testing group was assigned randomly to one of five bias conditions. Subjects in all conditions were told that a new testing technique for reducing overly verbose evaluations to a simplified set of checks was being developed and that data were needed to establish further reliability and validity. It was

stressed that the "test," rather than the students or their institutions, was being tested.

Subjects in the no bias (NB) conditions were told nothing about the music except that they would hear two performances by a trumpeter, an orchestra, and a pianist; or, two Baroque, two Twentieth-century, two Classical, and two Romantic compositions.

Subjects in the moderate bias toward one (M1) conditions were given alleged facts about the performers or the composers prior to hearing. The first member of each pair was labelled as the work of a "former symphony player," a "major Eastern orchestra," or a "veteran professional pianist"; the other paid member was labelled as the work of a "young graduate assistant," the "orchestra of one of the Big Ten universities," or "a young artist holding a doctoral fellowship." In the preference experiment, the first member of each pair was labelled as the work of Handel, Kabalevsky, Haydn, or Tchaikovsky; the other pair member was labelled as the work of the fictitious composers Friedrich von Krumpft, Gino Carmozza, Kurt Schlichter, or Leon d'Mauchet. In the moderate bias toward two (M2) conditions, identical information regarding the alleged performers or composers was presented as in M1, but the bias was directed toward the second member of each pair.

Subjects in the strong bias toward one (S1) conditions were given similar information about alleged performers and composers as in M1. Furthermore, they were given reasons why hypothetical prior listeners supposedly tended to prefer the work of the professional performer or eminent composer. In the performance experiment, such reasons included the professional performance's "tone quality and control, and overall musicality," "superior technique, execution, precision, and sonority," or "more subtle phrasings and precise technical execution." In the preference experiment, eminent composers were supposd to show superior "formal structure," "use of orchestral colors and rhythmic variety," "balance, form, and melodic treatment," or "melodic development." The bias direction was reversed for the strong bias toward two (S2) conditions, although the alleged information was identical.

Remarks intended to bias the listening groups varied in their exact wording in order to avoid a mechanical unnatural pattern. However, the alleged information was consistent. To maintain consistency of the authority figure, all performance sessions were administered by the researcher's graduate assistant, and the researcher administered all preference sessions.

Data Analysis

Each check indicating a preference for the second example, regardless of criterion, was scored as 1; preferences for the first example were scored as 0. A double check or no check for any listed criterion was scored as 1/2. Criterion scores were summed, thereby yielding individual scores ranging from 0 to 7 for the performance experiment and from 0 to 9 for the preference experiment. It was expected that if bias effects were strong and in the anticipated direction, S1 and S2 conditions scores would cluster around 0 and the upper bound, respectively, while M1 and M2 scores clustered closer to 3.5 or 4.5, where the NB scores were expected to cluster.

Fifteen students' data were selected randomly from each group to examine via analysis of variance. The resulting performance data were analyzed using a 2(orders) x 5(bias conditions) x 3(performance media) design, with repeated measures on the latter two factors. A similar 2 x 5 x 4 (style periods) design was used for preference data. In order to take advantage of an opportunity to test an extra group and also make comparisons using the extremes of the bias conditions with relatively homogeneous students, an additional analysis of S1, S2, and NB performance conditions was made with data obtained from three groups at the same institution. Seventeen subjects were selected randomly from each group; a 3(bias conditions) x 3(performance media) design was used. All comments appearing on the test forms were extracted and classified.

Results

The performance means are reported in Table 1 for each order and medium as well as bias condition because of the interactions appearing in the analysis reported below. The larger the mean, the more favorable the evaluation for the second performance. Although there are inconsistencies, there is a definite tendency for the larger means to appear in the M2 and S2 columns.

Analysis of variance for performance data, reported in Table 2, indicates a significant effect on listeners' evaluations attributable to the differing bias conditions. However, significant interactions, particularly the triple interaction, suggest that the bias effects varied with different performance media and differently so for the two performance orders (even though performances were identical). One-way analyses of variance show a significant bias effect for each performance medium within each order. This is as expected; it was hoped that different degrees of bias

Table 1
Performance Means

Medium	Order	S1	M1	NB	M2	S2
Trumpet	1	2.93	3.70	4.60	5.77	5.63
	2	3.70	1.53	5.80	6.47	5.77
Orchestra	1	3.70	3.73	5.60	5.50	6.27
	2	2.73	2.50	4.93	5.47	5.37
Piano	1	2.20	2.87	4.67	4.03	6.20
	2	1.63	3.47	4.43	6.27	4.70

Table 2
Analysis of Variance for Performance Data

Source	SS	df	ms	F
Total	2397.74	449		
Between Subjects	1402.24	149		
Order	3.47	1	3.47	0.76
Bias	711.42	4	177.85	39.17***
Order x Bias	51.70	4	12.92	2.85*
Error b	635.66	140	4.54	
Within Subjects	995.50	300		
Media	28.99	2	14.49	4.83*
Media x Order	19.22	2	9.61	3.20*
Media x Bias	39.14	8	4.89	1.63
Media x Order x Bias	67.47	8	8.43	2.81**
Error w	840.68	280	3.00	

* $p < .05$
** $p < .01$
*** $p < .001$

would show systematic quantitative results. However, differences among the bias conditions occasionally are nonsignificant and/or in the direction opposite to that expected. The greater bias obtained in the M1 condition as compared with the S1 condition for the trumpet performances during the second order, and the greater bias obtained in the M2 condition as compared with the S2 condition for the piano performance during the second order, are particularly deviant. Of 60 comparisons, 36 are significant in the direction of greater bias. Curiously, the S1 condition always differs significantly from the S2 and NB conditions, but the S2 and NB conditions never differ significantly from each other: One extreme differs from the other, but the middle differs significantly only from one extreme. This may be explained partially by the tendency, reported by Duerksen (1972), for listeners to favor the second of two identical performances when they are given no biasing information.

Table 3
Analysis of Variance, Additional One-Institution Comparison

Source	SS	df	ms	F
Total	839.06	152		
Between Subjects	503.48	50		
Bias	249.47	2	124.74	23.57*
Error b	254.00	48	5.29	
Within Subjects	335.58	102		
Media	68.65	2	34.33	12.97*
Media x Bias	12.91	4	3.23	1.22
Error w	254.02	96	2.65	

* $p < .001$

Table 3 reports analysis for the additional comparison at one institution. No significant media x bias interaction exists; each main effect is highly significant. The same general trend regarding bias mean comparisons is apparent: S1 differs significantly from S2 and NB, but S2 does not differ significantly from NB. Media means all differ significantly from each other; the "trumpet" elicited the strongest choices for the second performance. The individual bias condition and medium means are listed in Table 4.

Table 4
Means, Additional One-Institution Comparison

S1	NB	S2	Trumpet	Orchestra	Piano
2.48	4.81	5.45	5.10	4.19	3.46

Table 5
Preference Means

Style	Order	S1	M1	NB	M2	S2
Baroque	1	4.90	3.97	4.27	5.30	7.23
	2	2.47	4.63	4.53	4.47	4.90
Classical	1	4.60	5.13	5.20	6.87	6.20
	2	5.30	5.30	4.30	6.40	5.70
Romantic	1	4.23	4.07	3.87	6.33	4.77
	2	5.40	5.43	6.33	6.30	6.33
Twentieth-century	1	5.47	7.27	5.80	5.47	6.53
	2	3.90	3.37	3.70	4.13	3.03

Preference means, reported for each order and style period as well as bias condition because of interaction described below, are listed in Table 5. The preference data suggest less clearcut tendencies than do the performance data. Analysis of variance, reported in Table 6, shows a significant effect for each independent variable, each of which is tempered by significant interactions. The bias effects, although significant, are different for the different styles and within the different orders.

One-way analyses of variance show that significant bias effects occurred only for the Baroque examples and for the first performance order Romantic examples. Comparisons among the bias means within those three cases show that 11 of 36 comparisons are significant. The M2 bias condition differs significantly from the others, with the exception of S2,

for the Romantic case. In the second performance order of the Baroque examples, S2 and NB differ significantly from S1 but not from each other, in a manner similar to the relationship found in the performance data.

Table 6
Analysis of Variance for Preference Data

Source	SS	df	ms	F
Total	3277.05	599		
Between Subjects	952.36	149		
Order	54.30	1	54.30	10.22***
Bias	133.00	4	33.25	6.26****
Order x Bias	21.19	4	5.30	1.00
Error b	743.87	140	5.31	
Within Subjects	2324.69	450		
Styles	63.61	3	21.20	5.05****
Styles x Order	293.51	3	97.84	23.29****
Styles x Bias	93.84	12	7.82	1.86*
Styles x Order x Bias	109.69	12	9.14	2.18**
Error w	1764.03	420	4.20	

* $p < .05$
** $p < .025$
*** $p < .005$
**** $p < .001$

Table 7
Summary of Written Comments

Classification	Number	Percent
Performance		
Criticizing researcher for biasing judgments	52	24
Expressing superiority in bias direction	44	20
Expressing difficulty of evaluation	38	18
Criticizing experimental techniques	29	13
Expressing superiority opposite to bias direction	17	8
Expressing differences under no bias condition	13	6
Indicating suspicion of researcher's purpose	12	6
Criticizing quality of recording	11	5
Expressing enjoyment of music	1	<1
Preference		
Expressing superiority in bias direction	15	43
Expressing difficulty of evaluation	7	20
Expressing enjoyment of music	4	11
Criticizing researcher for biasing judgments	3	9
Expressing superiority opposite to bias direction	2	6
Criticizing experimental techniques	1	3
Criticizing quality of recording	1	3
Expressing differences under no bias condition	1	3
Indicating suspicion of researcher's purpose	1	3

The first Baroque performance order shows an opposite relationship: S1 does not differ significantly from NB. Perhaps there was a genuine preference for the Stoelzel work that was difficult to override by bias.

A total of 217 comments were provided by students taking the performance test; the preference test elicited only 35 comments. As indicated in Table 7, three-fourths of the performance-related comments (1) criticized the researcher for possibly biasing respondents, (2) indicated a reason for superiority of the performance toward which bias was directed, (3) expressed difficulty at making a choice, or (4) criticized some technical aspect, generally the length of the Brahms selection. Over 40 percent of the preference-related comments expressed a reason for superiority of the allegedly eminent composer's work and 20 percent expressed difficulty at making a choice. Only 6 percent of the performance-related comments and 3 percent of the preference-related comments indicated any suspicion of the true experimental purpose.

At the request of the faculty, students at one institution were not informed of the true experimental purpose. At the conclusion of sessions at the other institutions, the researcher or his assistant explained the experiment. Reactions generally included mild surprise. One person continued to insist vehemently that the performances were different even after it was explained directly to him that identical recordings were duplicated at identical levels with identical equipment on the same afternoon.

Conclusions

An authority figure providing bogus information regarding performers' professional roles may bias undergraduate music students' evaluations of identical performances. This may occur for ensemble as well as solo performances. The amount of influence varies with different groups. Performances in certain media may be more susceptible to bias effects than others; in the present study the piano performances elicited somewhat stronger contrasts than the trumpet or orchestra performances. Bias conditions, regardless of degree, tend to make a greater difference when they are directed toward the first members of paired examples.

The ability of an authority figure to bias preference judgments by providing bogus information regarding composers and musical bases for prior judgments is less clear. Undergraduate music students did vary their judgments with bias conditions, but the bias effects largely were limited to only one of the four style periods and were inconsistent in their direction. It is possible that there is less expectancy regarding unfamiliar compositions than there is regarding qualities of performance. Most music students are involved in performance through various ensembles and applied music study; the study of form, composition, and music history may be considerably less active and ego-involving.

Caution is needed because the listening groups may have differed regarding the apparent legitimacy and prominence assigned the authority figure. Rokeach indicates that reliance on authority may be based on one's

ability to distinguish between and separately assess information obtained from that source.[5] Although research regarding authoritarianism and conformity to authority is conflicting, some studies do suggest a positive relationship between authoritarianism and conformity or suggestibility.[6]

Future research needs to be directed toward the question of what makes a music student susceptible to expressing judgments on the basis of *who* says rather than *what* is said. Bias effects with differing performance media should be explored. Perhaps of greatest importance, music educators need to consider more closely the extent to which they influence students on the basis of appearance rather than substance.

■ University of Kansas
Lawrence, Kansas

[5] M. Rokeach, *The Open and Closed Mind* (New York: Basic Books, 1960), p. 60.

[6] R. R. Canning and J. M. Baker, "Effect of the Group on Authoritarian and Non-Authoritarian Persons," *American Journal of Sociology*, Vol. 64 (1959), pp. 579-581; E. Nadler, "Yielding, Authoritarianism, and Authoritarian Ideology Regarding Groups," *Journal of Abnormal and Social Psychology*, Vol. 58 (1959), pp. 408-410; H. D. Schmidt, "Investigation of Prestige-Suggestibility: Co-judge Suggestibility and Personality," *Archiv fur Psychologie*, Vol. 123 (1971), pp. 49-64.

EFFECT OF DIFFERENTIAL TEACHING TECHNIQUES ON ACHIEVEMENT, ATTITUDE, AND TEACHING SKILLS

Randall S. Moore

This study was designed to investigate the effect of differential teaching techniques on achievement, attitude, and teaching skills of 125 college students enrolled in elementary music education classes. Five teaching techniques included contingency-managed instruction (CMI), independent study, CMI-lecture discussion, contact control, and delay contact control groups. The five treatment groups were taught the same instructional materials, pretested, and posttested on modular units pertaining to the elementary music education competencies and teaching skills. Analyses of the data showed no significant differences among groups on pretests, while CMI groups performed better on posttests and the CMI-lecture discussion group best on teaching skills. CMI groups generally demonstrated higher attitude responses. It was concluded that CMI is effective in teaching elementary music education concepts and skills, and that the combination CMI-lecture discussion method includes the benefits of CMI while adding teacher modeling by way of class lectures. It was conjectured that this teacher modeling perhaps provided the basis for higher scores in actual teaching skills.

Key Words: elementary schools, methodology courses, music teacher, teacher training, teaching methods, testing.

The application of behavioral teaching techniques to facilitate learning has been the center of increasing educational interest. Contingent reinforcement has been used in various educational settings to guide student achievement and attitudes. The recent teaching technique that reinforces student learning on an individual basis is contingency-managed instruction (Keller, 1968). Contingency-managed instruction (CMI) generally involves the following aspects of instruction: (1) information or material broken down into small modules, (2) individually paced materials, (3) specific behavioral objectives to guide studying, (4) frequent evaluations based upon the