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The Effect of Structured Task Presentations and Reinforcement on Attention, Achievement, and Attitude of Selected High School Choirs.

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THE EFFECT OF STRUCTURED TASK PRESENTATIONS AND REINFORCEMENT ON ATTENTION, ACHIEVEMENT, AND ATTITUDE OF SELECTED HIGH SCHOOL CHOIRS

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DEDICATION

I dedicate this dissertation to my mother,

Dorothy Sue Dunn,

who introduced me to music and inspired my study of it,

And to those who oversaw my musical nurturing in her absence and now watch from above,

Eugene Earle Butts,

George Nason,

and

Dr. Ruth Whitlock.

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ABSTRACT

This study nested a behavioral design within an experimental design to observe performance improvement after structuring the presentation of musical academic tasks, and to examine the effect of teacher reinforcement on student attentiveness, musical achievement, and attitude in choral ensembles. Two high school choral music classes (N = 60) were assigned intact to one of two treatments. The No Feedback Group (n = 29) received task presentations and directions followed by student performance and no verbal/facial teacher reinforcement. The Feedback Group (n = 31) received task presentations, directions, student performance, and teacher reinforcement. Three similar choral music excerpts were edited for use in the study.

The structured presentation of musical concepts across six rehearsals was analyzed within a multiple baseline design. Concept presentations to improve pitch and rhythm accuracy, diction, articulation, dynamics, phrasing and word stress, were identical for both treatment groups and sequenced to improve musical performances. Instruction was evaluated using the sequential patterns of instruction model. Forty choral performances were recorded for evaluation by three expert judges. Individual concepts were evaluated using 10-point scales, and overall performances were evaluated using 100-point scales.

Results indicated that similar performance gains were made for all excerpts, though less instructional time was needed to teach previously learned concepts in new musical contexts. Choirs were able to maintain performance gains made immediately after

instruction through subsequent rehearsals, despite the addition of new musical concepts. Instruction was stopped for 11 days, and a slight ratings decline was recorded prior to continued instruction, but scores recovered to previous levels quickly.

Students receiving feedback were observed off-task a larger percentage of instructional time than students receiving no feedback. Both groups demonstrated lowest off-task percentages during group performance activities and increased off-task percentages during sectional performance and non-performance activities. Overall performances by the Feedback Group were rated higher (mean gain difference = 9.22 points) for the three excerpts. A more positive attitude toward rehearsal aspects was indicated consistently by subjects receiving feedback. Conclusions from the experimental study support previous research on the effect of teacher reinforcement on student performance and attitude, but not attentiveness.

INTRODUCTION

The preparation of future choral directors involves teaching many skills and transmitting a substantial amount of knowledge. At least two large knowledge bases must be included in this instruction. While prospective teachers must acquire adequate skills in the subject matter, choral music, they also must be taught effective educational skills to be able to transmit this musical knowledge to their students. Rehearsal conducting experiences, field practicum assignments, and student teaching internships provide the professional-in-training opportunities to apply and merge these skills in practical situations. Most courses in choral methods or conducting include instruction on topics which bridge both knowledge bases, such as manual gestures, sight-singing methods, literature selection/analysis, adolescent vocal technique, rehearsal organization, and choir administration. Yet, there is often little scientific information included on the relationship between musical and pedagogical bases in choral rehearsals.

Furthermore, choral music textbooks and conducting manuals offer scant information about this symbiotic relationship between knowledge bases. These sources stress the importance of rehearsal planning and organization (Busch, 1984; Heffernan, 1982; Hylton, 1995; Lamb, 1988; Miller, 1988;); encourage variety and flexibility in musical and pedagogical matters (Boyd, 1970; Decker & Kirk, 1988; Pfautsch, 1988;); and emphasize the value of musical skill acquisition as a rehearsal goal (Collins, 1993; Garretson, 1993; Robinson & Winold, 1976; Roe, 1983;). Some authors attempt to prioritize rehearsal objectives, providing a pedagogical

framework within which to approach musical problems (Gordon, 1977; Kohut & Grant, 1990; Lawson, 1967; Stanton, 1971; Whitlock, 1982;). Most authorities agree on terminal music objectives for choral rehearsals, such as precise diction or accurate intonation, but they seldom suggest a precise sequence of task presentations leading to student achievement of these objectives. Perhaps they do not believe a precise sequence of task presentations suitable for many different pieces of music exists, or perhaps they feel the sequence of presentation does not matter, so long as all musical objectives are eventually mastered. When they do provide such a sequence, it is derived from an experiential rather than scientific foundation. Thus, young teachers are provided little guidance in ordering the presentation of musical objectives, or in effective ways of presenting material to increase a student's long-term acquisition of musical objectives. While much of the musical knowledge base for prospective teachers can be agreed upon, the application of current pedagogical knowledge to choral music is less clear.

The emergence of process-product research in education has provided a means of accurately describing teacher/student interaction through the direct-instruction model. In music education, this model is represented in teaching units labeled sequential patterns of instruction (Yarbrough & Price, 1981; 1989). A complete pattern consists of 1) teacher task presentation (academic, social, or directional), 2) student response (verbal, nonverbal, or performance), and 3) appropriate teacher reinforcement (approval or disapproval). By structuring academic

task presentations and feedback of choral directors and analyzing their effect on student behaviors, guidelines may emerge for sequencing and pacing the academic content of choral rehearsals toward a performance that is both musical and meaningful.

While teacher feedback is recognized as an important component of a sequential pattern, especially for providing students knowledge of their progress toward an objective, it is unclear just how necessary it is in choral rehearsals as a reinforcement and motivation for the singer. Perhaps the experience of singing choral music is reinforcing enough to motivate students. Even though it is not sound educational pedagogy to maintain a negative learning environment, tyrannical choral directors who only offer disapproval of their choir's efforts may still have students who are highly motivated to continue rehearsing and performing music if they are being reinforced by musical experiences in rehearsals. Overt verbal or facial approvals may not be needed as motivation in this type of rehearsal, but may serve to improve instructional pacing or other pedagogical needs.

The first goal of this study was to examine the effect of structured task presentations on the choral students' ability to transfer performance skills to new musical material, both immediately and after a delay of two weeks. An additional goal sought to measure the effect of teacher reinforcement on choir behavior. Comparison of student attention, performance achievement, and attitude for two choirs rehearsed with identical task presentations but differential teacher reinforcement were examined.

REVIEW OF LITERATURE

Teaching is one of the most complex tasks a person can confront. Many people are required to teach as part of their everyday experience, whether as an employer teaching a new employee how to operate the cash register, a telephone operator instructing a customer how to place a collect call, or a parent teaching his child how to throw a ball. While choosing the profession of teaching as a career is a relatively simple procedure, aspiring to become an effective, productive "master" teacher requires not only a special type of person, but obligates that person to master certain skills and competencies. For the prospective music teacher, mastering additional skills and proficiencies within the subject matter is imperative, creating further confounding variables in the learning environment. Yet there is much disagreement as to how and whether these skills and competencies can be described and taught. Are good teachers born, or can one teach students to be good teachers?

Teacher Effectiveness Research In General Education

Research in effective teaching has focused on describing the qualities and behaviors of effective teachers, and subsequently training future teachers to exhibit those qualities and behaviors. Research on teacher effectiveness has progressed through several stages, first examining personality traits and characteristics of effective teachers, moving on to teaching methodologies and behaviors exhibited by effective teachers, and finally leading to development of the competency-based model for teacher education (Medley, 1979).

Early research into personality traits of teachers led to much curriculum focus in teacher training even though no link had been established between perceived effectiveness of teachers and their actual effectiveness. Nevertheless, certain teacher traits and behaviors were found appropriate for applied behavioral analysis (Hanley, 1970). Implementation of behavioral analysis led to the development of qualitative observation instruments, correlational studies of teacher behavior and student achievement, and experimental studies for causal effect (Brophy & Good, 1986).

As focus shifted from what teacher trainees must be to what they must do, process-product or process-outcome research became more widespread (Medley, 1979). This type of research stressed stable behavior patterns over other variables present in the classroom environment (student's interactions with peers, curriculum materials, computers, and so forth) and stressed student achievement gains, over gains in personal, social, or moral areas, as the most appropriate measure of teacher effectiveness (Brophy & Good, 1986). Berliner and Tikunoff (1976) discovered 61 variables distinguishing more-effective and less-effective teachers, but found some to be consistent only for a particular subject or grade level, while others were consistent across grades and subject areas. Thus, the context within which a behavior was exhibited was deemed important, not merely the behavior itself. Researchers speculated that there are times when the use of certain skills, abilities or knowledge might be inappropriate. They concluded that research in teacher competencies must examine not only *how* teachers behave, but also *when* and *why* (Medley, 1979).

Process-Product Research

Consistent results from a number of process-product studies were reported by Medley (1977). Elementary students showed positive achievement results in mathematics and/or reading when their teachers devoted more time to task-related, "academic" activities, spent more time with the whole class and less with small groups or individuals, asked more lower level questions, used less criticism and more praise, and were less permissive. Effective teachers also tended to build more positive student self-concepts and attitudes toward school.

Gage (1976) demonstrated instructional variables such as structuring, soliciting (questioning), and reacting could be manipulated by teachers. Adjustments of the teacher variables being observed showed a small, but sometimes statistically significant effect on student achievement.

The following teacher behaviors were derived from process-product research findings (Rosenshine & Stevens, 1986): (a) begin lessons with a review of previous learning; (b) provide a short statement of objectives; (c) present material in small steps at a rapid pace; (d) intersperse questions to check for understanding; (e) provide sufficient illustrations and examples; (f) model specific, concrete procedures; (g) provide guidance for initial student practice; and (h) give systematic feedback and corrections. The emphasis for effective teacher practices was on clarity, structural presentation, and generous feedback in a highly task-related learning environment.

Comparison of new and experienced math teachers on the first day of school revealed that experienced teachers are more task-oriented and better organized (Brooks, 1985). A teacher-centered learning environment was demonstrated by the experienced teachers, as well as higher levels of eye contact and appropriate facial expressions.

Research findings for effective classrooms demonstrated that academic learning is influenced by the amount of time students spend engaged in appropriate academic tasks. Students appeared to learn most efficiently when new information was structured and related to existing knowledge, student performance was monitored, and corrective feedback was provided (Brophy & Good, 1986).

Instructional Time

Early process-product research found that the use of instructional time had an effect on student achievement. In particular, the time spent on-task by the student and the time spent on task-oriented instruction and feedback by the teacher were important variables in connection with student achievement (Rosenshine, 1976). Teaching methods that increased direct instructional time consistently have shown positive gains in pupil performance as reported in the Beginning Teacher Evaluation Study (McDonald, 1976). Curricular content and task-oriented instruction were correlated strongly with student gain. Both the amount of content covered and the number of minutes students were engaged with the content were correlated with higher student achievement (Rosenshine, 1979). This report also found that teachers who

maintained a strong academic focus tended to rate moderate to high in affective measures such as warmth, conviviality, and concern for students.

Structuring Academic Tasks

Rosenshine and Stevens (1986) emphasized the importance of clear presentations in instructional effectiveness including: (a) clarity of goals; (b) proceeding small step by small step; (c) providing a specific, concrete model of procedures; and (d) frequent checks for understanding. Other research showed that optimal learning takes place when instruction moves at a brisk pace in small steps, demonstrating continuous progress and high success rates (Brophy & Evertson, 1976). Good and Grouws (1977, 1979) also observed that effective teachers ask fewer questions that yield incorrect answers or in which students fail to respond. In addition, they found effective teachers twice as likely to explain the steps involved in developing the correct answer rather than merely supplying the correct answer. Brophy (1979, 1980) recommended that teachers ask questions that students are able to answer correctly 75-80% of the time.

Teacher Feedback

The effects of teacher feedback behavior in relation to student behavior have been isolated and examined. The combination of ignoring inappropriate student behaviors and approving of appropriate behaviors has produced dramatic decreases in the frequency of inappropriate behaviors (Becker, Madsen, Arnold, & Thomas, 1967; Madsen, Becker, & Thomas, 1968). Both student achievement and attentiveness have been correlated with teacher

approval (Wright & Nuthall, 1970). In reviewing literature on operant conditioning, Altman and Linton (1971) found the "immediate and contingent usage of reinforcing events was shown to be a crucial element for effective classroom control" (p. 285). A subsequent study found teachers able to increase and decrease their rate of contingent approval by viewing a videotape of their teaching, then counting and graphing their approvals (Saudergas, 1972).

Direct Instruction Model

Results of process-product research led to formulation of the direct instruction teaching model, also known as systematic teaching or active teaching (Kindsvater, Wilen, & Ishler, 1992). The basic steps for direct instruction include (a) preparing students for the lesson, (b) presentation of the lesson, (c) student practicing, and (d) evaluating and providing feedback on student learning. This teacher-centered environment is focused on academic matters, with clear student goals, adequate and continuous instructional time, extensive content coverage, monitoring of student performance, and low-level cognitive questions producing many correct responses with immediate, contingent teacher feedback (Berliner & Rosenshine, 1976; Rosenshine, 1979). Direct instruction led to the development of a three-step teaching process consisting of teacher presentation, student response, and teacher reinforcement (Becker, Englemann, & Thomas, 1971). Research focus has shifted from isolated behaviors to patterns of behaviors because "it is <u>patterns</u> of practices rather

than single teaching practices or teaching skills which account for [teaching] effectiveness." (Powell, 1978, p. 28).

Achievement in basic skills has been affected positively by direct instruction. When teachers changed specified behaviors toward targeted low-participation students, academic achievement improved (Good & Brophy, 1974). Positive gains in math and reading for disadvantaged and low-intelligence elementary students have been reported (Becker & Englemann, 1976) as well as concomitant increases in direct instruction and improved student performance (McDonald, 1976).

Summarizing research in direct instruction, Brophy (1979) concluded that students in a structured curriculum outperform those in more individualized or discovery learning approaches. He characterized effective teachers as having high expectations, being task-oriented and businesslike in moving the class along at a brisk pace, and structuring learning that allows high levels of student success. In addition, they effectively manage the learning environment, using preventive techniques to deal with misconduct before it occurs which maximizes time spent on academic tasks.

Training teachers to implement and increase use of the direct instruction model was examined by Carnine and Fink (1978). Untrained math teachers demonstrated a lower implementation rate than trained math instructors, but increased and maintained presentation rates after training.

Research in general education has provided useful information and techniques for describing and manipulating effective teacher behaviors. Application of this knowledge base to

music teaching has been and continues to be a focus in music education research. The description and measurement of music teacher behaviors and methods of instruction is a necessary objective in attempting to accurately define effective music teaching.

Effective Music Teacher Behaviors

Investigations of teaching behaviors exhibited by successful music teachers has provided increased knowledge and insight for the development of future successful music teachers and classrooms. Observations of successful music teachers by experts and researchers have identified numerous and varied teacher and student characteristics present in successful classrooms and performing ensembles. Examination of observed characteristics provides a basis for thoughtful decision-making regarding teacher training and the structuring of academic tasks.

In a review of research on process-product applications in music, Brand (1985) enumerated such characteristics as eye contact, magnitude, energy, enthusiasm, and pacing as particularly important to music instruction. Master music teachers worked harder than their peers and searched for creative, extraordinary methods to achieve goals and musical excellence. Included in these methods were dramatic verbal and nonverbal behaviors, variety in activities and personal interaction skills, and choosing music curriculum of high worth (Brand, 1990). Characteristics such as structured and adaptable planning, control of pace and format, communication, and maintenance of a positive environment have

also been applied to excellent music teachers (Saunders & Worthington, 1990).

One study compared effective corporate leadership styles to successful conductor characteristics. Combinations of task-oriented behaviors and relationship oriented behaviors were presented to choral conductors who then chose the style they thought best represented their teaching. A leadership style representing high task and high relationship behaviors was chosen by 72% of those surveyed (Allen & Apfelstadt, 1990). It was also observed that conductors of beginning choirs may choose more high relationship behaviors while conductors of select ensembles may be able to emphasize high task-oriented behaviors.

Effective management of teaching time was another characteristic of master music teachers (Merrion, 1990). These teachers were able to balance content-oriented and student-oriented activities by presenting learnable skills, creating an atmosphere conducive to learning, and maintaining a current knowledge base. Rehearsing and active teaching were priorities for instructional time, resulting in little time for students and teacher to engage in activities that detracted from music making.

Music competencies and teaching competencies were ranked by public school music teachers (Taebel, 1980). Teaching competencies such as clear explanations/demonstrations of musical achievement, clear directions, support/encouragement of student effort, and instruction at appropriate level for students received high priority. Subjects considered teacher presentation and feedback to be important.

Nonverbal Teaching Behaviors

The nature of choral conducting requires extensive nonverbal communication from conductor to ensemble. During musical performances verbal behavior is unacceptable, necessitating the use of nonverbal behaviors if a director wishes to communicate with performers. Beyond the expressive use of conducting gestures and body movements, the face and eyes may be the most significant communicators of nonverbal messages. Examinations of nonverbal communication studies outside of music have been undertaken to provide information for conductors (Fredrickson, 1992; Julian, 1989; Ostling, 1976).

Eye contact is important in many areas of human interaction and is a component of good teaching, including music teaching. Teacher eye contact has been shown to exert a positive effect on student attentiveness and attitude (Fredrickson, 1992). While Sherrill (1986) found surprisingly low frequency of occurrence for group eye contact and conductor facial expression, with little effect on ensemble performance, other studies have reported these nonverbal behaviors to affect student behaviors and attitudes. Hendel (1994) examined the teaching of nine elementary music specialists teaching over several class sessions and reported the average percentage of eye contact as 91%. A high magnitude conductor, exhibiting extensive group eye contact and appropriate facial expressions was preferred by high school choir members over a low magnitude conductor lacking these behaviors (Yarbrough, 1975). Additionally, student attentiveness reflected the amount of

teacher eye contact and time spent in nonperformance activities (Yarbrough & Price, 1981).

A study comparing novice and expert conductors (Byo & Austin, 1993) examined eye contact and facial expression, and found differences in the use of nonverbal behaviors between the two groups. Expert conductors were able to maintain eye contact for longer durations than novice conductors. Byo and Austin also found expert conductors to use more diversity and effective combinations of nonverbal behaviors while novice conductors exhibited a limited range of behaviors. Eye contact in particular appeared to magnify the intensity of other nonverbal behaviors. Increased intensity may affect student perception of a conductor. A study by Thayer (cited in Ostling, 1976) showed that "recipients of extended looks judged the looker to be more dominant than recipients of brief gazes" (pp. 32-33).

Facial expression is also an important nonverbal communicator. The pleasant/unpleasant dimension of facial affect has demonstrated to be the most important (Ostling, 1976). Hendel (1994) reported elementary music teachers maintained a neutral facial affect for 55% of teaching time, with approving expressions demonstrated 41% of the time and disapproving expressions accounting for only 4% of instructional periods. Expert conductors manifest less time with a neutral facial expression than novice conductors (Byo & Austin, 1993). Grechesky (1986) reported facial approval exerted a positive effect on high school band performance while facial disapproval produced negative effects.

Verbal Teaching Behaviors

The emergence of process-product research in general education led to its adaptation and application in music education. Early descriptive research concentrated on observation and categorization of music behaviors. Daellenbach (1970) intended to develop an experimental approach to the process of data collection of overt music behaviors. He looked at four categories of teacher behavior, verbal, nonverbal, conducting, and modeling, as well as student verbal, motor (performance and nonperformance related), and attending behaviors. He reported more teacher non-verbal behaviors than verbal behaviors with little student verbal behavior. Students were, however, highly attentive. His use of videotape to accurately classify and time behaviors was an important contribution to research methodology in music. His results led him to suggest examination of a teaching process similar to the direct instruction model of Becker, Englemann and Thomas (1971), consisting of instructor stimulus, student response, and instructor consequence.

Forsythe (1977) classified teacher-student verbal interactions and found the nature of instructional activity to be a factor in student on-task behavior. Greater use of "active" participation activities promoted on-task behavior while two teacher verbal activities, "getting ready" and "verbal interaction" produced the highest off-task levels. This suggests that the nature of an activity itself either positively reinforces students, maintaining their attention, or may be incompatible with inattentiveness.

A qualitative analysis of 12 exemplary junior high and middle school choral directors (Fiocca, 1989) examined the following categories: (a) manner, (b) vocal pedagogy, (c) nonverbal behavior, (d) verbal behavior, (e) conducting, (f) classroom management, (g) sight reading and dictation skills, and (h) keyboard skills. These successful teachers maintained an appropriate classroom environment, avoided sarcasm, and included positive and motivational nonverbal communication.

Teacher Feedback

The use of teacher reinforcement is one behavior that has been examined and found to influence student achievement, attention and attitude in music classrooms. Elementary students in high approval environments were off-task significantly less than either control or high disapproval classrooms (Kuhn, 1975; Forsythe, 1975).

Comparison of high approval and high disapproval rehearsal conditions in high school choral classes showed more positive student attitudes toward the high approval environment (Murray, 1975). In addition to low off-task levels in high approval environments, Madsen and Alley (1979) found the lowest off-task behavior in choir and instrumental ensembles despite low approval ratios. This may support the view of others (Forsythe, 1977; Spradling, 1985; Yarbrough, 1975; Yarbrough & Price, 1981) who found that active activities, including perhaps musical performance, might serve as positive reinforcement and thus maintain student attention.

The effect of reinforcement training on pre-service teachers demonstrated perceptual differences (Madsen & Duke, 1985). Students trained in reinforcement techniques saw teacher approvals as more beneficial and effective than untrained students. Contingency Managed Instruction (CMI), which uses many direct instruction principles including immediate contingent feedback, was found to be an effective technique in music instruction for pre-service teachers (Moore, 1976). When compared with control and independent study groups, CMI students scored highest on achievement tests and had positive attitudes about the method of instruction. It would seem that training can make students aware of effective reinforcement and contingency techniques.

Sequential Patterns of Instruction

A three-step teaching pattern consisting of teacher presentation, student response, and teacher reinforcement has recently become an area of interest in effective music teacher research. The original process was derived from direct instruction (Becker, Englemann, & Thomas, 1971) and has been observed and developed in music research. Originally called teaching units or cycles, sequential patterns of music instruction were first observed and defined by Yarbrough and Price (1981), and consist of teacher presentation of music or social tasks, student responses, and teacher reinforcement. Initial research focused on the occurrence and effect of sequential patterns in elementary music classrooms (Moore, 1981; Rosenthal, 1981) and high school choral and instrumental rehearsals (Yarbrough & Price, 1981; Price, 1983). Further research and subsequent expansion of pattern

definitions (see Figure 2) has emanated most extensively from Yarbrough and Price (Price, 1985; 1989; 1992; Price & Yarbrough, 1993/1994; Yarbrough, 1985; 1988; Yarbrough & Hendel, 1993; Yarbrough & Price, 1989; Yarbrough, Price, & Hendel, 1994). Applications to private applied lessons have been pursued for violin (Benson, 1989), guitar (Duke & Madsen, 1991), and piano (Kostka, 1984; Speer, 1994). Studies of teacher/therapist training in the application of sequential patterns have included self-analysis techniques (Arnold, 1991), music majors (Rosenthal, 1981; 1989; Wolfe, 1989), non-music majors (Bowers, in press; Maclin, 1993), both majors and non-majors (Jellison & Wolfe, 1987), in-service opportunities for experienced music teachers (Yarbrough, Price, & Bowers, 1991), and music therapists (Standley & Greenfield, 1987).

Four of these citations will be discussed in greater detail due to their relevance to the present study. An attempt to describe teaching behaviors and sequential pattern components used by ensemble directors in rehearsal was undertaken by Yarbrough and Price (1989). Both experienced band and choir directors and undergraduate music education majors were observed and their teaching patterns analyzed for sequential patterns. Patterns were considered correct when a teacher academic task presentation was followed in order by student response and contingent teacher reinforcement, without error. Comparisons of band and choir directors demonstrated choir directors spent a higher percentage of rehearsal time using correct patterns (35% to 18%) and had a better approval/disapproval ratio (41/59 to 19/81) while band directors used more specific reinforcement (70% to 59%). The

seemingly high percentages of incorrect patterns for both groups were caused by several types of teaching errors which included task presentations without musical content, extraneous conductor talk when giving directions, and conductor reinforcement that lacked any relationship to the task presented.

Maclin (1993) was able to improve teaching behaviors in preservice teachers by providing training and practice in the use of sequential task analyses. Creating a task analysis involved analyzing the content of the lesson and arranging a sequential order of presentation of concepts from least to most complex. This was submitted as a detailed written sequence of behaviors intended to occur in teaching the lesson. Thus, task presentations were structured by means of sequential planning. One experimental group wrote a sequential task analysis before each of six teaching lessons detailing behaviors for the lesson. A second experimental group wrote two task analyses on lessons unrelated to their teaching presentations, while a control group did not write task analyses. For the final videotaped teaching lesson, the first group submitted their task analysis, while the other two groups submitted a traditional lesson plan containing objectives, procedures, and means of evaluation. The group trained in writing and implementing sequential task analyses spent a significantly larger percentage of time using complete sequential patterns of instruction, and began more patterns with academic tasks. An increase in the percentage of time students spent in performance activities was also noted for the first group. No differences in the percentage of time devoted to teacher feedback were observed.

In one of the only experimental studies to examine the effects of various kinds of sequential patterns on ensemble responses, Price (1983) examined the use of complete and incomplete patterns in university band rehearsals. Two conductors employed three instructional methods: (a) directions only followed by student performance; (b) musical task presentations followed by student performance; and (c) musical task presentations and student performance followed by contingent reinforcement. Performances of music rehearsed under this complete pattern condition were rated highest. In addition, this condition evoked a more positive attitude among band members. Only the directions followed by student performance method, which contained more time spent in student performance, had fewer off-task students than the complete pattern method.

In an attempt to classify sequential patterns where reinforcement is delayed, academic material is being drilled, or patterns are left incomplete, Hendel (1994) expanded pattern definitions to include extended patterns and functional types of incomplete patterns (see Figures 3 and 4). Such patterns might include a series of teacher presentations and student responses before appropriate feedback is provided, or preparatory steps for the ultimate academic objective. Also, inverted patterns where teacher behaviors fall out of sequence, such as giving feedback prior to student performance, were classified. These extended sequential patterns allow a more precise coding of teacher/student interactions according to teaching objectives and recognize more common uses and implementation of teacher feedback.

As examples of effective teaching presentations, preferences for certain types of sequential patterns have been measured. Price and Yarbrough (1991) found a preference for sequential patterns containing academic task presentations and patterns ending in approval feedback among undergraduate and graduate music majors and experienced music teachers. Patterns containing directions only with no feedback were preferred to patterns ending in disapproval. Additionally, a preference was shown for specific and related feedback rather than nonspecific feedback. Specific feedback was reinforcement verbally linked to certain student behaviors, while the term "related" indicated feedback given for student performance of behaviors just presented during teacher task presentation. Similar preferences were reported with nonmusician undergraduate education majors and in-service music teachers (Price & Yarbrough, 1993/1994; Yarbrough, Price, & Bowers, 1991).

Further validation of sequential pattern preferences was reported by Yarbrough and Hendel (1993). Examination of ratings by high school and elementary students showed a preference for patterns beginning with academic musical information rather than directions, patterns ending in approval rather than disapproval, and reinforcement that was specific rather than nonspecific. While mean evaluation scores for patterns ending in approvals were about the same for both high school and elementary students, scores for disapprovals were significantly higher for high school students compared to elementary students. This was consistent with other studies (Benson, 1989; Yarbrough, 1988) that indicated more

experienced students appeared to accept disapproval feedback more than elementary students. When results were separated according to vocal or instrumental experience, high school students in both groups demonstrated similar preferences. A similar study using experienced music and nonmusic teachers and university music and nonmusic students reported similar overall pattern preferences (Yarbrough, Price, & Hendel, 1994), although when looked at by specialty, vocalists appeared to show greater distaste for patterns ending in disapproval than instrumentalists. Evaluation scores for the experienced teachers and university students in this study were significantly higher than scores for high school and elementary students in the earlier study.

Sequential patterns of instruction are one method of describing effective teaching. These patterns have been found in both elementary and secondary music classes, and clear preferences have been recorded for certain types of patterns in terms of their effectiveness. In addition, teachers have demonstrated the ability to learn and increase their use of sequential patterns.

Additional Aspects of Music Teaching Behaviors

In a study designed to investigate specific teacher behaviors during rehearsals, investigators looked at verbal, non-verbal, and non-interactive teacher behaviors in middle and high school level bands (Blocher, Greenwood, & Shellahamer, 1994). Specifically targeted was the amount of time spent in conceptual teaching during rehearsal. Results indicated that directors spent less than three percent of observed teaching time engaged in conceptual

teaching behaviors. While over 31% of observed teaching time was spent giving verbal directions, less than 9% of time was used to provide verbal and nonverbal feedback to students. At the high school level, feedback time averaged less than four percent.

In an effort to efficiently use scarce rehearsal time, music teachers, especially ensemble conductors, often continue verbal instruction during student musical performances within a rehearsal. Short verbal statements as students are performing may serve to remind them of an upcoming event, intensify or amplify a current behavior, or provide reinforcement. Such teaching behaviors have been called "hustles," and have been noticed in music, drama, dance, athletic, and military training (Tharp & Gallimore, 1976). Defined by these authors, "hustles" are verbal statements that activate or intensify previously instructed behavior, and can serve as approval or disapproval in addition to their function as a cue.

While these verbal statements can be coded according to the same categories used for sequential patterns of instruction, calculating the length of time spent in each category presents a problem, as student performance is ongoing and is also one of the categories being timed. Furthermore, it is unclear to what extent these verbal statements are heard and processed by students engaged in performing behaviors. "Hustles" used in accordance with the above definition, to activate or intensify *previously* instructed behaviors, may function quite well, but the inclusion of *new* instruction while students are performing may not be as effective. The "hustle" also provides an opportunity for more immediate and

specific teacher feedback during student performance, which may increase teacher effectiveness.

Teacher Intensity

In addition to music teacher research focusing on specific teacher behaviors, a growing body of research has examined music teaching from a more global viewpoint. A number of inclusive traits associated with good teachers have been reported, including structured academic tasks and classroom contexts (Doyle, 1981), "withitness" and "overlap" (Kounin, 1970), "expertise" (Berliner 1986, 1991), magnitude (Yarbrough, 1975), enthusiasm (Collins, 1978), and teacher affect (Sims, 1986). Madsen and Geringer (1989) defined teacher intensity as a "global attribute that is used to describe sustained control of the student-teacher interaction evidenced by efficient, accurate presentation and correction of the subject matter with enthusiastic affect and effective pacing" (p. 90). This multidimensional combination of factors, integrating teacher delivery, accuracy, and classroom management provides the foundation for evaluating teacher intensity.

While specific skills or behaviors in teacher delivery, accuracy, or classroom management have been identified in effective teachers, it appears that the presence or absence of any one skill within a given situation has little to do with teacher intensity. It is possessing a collection of behaviors from which to draw and the ability to choose an appropriate behavior for a given instructional situation that positively identifies high teacher intensity (Cassidy, 1990). For example, enthusiasm is an essential indicator of high intensity and may describe teacher behaviors

during which accurate instruction is effectively delivered (Madsen, Standley, & Cassidy, 1989). However, if the teacher possesses inadequate knowledge of the subject matter, or poor verbal ability, no amount of enthusiasm will make the teaching ultimately successful. Teacher intensity has focused on the "inextricable interaction between knowledge of the subject matter and effective delivery and sequencing of the subject matter" (Madsen, 1990).

Both preservice and inservice teachers have been able to demonstrate intensity contrasts in their teaching by displaying many intensity indicators at varying levels (Byo, 1990; Madsen, Standley, Byo, & Cassidy, 1992). It also appears that certain intensity behaviors are acquired and improve with experience and practice (Cassidy, 1990, 1993; Colwell, 1995). It may be that experience helps the teacher learn to integrate two large knowledge bases, subject matter and effective teaching. For example, a good sense of classroom timing or pacing requires the teacher to understand not only the order and amount of subject matter appropriate for the situation, but also to evaluate student need and potential for assimilating that knowledge (Duke & Madsen, 1991; Madsen, 1990; Madsen & Geringer, 1989). Furthermore, the teacher's ability to balance high and low teaching intensities may affect the attention and enthusiasm of students (Cassidy, 1990). Clearly, teacher-student interactions in music rehearsals are complex, and effective choral conductors must have a wide repertoire of delivery skills, broad and accurate knowledge of the subject matter, and many classroom management techniques.

Structuring Academic Musical Tasks

The choral rehearsal is more than simply a work session where voice parts are "pounded out" toward a performance goal. It is the location of the choral experience, where the individual singer is the first audience (Robinson & Winold, 1976). Each rehearsal should be a "re-hearing" of the music--its nature and essence in addition to its musical elements. As such, the organization of curriculum and teaching methods both within and across rehearsals is a crucial competency.

Structure Within a Single Music Rehearsal

Choral music method textbooks and some conducting manuals often devote a chapter or section to the structure of choral rehearsals. The great majority of this information is focused on the structure within a single rehearsal, sometimes called rehearsal techniques. Many issues not related to actual rehearsal interactions may be included in such a discussion such as auditioning singers, preparing the physical space, seating arrangements, selecting repertoire, and working with accompanists. Two consistent topics that are more closely related to the rehearsal process itself are organization and pacing.

Organization

The order and rationale for curricular activities in choral rehearsals may affect the amount of ensemble progress toward instructional goals. Maximum efficiency can occur when psychomotor, cognitive, and affective considerations of ensemble members are considered. Often, a rehearsal consists of activities that are not focused on the performance literature, but on the

acquisition of musical skills. Vocal technique and choral tone are often developed during warm-up exercises. Familiarity and fluency in singing from notation are improved through daily, systematic sight-singing drills. As students master musical skills in isolation, they can be taught to replicate their performance in a musical context.

An investigation of preferred rehearsal structures of 60 Ohio high school choral directors was reported by Cox (1989). Subjects chose a preferred rehearsal organization from three structures recommended by choral authorities including (a) faster-paced activities at the beginning and end of rehearsal; (b) in addition to faster-paced activities at the beginning and end, a "climax" of the highest intensity level occurring about two-thirds of the way into rehearsal; and (c) alternating activities according to difficulty and familiarity with frequent changes of pace. Rehearsal structures were only applied to the portion of rehearsals devoted to preparing performance literature, excluding any warm-up or sight-singing activities. The majority of choral directors (52%) chose the first structure, although none of the directors indicated strong negative feelings toward the other two rehearsal structures. Cox concluded that having a rehearsal structure, regardless of how it is structured, is the critical factor.

Teaching Time Use and Pacing

In addition to structuring activities within a rehearsal, effective choral conductors also must make efficient use of instructional time. Conductors are encouraged by choral

authorities to spend less rehearsal time talking and more time with the ensemble performing.

The use of teaching time in music instruction has been measured. Average percentage of class time devoted to music teaching instruction was greater than time devoted to student interactions with music (singing, playing instruments, listening to music, and so forth) in several studies involving elementary music classrooms (Forsythe, 1977; Moore, 1976; 1981; Moore & Bonney, 1987; Wagner & Strul, 1979;). Conversely, considerable research examining music ensembles and applied lessons reports more time spent in student performance than teacher instruction (Caldwell, 1980; Cox, 1986; Kostka, 1984; Madsen & Geringer, 1983; Pontious, 1982; Single, 1990; Thurman, 1977; R. C. Watkins, 1993; Witt, 1986; Yarbrough & Price, 1989).

Studies have also reported lower percentages of off-task behavior in students during performance activities as compared with non-performance activities (Price, 1983; Spradling, 1985). However, when teacher instructional periods were lengthened there was no concomitant increase in student off-task behavior (Spradling, 1985).

Rehearsal pacing is also addressed by choral method textbooks. Conductors are urged to develop a feeling for timing, move at a rapid pace from activity to activity, vary musical styles and elements, keep the whole group involved, and balance time between talking and performing. In a descriptive investigation of pacing, Yarbrough (1988) found that most teacher verbal behavior occurred in short bursts. This was especially true for the

elementary teachers and professional conductor while giving directions. The investigator also observed more time spent in academic teaching by elementary music teachers while band and choral directors spent more time giving directions.

The structuring of music rehearsals seems to be an important factor in effective teaching. The most effective mode of organization is still unclear, but effective conductors of musical ensembles structure the majority of rehearsal time to keep students engaged in musical behavior. In addition, a rehearsal pace that moves forward with variety and involvement is recommended.

Structure Across a Series of Music Rehearsals

How a single music rehearsal fits into a series of music rehearsals may be important in effective music instruction. While many choral method textbooks advocate long-range planning and discuss various techniques to deal with musical problems, there is little information on effective rehearsal structuring across rehearsals. Most comments address proper conductor reactions to performance mistakes rather than a proactive structure to minimize problems before they occur.

Research Studies of Choral Rehearsals

R. E. Watkins (1986) examined high school choral directors' use of language and rehearsal time for two weeks prior and one week after a performance. He found that musical/technical language was used most (40.3%) and that about equal time was spent in teacher verbal behavior and student performance. As rehearsals neared the performance, teacher talk decreased and student performance increased.

Another study conducted over a series of choral rehearsals examined two teachers each directing an advanced and beginning choir as they prepared for district festival (Davis, 1993). One musical selection in each choir was observed from introduction to performance. Judges ranked the performances on a 5-point scale conforming to Florida Vocal Association Guidelines. Group ratings for all choirs rose from below IV to near I, with achievement gains occurring at similar places in the sequence of rehearsals for beginning and advanced groups under each conductor. Different rehearsal gains were measured for the two conductors. For the first conductor, percentage of time spent in reading and basic mastery of the music (Ratings IV and V) was 35%. "Refining" rehearsals, characterized by middle performance ratings (II and III) were observed for the next 56% of rehearsals and superior performance (Rating I) was observed for the final 9%. The second conductor's choirs received mid to low ratings (III, IV, V) for about 50% of rehearsals and high ratings (I, II) for the remaining 50%. It would appear that students in the second teacher's choirs spent more rehearsal time dealing with expressive, interpretive aspects of choral performance, achieving a high musical level more quickly and maintaining it over more rehearsals.

Additional general observations across the rehearsal period included a decrease in teacher verbal instruction, an increase in student rehearsal performance, a decrease in teaching sequences per minute, and decreased sequences ending with positive feedback as the choir approached performance. Information gathered across

a complete series of rehearsals from initial reading to performance has yielded interesting results.

Scope and Sequence

In discussing curriculum, instruction and material, Talmage and Eash (1979) defined curriculum as follows:

> Curriculum results from a preconceived idea or value position about the purpose of education and constitutes an educational program for fulfilling that purpose. This definition of curriculum allows for all possible value positions, which in turn will determine what content is selected and how that content is intentionally organized through learning activities as an educational program to fulfill the articulated purposes (p. 162).

In addition, Talmage and Eash (1979) state that curriculum "identifies what is taught," while instruction "encompasses planning and implementating the teaching-learning transactions" (p. 161). Instructional materials "provide the physical media through which the intents of the curriculum, mediated instructionally, are experienced" (p. 161).

In discussing choral music curriculum, Whitlock (1991) included both scope (that which is studied, taught, learned) and sequence (the order in which it is taught). The scope of a curriculum for choral music should include more than singing. Whitlock (1991) suggests the following five elements followed by a proposed sequence of implementation: (a) Vocal Technique, (b) Choral Technique, (c) Audiation/Music Reading, (d) Vocabulary/Music Fundamentals/Basic Theory, and (e) Style and History.

Within the total context of a choral music curriculum the elements proposed by Whitlock (1991) seem reasonable. However, within the context of preparing a specific choral work for performance, a different set of elements may be required. Most choral textbooks offer rehearsal techniques to deal with many musical elements including pitch, rhythm, melody, harmony, dynamics, tone quality, intonation diction, blend, balance, articulation, and many others. The majority of these are a synthesis of two or more elements in Whitlock's model. For example, articulation involves a choice based on notation (music fundamentals, reading), function (theory), context (style and history), and execution (vocal technique). Likewise work on intonation may require attention to physical adjustments (vocal technique), balance (choral technique, audiation), and harmonic/melodic context (basic theory). In addition, the examples just enumerated show the interrelatedness of the various elements and how skill acquisition of certain elements (balance) may function at times as a prerequisite for skill acquisition of other elements (intonation).

Taebel (1980) asked elementary, band and choral teachers to rank order a list of music competencies and teaching competencies in order of importance. Nine of the competencies involved aural skills, defined as an ability to detect performance errors or problems in pitch/intonation, rhythm, phrasing, tempo, expression, articulation/diction, tone quality, balance, and style. All nine competencies were ranked in the top eleven, receiving the highest mean score from choral directors. Methods to simplify and

organize conductor acquisition and implementation of these aural skills would make curricular organization easier and perhaps more effective.

Instructional sequencing, as an important aspect of curricular structure, seems supported by current practice. Bourne (1990) examined six exemplary children's choir directors and identified six common director attributes. Three attributes, identifying choristers, selecting musical literature, and expressing a philosophy of music education, can be classified as organizational attributes, which provide structure and direction to a choral organization. Three pedagogical attributes, which provide structure and direction to choral rehearsals, included the training of the child singing voice, appropriate conducting and vocal modeling, and sequencing instruction. For the exemplary directors examined in Bourne's study, sequencing instruction was an important instructional practice.

Structuring Rehearsals to Facilitate Transfer

The ability of students to apply previously learned knowledge or skills in new situations is important in music education. This gain (or loss) in capability for responding to a new task as a function of practice or experience with a previous task is known as transfer (Schmidt & Young, 1987). The transfer of motor skills has been extensively researched for the last century (Adams, 1987; Singley & Anderson, 1989). More recently, transfer has been recognized as an important area of study in need of additional analysis and development within music education (Campbell, 1991; Madsen, 1988; Sidwell, 1986)

Two categories of transfer have been recognized by researchers. The first type consists of transfers where the same level of complexity exists in a *new situation* as existed for the primary learning. This type of transfer is known as intralevel transfer (Sadek, 1985), low road transfer (Salomon & Perkins, 1989) or lateral transfer (Gagné, 1965; Singley & Anderson, 1989). The second type of transfer facilitates *new learning* at a higher level and is labeled by the previously mentioned researchers as interlevel transfer, high road transfer, or vertical transfer, respectively. This type of transfer requires the learner to abstract new knowledge from a context.

An important aspect of transfer is learning context. As knowledge or skills are learned and practiced in a variety of contexts, they become automatic and somewhat flexible. Similar stimuli can later trigger application of the knowledge or skills, but the stimuli must resemble the original stimulus close enough to fall within the "somewhat flexible" range. In other words, there must be a significant amount of overlap between the original learning context and the new context. Increased variety in the learning and practicing of skills allows them to be applied in more new contexts (Salomon & Perkins, 1989). In addition, a delayed retention effect has been documented in the study of transfer (Schroth & Lund, 1993) When feedback during learning is delayed, it lengthens the period of time required to learn a task (reach criterion), but it increases retention and the ability to transfer the learning during later opportunities. Within the parameters of the

study, the longer the delay before providing feedback, the better the transfer task was performed.

Transfer studies have also been reported in music education. Vertical transfer was observed in students trained in research when asked to use research skills in a new context (Geringer & Madsen, 1987). A series of music studies undertaken in Egypt provided examples of both vertical and lateral transfer (Sadek, 1985). Lateral transference of performance skills was examined by Duke and Pierce (1991), who found tempo to significantly affect a performer's ability to play a musical excerpt. Changes in tempo from the original resulted in more performance errors, regardless of whether the change was to a faster or slower tempo. Similar results were reported in a study of rhythm skills in instrumental music (Pierce, 1992).

A study concerning the ability of choirs to transfer knowledge in reading contemporary choral compositions reported performance differences based on the structure of each choir's training. A choir receiving structured instruction of theoretical derivations of musical problems and cross-referenced examples among the pieces being studied was judged superior in pitch accuracy, rhythm accuracy, and singing security to a choir engaged in typical rote drill of the music (Davis & Robison, 1969). The authors reported the "specific planned learning activities based upon analytically-derived problem features of the music are highly effective in building musical accuracy in the choral singers. . . . they do tend to carry over and accumulate into a transferable body of musical learning and growth." (p. 3).

An additional benefit of structuring tasks to facilitate transfer is the perceived and actual success of the learner. Perceived success affects learner motivation and desire to continue pursuit of higher levels of skill development (Duke & Pierce, 1991). Structured tasks also allow frequent correct student responses that can be reinforced specifically and contingently (Duke & Madsen, 1991; Madsen & Madsen, 1983). Task structuring is a way to become a more systematic music teacher.

Musical Performance Evaluation

In attempting to measure and rate choral performances, objective criteria are difficult to specify. Many music programs aim toward high performance standards and seek opportunities to demonstrate achievement of this goal at adjudicated festivals. Performances provide motivation for students and an evaluative tool for teachers to assess progress toward curricular goals. Performance evaluation would seem an appropriate measure of teaching effectiveness.

Evaluations of musical performance can be approached globally or based on specific performance criteria (Boyle & Radocy, 1987). Subjective judgment is inherent in measuring musical performance, and while one can attempt to structure the measurement process to enhance objectivity, "it never can be as objective as a multiple-choice test" (p.171). Likert-type scales, used in attitude measurement, can be justified if seen as a scaling of judges' attitudes toward what they are hearing. Most music festival evaluations are conducted using Likert-type scales from I

(high) to V (low). Comments reflecting judges' opinions about performance quality usually accompany the ratings.

Cooksey (1975) developed a rating scale for choral performances. Seven factors were included on the final rating scale, measuring the musical elements of diction, precision, dynamics, tone control, tempo, balance/blend and interpretation/musical effect. High interjudge reliability and criterion-related validity were reported.

Larkin (1986) constructed a five-point rating scale to measure musical achievement in choral performance. Five specific elements were rated: tone quality, intonation, rhythmic precision, expression, and balance/blend. Interjudge reliability was found to be moderately high to high.

Actual festival ratings were compared for interjudge reliability in the performances of 110 ensembles at four festivals (Burnsed, Hinkle, & King, 1985). Overall, ratings were not significantly different between three judges. However, when examining the judges' ratings for individual elements such as intonation, balance, or tone quality, the judges often disagreed. Nevertheless, the global ratings and ratings for six individual elements examined exhibit a statistically significant colinearity that implies such a close relationship as to function as a single global rating.

In a review of research on performance evaluation, Forbes (1994) looked at the issues of objectivity, validity and reliability of current evaluation methods. He suggested ensuring that performers are evaluated solely on the basis of their musical

performance by securing judges who do not know the performers or using an anonymous judging format. Furthermore, increasing the size of judging panels from three members to five would improve reliability. Using a more global approach to ratings, or creating criteria descriptors that have meaning for all judges would improve interjudge reliability and judging validity.

Robinson (1988) evaluated audiotaped choral performances using a written form with prescribed categories and a continuous response digital interface (CRDI). Nonmusicians responded differently from musicians, but overall ratings were similar. All judged tone or interpretation as the "best" performance element, but were divided in determining the "worst" performance element.

Fredrickson (1994) asked band members to evaluate themselves, their section, the band, and the director after each rehearsal in a series of band rehearsals. Band members tended to rate themselves lowest and the director highest in early rehearsals, but shifted to rating their section lowest in later rehearsals. The students were also asked to name the "best" and "worst" aspect of each rehearsal. Students tended to focus on musical elements when commenting on the "best" rehearsal aspects and nonmusical things, such as seating assignments or extraneous talking, when addressing the "worst" rehearsal aspects.

Objective measurements of choral performances are difficult to construct, but measures of attitude including Likert-scale type continuums produce reliable interjudge consistency. It may be possible to design such a scale that is more specifically connected to the choral performance curriculum.

Summary and Research Questions

The complex nature of verbal and nonverbal interaction in music rehearsals provides a challenge for training future generations of teachers. In addition to providing them with necessary musical knowledge and skills, they must also assimilate effective teaching behaviors. This can be accomplished only if these behaviors can be described, observed, practiced, and recorded.

Investigations of effective teaching behaviors have been conducted in elementary, secondary, and university classrooms. Observations have yielded descriptions of effective behaviors which can be taught to and practiced by teachers. Furthermore, effective behaviors specific to music classrooms in general and choral ensembles in particular have been identified. A direct instruction model consisting of teacher presentation of academic or social tasks, student performance or response, and appropriate teacher feedback has been reported and studied as an effective way to teach music. Called sequential patterns of instruction, students at the elementary, high school, and college level preferred complete patterns beginning with an academic task presentation and ending with specific approval over all others (Yarbrough, Price, & Bowers, 1991; Yarbrough, Price, & Hendel, 1994)

While the positive effects of teacher feedback on student attitude and attentiveness have been recorded, it is less clear whether such feedback helps improve choral performance. If it could be demonstrated that teacher feedback has a positive effect on performance achievement, this information would be important

to disseminate to current and future choral teachers. If teacher feedback has no effect or a negative effect on choral performances, researchers must continue to search for both the reasons why this is so, and what other teacher competencies positively affect choral performances. Perhaps students find the pleasure of making music a sufficient motivation when academic tasks are proactively structured and sequenced, regardless of the presence or absence of specific verbal feedback. Such a structure and sequence may also help students to transfer knowledge learned in one musical situation to a new situation that is similar. If musical elements related to style are taught in a highly structured way, students may be able to reproduce that style more quickly when presented with a similar musical passage.

Examinations of rehearsal structure and curriculum have focused on the variety of activities within a single rehearsal. Models of organization and pacing within a single rehearsal and lists of musical elements that should be addressed are readily available. The sequence of presenting and adding musical tasks across choral rehearsals has not been examined widely in music education research. The structure and sequence of musical task presentations within a series of choral rehearsals may be an important factor in effective choral music instruction. Rather than approaching rehearsals in a reactionary manner, responding to the choir's performance mistakes as they arise, a conductor may enter each rehearsal with specific, musical performance goals, sequenced appropriately with previous and future goals, thus minimizing problems before they occur.

This study attempted to provide answers to the following questions:

1. How does performance improvement of specific choral music concepts relate to structured task presentations of those concepts? Does improvement primarily occur prior to instruction, immediately after instruction, or in a subsequent rehearsal?

2. When task presentations are controlled, how does the presence or absence of teacher verbal and facial feedback, both approving and disapproving, affect choral performance achievement, student attention, and attitude?

3. How does the addition of academic musical tasks affect a choir's ability to maintain previous performance standards, attention, and attitude?

4. How does the amount of instructional time spent making task presentations for individual musical elements affect student progress toward achievement of those elements within a musical performance? Can similar performance results be expected if less time is spent in subsequent task presentations of musical elements in a similar context? Must this expectation be adjusted if subsequent presentations are delayed for two weeks?

METHOD

Subjects

Students in two select high school choral music classes (N = 60) served as subjects for this study. Each class remained intact and was randomly assigned to one of two treatment conditions (No Feedback Group, n = 29; Feedback Group, n = 31). The classes represented the best choral music classes at their schools. The same instructor (who was also the experimenter) conducted rehearsals for each treatment condition.

Selection of Music

As a vehicle to measure musical progress under the conditions being explored in this study, a set of similar musical excerpts was selected by the researcher for use by both choirs. Three excerpts of SATB choral literature were chosen based upon level of difficulty, diatonicism, and use of an English language text (see Appendix A). The excerpts contained 20 measures of 3/4 meter, 19 measures of 4/4 meter, and 28 measures of 4/4 meter, respectively, and each excerpt required between 60 and 90 seconds to perform.

Four printed versions of the first two excerpts were created for use in the experimental conditions. The first version consisted only of the notes, rests, and text for each excerpt, and contained no other editorial markings. Symbols representing additional musical elements were added cumulatively to each of three subsequent versions: the second version added editorial markings for phrase releases, staggered entrances, and marcato or staccato articulation; the third version added indications for dynamic levels

and phrasing, such as crescendo, and decrescendo; and the final version added markings for primary and secondary text stress. For the third excerpt, only two versions were created, corresponding to the first version containing only pitch, rhythm and text symbols, and the final version containing all additional editorial symbols.

Academic Musical Concepts

In order to provide matching academic instruction to both groups, a rehearsal hierarchy based on musical concepts was designed by the researcher. As pitch and rhythm form the basis for all musical performance, these musical concepts were taught first. Students developed pitch and rhythmic accuracy while using sol-fa syllables. As a choir demonstrated the ability to sing mostly correct notes, sol-fa syllables were replaced with text. After the choir could sing correct notes and text, additional musical concepts were taught.

Three additional sets of musical concepts were chosen for presentation to the ensemble after proficiency in pitches, rhythms, and words had been accomplished. The concepts represented three stages toward an artistic, musical choral performance of the excerpts. The first set of concepts concerned precision and articulation. It included the establishment of vocal entrances where individual parts entered at different times, accuracy of vocal releases including consonant placement, and changes from legato to staccato or marcato articulation. Operational definitions used for each aspect of the concept were as follows: (a) Establishment of individual entrances requires a slightly accented attack and an increase in dynamic level for the voice part that is

entering; (b) accurate vocal releases require precisely timed word endings by the entire ensemble, including the appropriate sounding of final consonants; (c) staccato articulation demands a separation of two tones by a brief silence; and (d) marcato articulation demands an energized tonal attack followed by immediate decay.

Dynamic changes both within and between phrases served as the second set of concepts. Choirs were taught to crescendo and decrescendo according to the shape of the musical phrase as indicated by dynamic markings and symbols in the score. Operational definitions of individual aspects of this concept were as follows: (a) Dynamic levels should correspond to dynamic markings in the score; (b) the climactic point(s) of each phrase will be loudest in volume; (c) a crescendo will be executed while singing notes leading up to the loudest point of a phrase; and (d) a decrescendo will be implemented while singing notes following the loudest point of a phrase.

The final set of concepts introduced primary and secondary syllabic stress. Changes in volume/weight were taught for stressed and unstressed text syllables. Operational definitions used for individual aspects of this concept were as follows: (a) Syllables receiving primary stress should receive one dynamic level more volume/weight than unstressed syllables surrounding them; (b) syllables receiving secondary stress should receive more volume/weight than unstressed syllables around them, but less than syllables receiving primary stress; and (c) unstressed syllables should be sung with the least volume/weight.

Editorial markings for each aspect of each concept were developed and placed into the score prior to the rehearsal for that concept (see Appendix B). During the introduction of each musical concept, the appropriate set of symbols was presented in the score and defined and demonstrated by the instructor. After being modeled by the instructor, choirs were allotted time for guided practice. As necessary, the instructor reminded choirs of concepts that previously had been taught and demonstrated, and reviewed academic material to help them maintain success in demonstrating any concept, including concepts used in learning correct pitches, rhythm and text. Each concept was introduced as an additional musical element to be added to elements previously taught. Similarly, score markings were cumulative, that is, once the first set of concepts had been taught, markings indicating that concept remained in subsequent versions of that score, even as the teaching of the second and third set of concepts and markings was implemented.

In addition to the specific musical concepts presented during treatment sessions, three additional musical concepts were included on the judging form used to evaluate performances. These concepts were included to make the evaluation form more comprehensive and mask the focus of the study from the judges. Intonation, defined as "chord alignment and balance, support, and tuning," was included as an additional concept to be evaluated. Tone quality, or "vowels, intensity, maturity, and blend," also was included as an concept. The third additional concept included "appropriate choice" of tempo, along with tempo "steadiness and

control," and was labeled tempo. These three concepts were not the focus of instruction during any rehearsal, but occasional instruction concerning these concepts was provided to help improve achievement toward primary musical concepts.

Experimental Environment and Equipment

Data were collected during six, 30-minute rehearsals for each choir over the course of 17 days. One session occurred on each of the first 5 consecutive days, followed by a period of 11 days before Session 6. Treatments occurred during regular rehearsal periods and in the usual rehearsal room for both ensembles. In addition to the experimental instructor, two Sony 8mm videotape cameras and media technicians were present (for a complete list of equipment see Appendix C). One video camera focused on the instructor to record verbal and nonverbal teaching behaviors. The second video camera was used to record student off-task behavior, focusing on small groups of students (5 to 10 in number) for intervals of 10 seconds alternating with intervals of 5 seconds to focus on a new group of students. Four groups of students were taped during each minute of the rehearsal, so that all ensemble members were observed several times during each rehearsal. Off-task behavior was recorded only during rehearsal portions of treatment sessions, and was not recorded during performance tests or time allotted for completion of the student attitude surveys. Regular rehearsal with the classroom teacher filled the remaining rehearsal time each day, and was not included in this study.

Research Design

The research design for this study consisted of two parts, one behavioral and one experimental. The multiple baseline design isolated changes in performance ratings of 10 music concepts which were sequentially presented across a series of rehearsals in a similar manner to all subjects. The ability of choirs to transfer previously demonstrated musical skills to new pieces of music requiring similar skills was also studied. The experimental phase explored the effects of differential reinforcement on student attention, achievement, and attitude.

Behavioral Study

Data for the initial baseline of the multiple baseline design were collected during the first two 30-minute sessions, which occurred on consecutive days. The three excerpts were rehearsed using the unedited scores, with a terminal objective of singing correct pitches, rhythms, and words. No instruction or effort toward a stylistically musical presentation of the excerpts was attempted, but the instructor pointed out musical problems that interfered with the terminal objective of the first two rehearsals. For example, if intonation was so poor that wrong notes were being performed, or if students did not know how to properly pronounce a word, the instructor provided instruction in an attempt to correct these problems and reach the objective.

The third, fourth, and fifth sessions occurred on the next three consecutive days, and used only the first two musical excerpts. During these sessions, three sets of musical concepts were cumulatively introduced, one set per session, resulting in a

multiple baseline design. Musical concepts introduced in Session 3 were accuracy and precision of entrances and releases, and choral articulation. Musical scores edited to present only this additional musical information were used during this session. Session 4 focused on the musical concepts of dynamics and phrasing, using a score which added appropriate editorial symbols for dynamics and phrasing to the symbols representing precision and articulation. Similarly, Session 5 addressed the musical concept of textual stress, cumulatively adding editorial marks to those representing previous concepts. The sixth session, taking place eleven days later, used only the third musical excerpt and included instruction for all academic musical tasks covered in Sessions 3, 4, and 5.

For both choirs, Session 1 began with a choral performance of the three excerpts, sung with the text at sight using the first version of the scores. After this recording, the instructor provided sequenced instruction to help the choir learn pitches, rhythms and words for each excerpt. This continued in Session 2, with a total of 12-15 minutes of rehearsal time across two rehearsals allotted to each piece. At the conclusion of Session 2, a second recording of the three excerpts was made.

At the beginning of Session 3, the choir recorded the first excerpt in its entirety using the unedited score. The instructor then passed out scores edited for entrances, releases, and articulation and provided scripted instruction as to the meaning of the editorial markings. Appropriate modeling and guided practice followed until the choir was able to perform the excerpt with the indicated precision and articulation, or until approximately 10

minutes had elapsed. Incorrect pitches, rhythms, and words also were corrected. The choir again recorded the excerpt in its entirety, then followed the same procedures using the second excerpt. The third excerpt was not used in Sessions 3, 4, or 5.

Sessions 4 and 5 followed the same procedure as Session 3, adding an additional musical concept and the appropriately edited score each day. The choir recorded each of the first two excerpts without stopping both before and after instruction on each day. While the focus of each session was on the new set of musical concepts, during instruction, the instructor reminded students of the concepts learned previously and the meaning of the score markings when the choir failed to perform concepts correctly.

Eleven days after Session 5, the instructor returned for the sixth and final session. A fully edited score of the third excerpt was provided and the choir was given an opportunity to look over the music briefly and remind themselves of the piece, as a full two weeks had passed since the choir had last rehearsed the piece during Session 2. The choir recorded the piece in its entirety followed by an instruction period of approximately 20 minutes. During the instruction period, the instructor reminded students of the concepts they had learned and the meaning of the editorial markings in the score, providing both modeling and opportunities for guided practice. A final tape recording of the piece concluded the treatment sessions.

Experimental Study

The experimental difference between the two choirs occurred in the area of teacher verbal/facial feedback. Nested within the

behavioral design, the experimental design allowed comparisons between the two choirs to determine the extent that teacher verbal/facial reinforcement affected the choirs' attention, achievement, and attitude. During the experiment, instructional activities for both choirs were identical except for the presence or lack of verbal/facial feedback from the instructor. The first choir, hereafter referred to as the No Feedback Group, received only structured task presentations and the opportunity to perform the music, parts one and two of a sequential pattern of instruction. No teacher verbal/facial feedback was provided. If students performed the music incorrectly, the instructor provided additional instruction by reteaching the element of the concept that was incorrect, but did not give the students specific information as to the correctness or incorrectness of their performance. While the students may have regarded the reteaching of an element as an indication of teacher feedback, specifically disapproval, no overt verbal or facial behaviors were used by the instructor to indicate either approval or disapproval. In the second choir, hereafter referred to as the Feedback Group, the instructor provided specific verbal feedback and appropriate facial affect after student performances, the third part of a sequential pattern, with an 80-20 ratio between approvals for correct performance and disapprovals for incorrect performance. This ratio is recommended in previous research as appropriate to maintain a positive classroom learning environment (Bennett & Adams, 1967; Forsythe, 1975; Kuhn, 1975; Madsen & Alley, 1979). An observer monitored the conductor in

Treatment B to provide immediate feedback concerning the number of approvals and disapprovals verbalized by the conductor.

While acknowledging that some other nonverbal forms of teacher feedback may have occurred in both treatment groups, at best this feedback was nonspecific, that is, vague as to what element of the musical performance was targeted by the approval or disapproval. In an attempt to control nonverbal feedback, the instructor maintained a balance of nonverbal feedback between the two groups, specifically with regard to eye contact and time spent in student performance of musical tasks. In addition, the instructor attempted to use approving and disapproving facial affect in conjunction with verbal approvals and disapprovals to reinforce student performance in the treatment group receiving reinforcement, maintaining a neutral facial expression at other times and with the other treatment group.

Measurement Procedures for Control Variables

Teacher Nonverbal Behavior

Two measures of teacher nonverbal behavior were observed from the conductor videotapes. Using a portion of the Music Conductor Observation Form (Madsen & Yarbrough, 1980, p.61-63), teacher eye contact and facial expression were observed for 10-second intervals, and recorded during subsequent 5-second intervals according to criteria in the operational definitions of Figure 1. For instructor eye contact, each 10-second observation period was labeled as either maintaining eye contact with the group or not maintaining eye contact. For instructor facial expression, each 10-second observation period could contain either

neutral expression, approval, disapproval, or both approval and disapproval. Categories for eye contact and facial expression were summed and percentages calculated for comparison between treatment conditions and across sessions.

Eye Contact

G - Conductor looked at entire group, section, or individual in the group for at least three continuous seconds.

O - Conductor looked at music, piano or something other than the group, section, or individuals. Mark "O" only if it occurs for the entire interval

Facial Expression

A - Conductor's face expresses approval by smiling, grinning, raising eyebrows, winking, opening and widening eyes, nodding head up and down.

D - Conductor's face expresses disapproval by frowning, knitting eyebrows, looking at ceiling, smirking, wrinkling mouth, squinting eyes, wrinkling forehead or nose, puckering lips, grimacing, tightening jaw or lips, twisting side of mouth, raising lips.

N - Conductor's face is neutral mask. No expressions which can be interpreted as approval/disapproval. No frowns, smiles, etc. Mark "N" only if expression is neutral for the entire interval.

Figure 1. Operational Definitions for Eye Contact and Facial Expression

Rehearsal Time

For each component of the sequential pattern model (task presentation, student response, teacher feedback) as well as the various sub-categories of each component, the amount of time spent (measured in seconds) was calculated by maintaining a continuous time log of videotaped sessions. Both actual time spent and the percentage of time spent in each component of sequential patterns was compared across sessions and between treatment conditions.

Measurement Procedures for Independent Variables

Verbatim typescripts of each rehearsal were created. All verbal interactions and student performance intervals were coded according to the operational definitions listed in Figures 2, 3, and 4. Total instructional time as well as each category and sub-category of sequential pattern components was timed. Frequency of individual pattern components and various sub-categories within each component, as well as ratios of complete/incomplete patterns, approval/disapproval and specific/nonspecific feedback were compared across rehearsals and between treatment conditions. The amount of instructional time used by each treatment group was totaled by session and musical excerpt. Percentage of instructional time spent in instructor academic task presentations, instructor directions, student performance and instructor feedback was calculated. Instructor task presentations and feedback were coded according to the musical concept being taught, and the percentage of time spent in instruction for each concept was calculated.

Sequential Pattern Components

Teacher Presentations (1)

1a - academic musical task presentation (talking or asking questions about musical elements, modeling)
1d - direction (giving directions regarding who is to sing, where singing will begin, counting beats, indicating how to sit/stand)
1s - social task (presenting rules of behavior)
1o - off-task statement (unnecessary and irrelevant comments such as talking to oneself)

Student Responses (2)

2p - performance (entire ensemble, sections, or individuals performing: including singing, chanting, speaking in rhythm, clapping, sight reading)
2v - verbal (ensemble members asking or answering a question or making a statement)
2nv- nonverbal (ensemble members nodding heads, raising hands, passing music or listening)
2o - off-task (ensemble members making noise, missing performances)

Reinforcement (3)

3n - neutral verbal response containing vague or no musical or social information
3a - verbal academic or social approval (positive statement about student performance or social behavior)
3d - verbal academic or social disapproval (negative statement about student performance or social behavior)

specific - exact feedback containing musical/social information
nonspecific - vague feedback containing no musical/social information

(Yarbrough & Price, 1989)

Figure 2. Operational Definitions for Components of Sequential Patterns of Instruction

Basic and Extended Complete Sequential Patterns

Complete Patterns:1 - 2 - 3
Teacher Presentation of Task (1), Student Response (2), Teacher Reinforcement (3)

Basic Complete Pattern: 1 - 2 - 3

Simple Extended Patterns: One to three 1 - 2's ending in 1 - 2 - 3

- Single Delayed Pattern: 1-2; 1-2-3
- Double Delayed Pattern: 1-2; 1-2; 1-2-3
- Triple Delayed Pattern: 1-2; 1-2; 1-2; 1-2-3

Complex Extended Patterns: Four or more 1 - 2's ending in 1 - 2 - 3

- Extended Commentary: Following an academic or directive presentation (1), students perform, listen, and/or practice (2) simultaneously with continuous teacher guidance or commentary that culminates in reinforcement (3).
- Extended Drill: Fast-paced academic or directive presentation (1), alternates with student responses (2) that concludes with teacher reinforcement (3).
- Extended Varied Delay: Following academic or directive presentation (1), and students' verbal responses (2), reinforcement (3) is delayed to allow for more accurate and/or thorough student responses.

(Yarbrough & Price, 1989; Hendel, 1994)

Figure 3. Operational Definitions for Complete Sequential Patterns of Instruction

Basic and Extended Incomplete Sequential Patterns

Incomplete Patterns: 1 - 2

Teacher Presentations of Task (1), Student Response (2), NO Reinforcement (3)

Basic Incomplete Pattern: 1 - 2

Related Patterns:	Content of teacher presentation (1) and student response is related.
Preparatory Steps:	A series of alternating teacher presentations (1) and student responses (2) occurring at the outset of an activity that requires no formal reinforcement (3).
Rapid Drill:	Fast-paced academic or directive presentation (1) alternates with student responses (2) omitting a culminating reinforcement (3).
Isolated Patterns:	Teacher presentation (1) or reinforcement (3) that responds to student input (2) but is remotely or unrelated to primary instruction.
Opening Steps:	A brief series of alternating teacher presentations (1) and student responses (2) that begin the class period, frequently relating to management and do not require reinforcement (3).
Transition Steps:	A series of alternating teacher presentations (1) and student responses (2) in which one activity concludes and another is initiated, neither set of components includes reinforcement (3).
Inverted Steps:	A two-step, interruptive procedure that combines reinforcement (3) and student responses (2), thus eliminating the presentation (1).
Closing Steps:	A brief series of alternating teacher presentations (1) and student responses (2) that end the class period, and frequently do not require reinforcement (3).

(Yarbrough & Price, 1989; Hendel, 1994)

Figure 4. Operational Definitions for Incomplete Sequential Patterns of Instruction

Measurement Procedures for Dependent Variables

Attentiveness

Student off-task behavior was recorded using the videotapes focused on the choir subjects. A running clock was simultaneously recorded on the videotapes to synchronize observations from this recording with the videotape recording of the instructor. Observations of student attentiveness were time sampled with 10-second "observe" intervals followed by 5-second "record" intervals. Student on/off-task was defined according to the operational definitions listed in Figure 5.

On-task: Active - When student is supposed to be singing/ performing he or she must be singing/ performing and looking at the music or teacher.

Passive - When student is not supposed to be singing/performing he or she must be quiet and looking at either music, teacher, or chorus members who are singing/performing.

Other - Student must follow instructions given by teacher.

Off-task: Observably not on-task

(from Madsen & Yarbrough, 1980, p. 56)

Figure 5. Operational Definitions for On-Task and Off-Task Behavior

Using portions of the Choral Rehearsal Observation Form (Madsen & Yarbrough, 1980, p. 55-60), observers counted the total number of students in view and the number observably off-task for each 10-second "observe" interval. Within each rehearsal, the total number of students observed off-task was divided by the total number of students observed, resulting in a percentage of students off-task. Percentages were compared across sessions and between treatment conditions.

Musical Achievement Ratings

The audio portion of choral performance tests from the videotapes was recorded onto digital audio tape. Performances preserved on this digital master were randomized and transferred to regular analog audio cassette tapes for subsequent judgment of musical achievement.

A panel of three expert judges was selected to assign musical performance ratings for recorded choral performances. Judges averaged more than 20 years of public school choral teaching experience, and averaged more than 15 years of experience teaching high school choirs. All three judges had completed a master's degree, although one of the degrees was awarded in counseling. Additional qualifications and similarities among judges included current membership in the Texas Music Adjudicators Association, serving as adjudicators for three different regional University Interscholastic League choral festivals in the last two years, conducting all-region choirs at the high school level within the last two years, serving as a choral clinician for at least three different choral programs in the last

two years, and conducting choirs in performance at state and national music conventions.

For each treatment group, the first two musical excerpts were recorded eight times each, while the third excerpt was recorded four times. Judges independently evaluated audiotaped recordings of the 20 performance tests recorded in each rehearsal condition, a total of 40 recorded performances. Performances were played in random order, with judges viewing the first version of the scores, containing only pitches, rhythms, and text, for each excerpt. A ten-point rating scale for each of the following musical concepts was used by the judges: pitch accuracy, rhythmic accuracy, intonation, tone quality, diction, text stress, articulation, dynamics, phrasing, and tempo. An additional rating for overall performance using a one hundred-point scale was made, divided into twenty-point sections representing the standard contest ratings of poor, fair, good, excellent, and superior (see Appendix D).

In order to identify the 20 recordings made of each choir according to its function in the research design, the following labels were devised. The first recorded performances occurred during Session 1 when students sightread through each excerpt. Thereafter, these performances were labeled as Sightreading. After working on pitches, rhythms, and text during Sessions 1 and 2, the three excerpts were recorded again, henceforth called Treatment Pretests. Performance tests, recorded before and after the rehearsal of each of the first two excerpts in Session 3 were labeled Pretreatment 1 and Posttreatment 1 for both excerpts,

respectively. Session 4 performance tests were sequentially labeled Pretreatment 2 and Posttreatment 2 for both excerpts, while performance tests recorded before instruction in Session 5 were labeled Pretreatment 3 for both excerpts. Performance tests recorded after instruction in Session 5 were the final recordings made for the first two excerpts, and were labeled Treatment Posttests. Before and after performance tests of the third excerpt during Session 6, which occurred after a delay of 11 days, were labeled Transfer Pretest and Transfer Posttest, respectively.

Attitude Assessment

To measure student attitudes, a scale adapted by Price (1983) from the Attitude Survey for Performance Groups (Madsen & Yarbrough, 1980, p. 143) was administered to the choirs after each treatment session (see Appendix E). Student attitudes toward their own participation, the music, the rehearsal, and the conductor/teacher were obtained. Modeled after Fredrickson (1994), this survey also included free response questions as to the best and worst aspects of each rehearsal.

Student responses to the attitude scales were averaged for comparison between treatment conditions and across sessions. The free responses provided for the best and worst aspects of rehearsals were categorized as related to "musical" issues, or "nonmusical" issues. Comparisons of the rátio of musical to nonmusical responses were made between treatments. Additionally, responses were separately categorized according to their focus into one of eight areas: music, student performance, conductor, rehearsal activities, other students, self, treatment

conditions, or unknown/other. Response frequencies for the eight categories were compared between treatments.

Reliability

A trained independent observer viewed 25% of the videotapes and recorded independent observations of student off-task frequency, teacher eye contact and facial expression. Observer reliability for behavioral observations was calculated by dividing the total number of agreements by agreements plus disagreements (Madsen & Madsen, 1983). Average reliability for student off-task was .90, with a range of .89 to .92; average reliability for instructor eye contact was .88, with a range of .87 to .89; and average reliability for instructor facial expression was .84, with a range of .79 to .86.

A second trained observer coded teacher/student verbal interactions according to sequential patterns of instruction for 25% of the verbatim typescripts. Reliability for the sample was 1.00. An independent rater categorized student responses to the free-response questions of the attitude survey for 25% of the surveys. Reliability for musical/nonmusical categories was .89 for the sample. Reliability for eight response focus areas was .81 for the sample.

Interjudge reliability (agreement) for the music performance ratings was tested for each treatment using a Kendall coefficient of concordance. Table 1 shows the results of an analysis of the two treatments by comparing the 20 performance scores for each treatment by each judge. Also, analysis of the treatment groups combined was undertaken to insure reliability for the behavioral

aspect of the study. A significant concordance (alpha level = .05) among judges performance ratings was found to exist for performance ratings analyzed by treatment and in combination.

Table 1

Kendall Coefficient of Concordance Summary for Music Performance Scores

Treatment	s	W	df	Chi Square
No Feedback	5046.50	.85	19	48.45**
Feedback	4115.00	.69	19	39.33*
Combined	37669.00	.79	39	92.43**

*p < .01 **p < .001

RESULTS

The purpose of this study was to observe performance improvement of 10 choral music concepts after sequential, structured task presentations across a series of choral rehearsals. In addition, the study was designed to determine the effects of teacher reinforcement on student attentiveness, performance achievement and attitude. At the completion of this study, six hours of videotape recordings of choral rehearsals using two different choirs had been made. Each choir rehearsed for 30-minute sessions on five consecutive days, with a sixth 30-minute session occurring eleven days later.

Behavioral Study

Individual Musical Concepts

The purpose of the behavioral component of this study was to examine the effect of structured task presentations of musical concepts across a series of choral rehearsals. During the first two treatment sessions, the choirs attempted to learn correct pitches, rhythms, and words for three similar pieces of choral music. Labeled pitch accuracy, rhythm accuracy, and diction, respectively, these concepts were the focus of Sessions 1 and 2, and served as musical prerequisites for treatment concepts presented in subsequent sessions. Each choir was recorded performing a Sightreading pretest before Session 1 and a Treatment Pretest following Session 2 to establish baseline data.

The focus of structured task presentations in Session 3 was on accurate entrances, releases and articulation. These concepts were measured in the categories for rhythm accuracy and

articulation. During Session 3, only the first two excerpts were rehearsed. Each excerpt was recorded both before and after treatment, labeled Pretreatment 1 and Posttreatment 1, respectively. Session 4 followed the same format as Session 3, but focused on the concepts of dynamics and phrasing in the two excerpts. Performance tests labeled Pretreatment 2 and Posttreatment 2 were recorded for each excerpt during Session 4. Similarly, Session 5 added the concept of word stress during instruction for the two excerpts. As this was the final rehearsal on these two excerpts, the performance tests were labeled Pretreatment 3 and Treatment Posttest. Once a musical concept had been sequentially introduced during instruction, the choir was expected to continue demonstrating that concept in subsequent sessions, and could receive further instruction as needed. Eight performance tests of each choir were recorded for each of the first two musical excerpts in each treatment group. Session 6 used only the third excerpt, and included instruction in all seven musical concepts presented during Sessions 3, 4, and 5.

Session 6 occurred eleven days after Session 5, and provided a means to observe the ability of students to transfer previously learned concepts into a new context. Consequently, performance tests for Session 6 were labeled Transfer Pretest and Transfer Posttest. Combined with the Sightreading and Treatment Pretest recordings made in Sessions 1 and 2, a total of four performance tests of each choir were recorded for the third excerpt.

Performance of three additional music concepts was rated by the judges. These concepts were included to make the judging form

more comprehensive and obscure the focus of the study from the judges. Instruction was provided for these concepts briefly and only when needed. Only 6.5% of total instructional time was used teaching these three concepts combined.

Videotapes of all sessions were analyzed to document whether treatment concepts were presented as intended. Verbatim typescripts were created of each rehearsal to identify the musical concept taught during teacher task presentations and feedback. Instructional time spent teaching and rehearsing the ten musical concepts being evaluated was measured and converted to percentages.

To evaluate performance achievement for the 10 musical concepts, a panel of three expert judges independently listened to and evaluated audiotape recordings of 40 performance tests made during six treatment sessions using an investigator designed Performance Judging Form (see Appendix D). Each individual concept was evaluated on a scale from 1-10 for each performance test, with the three judges' scores subsequently being averaged. For the Sightreading and Treatment Pretest, mean results for all three musical excerpts were averaged. For performance tests during Sessions 3, 4, and 5, only the mean results for the two excerpts being rehearsed were averaged. The Transfer Pretest and Posttest reflect the mean results recorded for the third excerpt, which was the only excerpt rehearsed during Session 6. The pretest/posttest multiple baseline design allowed for tracking improvement of individual musical concepts across rehearsal sessions.

Treatment

In order to document that academic musical concepts were presented as intended, the percentage of instructional time devoted to each concept was calculated. Typescripts of academic teaching were coded according to the 10 musical concepts being rated and timed. To establish the similarity of academic concept instruction, the percentage of instructional time spent for individual concepts by musical excerpt was calculated for each choir. These percentages are presented in Table 2.

Table 2

Percentage of Instructional Time Spent for Individual Musical Concepts by Choir by Excerpt

	Choir A			Choir B		
Musical Concept	Ex. 1	Ex. 2	Ex. 3	Ex. 1	Ex. 2	Ex. 3
Pitch Accuracy	21.32	18.29	35.72	21.90	16.37	12.74
Rhythm Accuracy	25.47	29.84	32.73	20.71	37.87	47.23
Diction	1.63	1.20	1.04	0.59	1.20	2.10
Articulation	20.51	13.64	5.48	19.27	9.56	8.55
Dynamics	12.74	11.99	12.39	12.82	11.59	11.10
Phrasing	7.23	11.24	4.30	5.35	8.60	6.60
Word Stress	5.51	11.24	5.08	9.59	7.41	6.60
Intonation	0.00	0.00	2.22	0.00	1.43	2.25
Tone Quality	3.88	1.20	0.26	4.58	2.03	1.35
Tempo	1.72	1.35	0.78	5.18	3.94	1.50

Since pitch accuracy and rhythm accuracy were the primary focus of the first two rehearsals and continued to be worked on in all sessions, it is not surprising that roughly half of instructional time was spent on these concepts for all excerpts. Since all excerpts were in English, very little instruction concerning diction was required during the sessions. The other focus concepts, articulation, dynamics, phrasing, and word stress, varied across excerpts within a range from 4.30% to 20.51%, with a mean of 11.80%. Each of the musical concepts not included as part of the structured task presentations, intonation, tone quality, and tempo, received an average of 1.87% of instructional time. Only in teaching pitch and rhythm accuracy for the third excerpt are percentage differences between choirs greater than 10%. The majority of instruction was clearly focused on the intended musical concepts in nearly similar proportions for both choirs.

The implementation of the musical concepts across sessions was also examined to insure their sequential presentation as designed. Except for a few brief encouragements to sing out (dynamics) during the first few rehearsals, each of the seven focus concepts was introduced during the appropriate session. Once introduced, inclusion of an concept during instruction was permitted in any subsequent session, but the focus of each session remained on the new concepts being added. Instruction for Sessions 1 and 2 was focused on the concepts of pitch accuracy, rhythm accuracy, and diction. In Session 3, additional aspects of rhythm accuracy and articulation were introduced. Dynamics and phrasing were the focus of Session 4, while attention was directed toward

word stress during Session 5. After a delay of 11 days, the third musical excerpt was reintroduced during Session 6. Instruction of all musical concepts was permitted during Session 6, to see if concepts that had been previously taught could be reviewed and demonstrated more rapidly in a subsequent similar situation.

It might be expected that the cumulative nature of concept presentation would affect the amount of instructional focus, or weight of focus, given to a concept. For example, the concept of rhythm accuracy was a primary focus for the first three sessions, and could also be addressed in subsequent sessions, while word stress was not an instructional focus until Session 5. While word stress should have been the primary focus of Session 5, the fact that so many other concepts had been presented and were "fair game" by this time may have served to lessen the weight of focus accorded to word stress in comparison with previously presented concepts.

Table 3 indicates the percentage of time devoted to each concept by session for both choirs. Percentages in boldface type indicate the primary musical concepts presented during that session. Dashes represent concepts receiving no instruction. Sessions 1 and 2 included rehearsal of all three excerpts. Sessions 3, 4, and 5 used the first two excerpts only, and Session 6 was restricted to excerpt three. As is clearly shown by the table, the majority of time in each session was spent on focus concepts, with the exception of Session 5. However, Session 5 was also the final rehearsal before the Treatment Posttest and therefore provided the last opportunity for instruction of all musical concepts. In spite of

Table 3

Percentage of Instructional Time Devoted to Individual Musical Concepts by Session by Choir

Musical Concept by Choir	Session					
	1	2	3	4	5	6
Pitch Accuracy						
Choir A	**77.10**	**75.06**	4.30	5.23	6.07	10.77
Choir B	**62.60**	**55.18**	3.90	1.47	6.49	1.38
Rhythm Accuracy						
Choir A	**16.79**	**19.01**	**45.49**	19.72	17.08	44.23
Choir B	**27.48**	**35.26**	**48.99**	10.57	7.21	50.59
Diction						
Choir A	**4.96**	**4.20**	-	-	.90	-
Choir B	**3.05**	**3.38**	-	-	-	1.58
Articulation						
Choir A	-	-	**42.01**	14.49	11.69	8.08
Choir B	-	-	**42.28**	8.85	-	11.27
Dynamics						
Choir A	-	-	4.92	**29.93**	15.96	18.27
Choir B	5.34	1.80	2.34	**44.96**	10.58	11.46
Phrasing						
Choir A	-	-	-	**26.60**	9.66	6.35
Choir B	-	-	-	**17.45**	15.39	8.70
Word Stress						
Choir A	-	-	-	-	**30.56**	7.50
Choir B	-	-	-	-	**42.07**	8.70
Intonation						
Choir A	-	-	-	-	-	3.27
Choir B	-	-	-	-	2.89	2.96
Tone Quality						
Choir A	1.15	.74	1.43	.48	8.09	.39
Choir B	1.53	3.38	2.50	5.16	4.09	1.38
Tempo						
Choir A	-	.99	1.84	3.56	-	1.15
Choir B	-	-	-	11.55	11.30	1.98

this, the focus concept for Session 5, word stress, still received the highest percentage of instructional time in comparison to other concepts. Session 6 did not have a specific focus concept, so primary emphasis was directed to the first seven concepts.

Academic information about the musical concepts of the excerpts was also included in certain teacher "hustles." Since these short instructor verbal behaviors occurred simultaneously with student performance, they were not coded or timed as academic task presentations. Nevertheless, they may have added to the amount of instruction provided for each of the musical concepts. Labeled according to the concept being addressed, frequency counts of "hustles" across treatment sessions are summarized in Table 4.

It can be noted that no "hustles" were included during a session prior to being the primary focus of a session. "Hustles" concerning articulation did not occur until Session 3, where articulation was the primary focus. Similarly, "hustles" directed toward the concepts of dynamics and phrasing did not occur until Session 4, and word stress "hustles" occurred only in Session 5. While it is unclear whether "hustles" affected student performance in this study, "hustles" were used in a manner consistent with the sequential presentation of musical concepts.

The focus of the behavioral design was to evaluate student performance improvement of musical concepts over a series of choral rehearsals. Efforts to implement structured task presentations equally for both choirs has been documented

Table 4

Frequency of Instructional "Hustles" Devoted to Individual Musical Concepts by Session

Musical Concepts	Session					
	1	2	3	4	5	6
Pitch Accuracy	5	14	1	-	1	3
Rhythm Accuracy	8	16	36	7	4	33
Diction	-	-	-	-	-	-
Articulation	-	-	5	-	3	1
Dynamics	-	-	-	6	4	6
Phrasing	-	-	-	3	5	10
Word Stress	-	-	-	-	7	-
Intonation	-	1	-	-	-	-
Tone Quality	-	-	-	-	-	-
Tempo	-	-	-	-	-	-

according to the percentage of time allocated to individual concepts by excerpt and by session, and frequency of other instructional speech. Further analysis of student performance improvement combined ratings of the two choirs in order to examine improvement in concept performance.

Musical Concept Improvement

Mean judges' ratings for 10 musical concepts were collected for three musical excerpts across a series of performance tests. These tests were recorded and labeled according to the legend

presented in Figure 6. As can be seen, concept performance ratings represented mean judges' ratings for between one and three musical excerpts.

Test #	Test Label	Excerpt	When Recorded
1	Sightreading	1,2,3	Before Session 1
2	Treatment Pretest	1,2,3	After Session 2
3	Pretreatment 1	1,2	Before treatment Session 3
4	Posttreatment 1	1,2	After treatment Session 3
5	Pretreatment 2	1,2	Before treatment Session 4
6	Posttreatment 2	1,2	After treatment Session 4
7	Pretreatment 3	1,2	Before treatment Session 5
8	Treatment Posttest	1,2	After treatment Session 5
9	Transfer Pretest	3	Before Session 6
10	Transfer Posttest	3	After Session 6

Figure 6. Performance Test Legend

Judges' mean scores for individual musical concepts were subjected to graphical analysis for presentation. Figure 7 is a multiple baseline graph showing performance scores for all 10 musical concepts. Concepts targeted for structured academic task presentations are shown using solid black markers; non-targeted concepts are shown using clear markers. A dashed line represents implementation of treatment for certain targeted concepts. A

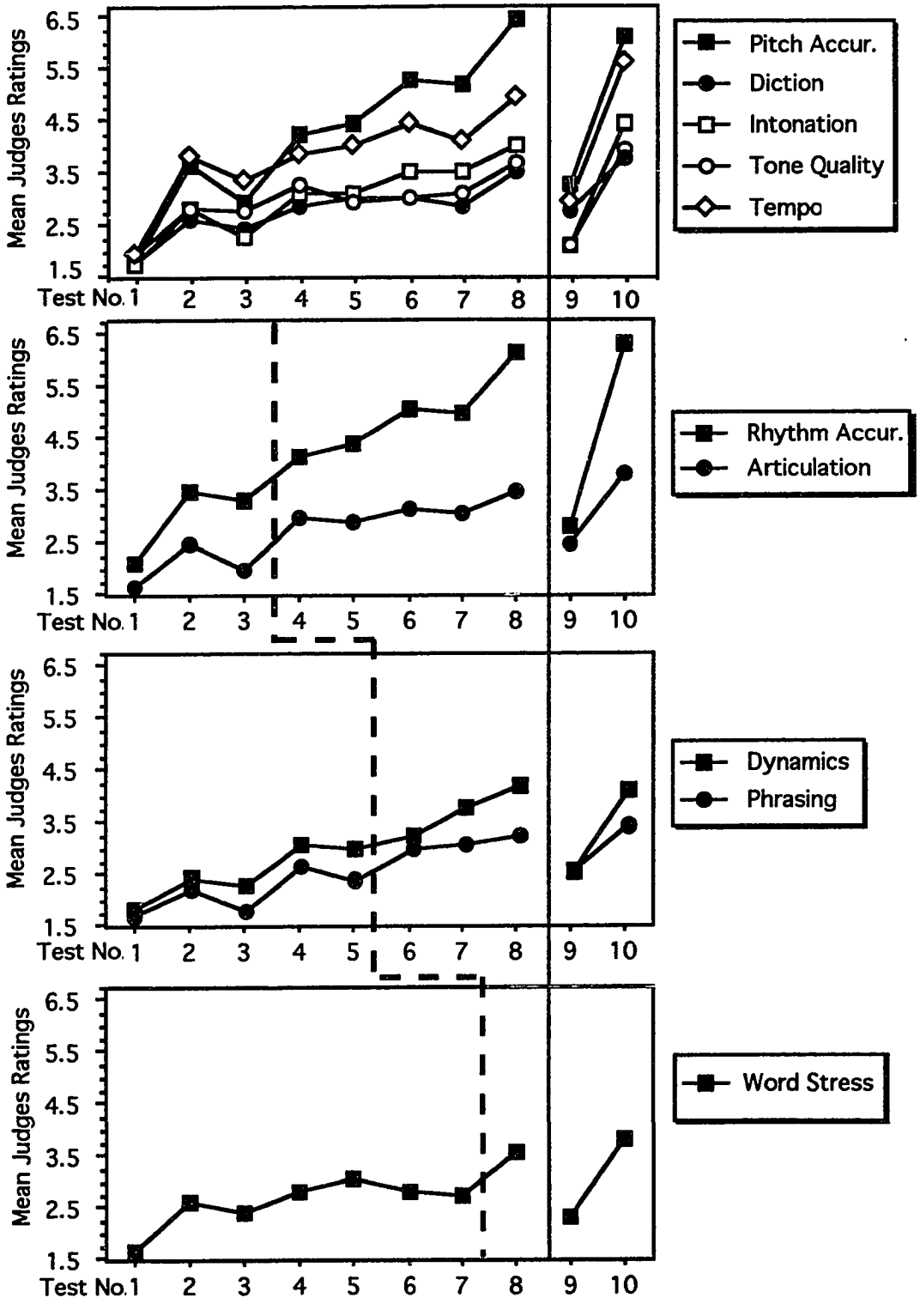

Figure 7. Multiple Baseline Graph of Individual Musical Concepts

solid line indicates the eleven day period between the Treatment Posttest in Session 5 and the Transfer Pretest in Session 6.

The seven music concepts targeted for structured task presentations during the study showed steady, if not always dramatic, improvement across the first eight performance tests. Only between the Treatment Pretest (Test 2) and Pretreatment 1 (Test 3) were markedly lower mean scores recorded for concepts. Small declines were recorded between Posttreatment 1 (Test 4) and Pretreatment 2 (Test 5) for the concepts articulation, dynamics, and phrasing, and between Pretreatment 2 (Test 5) and Posttreatment 2 (Test 6) for word stress. Between Posttreatment 2 (Test 6) and Pretreatment 3 (Test 7) small declines were recorded for pitch and rhythm accuracy, diction, articulation, and word stress. Ratings for pitch and rhythm accuracy demonstrated the most dramatic gain across all performance tests, with the non-targeted concept of tempo also improving noticeably. All other concepts showed similar amounts of total gain.

It was expected that targeted concepts for Sessions 3, 4, and 5 would show dramatic improvement immediately after instruction. The implementation of structured task presentations for targeted concepts was represented by crossing the dashed line in Figure 7. Ratings for all targeted concepts declined for the performance tests immediately preceding the beginning of task presentations, then showed marked improvement immediately after treatment.

Results for the Transfer Pretest (Test 9) include ratings only for the third musical excerpt, which had not been rehearsed or

tested since the Treatment Pretest (Test 2). While mean ratings declined for most concepts when comparing Test 2 and Test 9, scores on the Transfer Posttest (Test 10) indicated students were able to equal or surpass final mean ratings achieved for the other two excerpts (Test 8) with only a single session of rehearsal.

Overall Performance Gain

Mean judges' ratings for each concept within each excerpt across all performance tests is presented in Table 5. The sum total of the 10 concept ratings is also included to provide a measure of overall performance improvement. Although Sum Total ratings for Sightreading (Test 1) showed some disparity between excerpts (from 14.66 to 21.33), by the Treatment Pretest (Test 2), performances of all three excerpts were judged to be quite similar (from 27.83 to 31.83). By the Treatment Posttest (Test 8), the second excerpt was rated higher than the first excerpt. For the Transfer Posttest (Test 10), the third excerpt received a final rating approaching the final rating given to the second excerpt.

Since instruction and practice were expected to improve the performance of targeted concepts, positive gains in concept ratings were expected when examining changes in ratings between two performance tests *within* an instructional session. Time between sessions was expected to negatively affect performance of targeted concepts, so declines in concept ratings were expected when examining changes in ratings for two tests administered *between* instructional sessions. Therefore, rating changes within instructional sessions were an indication of learning, whereas rating changes between sessions were an indication of retention.

Table 5

Total and Individual Concept Performance Ratings by Test Within Sessions

Concept by Excerpt	Session 1-2		Session 3		Session 4		Session 5		Session 6	
	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Test 7	Test 8	Test 9	Test 10
Sum Total 1	14.66	28.00	24.33	21.00	31.33	28.17	29.67	40.33	-	-
Sum Total 2	19.00	27.83	27.50	35.00	35.83	39.00	43.67	46.50	-	-
Sum Total 3	21.33	31.83	-	-	-	-	-	-	26.17	45.50
Pitch Acc. 1	1.33	3.83	3.00	3.55	4.33	4.83	4.17	6.00	-	-
Pitch Acc. 2	1.83	3.00	3.00	5.00	4.83	5.83	6.33	7.00	-	-
Pitch Acc. 3	2.33	4.33	-	-	-	-	-	-	3.33	6.17
Diction 1	1.50	2.33	2.33	2.83	2.83	3.00	2.50	3.50	-	-
Diction 2	1.83	2.67	2.67	3.00	3.33	3.17	3.33	3.67	-	-
Diction 3	2.17	3.00	-	-	-	-	-	-	2.50	3.83
Rhythm Acc. 1	1.33	3.00	2.83	4.00	4.50	4.33	4.17	5.83	-	-
Rhythm Acc. 2	2.17	3.50	3.83	4.33	4.33	5.83	5.83	6.50	-	-
Rhythm Acc. 3	2.83	4.00	-	-	-	-	-	-	2.83	6.33
Articulation 1	1.33	2.50	1.83	2.83	2.50	3.00	2.50	3.00	-	-
Articulation 2	2.00	2.33	2.17	3.17	3.33	3.33	3.67	4.00	-	-
Articulation 3	1.67	2.67	-	-	-	-	-	-	2.33	3.83
Dynamics 1	1.50	2.33	2.00	3.17	2.50	3.17	2.83	3.33	-	-
Dynamics 2	2.00	2.33	2.50	2.83	3.33	3.17	4.50	4.83	-	-
Dynamics 3	1.83	2.50	-	-	-	-	-	-	2.17	4.00

(table con'd.)

Concept by Excerpt	Session 1-2		Session 3		Session 4		Session 5		Session 6	
	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Test 7	Test 8	Test 9	Test 10
Phrasing 1	1.33	2.00	1.67	2.50	2.00	3.00	2.33	3.00	-	-
Phrasing 2	1.83	2.00	1.83	2.67	2.67	2.83	3.67	3.33	-	-
Phrasing 3	1.83	2.50	-	-	-	-	-	-	2.17	3.33
Word Stress 1	1.33	2.50	2.33	2.83	3.00	2.83	2.33	3.67	-	-
Word Stress 2	1.67	2.67	2.50	2.83	3.17	2.83	3.17	3.50	-	-
Word Stress 3	2.00	2.67	-	-	-	-	-	-	2.50	3.83
Intonation 1	1.33	2.67	2.00	3.00	3.00	3.17	3.00	4.00	-	-
Intonation 2	2.00	2.83	2.67	3.33	3.33	4.00	4.17	4.17	-	-
Intonation 3	2.00	3.17	-	-	-	-	-	-	2.83	4.50
Tone Quality 1	1.83	2.83	2.67	3.17	2.67	3.00	2.50	3.50	-	-
Tone Quality 2	2.00	2.67	3.00	3.50	3.33	3.17	3.83	4.00	-	-
Tone Quality 3	2.17	3.17	-	-	-	-	-	-	2.50	4.00
Tempo 1	1.83	4.00	3.67	3.50	4.00	4.50	3.33	4.50	-	-
Tempo 2	1.67	3.83	3.17	4.33	4.17	4.50	5.00	4.50	-	-
Tempo 3	2.50	3.83	-	-	-	-	-	-	3.00	5.67

Table 6 presents the frequency of gains and declines in individual concept ratings for the three excerpts both within and between sessions.

Table 6

Frequency of Rating Gain/Loss Within and Between Sessions by Excerpt

Excerpt	Rating Increase (Gain)	Rating Unchanged	Rating Decrease (Loss)
Excerpt 1			
Within Sessions	37	0	3
Between Sessions	4	3	23
Excerpt 2			
Within Sessions	32	2	6
Between Sessions	16	6	8
Excerpt 3			
Within Sessions	20	0	0
Between Sessions	0	0	10

Interestingly, while the first two excerpts had similar numbers of gains and losses for Within Session rating changes, the second excerpt also recorded rating increases for the majority of Between Session rating changes. For the first excerpt, tests that preceded a treatment session were almost always lower than the previous session's posttest. The third excerpt, which had a delay

of 15 days between sessions, showed expected gains and losses in rating changes.

In summary, whereas the amount of rating gain (or loss) fluctuated greatly for the first excerpt across sessions, the second excerpt showed smaller gains within sessions, but had less score decline between sessions, often posting a gain. These gains may have demonstrated the ability of students to transfer knowledge they learned while singing in one context (the first excerpt) to a new context (the second excerpt), prior to receiving instruction in the new context.

Relationship of Teaching Time to Test Gain

Table 7 presents a breakdown of teaching time in seconds for each individual concept within each excerpt. Cells, containing instructional time spent teaching one musical concept over one instructional session, have been bordered for ease of discussion.

To examine teaching time for the first two excerpts, which were taught during the same five sessions, the number of seconds of instruction was compared for each concept by session. The first excerpt received the greater amount of teaching time in 21 cells, while the second excerpt received the greater amount of teaching time in 8 cells. There were 11 cells in which no teaching time was recorded for either excerpt.

During the first instructional session (Session 1-2), the third excerpt received less or equal teaching time than either of the other excerpts for diction, rhythm accuracy, and tone quality, and more teaching time than either of the other excerpts for dynamics. For pitch accuracy, the third excerpt received less teaching time

Table 7

Seconds of Instructional Time Spent Teaching Individual Concepts and Treatment Pretest to Posttest Ratings Gain by Excerpt by Session

Concept by Excerpt	Session 1-2	Session 3	Session 4	Session 5	Session 6	Total	Ratings Gain
Pitch Acc. 1	394	26	22	52	-	494	2.17
Pitch Acc. 2	231	20	6	2	-	259	4.00
Pitch Acc. 3	390	-	-	-	63	453	1.83
Diction 1	21	0	0	4	-	25	1.17
Diction 2	18	0	0	0	-	18	1.00
Diction 3	14	-	-	-	8	22	0.83
Rhythm Acc. 1	117	252	81	76	-	526	2.83
Rhythm Acc. 2	157	284	45	30	-	516	3.00
Rhythm Acc. 3	80	-	-	-	486	566	2.33
Articulation 1	0	379	65	10	-	454	0.50
Articulation 2	0	97	32	42	-	171	1.67
Articulation 3	0	-	-	-	99	99	1.17
Dynamics 1	6	0	215	71	-	292	1.00
Dynamics 2	0	39	94	44	-	177	2.50
Dynamics 3	16	-	-	-	153	169	1.50

(table con'd.)

Concept by Excerpt	Session 1-2	Session 3	Session 4	Session 5	Session 6	Total	Ratings Gain
Phrasing 1	0	0	100	43	-	143	1.00
Phrasing 2	0	0	83	64	-	147	1.33
Phrasing 3	0	-	-	-	77	77	0.83
Word Stress 1	0	0	0	174	-	174	1.17
Word Stress 2	0	0	0	137	-	137	0.83
Word Stress 3	0	-	-	-	83	83	1.17
Intonation 1	0	0	0	0	-	0	1.33
Intonation 2	0	0	0	12	-	12	1.33
Intonation 3	0	-	-	-	32	32	1.33
Tone Quality 1	21	19	10	47	-	97	0.67
Tone Quality 2	2	4	13	6	-	25	1.33
Tone Quality 3	2	-	-	-	9	11	0.83
Tempo 1	4	8	21	47	-	80	0.50
Tempo 2	0	1	41	0	-	42	0.67
Tempo 3	0	-	-	-	16	16	1.83

than the first excerpt, but more teaching time than the second excerpt during the first instructional session. No teaching time was recorded for the other concepts during the first instructional session.

Comparison of the magnitude of concept rating changes within sessions for the first two excerpts in Table 5 revealed that the most dramatic performance gains were not associated with the excerpt receiving the most instruction for that concept (see Table 7). Performance rating improvement within sessions was calculated by measuring the gain or loss between the first test and last test of each concept within a session, such as Test 3 and 4 of pitch accuracy in Session 3. This number was then compared with the amount of time spent teaching that concept for each excerpt. In the 29 instances where ratings for the first excerpt showed a larger performance gain than ratings for the second excerpt, comparisons with the number of seconds spent in instruction showed almost equal instances where the first excerpt received more instruction, instructional time was equal, or the second excerpt received more instruction. For the five instances that showed a larger performance score gain for the second excerpt, the second excerpt never received more instructional time than the first excerpt. While five cells showed parallel score movement for both excerpts, a performance decline was recorded for both excerpts for the concept word stress in Session 4.

Further comparisons were conducted concerning the magnitude of concept rating changes for two tests occurring between sessions, such as Test 2 and 3 for pitch accuracy.

Comparing only the first two excerpts, a larger rating decline was recorded in 21 instances for the first excerpt but in only 3 instances for the second excerpt. Whereas a gain in performance ratings between sessions was recorded in only 4 instances for the first excerpt, ratings for the second excerpt improved between sessions in 16 instances.

Concept rating gains from Treatment Pretests (Test 2) to Treatment or Transfer Posttests (Tests 8 or 10) showed that all three excerpts made similar improvement, although the second excerpt often showed the largest ratings gain. The largest overall ratings gain was recorded for the second excerpt in six individual concepts, including the targeted concepts of pitch accuracy, rhythm accuracy, articulation, dynamics and phrasing. The first excerpt recorded the largest overall ratings gain for the targeted concept of diction. Tempo ratings showed the largest gain for the third excerpt, while the first and third excerpts showed equal gains for word stress. All excerpts recorded equal gains in intonation.

In summary, results from the behavioral study showed similar performance gains were made for all excerpts. While some individual concepts made more dramatic gains, all showed improvement. Structured task presentations of targeted concepts produced marked improvement in performance scores immediately after instruction. These higher performance scores were maintained or increased in subsequent sessions. When compared to performance ratings for the second excerpt, ratings for the first excerpt tended to increase more dramatically within rehearsal sessions. However, the first excerpt often showed rating declines

between rehearsal sessions while the second excerpt posted twice as many rating gains as declines between rehearsal sessions. Final ratings for the third excerpt were similar to final ratings for the other two excerpts, despite more than two weeks between rehearsal sessions.

The first excerpt received more total instructional time than either of the other two excerpts for almost all individual concepts. For phrasing and intonation, the second excerpt received 4 and 12 additional seconds of instruction respectively, compared with the first excerpt. For rhythm accuracy and intonation, the third excerpt received 40 and 32 additional seconds of instruction respectively, compared with the first excerpt. Despite receiving less total instruction for most concepts, final performance ratings for the second and third excerpts were similar to final ratings for the first excerpt.

Experimental Study

The purpose of the experimental component of this study was to determine the effect of teacher reinforcement on student attentiveness, performance achievement, and attitude. Two choirs were each videotaped during six 30-minute rehearsals. Each choir rehearsed under one of two treatment conditions: (a) structured academic task presentations followed by directions and student performance or (b) structured academic task presentations, directions, and student performance, followed by contingent teacher reinforcement. These conditions will be referred to as the No Feedback Group and the Feedback Group, respectively.

Videotapes of all sessions were analyzed to document whether treatments were implemented as intended. Behavioral observations of conductor videotapes were completed, recording frequencies of conductor eye contact and facial expressions of approval or disapproval. In addition, verbatim typescripts were created of each rehearsal to identify sequential patterns of instruction. Teacher task presentations, including academic, directional, social, and off-task categories, along with student performances, verbal, and non-verbal responses, and teacher verbal feedback, including approval, disapproval and neutral categories were coded and timed. These behaviors were analyzed to assess frequency, duration, and sequencing.

Dependent variables were recorded and analyzed for the two choirs. To evaluate student attentiveness, videotapes of the choral students were observed, with types of student activity and student off-task behavior during each activity being recorded. To evaluate performance achievement, a panel of expert judges independently listened to and evaluated audiotape recordings of 40 performance tests made during the six treatment sessions using an investigator designed Performance Judging Form (see Appendix D). Judges assigned each performance an overall rating between 1 and 100, designed to correspond to a standard contest rating from I-V. A second measure of judge preference was obtained by summing scores assigned ten individual concepts, each rated from 1-10. These overall ratings and summed concept ratings were averaged for the three judges. Ensemble attitude was assessed after each session by administering the Attitude Survey for Performance

Groups (Madsen & Yarbrough, 1980, p. 143) as modified by Price (1983). Further modifications using free-response questions were based on Fredrickson (1994) (see Appendix E).

Treatment

Before analyzing the effect of treatments on student attentiveness, achievement and attitude, it was necessary to see whether the two treatments were implemented as planned. Data gathered through the coding and timing of sequential patterns of instruction and the Music Conductor Observation Form (Madsen & Yarbrough, 1980, p. 61) were analyzed to show the relationship of the instructor's rehearsal behaviors to the *a priori* treatment definitions. Data for comparing treatment groups consisted of: (1) amount of time spent in sequential pattern components, such as academic task presentations, directions, student performance and instructor verbal feedback; (2) categories, frequencies and percentages of instructor feedback; and (3) frequencies and percentages of instructor eye contact and facial expression.

Use of Instructional Time

Table 8 provides a summary of mean time spent, in seconds, for sequential pattern components, as well as the percentage of total time for each component. As can be seen, there was very little verbal feedback present for the No Feedback Group, while the Feedback Group received more than ten times as many seconds spent giving feedback.

Examination of individual sessions showed that similar ratios were maintained for most of the six sessions (see Appendix F). The Feedback Group received 80 and 95 more seconds of

academic task presentations in Sessions 1 and 3 respectively, while the No Feedback Group received 107 seconds more in Session

Table 8

Mean Time Spent in Seconds and Percentage of Total Time for Sequential Pattern Components

	Academic Tasks		Directions		Student Performance		Teacher Feedback	
Treatment	Sec.	%	Sec.	%	Sec.	%	Sec.	%
No Feedback	363	32%	213	19%	543	48%	4	0.4%
Feedback	378	32%	259	22%	517	43%	44	4.0%

5. The Feedback Group received 95 and 134 additional seconds of direction in Sessions 5 and 6 respectively, and 177 additional seconds of student performance in Session 2. The No Feedback Group received 267 more seconds of student performance in Session 3. The few seconds of teacher feedback recorded for the No Feedback Group were instructor errors.

Direction/Performance Pattern Frequency

Direction/performance patterns, defined as student performance preceded by directions with no academic task presentations, occurred with similar frequency for the two treatment conditions (mean frequencies of 12.00 for the No Feedback Group and 14.83 for the Feedback Group). These results indicated that both treatments averaged similar numbers of direction/performance patterns across rehearsals.

Academic Task/Direction/Performance Pattern Frequency

The frequency of academic task/direction/performance patterns, defined as student performance preceded by academic task presentations and then directions, was also compared. Table 9 lists the frequency of these patterns by session.

Table 9

Frequency of Academic Task/Direction/Performance Patterns by Session

Session	No Feedback Group	Feedback Group
1	19	17
2	16	17
3	28	24
4	38	29
5	19	18
6	9	6
Total	129	111
Mean	21.5	18.5

Since these patterns served as indicators of concept presentations, it was of consequential importance that a balance was maintained between the two treatment groups as one method of demonstrating similar amounts and rates of instruction. Mean frequencies were similar for both treatment conditions. Further analysis of both groups across sessions found similar increases in

academic task pattern frequencies for Sessions 3 and 4, a decrease to earlier levels for Session 5, and a further decrease in Session 6. The increase in Sessions 3 and 4 corresponds to the introduction of treatment instruction in the behavioral study, and indicates similar rates of instruction occurred in both groups. The frequency of academic task/direction/ performance patterns during treatment sessions appeared be similar for both treatment groups.

Reinforcement Frequency

Reinforcement frequency was calculated by adding the number of verbal reinforcement statements to the number of facial expressions expressing either approval or disapproval. Results indicated that the Feedback Group contained considerably more reinforcements than the No Feedback Group (mean frequencies of 31.50 for the Feedback Group and 4.17 for the No Feedback Group). The few reinforcements that were observed in the No Feedback Group were instructor errors, but were quite infrequent. As might be expected, the only treatment which by *a priori* definition was to include reinforcement (Feedback Group) did contain a substantially higher frequency of reinforcements.

In summary, both treatment groups spent similar amounts of instructional time in teacher academic tasks, direction, and student performance. The frequency of direction/performance and academic task/direction/performance patterns was similar. Only for instructor reinforcement did the treatment groups appear consequentially different, with substantially more time spent reinforcing students in the Feedback Group. They also received a higher frequency of verbal/facial reinforcements than did students

in the No Feedback Group. Data thus indicated that treatments were implemented accurately for both treatment conditions.

Sequential Patterns of Instruction

Instructional Activities

Students were videotaped only during the instructional portions of each session to ascertain their attentiveness. The instructional portion of a session excluded time spent passing out materials, performing excerpts, or completing attitude surveys. Total time for completing all activities was 30 minutes per session, making it was necessary to compare actual amounts of instructional time to insure they were similar for each group. Table 10 shows the time spent for instruction during each session.

Table 10

Time Spent for Instructional Activities by Session

Session	No Feedback Group	Feedback Group
1	17 min 00 sec	19 min 30 sec
2	22 min 00 sec	25 min 45 sec
3	20 min 45 sec	19 min 30 sec
4	21 min 00 sec	19 min 30 sec
5	15 min 00 sec	16 min 45 sec
6	19 min 00 sec	20 min 15 sec
Total	114 min 45 sec	121 min 15 sec
Mean	19 min 07 sec	20 min 12 sec

The total time spent in instruction over the course of the six sessions was similar for both treatment groups. With a total instructional time for each treatment of about two hours, the difference in instructional time spent was 6 minutes 30 seconds. The mean shows an average of 65 seconds per session of additional instructional time occurred with the Feedback Group.

The instructional time spent on each of the three musical excerpts was compared to document balance in time spent learning each musical selection between treatments. Table 11 shows the total and mean time spent for each of the musical selections across treatments.

Table 11

Mean and Total Instructional Time by Excerpt by Treatment

Treatment	Excerpt 1	Excerpt 2	Excerpt 3
Total Seconds			
No Feedback	45 min 30 sec	37 min 15 sec	32 min 00 sec
Feedback	45 min 00 sec	43 min 15 sec	33 min 00 sec
Mean Seconds			
No Feedback	9 min 06 sec	7 min 27 sec	10 min 40 sec
Feedback	9 min 00 sec	8 min 39 sec	11 min 00 sec

Instructional time spent learning the first and third excerpt were nearly identical between treatment groups, with an average difference of 20 seconds or less per session. The second excerpt

had slightly more discrepancy, averaging 72 seconds more instructional time for the Feedback Group. Overall, there was minimal difference in instructional time spent between the two treatment groups.

Teacher Feedback

In order to maintain a positive classroom environment for the Feedback Group, an attempt was made to maintain a high approval/low disapproval ratio of 80/20 as recommended by previous research (Bennett & Adams, 1967; Forsythe, 1975; Kuhn, 1975; Madsen & Alley, 1979). The frequency and percentages of combined verbal and facial approvals and disapprovals are presented in Table 12.

Table 12

Frequency and Percentage of Approvals and Disapprovals by Treatment

Treatment	Frequency Approval	Frequency Disapproval	Percentage Approval	Percentage Disapproval
No Feedback	21	4	84.00	16.00
Feedback	144	45	76.19	23.81

Target ratios were met within four percentage points over the six treatment sessions. The frequency counts for the No Feedback Group are instructor errors, mostly involving facial expression.

The quality of reinforcement used in completed patterns was also analyzed as to the use of specific or non-specific verbal

feedback. Table 13 summarizes the frequency and percentages of specific and non-specific verbal reinforcement by treatment.

Table 13

Frequency and Percentage of Specific and Non-Specific Completed Patterns by Treatment

Treatment	Frequency Specific	Frequency Non-Specific	Percentage Specific	Percentage Non-Specific
No Feedback	2	5	28.57	71.43
Feedback	34	13	72.34	27.66

In addition to greater frequency of reinforcement recorded for the Feedback Group, there was also a difference in verbal reinforcement quality, with nearly three-quarters of the verbal feedback being specific for the Feedback Group. This is a reversal of reinforcement specificity for the No Feedback Group, where nearly three-quarters of verbal feedback was non-specific. Since reinforcement in the No Feedback Group rehearsals was an instructor error, this is to be expected. Both in quantity and quality of feedback, there was considerably more reinforcement used in the Feedback Group as compared with reinforcement used in the No Feedback Group.

Completed Patterns

Verbal interaction patterns were analyzed and categorized as to completion of patterns with reinforcement. Patterns beginning with one or more task presentations, followed by one or more

periods of student response, and ending with verbal teacher approval or disapproval were labeled complete. Patterns not displaying these components or this ordering were labeled incomplete. Table 14 shows the frequency and percentage of complete and incomplete patterns for both treatment groups.

Table 14

Frequency and Percentage of Complete vs. Incomplete Patterns by Treatment

Treatment	Frequency Complete	Frequency Incomplete	Percentage Complete	Percentage Incomplete
No Feedback	7	127	5.22	94.78
Feedback	47	98	32.41	67.59

There were nearly seven times as many complete patterns evident in the Feedback Group than were evident in the No Feedback Group, resulting in a much higher percentage of complete patterns for the Feedback Group. As the presence or absence of reinforcement within a naturalistic rehearsal setting was a focus of this study, the quantity and quality of reinforcement, as well as the difference in pattern completion provided a parameter to view differences between the two treatments.

Other Teacher Behaviors

In an effort to quantify teacher instruction that occurred during student performance, the category "hustles" was created, and defined as teacher verbal statements during student

performance that activate or intensify previously instructed behavior. The frequency of teacher statements during performance was calculated and each statement categorized according to sequential pattern codes. Results are summarized in Table 15 (see also Appendix G).

Table 15

Frequency of "Hustles" by Category and Treatment

Treatment	Academic Instruction	Teacher Direction	Approval Feedback	Neutral Feedback	Total
No Feedback	77	59	0	1	137
Feedback	96	93	1	0	190

There were more "hustles" given during the Feedback Group rehearsals than during the No Feedback Group rehearsals. This difference was apparent for both academic instruction and teacher direction. Other categories of teacher "hustles" were negligible.

Instructor eye contact was also measured during the instructional portion of rehearsals. Table 16 summarizes the percentage of observation periods in which the instructor made eye contact with the subjects for at least three consecutive seconds. With the exception of nearly identical percentages in Session 1, more instructor eye contact was made with the Feedback Group for every rehearsal. Substantial disparity in percentages are evident for Sessions 2, 3, and 4. Overall, a ten percent difference in

Table 16

Percentage of Instructor Eye Contact by Treatment by Session

Treatment	Session						
	1	2	3	4	5	6	Total
No Feedback	39.70	37.50	53.01	45.12	60.00	45.21	46.26
Feedback	38.46	50.50	78.21	61.73	62.69	48.10	56.20

instructor eye contact was recorded for the Feedback Group as compared with the No Feedback Group.

Dependent Variables

Student Attentiveness

The attentiveness of students in the two treatment groups was calculated by behavioral observations of videotapes from the camera focused on the students. Observation periods of 10 seconds were followed by 5-second record periods during which the camera was focused on a new group of students. Observers counted the total number of performers in view and those observably off-task during each observation period. A percentage of off-task behavior was computed for each instructional session by dividing the number of students off-task by the total number of students observed for that session (see Appendix H). Table 17 is a summary of the percentage of students off-task by treatment and session.

Students for both treatment groups were off-task between 10% and 20% of instructional time in every session. The following

Table 17

Percentage of Students Off-Task: Treatment by Session

Session	No Feedback	Feedback	Combined
1	19.73	20.26	20.00
2	10.39	18.30	14.49
3	13.60	17.30	15.41
4	13.43	14.73	14.09
5	14.32	17.14	15.77
6	12.74	20.33	16.46
Mean	13.85	17.95	15.92

figure (see Figure 8) is a graphical display of the data in Table 17. It illustrates that, although both groups were observed with nearly identical off-task rates during Session 1, students in the No Feedback Group maintained a consistently lower off-task rate than the students in Feedback Group for all sessions.

Off-task percentages were further examined in relationship to the type of instructional activity in which students were engaged. Observations were categorized based on the performance activities of the subjects for the majority of time in each observation period as either group performance, sectional performance, or non-performance. Results of the percentage of subjects labeled off-task by category are summarized in Table 18 (see also Appendix I).

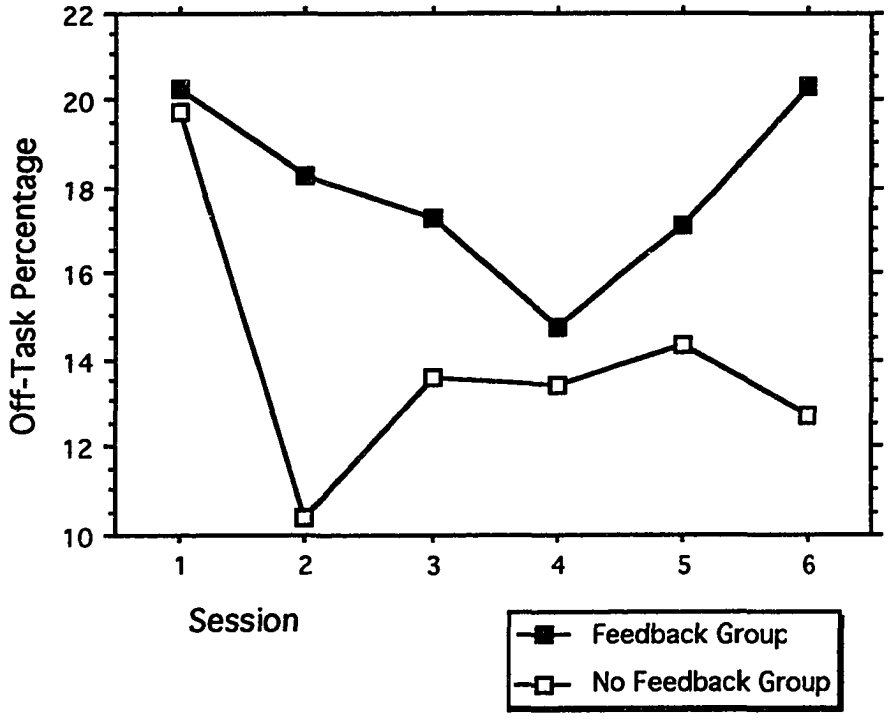

Figure 8. Percentage of Off-Task Behavior by Session

Table 18

Mean Percentage of Off-Task Behavior: Activity by Treatment

Activity	No Feedback	Feedback
Group Performance	4.86	5.28
Sectional Performance	15.75	22.73
Non-Performance	19.07	24.58

Subjects in the Feedback Group were consistently more off-task than subjects in the No Feedback Group in both sectional and non-performance categories, although during group performance both treatment groups demonstrated nearly identical off-task percentages. The number of observational periods assigned to each performance category was examined to see if any relationship existed between off-task behavior and the amount of time students from each treatment group were observed in various activities. Each observational period lasted 10 seconds. These period totals are summarized in Table 19 (see also Appendix J).

Table 19

Frequency of Observational Periods: Activity by Treatment

Activity	No Feedback	Feedback
Group Performance	166	157
Sectional Performance	72	67
Non-Performance	216	260

While the discrepancy in group performance periods and sectional performance periods between the two treatment groups is minimal (9 periods totaling 90 seconds for Group Performance and 5 periods totaling 50 seconds for Sectional Performance over the course of six sessions), there is a larger difference in the number of non-performance periods observed for the two groups. Subjects in the Feedback Group were engaged in non-performance

activities for 34 additional observational periods than students in the No Feedback Group, equivalent to almost six minutes.

Musical Achievement

A panel of three expert judges listened to 40 performance tests recorded during treatment sessions. The 40 performances were played in random order as to composition, treatment group, and type of test (pretest versus posttest). Judges were instructed to listen to each performance only once, without stopping the tape during the performance. The tape could be paused between performances to complete the judging form. Ten individual musical concepts, including pitch accuracy, rhythm accuracy, intonation, tone quality, diction, word stress, articulation, dynamics, phrasing, and tempo were rated from 1 (extremely poor) to 10 (superior) and the choir's overall performance was rated from 1 (poor) to 100 (superior) (see Appendix D). Additionally, a place was provided for the judges to make comments concerning the performance. Judges were asked to maintain a consistent scale while judging, and to scale their overall performance ratings to standard I-V contest ratings. The overall performance scale was divided into five blocks of 20 points each and assigned the following label: (a) Poor-V, 1-20; (b) Fair-IV, 21-40; (c) Good-III, 41-60; (d) Excellent-II, 61-80; and (e) Superior-I, 81-100. In addition to using the overall performance scores assigned by the judges, the 10 individual concept scores were totaled for comparison. Since judges were required to keep in mind standard contest ratings when assigning overall scores, the summed concepts provided an

additional measure of cumulative choral performance without adjustment to the contest rating scale.

Mean musical achievement gains for the treatments are summarized in Table 20 (see also Appendix L). Overall performance scores were obtained by averaging the three judges overall ratings for the three excerpts. Scores labeled "summed concepts" were obtained by totaling each judge's ratings for the 10 individual music concepts in the three excerpts, then averaging these totals. Pretest scores reflect ratings assigned for the initial sightreading performance of the three excerpts and posttest scores reflect ratings assigned to the final performance of each of the three excerpts.

Table 20

Mean Pre- to Posttest Gain Scores for Musical Achievement by Treatment

	Overall Performance			Summed Concepts		
Treatment	Pretest	Posttest	Gain	Pretest	Posttest	Gain
No Feedback	13.33	41.33	28.00	17.56	38.44	20.88
Feedback	15.33	52.55	37.22	19.11	49.78	30.67
Range:	2.00	11.22	9.22	1.55	11.34	9.79

The Feedback Group demonstrated a higher mean gain both when comparing overall performance scores given by the judges and when comparing the summed concept scores. Whereas both treatment

groups received almost identical pretest performance scores (range $\leq$ 2.00), the difference in posttest scores was approximately six times larger (range > 11.00), indicating a differential effect between groups. Although overall assigned scores resulted in more extreme pretest and posttest scores, the range of differences between the two treatment groups remained almost identical to differences observed for the summed concepts.

The frequency of performances categorized in each of the 20-point blocks was calculated from the judges overall performance mean ratings (see Table 21). While none of the mean ratings fell in the excellent or superior blocks, there were more performances judged as poor for the No Feedback Group than for the Feedback Group. Moreover, there were more performances judged as good for the Feedback Group than for the No Feedback Group. Similar numbers of fair performances were recorded for both groups.

Table 21

Frequency of Judges Overall Performance Ratings by Category

Treatment	Poor	Fair	Good	Excellent	Superior
No Feedback	7	10	3	0	0
Feedback	2	12	6	0	0

Student Attitude

An attitude survey, in the form of a pencil and paper questionnaire, was completed anonymously by each student at the

end of each rehearsal session. Likert-type scales were used to measure student attitudes concerning how much they liked the music, enjoyed rehearsing the music, liked the conductor, were "turned on" during the rehearsal, and whether they thought the conductor was a good teacher. The items were rated on a scale from 1 (strongly disagree) to 10 (strongly agree), with a higher score indicating a more positive rating. Additionally, the students were allowed to freely respond to the what they considered to be the best and worst aspects of each rehearsal.

For the five scaled questions, mean scores for each treatment group were compared for similarities and differences across sessions. The two free response questions were first categorized according to whether student comments were "musical," "nonmusical," or contained elements of "both." Some participants made no comment for some rehearsals. Additionally, comments were categorized more narrowly into eight subcategories according to the area of focus to which the comment was addressed. These eight areas were: comments about the music, student performance, the conductor, rehearsal activities, other students, self, treatment conditions, and unknown/other.

Music

Student ratings of the statement, "I like this *music*," were averaged and compared by means of graphical analysis techniques. Figure 9 is a plot of the mean music preference ratings for the treatment compositions by session. The mean rating for the Feedback Group was consistently higher than the mean rating for the No Feedback Group. Both groups showed an initial decline in

ratings for the first few sessions, followed by a rise to the highest rating in the final session.

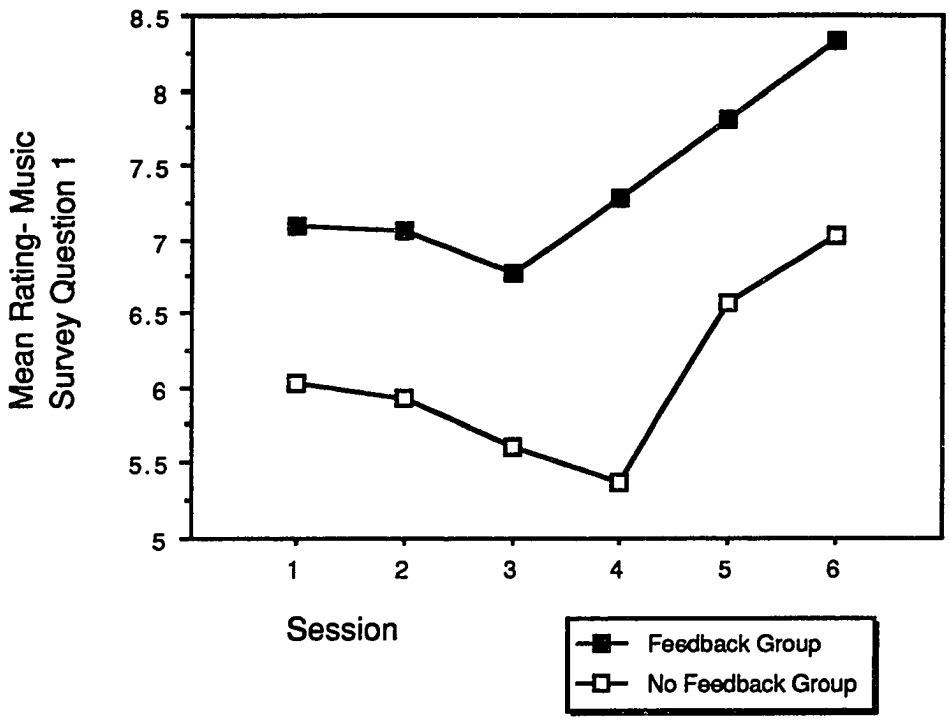

Figure 9. Plot of Attitude Ratings - Music by Session

Rehearsal

Student ratings of the statement, "I enjoyed *rehearsing* this music," were averaged and compared by means of graphical analysis techniques. Figure 10 is a plot of the mean rehearsal preference ratings for the treatment groups by session. The mean rating for the Feedback Group was consistently higher than the mean rating for the No Feedback Group. Ratings for the Feedback Group remained fairly stable, rising slightly to their highest level for

Session 6. Ratings for the No Feedback Group remained stable for the first four sessions before they dramatically rose in Session 5 and remained stable at this higher rating for the last two sessions.

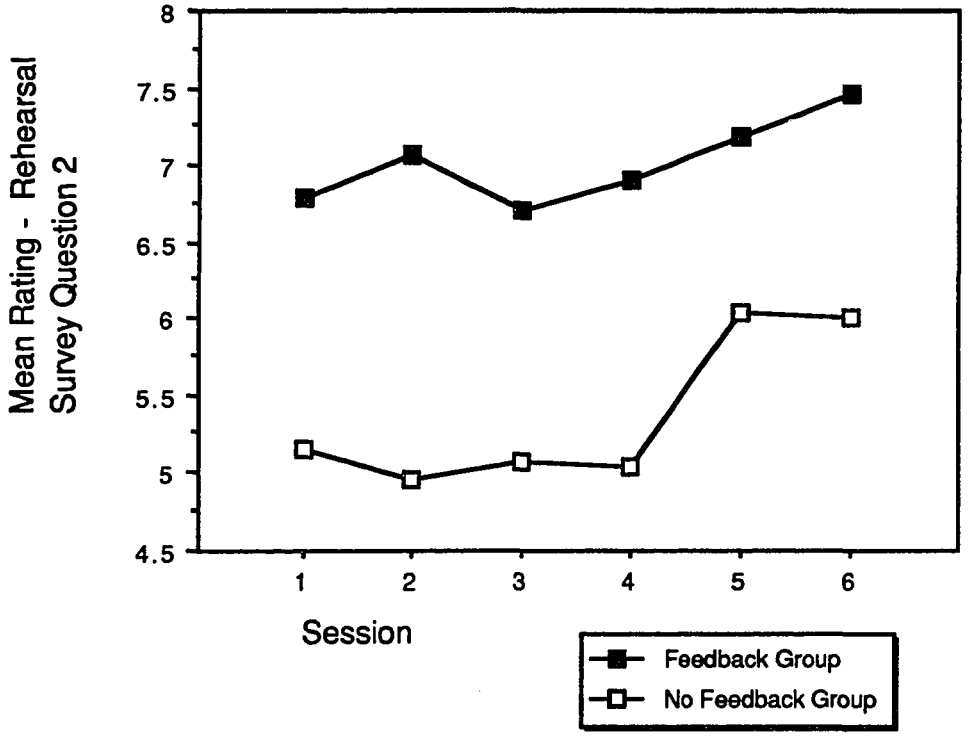

Figure 10. Plot of Attitude Ratings - Rehearsal by Session

Conductor

Student ratings of the statement, "I like this *conductor*," were averaged and compared by means of graphical analysis techniques. Figure 11 is a plot of the mean conductor preference ratings for the treatment groups by session. The mean rating for the Feedback Group was consistently higher than the mean rating for the No Feedback Group. Ratings for the Feedback Group of the

final three sessions were slightly lower than ratings for the first three sessions. By contrast, ratings for the No Feedback Group steadily declined for the first three rehearsals and sharply dropped for Session 4 before they dramatically rose in Session 5. Ratings for the No Feedback Group were highest for the last two sessions, nearing the ratings of the Feedback Group.

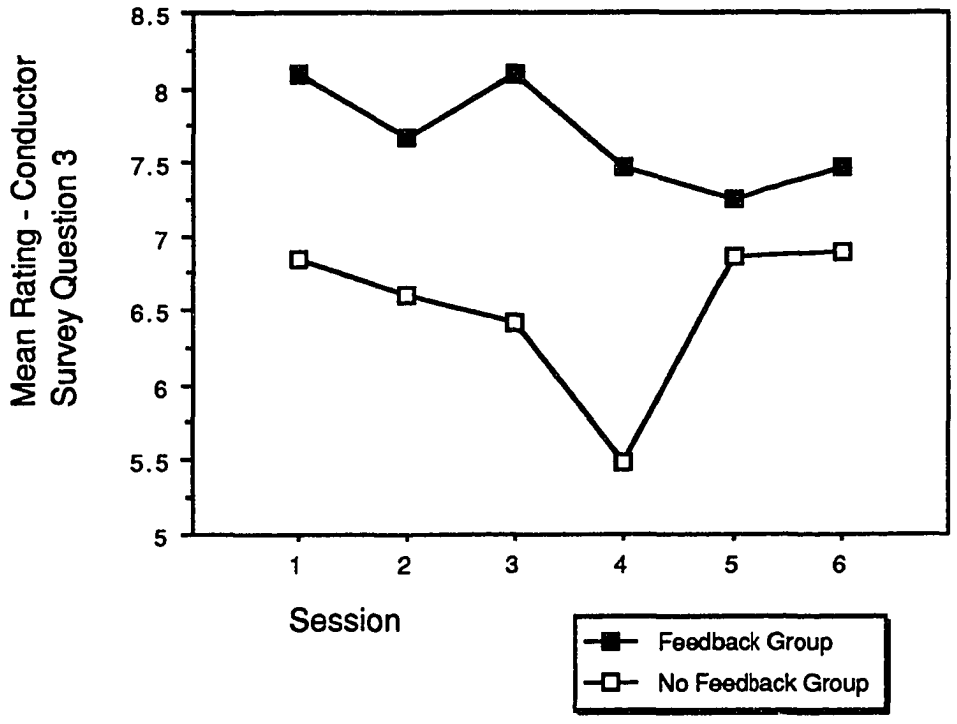

Figure 11. Plot of Attitude Ratings - Conductor by Session

Teacher

Student ratings of the statement, "This conductor is a good *teacher*," were averaged and compared by means of graphical analysis techniques. Figure 12 is a plot of the mean teacher

preference ratings for the treatment groups by session. The mean rating for the Feedback Group was consistently higher than the mean rating for the No Feedback Group. Ratings for the Feedback Group were highest for Sessions 2 and 3 before declining slightly in the last three sessions. Ratings for the No Feedback Group remained stable with the exception of a sharp drop recorded for Session 4.

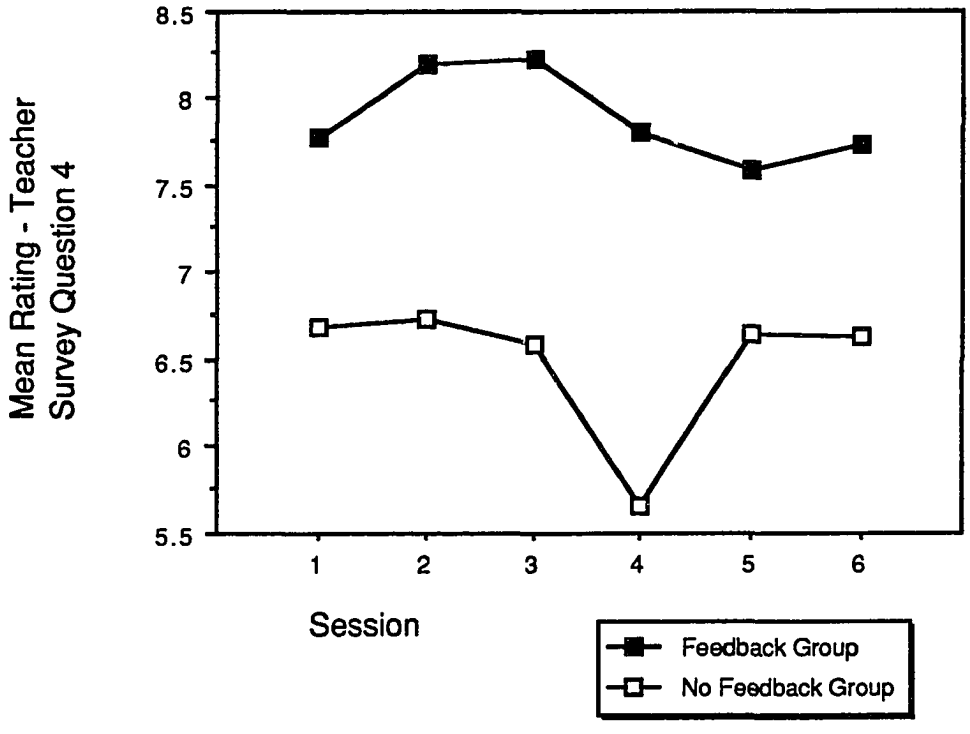

Figure 12. Plot of Attitude Ratings - Teacher by Session

"Turned on"

Student ratings of the statement, "During this rehearsal *I was* (turned on to turned off)," were averaged and compared by

means of graphical analysis techniques. Figure 13 is a plot of the mean rating of how "turned on" the students were during each treatment condition by session. The mean rating for the Feedback Group was substantially higher than the mean rating for the No Feedback Group for the first four sessions. Mean ratings for the fifth session were nearly identical, while the No Feedback Group recorded higher ratings for Session 6. Ratings for the Feedback Group were variable across the six rehearsals. Ratings for the No Feedback Group remained stable until dropping in Session 4. Sessions 5 and 6 received dramatically higher "turned on" ratings from the No Feedback Group.

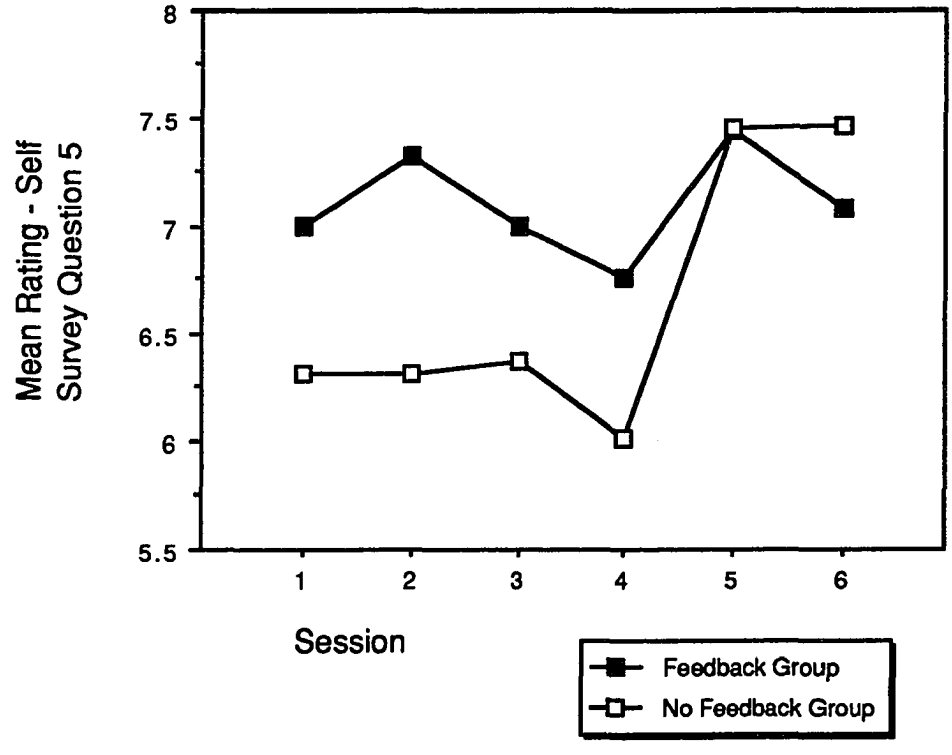

Figure 13. Plot of Attitude Ratings - "Turned On" by Session

Best and worst aspects of the rehearsal.

Subjects gave 393 responses considered to be related to musical aspects of the rehearsals, 315 considered to be related to nonmusical aspects, and 39 related to both. These categories were then divided into "best" (219 musical, 132 nonmusical) and "worst" (174 musical, 183 nonmusical) aspects.

Results of a Pearson Chi-Square analysis (Hays, 1973) indicated that the categories "best" and "worst" were significantly different [χ^2 (1, $\underline{N}$=708) = 13.36, $\underline{p}$ < .05]. One-way Chi-Square tests showed significantly more comments were classified as musical in the "best aspect of rehearsal" category [χ^2 (1, $\underline{N}$=351) = 21.56, $\underline{p}$ < .05]. There was not a significant difference between musical and nonmusical comments in the "worst aspect of rehearsal" category [χ^2 (1, $\underline{N}$ = 357) = .23, $\underline{p}$ > .05].

Comparisons split by treatment group yielded similar results. The number of "best" and "worst" responses for the No Feedback Group were significantly different according to a Pearson Chi-Square analysis [χ^2 (1, $\underline{N}$ = 367) = 7.67, $\underline{p}$ < .05]. One-way Chi Square tests indicated significantly more responses classified as musical in the "best aspect of rehearsal" category [χ^2 (1, $\underline{N}$ = 176) = 12.02, $\underline{p}$ < .05], but no significant difference was found between musical and nonmusical comments in the "worst aspect of rehearsal" category [χ^2 (1, $\underline{N}$ = 191) = .13, $\underline{p}$ > .05]. Similarly, a Pearson Chi-Square analysis of "best" and "worst" responses for the Feedback Group resulted in a significant difference [χ^2 (1, $\underline{N}$ = 341) = 5.76, $\underline{p}$ < .05]. Results of One-way Chi-Square tests on

classifications of musical and nonmusical responses within the "best aspect of rehearsal" category found significant differences [χ^2 (1, N = 175) = 9.61, p < .05], while within the "worst aspect of rehearsal" category, musical/nonmusical classifications were not significantly different [χ^2 (1, N = 166) = .10, p > .05]. Both groups had similar differences in the frequency of musical and nonmusical responses to the "best" and "worst" aspect of rehearsal survey.

Additionally, analysis was performed on the frequency of "best" and "worst" aspect of rehearsal responses as categorized according to eight areas of focus. Seventeen surveys contained more than one response for a statement, so only the first response was categorized for these surveys. Table 22 presents the frequency of responses for each of the eight categories by treatment group.

Pearson Chi-Square analysis showed a significant difference for the frequency of category responses between the "best" and "worst" survey questions [χ^2 (7, N=691) = 48.66, p < .05]. One-way Chi-Square analysis performed on the eight categories resulted in three significant results. There were significantly more comments about student performance in the "best aspect of rehearsal" category [χ^2 (1, N = 185) = 12.98, p < .05]. In the "worst aspect of rehearsal" category, students made significantly more comments about self [χ^2 (1, N = 56) = 5.79, p < .05], and treatment conditions [χ^2 (1, N = 62) = 16.52, p < .05]. It is also interesting to note that the highest frequency of responses occurred in the same two categories, student performance and rehearsal activities, by students in both treatment groups.

Table 22

Frequency of Responses to "Best" and "Worst" Aspect of Rehearsal by Treatment by Category

Category	No Feedback		Feedback		Total	
	Best	Worst	Best	Worst	Best	Worst
Music	20	20	30	19	50	39
Student Performance	75	46	42	22	117	68
Conductor	10	14	21	18	31	32
Rehearsal Activities	35	26	42	32	77	58
Other Students	5	2	14	27	19	29
Self	8	21	11	16	19	37
Treatment Conditions	6	22	9	25	15	47
Unknown/Other	18	17	14	4	32	21

To summarize results of the experimental study, differential effects were found in examining student attentiveness, performance achievement, and attitude. Subjects who received instructor verbal/facial feedback as part of instruction had a higher off-task percentage than subjects receiving no feedback. Although almost identical percentages were recorded during group performance activities and both treatment groups were more off-task when sectional performances or non-performance instruction was occurring, the Feedback Group demonstrated a higher

percentage of off-task behavior consistently across the six sessions.

Students in the Feedback Group had higher gains in musical performance ratings. While both groups had similar scores for the sightreading pretest, the Feedback Group had a much larger increase in scores by the final recorded performance. In addition, students in the Feedback Group maintained a more positive attitude toward the music, rehearsal, conductor, teacher, and their own affective state. Only for one session did the No Feedback Group indicate a more positive attitude toward their affective ("turned on") state. While numbers of musical and non-musical statements about the best and worst aspect of rehearsal were similar for both groups, there were slight differences recorded for the best and worst aspects of rehearsal when these statements were categorized according to eight areas of focus.

DISCUSSION

Two separate studies were included in the design of this research project. A behavioral study sought to measure the performance improvement of choral music concepts after their structured presentation in rehearsal, and the ability of students to demonstrate previously learned concepts in new musical contexts. Simultaneously, an experimental study was undertaken to examine the effects of teacher reinforcement on student attentiveness, achievement, and attitude within high school choral music rehearsals.

Experimental Control

Because this study was conducted in a field setting, a brief discussion of attempts to control environmental variables seems warranted. Within the study itself, attempts were made to choose musical excerpts of similar difficulty, match choirs according to musical ability, and provide identical instruction with the exception of the independent variable of teacher reinforcement. External variables that may have affected the results included the types of school environments and populations, the time of day each choir met, the placement of the treatment sessions within regular rehearsals, and behaviors and attitudes exhibited by the regular choral directors.

Difference between the three musical excerpts may have affected the amount of instructional time required for each piece. The first excerpt was almost totally homophonic in texture, but did contain several accidentals and brief modulations. The second excerpt was entirely diatonic, but contained occasional sections of

polyphony and voice independence. Both of the first two excerpts were in the key of G major. The third excerpt was in A minor, was primarily polyphonic, and exhibited much vocal line independence. On the other hand, it included an easier text and longer note durations, allowing more time to mentally prepare for the next note. Even though attempts were made in this study to choose music that was similar, differences will be found between any separate musical compositions.

In selecting choirs for the study, attempts were made to match choral ensembles. Both choirs selected have maintained excellent performance reputations for several years and have similar records of accomplishment in district and state choir festivals. Observations were conducted of both choirs in normal rehearsal and performance situations prior to selection for this study. Assessments of ensemble size, balance in voice parts, performance literature difficulty, and rehearsal schedule were undertaken in matching groups for this study. Some differences were noted with regard to usual rehearsal environment and classroom discipline. These differences will be addressed subsequently in discussions concerning school environment and student populations.

Efforts to provide identical instruction, excluding teacher reinforcement, were extensive. These efforts included attempts to control the sequence of concept presentations, amount of instructional time, and instructor verbal and nonverbal behaviors. Specific data will be analyzed in greater detail during discussion of treatment implementation for each of the studies.

External variables also may have influenced the results of this research study. Despite attempts to match the specific choral ensembles chosen for the study, differences between the two schools and their student populations existed. The high school used for the No Feedback Group was a laboratory school on a large university campus. The school attempts to maintain a student population that reflects the local population and provide a public school atmosphere, but unique aspects of the school's function as a laboratory school were evident, including that these subjects were desensitized to having visitors work with and observe choir rehearsals. The choir maintained a busy performing schedule including out-of-state travel and a musical theater production. Normal rehearsals were observed to be intense and productive, using every available minute of rehearsal time, with frequent after-school and weekend rehearsals needed in order to fulfill performance obligations.

Subjects in the choir labeled as the Feedback Group came from a pair of private parochial schools, segregated by gender. The young women and men met together only for choir class, and some subjects were required to travel a few blocks to the other school for rehearsal. Visitors and research equipment were not a part of normal choir rehearsal procedures in the parochial schools. Rehearsals focused upon two or three main concerts per semester, and were observed to be less intense compared with the No Feedback Group. Rather than fulfilling a concert schedule, there was a curricular emphasis on music making and less reliance on out-of-class rehearsals. A dress code was enforced at the

parochial schools, but not at the laboratory school, and there was slightly less ethnic and socioeconomic diversity at the parochial schools.

Additionally, the No Feedback Group rehearsed during the morning while the Feedback Group rehearsed in the afternoon, just before school was dismissed. These times were set by the individual schools and could not be adjusted. Furthermore, experimental treatments were conducted at the end of normal rehearsals for the No Feedback Group, but at the beginning of normal rehearsals for the Feedback Group. Since the experiment was conducted in field settings, control over the placement of treatments within rehearsals was surrendered. This resulted in differences such as subjects in the No Feedback Group already having warmed-up the singing voice prior to treatment, which was not possible in the Feedback Group. Also, the No Feedback Group was preparing for several upcoming performances, causing the classroom teacher to squeeze as much rehearsal work as possible into the portion of class not used for treatment. The choir members were working at a frantic pace prior to treatment, so efforts by the experimenter to maintain similar instructional pace between treatment groups may have been perceived as a slowing of pace by subjects in the No Feedback Group. Evidence of this was reflected in subject comments made on the attitude survey concerning the loss of regular rehearsal time as a result of the experiment. On the other hand, subjects in the Feedback Group participated in the experiment before returning to regular

rehearsal, and appeared less impatient, as the investigator was able to establish the initial rehearsal environment in each session.

Finally, behaviors and attitudes of the regular classroom directors may have influenced results in this study. The teacher for the No Feedback Group was more intense in rehearsal, and made numerous comments to the subjects concerning the large amount of music they had to prepare for upcoming performances. While she emphasized her support for having the choir participate in the research project, it was clearly a busy time to accommodate such a project.

An incident that occurred during Sessions 3 and 4 for the No Feedback Group illustrated how regular teacher behaviors may have influenced the results of the study. In order to make maximum use of rehearsal time, the regular choir teacher used the treatment portion of class to practice with individual students in a separate facility, resulting in a relaxation of classroom discipline by the middle of Session 4. As this was the No Feedback Group, feedback was not used to change classroom social behavior, however, the teacher was requested to remain in the rehearsal for Sessions 5 and 6 to match the behavior of the regular choir teacher for the Feedback Group. No further problems with classroom discipline were noticed, but this difference in environmental conditions and the resulting change in subject social behaviors may have been responsible for significantly lower attitude ratings for the No Feedback Group in Session 4.

Ensemble research conducted in field settings, while appealing in terms of observing the application of treatments in

the "real world," presents the researcher with many factors and variables which are difficult to control or match. Practical difficulties involving sample sizes, length of treatment, and bureaucratic permission do not always allow a researcher the opportunity to create optimum research conditions. Environmental variables such as scheduling, school location and environment, student population, and teacher behavior may not be within a researcher's ability to control. Though efforts were made to minimize the effect of external factors, these factors existed in the present study and should be recognized and considered when interpreting results. Despite the difficulties, research conducted in field settings is necessary if theories and ideas are ever to have a practical application and effect. Continued use of field settings for research in teacher/student interactions and ensemble instruction should be supported and encouraged as one means of seeking answers to important questions in music education.

Behavioral Study

That improvement in musical performance across a series of rehearsals occurs is demonstrated daily in performing ensembles. Describing exactly how much improvement occurs from rehearsal to rehearsal over time has been more difficult to pinpoint. Furthermore, not all musical aspects within a given piece of music will improve at the same time, or at the same rate. The behavioral design used in this study attempted to examine the rate of improvement and transfer of musical learning across a series of choral rehearsals. Ten individual musical elements were rated for each performance test of each excerpt. Seven of these ten

elements formed the primary focus for structured academic task presentations during the treatment sessions. These elements were presented sequentially in edited versions of the excerpts containing symbols for the performance of these elements.

Treatment

Treatment for the behavioral study consisted of sequential implementation of musical concepts using structured task presentations across a series of choral rehearsals. Results indicated that efforts to spend equal amounts of instructional time on individual music concepts for both groups were successful. For all excerpts in both choirs, about one-half of instructional time was spent learning pitch accuracy, rhythm accuracy, and diction, with the other half of instructional time spent learning the four other focus concepts of articulation, dynamics, phrasing, and word stress. Only 6.5% of instructional time was spent on the concepts of intonation, tone quality, and tempo, which were not a focus of this study. Between both choirs and across all excerpts, instructional percentages remained within 10 percentage points for all concepts, with two exceptions. Percentage of time spent teaching pitch and rhythm accuracy for the third excerpt showed Choir A spent a substantially larger percentage of time on pitch accuracy (35.72% to 12.74 %), and Choir B spent a substantially larger percentage of time on rhythm accuracy (47.23% to 32.73%). Moving from the major mode with shorter note values in the first two excerpts to the minor mode with longer note values for the third excerpt may have accounted for this difference. Perhaps Choir A did not have as much experience in singing songs in the

minor mode, and Choir B was not used to independent, polyphonic rhythmic writing.

In analyzing instructional time and teacher speech, results confirmed that concepts were presented sequentially as planned. For each of the first four sessions, the majority of instructional time was spent on the intended focus concepts. During the fifth session the focus concept was word stress. In addition, all concepts were being reviewed and polished for the final performance test. Nevertheless, word stress still received a substantially higher percentage of instruction than any of the other concepts. Percentages for Session 6 indicated nearly one-half of instructional time for both choirs was spent on rhythmic accuracy. With the exception of diction which received little instruction, the remaining time was split fairly evenly among the six other focus concepts in Session 6. Teacher "hustles" also demonstrated that the intended sequencing of instruction was observed in teacher verbal statements during student performance.

From the data presented, it would seem that musical concept instruction was implemented as intended. This was true as to the sequence of instruction and the percentage of time spent teaching each concept. In addition, similar percentages of concept instruction were recorded for both choirs, indicating that instructional time for music concepts was used in the same proportions for both choirs.

Musical Concept Improvement

Performance improvement for all 10 musical concepts was displayed in Figure 7. Ratings for most concepts showed

improvement of about two rating points, with some concepts improving by nearly five rating points over the series of rehearsals. It was not surprising that pitch and rhythm accuracy showed the greatest improvement, as these were the first concepts presented, and formed the foundation upon which subsequent musical concepts could be taught. Although not a focus of instruction, the concept of tempo also showed marked improvement during the sessions. As pitches and rhythms became more accurate, performances of the piece could be made at tempi which were more appropriate.

All other concepts showed similar rates and amounts of improvement. It was encouraging to note that as choirs received instruction for specific musical concepts those concepts showed immediate improvement in performances. This was true for all of the focus concepts presented in Sessions 3, 4, and 5. Furthermore, these higher performance levels were maintained in subsequent performances of the excerpts.

Even though they were not a focus of the study, intonation and tone quality showed similar improvement to the other concepts. It may be that after the easily discriminated concepts of pitch accuracy, rhythm accuracy, and tempo, judges had difficulty discriminating between the other seven musical concepts in performance. While comparisons of specific performance improvement from session to session were inconsistent for these seven concepts, overall patterns of ratings gain were similar. This would support the findings of Burnsed, Hinkle, and King (1985) who

found judges often disagreed when rating individual musical elements, even when their overall ratings were similar.

Comparisons of rating changes across sessions for the first two excerpts showed interesting differences between excerpts. For the first excerpt, instruction produced an immediate rating gain (measured as "within session" rating increase) in 37 of 40 instances and an immediate rating loss (measured as "within session" rating decrease) in the remaining 3 instances. Ratings for the second excerpt exhibited similar "within session" rating changes (32 increases, 6 decreases, 2 no change). However, rating changes that occurred overnight, or "between sessions," showed substantial differences between the two excerpts. Ratings for the first excerpt declined for more than 75% of "between session" changes, while ratings for the second excerpt actually improved or showed no change for nearly 75% of "between session" changes. As pretreatment tests for the second excerpt occurred after the completion of instruction for the first excerpt each day, the rating improvement for the second excerpt may have indicated an ability of subjects to transfer musical concepts learned for the first excerpt to the second excerpt, even before instruction for those concepts with the second excerpt had occurred.

Only the third excerpt was rated in the Transfer Pretest (Test 9). This excerpt had not been tested sing the Treatment Pretest (Test 2), but after a period of eleven days without instruction or rehearsal on the concepts, concept ratings showed only a small decline. Performance ratings did not sink as low as Sightreading (Test 1) levels, but were slightly lower than the

Treatment Pretest (Test 2) for most concepts. As encouraging as it was to find so little decline in performance ratings between the Treatment Pretest and the Transfer Pretest, it was also exciting to note the improvement made during Session 6. Ratings for the Transfer Posttest (Test 10) were equal to or higher than the Treatment Posttest (Test 8) ratings of the other two excerpts for almost all concepts. This indicated that subjects were able to apply previously learned concepts and perform at the same level despite 11 days without instruction and less total rehearsal time. Summed ratings of the 10 concepts indicated the third excerpt was rated nearly as high as the second excerpt, both having been rated higher than the first excerpt.

Relationship of Teaching Time to Test Gain

While individual concepts often made their most dramatic performance gains during the session in which they were the primary focus, the amount of instructional time spent for each of the three excerpts did not correspond to individual excerpt rating gains. The first excerpt received the most instructional time for six of the seven focus concepts, with the concept phrasing receiving four additional seconds of time for the second excerpt. However, the second excerpt recorded the largest ratings gains for pitch accuracy, dynamics, and phrasing from Sightreading (Test 1) to Treatment Posttest (Test 8). When rating gains are measured from the Treatment Pretest (Test 2) to the Treatment Posttest (Test 8), the second excerpt showed the largest gains for pitch accuracy, rhythm accuracy, articulation, dynamics, and phrasing. Total instructional time for the third excerpt exceeded time for

the first excerpt only for the concepts of rhythm accuracy (by 40 seconds) and intonation (by 20 seconds). Transfer Posttest (Test 10) ratings for the third excerpt exceeded Treatment Posttest (Test 8) ratings for the first excerpt for all 10 concepts.

Performance rating gains that occurred within sessions for individual concepts bore little or no relation to the amount of time spent in instruction. In fact, for every instance of a larger concept rating gain for the second excerpt, more time had been spent teaching that concept for the first excerpt. Additionally, there were many more rating declines that occurred between sessions for the first excerpt, while ratings for the second excerpt often stayed the same or actually improved.

To summarize results from the behavioral study, 10 musical concepts showed improvement over the course of six sessions when instruction included structured task presentations in a logical sequence. Judges may have been able to discriminate the concepts of pitch accuracy, rhythm accuracy, and tempo more easily than other concepts. Subjects were able to maintain performance gains after instruction, and appeared to apply concepts learned using one musical excerpt into the performance of a different excerpt prior to receiving instruction for that concept with the new excerpt. Also, subjects could quickly demonstrate previously learned concepts in a new, similar musical context despite receiving no instruction for 11 days. Performance improvement of individual musical concepts was not related to the amount of instructional time spent on an excerpt.

Experimental Study

Treatment

Before attempting to interpret the meaning of results in the experimental study, the two treatment conditions must be examined to insure they were implemented as planned. The No Feedback treatment consisted of teacher academic task presentations and directions followed by student performance without reinforcement. The Feedback treatment consisted of teacher academic task presentations, directions, and student performance which in many cases were followed by reinforcement. The sessions were all approximately 30 minutes in total length (+ or - 90 seconds). Session 1 was preceded by a performance of all three musical excerpts, after which each piece was rehearsed. Session 2 began by continuing rehearsal of all three excerpts and concluded with a performance test. Sessions 3, 4, and 5 were structured similarly, and included a pretest, rehearsal, and posttest on the first excerpt, followed by a pretest, rehearsal, and posttest on the second excerpt. The final session took place eleven days after Session 5, and consisted of a pretest, rehearsal, and posttest of the third excerpt only. The musical excerpts used consisted of three segments of compositions approximately 60-90 seconds in duration, and were of comparable difficulty.

Additional examination of treatment implementation can be seen in the duration of the instructional portion of each session. The instructional portion of a session excluded passing out music, performance pretests and posttests, and completing the attitude survey. Mean number of seconds across the six treatments differed

by 65 seconds out of average instructional periods of about 20 minutes. In comparing the amount of time each excerpt was rehearsed, nearly identical amounts were recorded for the first and third excerpt. A difference in rehearsal time for the second piece may be due to an inadvertent shortening of Session 5 for the No Feedback Group. As the 30 minutes allotted for the experiment came at the end of regular classtime for the No Feedback Group, every effort was made by the investigator to begin instruction on time so that the final posttest could be recorded without interruption. In addition, time was required after the final posttest for subjects to complete the attitude survey for that session before class was dismissed. Thinking that the end of class was imminent during Session 5, the instructor had the choir perform its final posttest about two minutes earlier than necessary. This would not have corrected all of the time discrepancy for excerpt two, but would have made the amount of time spent between the two groups more similar.

The percentage of time spent in sequential patterns of instruction components was comparable for the two treatments with the intended exception of reinforcement. The mean percentage of time spent in academic task presentations was identical for both groups. The No Feedback Group averaged 5% more time for student performance, while the Feedback Group averaged 3% more time for teacher directions. Compared with the No Feedback Group, the Feedback Group received about 10 times the mean percentage of time devoted to reinforcement. The percentage of instructional time devoted to directions and student

performance was almost identical to percentages reported by Yarbrough and Price (1989), with slightly higher academic task percentages reported for the present study. This discrepancy is not surprising given the focus on structured task presentations as a major part of this study.

Another view of the similarities and differences between treatments can be shown by examining direction/performance patterns and academic task/direction/performance patterns. Similar mean frequencies for both types of patterns indicated that the number of teacher presentations followed by student performance was similar in both groups. An examination of the number of combined verbal and facial reinforcements reveals a large difference weighted toward the Feedback Group. Occasional, inadvertent approvals were recorded during sessions with the No Feedback Group, but remained so consistently low in number as to be negligible.

The instructor attempted to provide appropriate facial expression to match verbal reinforcement. Attempts to maintain a positive rehearsal environment with an 80/20 ratio of approval to disapproval were successful within four percentage points of this target. In addition to maintaining an 80/20 ratio between teacher approval and disapproval, the instructor used more specificity in the reinforcement expressed in the Feedback Group. Only two specific reinforcements were recorded in the No Feedback Group sessions, while 34 were recorded in the Feedback Group. This resulted in six times as many completed sequential patterns in the

Feedback Group sessions as compared with completed patterns in the No Feedback Group sessions.

An argument can been raised that by stopping a rehearsal, repeating instructions, and rehearsing a section again, a type of disapproval feedback is implied. This "feedback" is nonspecific at best, and out of the control of the instructor. Students always can choose to attach specific meanings to instructor behaviors that were not intended to convey such meanings. Presently, there is no way to measure such "feedback" in order to quantify its effect, but it is important to consider this point in interpreting results.

Instructional differences between the two groups were noted in two areas. A difference in verbal instruction between treatment groups was recorded in the frequency of teacher "hustles." More "hustles" involving both academic instruction and directions were observed in the Feedback Group. While the effect of these short verbal statements has not been precisely studied and measured, the opportunity to cue subjects and remind them of previous instruction may have affected the results of the study. In examining teacher eye contact, the absence of the classroom teacher may have had an effect during Sessions 3 and 4. Eye contact was observed to be similar for the two groups in Sessions 1, 5, and 6, while separating slightly in Session 2. Teacher eye contact in the Feedback Group was significantly higher during Sessions 3 and 4. This may have been due to efforts on the part of the instructor not to provide reinforcement despite growing discipline problems. Avoidance of eye contact may have been an attempt to ignore inappropriate behavior during those rehearsals.

These two sessions account for more than half of the mean difference in eye contact percentage between groups. In spite of this instructional difference, it would appear that the two treatment conditions were implemented as designed, with similar amounts and types of instructional activities and student performances occurring in both groups, but teacher reinforcement occurring only in the Feedback Group.

Student Attentiveness

Total overall off-task percentages in the current study averaged almost 16%, a figure comparable to previous research studies in music classes (Forsythe, 1975, 1977; Madsen & Alley, 1979; Price, 1983). Subjects in the Feedback Group, who received teacher reinforcement were consistently more off-task than subjects in the No Feedback Group, who did not receive any teacher reinforcement. This is contradictory to the findings of Kuhn (1975) and Madsen and Alley (1979), who found high approval environments produced lower off-task percentages. This result is also surprising when teacher eye contact is examined. In this study, more teacher eye contact was observed in the Feedback Group, which was more off-task.

One possible explanation for higher off-task percentages in the Feedback Group could be the focus of the feedback being provided. In this study, instructor verbal feedback addressed musical performance rather than social behavior. If instructor feedback had specifically addressed student attentiveness, improvement in the off-task percentages for the Feedback Group would likely have occurred.

Looking at off-task percentages over a series of rehearsals shows that initial high off-task rates became progressively lower. As new academic challenges and materials were presented, subjects may have felt the need to stay on-task. Increased familiarity with the music eventually appears to reverse this trend. Perhaps one way to increase student attentiveness is to continue to bring new academic information to the rehearsal.

For both treatments, off-task percentages were lowest when the entire group was performing and highest during non-performance activities. This is consistent with findings by Murray, (1975), Forsythe (1977), Price (1983), and Yarbrough and Price (1989), and supports previous evidence that "active" activities, including participating in music may serve as a reinforcement itself (Forsythe, 1977; Madsen & Alley, 1979; Spradling, 1985; Yarbrough, 1975)

An interesting aspect of student attentiveness was the high percentage of off-task behavior observed during sectional performance activities. These activities included one or more sections involved in performance, but less than the entire group. An interesting future topic might be to see how off-task behavior breaks down between performing and non-performing students during sectional activities. As the teacher's attention is usually focused on the section or sections actually performing, it is not surprising that subjects in non-performing sections of the ensemble were more off-task. During sectional activities, if non-performing students are videotaped, off-task percentages are likely to be higher, than if performing students are videotaped.

This may have been a factor in differences between off-task percentages in this study. Sectional off-task percentages may even be higher than during certain non-performance activities where teacher attention is directed to the entire group as a whole.

The fact that there was more time spent in non-performance activity by the Feedback Group may have been a contributing factor to the higher off-task percentages reported for that group. However, casual observation of the choirs prior to treatment sessions indicated a more relaxed atmosphere and higher off-task behavior for the Feedback Group in their regular rehearsals. This is quite likely due to the unique nature of the class within the schools involved. Meeting during the last period of the day, this was the only class these subjects attended where genders were mixed, which increased the amount of social activity and intensity. The regular classroom teacher commented that he had more difficulty managing behavior in this class than in any of the single gender classes he taught. While the magnitude of difference in off-task percentages in this study is not large (averaging just over 4%), it would appear that instructor reinforcement did not have a positive effect on student attentiveness. Also, if one considered that teacher behaviors in the No Feedback Group constituted an "implied disapproval," it would not seem prudent to suggest this contributed to lower off-task percentages.

One future consideration for studying off-task behavior in music ensembles is to direct reinforcement specifically toward social behavior. Reinforcement in this study was almost totally confined to academic reinforcement of student musical

performance. Reinforcement targeted to praise on-task behavior and disapprove of off-task behavior may have a more significant effect on student attentiveness, and thereby, perhaps, offer a way to improve musical performance.

Musical Achievement

A gain in musical achievement was recorded for both treatment groups. This is not surprising in light of the fact that efforts toward a culminating musical performance often are the understood goal of music ensembles. The ability to track performance gains across rehearsals provides a clearer picture of how performance improves. This will be discussed in more detail when examining the behavioral aspect of this study.

The group receiving teacher reinforcement received higher posttest performance scores from the judges than the group receiving no teacher feedback. Pretest results indicated very little difference between group performances. This would indicate that both groups entered the instructional portion of the treatment at similar performance levels. For the pretest, both groups were asked to sightread the piece using the text. This was not the usual sightreading procedure for either group, both of which use a movable do based system of music reading which substitutes sol-fa syllables for text during initial readings of a new composition. The piano was used as necessary to support these pretest performances. Since all pieces were to be performed without accompaniment, the use of the piano may have influenced the rating of the judges, but if so, the similarity of Sightreading scores indicated it affected the ratings for both groups similarly.

By the final posttest, both treatment groups could comfortably sing through the excerpts without piano support, maintaining tonality. However, posttest scores show more than an 11 point difference between treatment groups. This is equivalent to one-half of one contest rating based on the 100-point judging scale being used in this study. These results support the idea that given equivalent amounts of teacher instruction and performance time, the addition of teacher academic reinforcement might produce better musical performances. This supports earlier research on the effects of feedback versus no feedback (Price, 1983) and of approving feedback versus disapproving feedback (Grechesky, 1986) on musical achievement.

Since only five rehearsals of 10-12 minutes each were included in this study, the choirs were able to make only a limited amount of musical improvement. This is reflected in the absence of performances whose overall rating fell in the "excellent" or "superior" categories. However, more performances for the Feedback Group were rated in the "good" category and more performances of the No Feedback Group were rated as "poor." For both groups, similar numbers of performances were rated as "fair" by the judges. Future research might include enough rehearsals for a polished, final performance of excerpts, creating a more complete picture of performance gains across time.

It should be noted that there are many additional factors which may have accounted for the difference in results. Both choirs were taught using instructional methods that differed from their normal routines. It is possible that one group adapted to this

different method more quickly, and therefore made more musical progress during the six treatment sessions. Furthermore, since the No Feedback Group did not start treatment until after 20 minutes of regular classroom rehearsal, they may have been too tired or "burned out" to concentrate on learning the music used in the study. It is possible that the Feedback Group was always the better choir, and that the presence of instructor feedback was not a factor in their ratings. In fact, their higher off-task rate suggests they may not have been in a position to receive feedback. Factors such as maturation, practice, and/or experience may have contributed to gains in musical achievement. This would seem to be the case when continued improvement is shown in one aspect of performance (articulation for example) even when instruction for that aspect had ceased. Therefore, caution should be exercised in the interpretation of achievement results.

One of the judges commented on the difficulty of judging choirs without a visual reference. The judge was accustomed to using visual cues about the age, developmental level, size, balance, and attitude of a choir to aid in evaluating their musical performance. With the limitation of only the audio performance to evaluate, it was "a different type of judging" than a standard contest or festival. Performance ratings from this study did not take into account such things as a choir's enthusiasm or lack of enthusiasm during a particular performance, or the fact that only three tenors were present for one rehearsal. These can be important aspects in differences between performances, and

certainly invite further study, as choir performances occur before audiences, and therefore include a visual element.

Student Attitude

Responses to the scalar questions on the attitude survey were consistent across sessions. Subjects in the Feedback Group recorded higher mean attitude ratings for every question during every session with two exceptions. Subjects in the No Feedback Group rated their affective ("turned on") state slightly higher in Sessions 5 and 6.

Both groups rated their liking of the music highest for the last two rehearsals. These rehearsals correspond to the most musical performances of the three excerpts. In other words, the subjects increasingly liked the music as they were able to achieve a more musical performance singing it. Results concerning the rehearsal showed less variability, with the exception of a large rating improvement for subjects in the No Feedback Group between Sessions 4 and 5. This may be the result of the relaxation of classroom discipline negatively affecting subject attitudes. The return of the classroom teacher to treatment Session 5 corresponds to the large jump in attitude rating.

Conductor and teacher ratings showed similar patterns. Ratings for the Feedback Group remained fairly stable, with slightly lower ratings toward the end of the treatment sessions. Ratings for the No Feedback Group were also quite stable with the exception of a large dip for Session 4. This corresponds to the discipline situation previously mentioned, and may be a reflection

of subject unhappiness with the experimental instructor's response to inappropriate behavior.

For both groups, affective ratings showed greater variability across sessions. An exceptionally large jump in ratings between Session 4 and Session 5 for subjects in the No Feedback Group elevated their ratings above ratings for the Feedback Group. It is unclear what may have caused this dramatic positive gain on only this one question. Perhaps subjects were expressing pleasure at the end of the experiment, allowing them to return to a very demanding rehearsal schedule which provided them more tangible rewards.

When answering questions concerning the best and worst aspect of rehearsal, subjects in both groups made significantly more comments of a musical nature when responding to the "best" aspect of rehearsal question. This result is similar to results obtained by Fredrickson (1994), however, in the "worst" aspect category, he found subjects made significantly more nonmusical responses. This result was not duplicated in the current study. Subjects made significantly more comments about their musical performance in the "best" aspect category, and subjects commented more often about the treatment conditions or personal feelings of self in the "worst" aspect category. For example, subjects often wrote the best thing about a rehearsal was "the way we sounded" or "the music is starting to sound good." For the worst aspect of rehearsal, subjects often wrote "being videotaped" or "I am sick today."

Although additional factors must be considered in interpreting these results, data from the attitude survey indicated higher attitude ratings by the group receiving reinforcement with a high approval to disapproval ratio. This finding was supported by previous research. Murray (1975) found that high approval reinforcement produced the highest attitude rating in high school choirs, and Yarbrough (1975) observed a more positive attitude toward a high magnitude conductor using facial approvals and eye contact. Furthermore, Price (1983) concluded that both positive teacher reinforcement and the music itself as reinforcement had an affect on student attitude.

To summarize results from the experimental study, data suggested that teacher reinforcement may be a contributing factor in musical achievement of choirs and more positive attitudes among choir members. When reinforcement is restricted to academic feedback, it may also contribute to higher off-task behavior in rehearsals. Results suggest the importance of rehearsal activity on student off-task behavior, with students less off-task during group performance activities. Additionally, subjects tended to make more comments described as musical when asked to describe the best aspect of the rehearsal. The addition of musical tasks appeared to contribute in a positive way to improved choral performance. As choirs were provided new expressive concepts to implement, musical achievement increased without any noticeable effect on student attitudes. Initial presentation of new material may serve to increase the number of

students on-task, but as the music becomes more familiar, this trend reverses.

Summary and Suggestions for Future Research

While research on teaching within a music ensemble is becoming more prevalent, there is much teaching "magic" in the development of artistic performances that is not understood. This study attempted to examine the effect of teacher reinforcement on student attentiveness, achievement, and attitude in high school choral music rehearsals. The group receiving reinforcement had higher performance scores and a more positive attitude than the no reinforcement group. The reinforcement group also exhibited greater off-task behavior, especially during nonperformance and sectional activity.

The examination of individual student behavior during sectional performance activities is worthy of additional study. If students tend to be more off-task during these activities, teachers may decide decrease the amount of sectional rehearsal activities and increase periods where the entire group performs. Additional research that focuses on the social behavior of students would be welcome. Targeting teacher reinforcement to social behavior in addition or instead of academic reinforcement might provide interesting information on the most effective use of reinforcement. The lack of a totally objective tool for the evaluation of musical performance is also a major problem. While the judges for this study showed substantial agreement in their ranking of performances, it is hard to pinpoint precisely on what it is they agreed. Musical performance tends to be assessed by a

highly subjective platform, leading to disagreement in musical worth even among "experts."

There is little data available on improvement of specific musical performance aspects across a series of choral rehearsals. While this study provides some information concerning this improvement for a few rehearsals, additional studies which examine musical improvement through a culminating performance would provide important additional information. Another area in need of study concerns whether performance judges make accurate discriminations for certain musical concepts. While pitch, rhythm, and tempo are often clearly heard, more subtle concepts like dynamics and phrasing may not be judged discriminatingly. They may receive a score based on the judges impression of the overall performance.

The transfer of previously learned musical information to new musical contexts is a skill conductors wish all choral singers possessed. Data from this study indicated that less time was required to teach previously learned concepts in new contexts, although additional time may be required if there is a delay before attempting the transfer. Results also revealed different patterns of improvement for new academic concepts and transferred academic concepts. A more steady gain in performance was found for the second excerpt, compared with the more dramatic gains and losses associated with the first excerpt.

Much additional work needs to be done in studying the transfer of musical concepts. This research is at least minimally longitudinal in nature, requiring substantial investments of both

time and patience. Understanding in this area may help music teachers become more efficient and effective teachers, and may create more independent, musically intelligent performers.

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APPENDICES

APPENDIX A

List of Musical Excerpts

Excerpt 1 - No. 1 - I Will Give Thanks
(measures 1-20)
from "Three Short Anthems" by Henry Purcell
in The English Choral Tradition, Volume 1
(New York: Associated Music Publishers. 1984)

Excerpt 2 - No. 1 - O Come, Ye Servants of the Lord
(measures 1-19, no repeat)
from "Four Motets" by Christopher Tye
(Chapel Hill, NC: Hinshaw Music. 1950)

Excerpt 3 - Weep, O Mine Eyes
(measures 1-28)
Madrigal by John Bennet
in The English Choral Tradition, Volume 3
(New York: Associated Music Publishers. 1984)

Symbol	Meaning	Symbol	Meaning
✓	- stop vowel sound and/or say consonant		- marcato, accented with decay
⊏	- separate entrance, sing first few notes one level louder.		- staccato, short and separated
	- crescendo, gradually louder		- decrescendo, gradually softer
mf	- medium loud	*mp*	- medium soft
f	- loud	*p*	- soft
ff	- very loud	*pp*	- very soft
text	- primary text stress, one level louder	text	- secondary text stress, one-half level louder

APPENDIX C

List of Equipment

2 - Sony CCD-F301 Video 8 Handycam Videorecorders

8 - Fuji Super HG P6-120 8mm Videotapes

2 - Promaster 4600 Tripods

1 - Panasonic SV-370 Professional Digital Audio Tape Deck

1 - Tascam 112 Master Cassette Deck

1 - Sony HX-Pro Stereo Cassette Deck IC-WR570

1 - Fuji Digital Audio Tape R-120P

4 - Sony UX High Bias 100 Audio Tapes

Assorted extension cords and cables.

APPENDIX D

Performance Judging Form

Performance Judging Form

Performance No. _____ Judge No._____
Please assign a numerical rating from 1 (extremely poor) to 10 (superior) for each of the first ten performance criteria.

1. Pitch Accuracy
   (correct pitches) _____ (1 - 10)

2. Rhythmic Accuracy
   (correct rhythms/patterns, precise attack and release) _____ (1 - 10)

3. Intonation
   (chord alignment and balance, support, tuning) _____ (1 - 10)

4. Tone Quality
   (vowels, intensity, maturity, blend) _____ (1 - 10)

5. Diction
   (pronunciation, enunciation) _____ (1 - 10)

6. Word Stress
   (primary and secondary word stress, unstressed words) _____ (1 - 10)

7. Articulation
   (fluency, accents, note spacing) _____ (1 - 10)

8. Dynamics
   (volume levels, contrast, dynamic control) _____ (1 - 10)

9. Phrasing
   (expression, control-crescendo/decrescendo) _____ (1 - 10)

10. Tempo
    (appropriate choice, steadiness, control) _____ (1 - 10)

Please assign a numerical overall rating from 1 to 100 according to the following scale:

Poor	Fair	Good	Excellent	Superior
1 20	40	60	80	100

11. OVERALL PERFORMANCE RATING _____ **(1-100)**

Comments:_____
_____
_____

APPENDIX E

Attitude Survey

Circle the number that best expresses your agreement or disagreement with each of the statements below:

A. I like this music.

1	2	3	4	5	6	7	8	9	10
Strongly Disagree		Disagree		Uncertain		Agree		Strongly Agree	

B. I enjoyed rehearsing this music.

1	2	3	4	5	6	7	8	9	10
Strongly Disagree		Disagree		Uncertain		Agree		Strongly Agree	

C. I like this conductor.

1	2	3	4	5	6	7	8	9	10
Strongly Disagree		Disagree		Uncertain		Agree		Strongly Agree	

D. This conductor is a good teacher.

1	2	3	4	5	6	7	8	9	10
Strongly Disagree		Disagree		Uncertain		Agree		Strongly Agree	

E. During this rehearsal I was

1	2	3	4	5	6	7	8	9	10
Turned Off		Out of it		Partici-pating		With it		Turned On	

F. The best thing about this rehearsal was _____

_____

_____

G. The worst thing about this rehearsal was _____

_____

_____

APPENDIX F

Time Spent in Seconds and Percentage of Total Time for Sequential Pattern Components

Group by Session	Academic Tasks		Directions		Student Performance		Teacher Feedback	
	Sec.	%	Sec.	%	Sec.	%	Sec.	%
No Feedback								
1	168	17%	228	23%	581	59%	6	0.6%
2	375	30%	312	25%	582	46%	0	0.0%
3	461	36%	224	17%	590	46%	11	0.9%
4	303	25%	304	26%	584	49%	1	0.1%
5	372	40%	122	13%	433	47%	4	0.4%
6	500	47%	87	8%	487	45%	0	0.0%
Feedback								
1	248	23%	287	27%	528	49%	15	1.4%
2	399	26%	356	23%	759	49%	45	2.9%
3	556	49%	205	18%	323	29%	51	4.5%
4	336	28%	265	22%	579	48%	34	2.8%
5	265	27%	217	22%	465	46%	55	5.5%
6	461	39%	221	19%	487	38%	63	5.3%

APPENDIX G

Frequency of "Hustles" by Category and Session

Group	Academic Instruction	Teacher Direction	Approval Feedback	Neutral Feedback	Total
No Feedback					
1	6	12			18
2	8	13			21
3	23	8			31
4	4	4			8
5	8	3			11
6	28	19		1	48
Feedback					
1	6	15			21
2	21	22	1		44
3	18	14			32
4	12	15			27
5	14	7			21
6	25	20			45

APPENDIX H

Percentage of Students Off-Task: Excerpt by Group by Session

Group by Session	Excerpt 1	Excerpt 2	Excerpt 3	Total
No Feedback				
1	17.53	21.95	18.29	19.73
2	9.38	12.98	9.06	10.39
3	8.60	20.47		13.60
4	7.82	20.73		13.43
5	11.40	20.63		14.32
6			12.74	12.74
Feedback				
1	23.81	18.85	18.32	20.26
2	25.59	15.44	14.69	18.30
3	17.63	17.00		17.30
4	12.53	18.49		14.73
5	15.50	19.39		17.14
6			20.33	20.33

APPENDIX I

Percentage Off-Task: Activity by Group by Session

Group by Session	Group Performance	Sectional Performance	Non-Performance
No Feedback			
1	9.49	18.33	18.09
2	3.69	14.84	12.95
3	3.10	26.15	18.59
4	7.65	2.27	22.52
5	2.44	23.33	22.55
6	2.78	9.58	19.73
Feedback			
1	10.16	17.88	26.52
2	3.13	23.74	26.28
3	2.75	n/a	24.55
4	7.21	25.00	20.89
5	4.55	27.78	21.40
6	3.87	19.23	27.81

APPENDIX J

Number of Observational Units: Activity by Group by Session

Group by Session	Group Performance	Sectional Performance	Non-Performance
No Feedback			
1	18	24	26
2	27	17	44
3	31	9	43
4	43	6	33
5	24	5	31
6	23	11	39
Feedback			
1	19	22	37
2	32	20	51
3	26	0	52
4	36	6	36
5	22	11	34
6	22	8	50

APPENDIX K

Judges' Overall Performance Scores and Summed Concept Scores by Test for Excerpts Within Groups

Rating Type by Test No.	No Feedback Group			Feedback Group		
	Excerpt 1	Excerpt 2	Excerpt 3	Excerpt 1	Excerpt 2	Excerpt 3
Judges' Overall Scores						
Test 1	7.67	15.00	17.33	14.00	19.67	19.00
Test 2	19.67	22.67	18.33	23.67	26.00	24.00
Test 3	17.33	26.67	-	20.00	24.67	-
Test 4	29.33	22.67	-	28.67	27.67	-
Test 5	32.33	32.67	-	34.67	34.33	-
Test 6	38.67	30.67	-	35.33	34.00	-
Test 7	30.00	50.33	-	29.00	45.67	-
Test 8	33.00	48.00	-	33.00	43.00	-
Test 9	-	-	11.67	-	-	18.00
Test 10	-	-	43.00	-	-	39.33
Summed Concepts						
Test 1	9.00	13.00	24.00	15.33	18.33	23.67
Test 2	33.00	32.67	38.00	32.33	29.67	39.67
Test 3	24.67	24.00	-	28.67	30.33	-
Test 4	29.33	41.67	-	34.00	42.33	-
Test5	30.33	36.00	-	28.00	37.33	-
Test 6	29.67	47.00	-	34.33	44.00	-
Test 7	31.00	46.33	-	30.33	41.67	-
Test 8	51.33	51.00	-	47.67	50.00	-
Test 9	-	-	36.00	-	-	34.33
Test 10	-	-	55.33	-	-	51.67

VITA

Dwayne Earle Dunn was born March 7, 1962 in Joplin, MO. Growing up in Albuquerque, NM, Mr. Dunn attended Eldorado High School, graduating number one in a class of 720. Upon receiving a choral scholarship and a Dean's scholarship, Mr. Dunn attended Texas Christian University in Fort Worth, TX. A four-year participant in the TCU Honors Program, his senior honors project was entitled, The Requiem Mass in the Nineteenth Century. He received his Bachelor of Music Education, summa cum laude, and was named the Senior Scholar in Music in May, 1984.

Mr. Dunn accepted a teaching position with the Grand Prairie (TX) Independent School District in 1984, serving as choral director of Truman Middle School for four years. He split time during those years assisting with choirs at both Grand Prairie high schools, and served in numerous campus, district, and regional offices. In 1988, Mr. Dunn began a new position as Assistant Director of Choral Music for the Harlingen (TX) Consolodated Independent School District where he helped supervise a large high school choral music department, served by three choral directors.

Mr. Dunn went on to receive his Master of Music degree in choral conducting from Southwest Texas State University in 1992, serving as a graduate assistant for choral student teachers. Awarded an Alumni Fellowship to attend Louisiana State University, Mr. Dunn began doctoral studies in 1992, teaching courses in music education. Mr. Dunn will complete his doctorate in August of 1995, and has accepted a position with the University of Arizona in Tucson.

DOCTORAL EXAMINATION AND DISSERTATION REPORT

Candidate: Dwayne E. Dunn

Major Field: Music Education

Title of Dissertation: The Effect of Structured Task Presentations and Reinforcement on Attention, Achievement, and Attitude of Selected High School Choirs

Approved:

Major Professor and Chairman

Dean of the Graduate School

EXAMINING COMMITTEE:

Date of Examination:

May 16, 1995