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THE EFFECT OF TEACHER APPROVAL/DISAPPROVAL ON  
STUDENTS' ON-TASK BEHAVIORS IN A  
SELECTED BEGINNING STRINGS CLASS

THESIS

Presented to the Graduate Council of the  
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By

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*Why?*

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The present study explored whether (a) positive or negative reinforcement would produce higher percentages of on-task student behavior at set timed intervals, (b) positive, negative, or total reinforcement would increase student attentiveness after reinforcement, and (c) if natural fluctuations in teacher approval/disapproval would have any bearing on percentages of student attentiveness.

Findings of the 15-day study concluded that (a) positive reinforcement maintained significantly higher levels of student attentiveness over negative reinforcement, (b) negative reinforcement did not significantly lower percentages of student attentiveness, and (c) natural fluctuations in rates of teacher approval/disapproval had no apparent effect on the amount of on-task behavior in the beginning strings class.

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## CHAPTER I

### INTRODUCTION

#### Statement of the Problem

The emphasis in education today is to create an optimum environment in the classroom so that the learning process can be utilized to its utmost potential. Developing an atmosphere conducive to learning could influence the amount of enjoyment or knowledge a student attains from a particular subject (Denham & Lieberman, 1980). Past research in education has shown a direct correlation between students' "engaged" time or "time-on-task" and the amount of learning which takes place in the classroom (O'Leary & O'Leary, 1977). In all areas of education, including the fine arts, teachers are being asked to increase the amount of time-on-task for every student.

Researchers have shared the belief that various management strategies can have an effect on student time-on-task (Forsythe, 1977; Witt, 1986; Yarbrough & Price, 1981). One strategy that has been shown to increase on-task behavior in the classroom is the effective use of positive/negative reinforcement. This method has been studied in many subject areas and in various age groupings, but little research has been done in this regard using beginning

string instrumental students as subjects. The effects of positive/negative reinforcement on students' on-task behavior have not been studied in the beginning strings class environment. This investigation was concerned with the implementation and interpretation of teacher approval/disapproval responses in the beginning strings class and their effect on students' time-on-task behavior.

#### Background of the Problem

The amount of time a student spends in the learning process of education has been of prime importance to educators. The link between time-on-task behavior and student achievement was the focus of a major study from 1972 to 1978 by the National Institute of Education through the California Commission for Teacher Preparation and Licensing. This study, known as the Beginning Teacher Evaluation Study (BTES), centered on "academic learning time" (the amount of time a student spends engaged in academic tasks) as a measure of learning (O'Leary & O'Leary, 1977). After years of classroom observations and research, the study found that academic learning time is directly related to student achievement; however, their observations also showed large amounts of time during the school day when students were not engaged in learning. The BTES concluded that not only was time a key influence on learning, but that teachers needed to evaluate and improve the amount of academic learning time



in the classroom (O'Leary & O'Leary, 1977).

How can a teacher increase the amount of academic learning time, or time-on-task in the classroom? Maintaining the students' attention is a key factor, but this is not an easy task. A child's interest and attention to a subject does not automatically generate the application and adherence to procedures necessary for doing a good job on a class assignment, even when the assignment is self-chosen (Tanner, 1978). Since beginning instrumental music courses, such as strings, are typically elective courses in our public school structure, those students enrolled theoretically would have more interest in the subject matter and would generate the self-discipline necessary to complete all academic tasks assigned. Even in an elective course, maintaining student interest throughout the entire class period can be a challenge, even for the most well-organized and disciplined teacher. Various management tactics can minimize disengaged time, but if the behavior of the students keeps them from being attentive, the teacher must find ways to modify those behaviors. A teacher that is well-versed in the principles of such behavior modification can increase learning and make their classrooms more productive places, both for their students and for themselves (Sarason, Glaser, & Fargo, 1972).

The basic principles of behavior modification are well-entrenched in classroom management strategies, those principles being (a) behavior is influenced by its

consequences, and (b) a teacher's behavior influences a pupil's behavior (Sarason et al., 1972). The first principle deals with the theory of operant conditioning; that is, the systematic use of the consequences of behavior in order to strengthen or weaken subsequent behavior (Sarason et al., 1972). The use of operant conditioning in schools is growing because it can be applied by classroom teachers in group settings (Howie & Winkleman, 1977). The second principle of behavior modification deals with the use of reinforcement to encourage productive behavior. By definition, a reinforcer is "an event which changes behavior" (Buckley & Walker, 1973). Its traditional use in education has dealt with controlling student responses so that they are emitted only at appropriate times (Ferster & Skinner, 1957). If a teacher in the classroom immediately signals approval to a student after viewing a specific behavior, the likelihood that the student will behave in the same way again will increase (Ferster & Skinner, 1957). If a negative reinforcer follows a behavior, it will most likely decrease the use of that behavior by the student.

But can various forms of reinforcement modify a child's behavior so that attentiveness and time-on-task is increased in the music classroom? Past studies in music education have dealt with various strategies in maintaining student attentiveness (Forsythe, 1975; Forsythe, 1977; Kuhn, 1975; Murray, 1975; Price, 1983; Witt, 1986; Yarbrough & Price,

1981), yet none have dealt specifically with the issue of improving time-on-task through positive reinforcement in string education. Music researchers have focused on use of class time in a variety of musical environments--elementary general music classes, ensemble rehearsals, private lessons--and have concentrated on student attentiveness and performance levels. Forsythe (1977) concluded that off-task behavior was related to the nature of the classroom activity, with those activities involving more "active" participation more likely to promote on-task behavior. Yarbrough and Price (1981) came to these same conclusions after observing six high school ensembles, and added that teacher eye contact (a nonverbal reinforcer) can noticeably drop off-task percentages. Price (1983) again found that high percentages of on-task student behavior occurred when there was a limited amount of verbalization and high amounts of performance in the college-level ensemble rehearsal, yet also noted that the largest musical gains and highest student attitude ratings were given when the 80% approval/20% disapproval feedback ratio was incorporated into the rehearsal. One study dealt with public school string education (Witt, 1986), but concentrated on secondary instrumental music rehearsals with regard to various uses of class time by teachers and their effect on student attentiveness. Students' time-on-task behavior was observed as a function to the type of activity in the classroom, with no mention of teacher reinforcement

or its effect on student attentiveness (Witt, 1986). Research regarding aspects of public school beginning strings teaching is very limited; therefore, it is apparent that this void in string education needs to be filled.

#### Purpose of the Study

The purpose of this study was to determine the effect of both positive and negative teacher reinforcement on students' time-on-task behavior in the public school beginning strings class. A critical examination of documented observations was made to surmise the impact of positive and negative teacher responses on the on-task performance of the students in order to clarify the effects of positive and negative reinforcement on student time-on-task behavior in the beginning strings class.

#### Research Questions

In order to determine the effect of positive/negative teacher reinforcement on student attentiveness, answers were sought to the following research questions:

1. Will positive or negative teacher reinforcement yield higher percentages of student on-task behavior at the post-response five second interval?
2. Will positive or negative teacher reinforcement yield higher percentages of student on-task behavior at the post-response ten second interval?
3. Will positive or negative teacher reinforcement

yield higher percentages of student on-task behavior at the post-response twenty second interval?

4. Will there be a difference in student time-on-task behavior percentages after reinforcement when compared to on-task percentages prior to reinforcement?

5. Will higher daily percentages of positive teacher reinforcement produce higher daily percentages of student on-task behavior?

#### Definition of Terms

The following terms were operationally defined for the purposes of this study:

1. on-task student behavior: students were counted "on-task" if they met the following criteria: (a) when the students were supposed to be playing, they must have been playing and looking at either the music or the teacher; (b) when the students were not supposed to be playing, they must have been silent and looking at either the music, the teacher, or others that were playing; (c) when the teacher gave instructions, the students must have followed those instructions (Murray, 1975).

2. off-task student behavior: students were counted "off-task" if they did not meet the criteria for "on-task" behavior.

3. approval responses (a.k.a. positive reinforcement): approval responses were guided by these examples: (a) verbal:

good job; that is correct; that's much better; you play very well; I'm proud of you; I appreciate your hard work; (b) nonverbal: head nodding vertically; grinning; laughing; widening eyes (Price, 1983).

4. disapproval responses (a.k.a. negative reinforcement): disapproval responses were guided by these examples: (a) verbal: that's incorrect; that's wrong; not that way; don't play so loud; (b) nonverbal: shake head horizontally; knitting the eyebrows; frowning; narrowing the eyes; pursing the lips (Price, 1983).

5. general teaching instructions: general teaching instructions and directions were guided by these examples: (a) verbal: please open your book; write down the following; please look at the board; listen carefully; (b) nonverbal: writing on the chalkboard; passing out papers; tuning instruments.

6. daily teacher approval percentage: the percentage of positive teacher reinforcement given on a particular day.

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## CHAPTER II

### RELATED LITERATURE

#### Verbal Reinforcement in the Classroom

"Yes, Johnny, that is the correct answer." "Good job, Susan, you did that very well." "I appreciate your hard work and effort, Jane." "This is a very neat paper, Tom."

Verbal reinforcement and teacher attention can do wonders for a child's emotional and educational development. Research has repeatedly found that teacher attention and verbal praise, such as the examples above, are effective behavior reinforcers for pre-school and elementary school children (Hall, Lund, & Jackson, 1968; Madsen, Becker, & Thomas, 1968; Thomas, Becker, & Armstrong, 1968; Ward & Baker, 1968). Studies in public school classrooms have evaluated the effects of verbal reinforcement on student attentiveness at all age levels. After observing a kindergarten class for 20 days, Schutte and Hopkins (1970) found that student attentiveness jumped from 60% to 78% when the teacher verbally praised a student after following an instruction. Praise was given to a child contingent upon a student's immediate response to instruction, and withheld if the child did not follow instructions. By the end of the study, the percentage of student attentiveness

had reached 83.7%; this clearly implied that the consequences of instructed behavior can determine the extent to which a child follows instructions (Schutte & Hopkins, 1970).

In 1968, Hall conducted two studies using contingent teacher attention following appropriate study behavior. One study centered around five third-grade students who had high rates of disruptive behavior. A reinforcement period in which teacher attention followed a student's study behavior and ignored non-study behavior resulted in sharply increased study rates from 43% to 85% (Hall, Lund, & Jackson, 1968). The other study (Hall, Payton, Rabon, & Broden, 1968) focused on a regular first grade class; positive verbal responses were given after viewing appropriate study behavior. This behavior decreased when positive feedback was not administered, then increased after its reinstatement. The study (Hall, Payton et al., 1968) concluded in part that positive reinforcement had a direct affect on students' time-on-task behavior.

Other studies (Becker, Madsen, Arnold, & Thomas, 1966; Sarason, Glaser, & Fargo, 1972; Wasik, Senn, Welch, & Cooper, 1969) have shown that verbal attention by the teacher is an effective means of improving student on-task percentages. Sarason et al. (1972) went one step further by concluding that a teacher's planned use of a reinforcer was much more influential over study behavior; that is, it must be contingent upon correct study responses from the child.

Positive verbal reinforcement can also have a direct impact on deviant behavior. Becker et al. (1966) observed the selective use of teacher attention and praise in managing classroom behavior. The study found that the average deviant behavior for 10 fifth-grade children was 62% during regular class time and 29% during the experimental period when verbal approval responses were given by the teacher and inappropriate student behavior was ignored. Becker et al. (1966) concluded that rules alone do nothing and that simply ignoring deviant behavior actually increased such behavior; therefore, the ability of the teacher to ignore deviant behavior and reinforce an incompatible appropriate behavior was critical in maintaining high student attention levels. Madsen, Becker and Thomas (1968) summed up the importance of positive verbal reinforcement in combination with other management strategies when they concluded that (a) rules alone exert little effect on classroom behavior, (b) a combination of ignoring inappropriate behavior and praising appropriate behavior is most effective in maintaining high student attention, and (c) showing approval for appropriate student behavior is probably the key to effective classroom management.

#### Nonverbal Reinforcement in the Classroom

Verbal approval responses, as opposed to nonverbal approval responses, constitute most (about 85%) of teacher

attending behavior (Madsen, Becker, & Thomas, 1968). Moreover, teacher training is more likely to emphasize verbal behaviors; nevertheless, nonverbal teacher behaviors may provide an important source of reinforcement in the classroom (Kazdin & Klock, 1973).

In 1927, Sapir wrote "we respond to gestures with an extreme alertness and, one might say, in accordance with an elaborate and secret code that is written nowhere, known by none, and understood by all" (Duncan, 1969). The significance of nonverbal responses in human communication did not enter into the world of educational research until the 1950's, when studies began to appear reporting systematic efforts to transcribe gestures and other non-language behaviors, and to understand their use in various cultures (Duncan, 1969).

Communication through nonverbal modes include the following: (a) body motion: gestures and other body movements, including facial expressions, eye movement and posture; (b) paralanguage: voice qualities, laughing, and yawning; (c) proxemics: use of personal space; (d) olfaction: the sense of smell, and (e) use of artifacts, such as dress and cosmetics (Duncan, 1969).

Although nonverbal behaviors are often included in definitions of teacher approval responses, their individual effect on student behavior is rarely evaluated. Even when observation guidelines include nonverbal teacher behaviors such as facial expressions and physical contact, it remains

unclear whether these behaviors contribute to behavior change in the students independently of verbal approval alone (Kazdin & Klock, 1973). Kazdin and Klock (1973) did attain positive results after observing the effect of increased nonverbal teacher responses on attending behavior of 12 retarded children. After determining average teacher response patterns, the teacher was instructed to increase her use of nonverbal responses (smiles and physical contact) and maintain her baseline level of verbal approval. Results of the study show that 11 of 12 children had increases in attending behavior during the phases in which contingent nonverbal teacher approval increased (Kazdin & Klock, 1973). Although separation of verbal and nonverbal teacher responses has yet to be researched, their combination in the classroom has consistently yielded positive results.

#### Disapproval Responses in the Classroom

Despite the extensive documentation of the effectiveness of teacher approval in maintaining student attentiveness, most teachers, unless trained in behavior modification techniques, will voice disapproval 3.3 times as often as approval when responding to student behavior (Madsen & Alley, 1979). In fact, several studies have suggested that teacher criticism and strong disapproval appear to be more consistent and more significant predictors of class achievement than

measures of teacher approval. In Teaching Behaviors and Student Achievement, Barak Rosenshine (1971) investigated 16 case studies and found a small but significant correlation between student achievement and teacher disapproval. The overall conclusion from 11 studies was that an indirect/direct ratio between teacher disapproval and student achievement yields consistently positive, but low linear correlations; however, because the correlation is low, Rosenshine (1971) suggested an increase in investigations of those teacher behaviors that relate to student achievement.

Other research has shown that frequent disapproval responses from the teacher can negatively affect a child's behavior in the classroom. Thomas, Becker, and Armstrong (1968) sought to show the importance of positive versus negative teacher responses to student attentiveness by observing 28 middle-primary students over a period of 70 days. The results of their study concluded that approving teacher responses serve as a positive reinforcing function in maintaining appropriate classroom behaviors: disruptive behaviors increased each time approving teacher behavior was withdrawn, and when disapproval responses were tripled, increases appeared most markedly in the noise-making category of disruptive behavior guidelines (Thomas et al., 1968).

A combination of teacher disapproval and praise for appropriate incompatible behaviors has been shown to be quite

effective in the classroom. McAllister, Loring, Stachowiak, Baer and Conderman (1969) studied the effect of teacher praise and disapproval on target behaviors in a high school English class. Results from the 62 day study indicated that teacher praise for incompatible behaviors coupled with disapproval for the target behaviors substantially reduced the incidence of those behaviors in class (McAllister et al., 1969). Clearly teacher disapproval, whether used separately or in combination with other behavior modification strategies, has been shown to be an effective method of maintaining student attentiveness in the classroom.

#### Overuse of Positive Reinforcement

Research has consistently shown that positive reinforcement in the classroom can increase student attending behavior (Hall, Lund, & Jackson, 1968; Madsen et al., 1968; and others). But can a student remain at a high attention level in an all-positive environment? Past studies have always included a percentage of teacher disapproval responses, with some as low as 20% (Kuhn, 1975; Murray, 1975; Price, 1983), yet student attentiveness percentages remained high. However, an all-positive environment has yielded negative results. After a 46 day study, Pfiffer, Rosen, and O'Leary (1985) concluded that an all-positive approach in the classroom that relied primarily on praise was not effective, and that behavior problem children cannot be

successfully managed in an all-positive environment. Researchers have yet to study the effect of an all-positive response strategy on the attention and achievement levels of students in the traditional classroom.

#### Natural Rates of Reinforcement Versus Set Levels

The fact that teachers use more disapproval responses in the classroom has already been mentioned. But why do teachers teach this way? The most reasonable hypothesis is that these observed rates of disapproval are, in themselves, reinforcing to teachers. Disapproval responses often terminate student misbehavior immediately, although often temporarily, thereby rewarding teachers immediately in their roles as classroom managers; however, a higher rate of disapproval is not likely to decrease inappropriate managerial behaviors in the long run (White, 1975).

Although a number of studies have reported on the experimental manipulation of rates of teacher verbal reinforcement in the classroom, little has been reported on rates of verbal reinforcement as they typically (White, 1975). Studies have reported mixed results in this research environment. Kostka (1984) found that the natural rates of approval responses in the private piano studio varied on average from 41% to 54%, yet no evidence of their effects on student attentiveness was apparent. The study concluded that individualized instruction in itself maintained a high



degree of student on-task behavior (Kostka, 1984).

Outside of music, few studies have dealt with natural rates of reinforcement in the classroom. White (1975) conducted 16 studies to determine natural rates of teacher approval/disapproval in 1st through 12th-grade classrooms. Findings revealed that teacher approval rates dropped as grades progressed, with a marked drop after second grade. In every grade after second, the rate of teacher verbal disapproval exceeded the rate of verbal approval. White (1975) also found that teachers tend to give disapproval responses three times as often as approval, which was later corroborated in the findings of Madsen and Alley (1979). Thomas, Presland, Dilys Grant, and Glynn (1978) studied natural rates of reinforcement in 10 seventh-grade classes and compared their results to those of White (1975). Their hypothesis was proven when results showed that the majority of teachers observed displayed higher individual rates of disapproval (Thomas et al., 1978). Although these studies do not directly report the effect of high disapproval responses to student attentiveness, they do suggest that if these rates are measured appropriately, some of the learning problems that teachers encounter with children may be explained, such as lack of interest, poor concentration, or even skill deficits (Thomas et al., 1978).

Set ratios of reinforcement have been the subject of several studies. Researchers have shown that positive

reinforcement levels of 75% or higher are most effective for maintaining student attention (Forsythe, 1975; Madsen & Alley, 1979). Forsythe (1975) concluded that use of approval ratios set at the 75% level produce significantly higher attention levels than disapproval responses set at the same level. Studies using 80% approval ratios have yielded mixed results. Kuhn (1975) found that fifth-grade students have higher attention rates when teacher approval is kept at the 80% positive level. After observing high school choir students, Murray (1975) detected no significant difference in student on-task percentages at the 80% approval rate; however, the results of Murray's research likely were subject to Hawthorne effects. The environment in which the study took place included two outside observers seated directly in front of and facing the students, microphones, and a "flip chart" designed to help the instructor keep track of approval/disapproval responses. If normal student attentiveness rates are sought, the surroundings used for the observations need to be as familiar to the students as possible. While handsignals and lights have been found to be effective in helping parents learn to discriminate when to respond to or ignore a child's behavior, the procedure is too disruptive when the teacher is in the middle of a lesson and is consequently placed in conflict about which type of response should come next (Becker et al., 1966).

Findings of past research have concluded that both positive and negative reinforcement are effective means in improving student attentiveness. Contradictory conclusions have been reached regarding the percentage of teacher approval/disapproval that is most effective in maintaining student attentiveness. Past research has not determined the immediate effect of positive/negative reinforcement on student time-on-task behavior in the beginning strings class environment.

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## CHAPTER III

### METHODOLOGY

A critical examination of documented observations was made to surmise the impact of teacher approval/disapproval responses on students' time-on-task behavior in the beginning strings class. In order to determine the results of this investigation, the following methodology was employed.

#### Subjects

Students participating in this study were from the Plano Independent School District of Plano, Texas. The Plano Independent School District was selected due to the structure of their beginning strings program: instruction begins in the sixth-grade, and meets daily for 50 minutes. It was assumed that a 50 minute class period would provide ample time at the beginning of class for students to get settled and for instruments to be tuned, yet still provide a large block of observation time before the students needed to prepare for their next class. It was also assumed that the district's schedule of daily instruction, rather than three times per week as most districts have their beginning strings classes scheduled, would provide a more accurate account of day-to-day student behavior in the classroom.



Students participating in this study were members of one intact beginning strings class. Since randomization was not possible, findings of the study are limited to the sample population. The findings may be useful to teachers of similar subject populations; therefore, a description of the subjects' general environment is included here to aid the reader.

Plano is a community of approximately 120,200 residents, located in the southwest corner of Collin County, Texas. The school district currently enrolls 28,000 students from kindergarten through 12th-grade. Current statistics regarding the student population are as follows (courtesy Plano Chamber of Commerce, telephone interview):

Race: 89% White, 3.50% Hispanic, 3.25% Black,  
2.25% Asian, 2% Other

Gender: 51.25% Male, 48.75% Female

Median Family Income: \$54,547.00

Percentage of Graduating Seniors: 94.6%

Percentages of Seniors Who Will Attend College: 81%

One sixth-grade beginning strings class was observed in this study. Criteria for class selection was as follows: (a) class enrollment would not exceed 15 students, so that all students would be clearly visible on camera, and (b) the string instructor must have been willing to fully participate in this study. Using this criteria, the first

period beginning strings class at Armstrong Middle School was chosen. Class enrollment was 11 students, 8 girls and 3 boys.

Observations were conducted for 15 consecutive school days. Each class period was videotaped for an ex post facto analysis by the researcher, as suggested by Witt (1986). For the purposes of this study, the researcher observed 15 consecutive minutes of each taped class period, beginning 15 minutes after the tardy bell. It was hoped there would be fewer distractions to teacher and students toward the center of the 50-minute class.

Class was held in its normal surroundings under the direction of its regular instructor. It was hoped that in this environment students would behave in a more realistic, normal manner. Students were told that the videotaping was for course curriculum evaluation purposes. Students were not told the true nature of the study. It was hoped that this procedure, along with other foils discussed later in this chapter, would help control for possible Hawthorne effects related to the presence of the camera.

#### Equipment

A General Electric Newvicon Video Camera with electric viewfinder and stereo microphone was mounted on a Velbon VG-3C Tripod and placed in one corner of the classroom. A General Electric 128 Channel Keyboard Tuner and Four Head

Portable Tape Player was connected to the camera and set on a small table next to the tripod. Polaroid Supercolor Plus T-120 VHS videotape was used to record each session. A timer-counter, built into the camera, was utilized to project the hour, minute, and second onto the videotape. Four videotapes were used for recording purposes. Each tape recorded five class periods. The tapes were labeled 0, 1, 2, and 3, to denote each week of observations. A Hitachi VHS Video Recorder model VT-12AX and RCA Colortrak Television were used to review each tape for data analysis.

#### Procedures

All equipment was set up in the classroom one week prior to the actual observations. Taping began during this week using tape 0. This tape was not used for data analysis. Its purpose was to allow the teacher and students to become familiar with the camera's presence. Duct tape was placed over a small red light on the camera that flashed when filming, so that the students were not constantly reminded that the camera was recording the class.

For each day of filming, the teacher turned on the video camera when the tardy bell rang at the beginning of class. When students began to put away their instruments at the end of class, the teacher turned off the camera. At the end of each week of the study, a new videotape was inserted into the tape player for the next week of observations.

During class time, the teacher followed her normal lesson plans, and instructed her students as she would have for any regular school day. No added emphasis was placed on either positive or negative responses to the students. The teacher was not asked by the researcher to vary any part of the class' normal routine. It was hoped that this procedure would produce normal student responses to teacher reinforcement.

The following information from each taped session was documented onto an observation chart designed by the researcher (Figure 1):

1. Time of teacher reinforcer: the hour, minute, and second of each reinforcer was notated on each student's observation chart.

2. Type of reinforcer: teacher responses to students were charted by the researcher as either positive or negative, according to established definitions of positive and negative responses from previous research (Price, 1983).

3. Student attentiveness to reinforcer: each student was observed at 5, 10, and 20 second intervals prior to each reinforcer in order to establish an on-task behavior pattern, and at 5, 10, and 20 second intervals after the reinforcer to record any change in time-on-task behavior. Past research has suggested that outside variables may contribute to student attentiveness (Yarbrough & Price,

1981) and that adolescents are simply incapable of total and consistent application of attention at all times (Sabatino, Sabatino, & Mann, 1983). Lacking any further guidance regarding a reliable indication of a student's response to a reinforcer over time, this investigator chose to halt the observation time for each reinforcer at the 20 second interval.

4. Indirect response to reinforcers: each child was observed at the same intervals stated above when a reinforcer was given to another student, in order to chart indirect responses to positive/negative reinforcement. Although past studies in music education have used various strategies when dealing with student attentiveness (Kuhn, 1975; Murray, 1975), none have dealt with the issue of indirect responses of students to reinforcers given to other members of the class.

Response Time	Given To	20	10	5		5	10	20
_____	_____	___	___	___	P N	___	___	___
_____	_____	___	___	___	P N	___	___	___
_____	_____	___	___	___	P N	___	___	___

Figure 1. Sample observation chart.

#### Data Analysis

The purpose of this study was to determine the effect of positive/negative teacher reinforcement on students'

time-on-task behavior in the beginning strings class. To compare the data obtained from the 15 days of observation, the following analysis was performed:

All teacher responses were charted as positive or negative. General teaching instructions and directions were not charted. These responses were counted and averaged for each observation period to determine a daily percentage of positive/negative reinforcement. Overall percentages were then averaged to determine a final approval/disapproval ratio. Although this latter percentage had little bearing on the results of this study, the investigator thought that it might be of some later use.

Daily percentages of on-task behavior were determined for each student for each of the six timed intervals. Direct and indirect responses were grouped together to produce an overall on-task behavior percentage for each timed interval in each class period. These percentages were then graphed for comparison.

#### Reliability and Validity

Reliability of this analysis was tested by randomly selecting one observation period, recalculating all on-task percentages, and comparing the results to the first set of percentages using Pearson Product Moment Coefficient of Correlation to establish the degree of reliability.

Reliability would be accepted if the correlation between the

two test results was  $r = .90$  or higher.

After determining percentages of on-task student behavior to combined positive/negative teacher reinforcement, reliability estimates were  $r = .99$  for percentages prior to reinforcement, and  $r = .98$  for percentages after reinforcement. Procedures for calculating on-task behavior percentages were therefore considered reliable for the purposes of this investigation.

The purpose of this study was to determine the effect of positive/negative teacher reinforcement of students' time-on-task behavior in the beginning strings class. Measurement of data was set in accordance to specific definitions and guidelines of past research, and through direct observations of student responses. Based upon this information, it was this researcher's best judgement that all measurement devices used in this study were reliable and valid, and that the sample being measured was an adequate representation of student responses to reinforcement in the beginning strings class.

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## CHAPTER IV

### RESULTS

This chapter will discuss the data obtained from the analysis of teacher approval/disapproval responses on student attentiveness in the beginning strings class. Results were based on 225 minutes of classroom observation time over 15 consecutive school days.

#### Teacher Approval/Disapproval Responses

Daily percentages of teacher approval/disapproval were determined by counting the number of responses given, classifying them as positive or negative, and dividing the number in each category by total responses. Combined positive/negative reinforcers totaled 182 over the course of this study, with 123 positive and 59 negative given. As shown in Table 1, total teacher responses per day ranged from 8 to 22; positive responses from 4 to 18; negative responses from 1 to 9. Positive responses outnumbered negative responses for 12 of 15 days. The overall teacher approval percentage was 67.6%. Nine days met or exceeded this percentage. Daily approval percentages ranged from 40.0% to 90.9%.

Table 1

Teacher Approval/Disapproval Responses

Day	+ Responses	- Responses	Total	Approval %
1	13	4	17	76.5
2	6	9	15	40.0
3	4	4	8	50.0
4	5	4	9	55.5
5	10	1	11	90.9
6	7	3	10	70.0
7	7	3	10	70.0
8	7	2	9	77.7
9	7	9	16	43.8
10	5	3	8	62.5
11	8	5	13	61.5
12	7	3	10	70.0
13	12	3	15	80.0
14	7	2	9	77.8
15	18	4	22	81.8

## On-Task Percentages at Set Time Intervals

Students were observed at five, ten, and twenty second intervals after reinforcement and recorded as being on or off-task. Percentages were calculated to determine

Table 2

Overall On-Task Percentages: Post-Five, Ten and  
Twenty Second Intervals

Student	Five		Ten		Twenty	
	+	-	+	-	+	-
1	83.4	67.1	83.4	67.1	89.3	62.3
2	83.1	75.9	84.1	84.9	87.7	68.3
3	77.4	66.2	77.2	60.1	82.0	46.0
4	86.2	84.7	87.3	80.6	86.2	60.0
5	86.7	66.5	87.3	78.7	86.7	72.7
6	96.1	87.9	94.9	90.7	90.3	75.2
7	97.1	89.5	95.8	87.3	96.3	75.6
8	92.0	85.5	90.5	85.8	91.8	69.6
9	94.4	92.0	96.7	86.7	94.6	72.2
10	92.3	86.3	91.7	85.9	88.1	76.8
11	85.9	69.7	81.2	83.5	85.0	66.6

each student's daily on-task percentage at each interval after positive or negative reinforcement. Interval percentages were then averaged by category for the 15 days of observation to create an overall on-task percentage for each student at each of the timed intervals.

Post-reinforcement on-task percentages are reported in Table 2. Pre-reinforcement on-task percentages will be discussed later with regard to research question number four.

#### Post-Five Second Interval

On-task percentages based on positive reinforcement ranged from 77.4% to 97.1%. On-task percentages based on negative reinforcement ranged from 66.2% to 92.0%. At this interval, all students had higher percentages of on-task behavior following positive reinforcement.

#### Post-Ten Second Interval

The overall on-task percentages based on positive reinforcement ranged from 77.2% to 96.7%. On-task percentages based on negative reinforcement ranged from 60.1% to 90.7%. At this interval, 9 of 11 students had higher percentages of on-task behavior after positive reinforcement.

#### Post-Twenty Second Interval

On-task percentages at the post-twenty second interval yielded higher on-task percentages after positive reinforcement for all students. Positive reinforcement produced on-task percentages ranging from 82.0% to 96.3%, with 6 of 11 students achieving a higher on-task percentage over their post-ten second percentage. On-task percentages after negative reinforcement dropped considerably, ranging from 46.0% to 75.6%.

Figure 2 displays a visual comparison of the students' mean on-task percentages to positive and negative reinforcement

over the five, ten, and twenty second intervals for this study. Over these three intervals, positive reinforcement maintained a consistently high on-task percentage, varying only .7% between intervals: 88.6% at the post-five interval, 88.2% at the post-ten interval, and 88.9% at the post-twenty second interval. Negative reinforcement over these three intervals increased on-task behavior from 79.2% to 81.0% from the post-five to post-ten second interval, then dropped considerably at the post-twenty second interval to 67.8%.

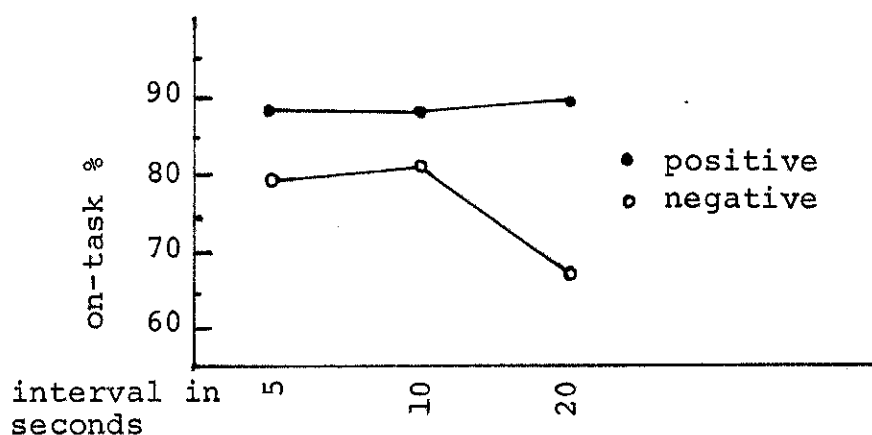


Figure 2. Mean on-task percentages at the post-five, ten, and twenty second intervals.

#### On-Task Percentages Before and After Reinforcement

For the purposes of this study, teacher reinforcement was broken down into three categories: positive reinforcement, negative reinforcement, and combined positive/negative reinforcement.

### Combined Positive/Negative Reinforcement

Each student's daily percentage of on-task behavior before combined reinforcement was calculated by dividing the number of on-task markings over the three pre-response intervals by the total number of on/off-task markings before reinforcement. The same procedure was used to determine student's overall on-task percentage before and after combined reinforcement.

The overall on-task percentages before and after combined reinforcement for each student are listed in Table 3. The total number of teacher responses are listed because the on-task percentages of some students, due to absences during the 15 days of the study, were calculated using varying numbers of teacher responses. Percentages of on-task behavior, both before and after combined reinforcement, are listed with the increase/decrease in attending behavior noted. During the course of this study, all students increased on-task behaviors following reinforcement. Increases in attending behavior were from .9% to 4.6%.

### Positive/Negative Reinforcement

When teacher reinforcement was broken down into positive and negative categories, as in Table 4, 10 of 11 students had increases in attending behavior after positive reinforcement, while 9 of 11 had decreases in on-task behavior

Table 3

Overall On-Task Percentages to Combined  
Positive/Negative Reinforcement

Student	Total Reinforcers	On-Task %		
		Before	After	Increase
1	182	78.3	80.4	2.1
2	182	80.9	82.4	1.5
3	164 <sup>a</sup>	70.7	73.6	2.9
4	165 <sup>b</sup>	79.7	82.9	3.2
5	182	77.7	81.2	3.5
6	182	89.3	90.7	1.4
7	182	91.1	92.0	.9
8	159 <sup>c</sup>	84.4	86.2	1.8
9	165 <sup>d</sup>	88.1	90.9	2.8
10	182	82.7	87.3	4.6
11	182	77.9	80.9	3.0

Note. <sup>a</sup>Absent days 6 & 10. <sup>b</sup>Absent day 1. <sup>c</sup>Absent days 6 & 11. <sup>d</sup>Absent day 1.

after negative reinforcement. The largest increase in on-task behavior came after positive reinforcement (+9.5%); the largest decrease came after negative reinforcement (-9.2%).



Table 4

Overall On-Task Percentages to Positive/Negative Reinforcement

Student	Positive Reinforcement			Negative Reinforcement		
	Before	After	Deviation	Before	After	Deviation
1	82.9	86.0	+3.1	70.0	68.1	-1.9
2	86.2	85.0	-1.2	74.5	76.4	+1.9
3	74.7	78.9	+4.2	61.7	57.4	-4.3
4	81.3	86.6	+5.3	78.5	75.1	-3.4
5	81.3	86.9	+5.6	68.0	72.6	+4.6
6	91.1	93.8	+2.7	86.2	84.6	-1.6
7	90.7	96.4	+5.7	93.3	84.1	-9.2
8	85.0	91.4	+6.4	82.6	80.3	-2.3
9	86.8	95.2	+8.4	90.0	83.6	-6.4
10	81.2	90.7	+9.5	87.2	83.0	-4.2
11	78.5	84.0	+5.5	73.4	73.3	-0.1

Students' mean on-task percentages before and after positive/negative reinforcement are illustrated in Figure 3. Mean on-task behavior averaged 83.6% prior to positive reinforcement, 88.6% after positive reinforcement. Mean on-task behavior averaged 78.7% prior to negative reinforcement,

and 76.2% after negative reinforcement.

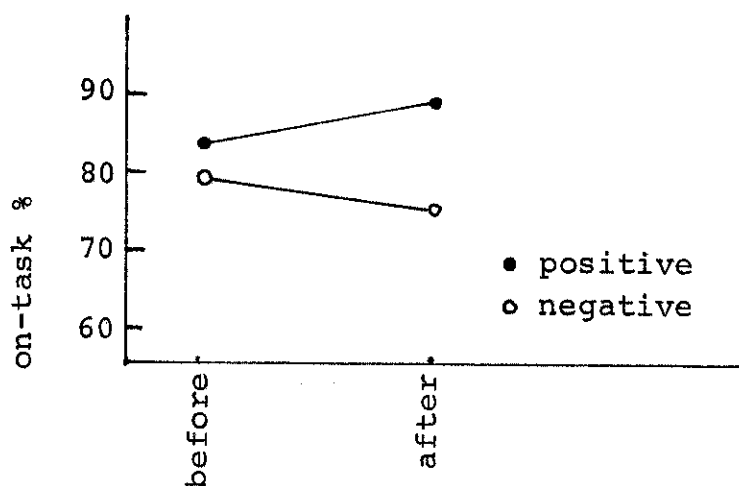


Figure 3. Mean on-task percentages before and after positive/negative reinforcement.

#### Hypotheses

In order to determine whether positive, negative, or combined positive/negative teacher reinforcement, given over the course of this study, produced a significant change, i.e., change beyond chance, in students' on-task behavior percentages after reinforcement, the following alternate hypotheses were tested:

1. The overall students' on-task percentages will be significantly greater after positive reinforcement when compared to overall on-task percentages after negative reinforcement at the post-five second interval.

2. The overall students' on-task percentages will be significantly greater after positive reinforcement when

compared to overall on-task percentages after negative reinforcement at the post-ten second interval.

3. The overall students' on-task percentages will be significantly greater after positive reinforcement when compared to overall on-task percentages after negative reinforcement at the post-twenty second interval.

4. Overall on-task percentages will be significantly greater after total reinforcement when compared to overall on-task percentages prior to total reinforcement.

5. Overall on-task percentages will be significantly greater after positive reinforcement when compared to on-task percentages prior to positive reinforcement.

6. Overall on-task percentages will be significantly lower after negative reinforcement when compared to overall on-task percentages prior to negative reinforcement.

Due to the small sample size, testing of hypotheses was performed using the Walsh Test for nonparametric statistics (Siegel, 1956). Confidence levels were set at  $\alpha = .048$ . This confidence limit, rather than the traditional  $\alpha = .05$  level, was set as an artifact of the statistic, rather than investigator preference. Analysis failed to reject hypotheses 1, 2, 3, 4, and 5. Analysis yielded rejection of hypothesis 6.

## The Relationship of Teacher Approval to On-Task Behavior

Past research in music education has indicated that varying percentages of teacher approval do not affect the amount of student time-on-task (Kostka, 1984). This investigation supports this finding. Table 5 lists the students' daily on-task percentages after positive, negative, and combined reinforcement. When compared to the daily teacher approval percentages, no pattern can be found linking high approval to high on-task percentages. Figure 4 gives a visual replication of these results. On day 5, when teacher approval was 81%, both on-task percentages for

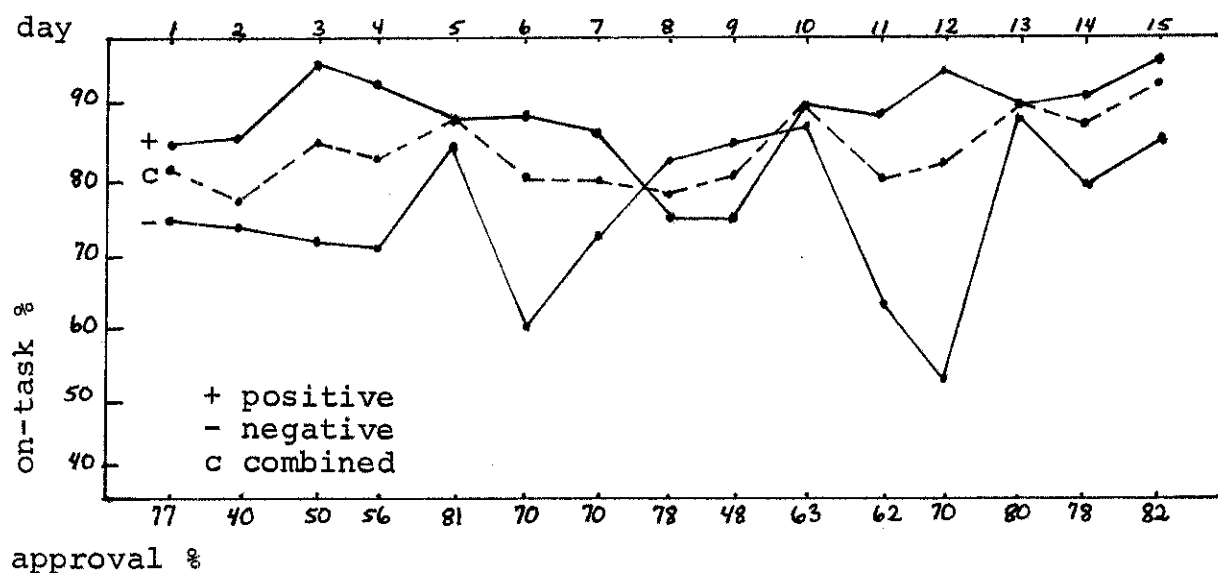


Figure 4. Average daily on-task percentages of positive, negative, and combined reinforcement in relation to daily teacher approval percentages.

Table 5

Relationship of Teacher Approval to Average On-Task  
Behavior Percentages

Day	Positive	Negative	Combined	Teacher Approval %
1	85.2	74.9	82.8	76.5
2	85.7	73.5	78.3	40.0
3	96.4	71.9	84.5	50.0
4	92.6	71.2	83.7	55.5
5	89.1	84.9	88.8	90.9
6	89.8	60.4	80.6	70.0
7	87.1	72.0	81.9	70.0
8	76.1	83.3	77.6	77.7
9	75.7	86.0	81.7	43.8
10	90.0	89.0	89.4	62.5
11	89.0	63.3	79.6	61.5
12	95.1	53.6	82.8	70.0
13	90.1	89.3	90.2	80.0
14	92.3	80.1	89.0	77.8
15	96.7	86.4	94.5	81.8

positive and combined reinforcement reaches 89%. However, day 10 shows both these percentages reaching 90%, with teacher approval only at 63%. On-task behavior after positive

reinforcement climbed to 97% when teacher approval was 82% (day 15), yet reached 96% when teacher approval dropped to 50% (day 3). Results of data analysis determined that attentiveness seemingly was not related to fluctuations in teacher approval.

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## CHAPTER V

### SUMMARY AND CONCLUSIONS

#### Summary

The purpose of this study was to determine the effect of teacher approval/disapproval on students' time-on-task behavior in the beginning strings class. One beginning strings class was videotaped over a period of 15 consecutive school days. Percentages of on-task behavior were calculated before and after exposure to positive/negative teacher reinforcement. These percentages were then compared to determine the effect of positive, negative, and combined positive/negative reinforcement on student time-on-task behavior. These effects will be discussed below, with respect to the research questions posed earlier.

#### The Research Questions

In order to determine the effect of positive/negative teacher reinforcement on student attentiveness, answers were sought to the following research questions:

1. Will positive or negative teacher reinforcement yield higher percentages of student on-task behavior at the post-response five second interval?
2. Will positive or negative teacher reinforcement yield higher percentages of student on-task behavior at the



post-response ten second interval?

3. Will positive or negative teacher reinforcement yield higher percentages of student on-task behavior at the post-response twenty second interval?

4. Will there be a difference in student time-on-task behavior percentages after reinforcement when compared to on-task percentages prior to reinforcement?

5. Will higher daily percentages of positive teacher reinforcement produce higher daily percentages of student on-task behavior?

#### Conclusions

The conclusions of this study were affected by several research limitations. First, the number of subjects was small and, as a result, the findings cannot be generalized to a larger population. Second, this study was limited to 15 days, and may not accurately depict on-task behavior in the classroom over long periods of time. Third, the subjects were enrolled in a grade 6-7-8 middle school. Behaviors of sixth-grade beginning string students located in an elementary school may differ due to environmental factors. Finally, this study centered on a homogeneous beginning strings class, which may or may not represent comparable on-task behavior patterns in a heterogeneous beginning strings class. Given those research limitations, the following conclusions were reached in regard to the

research questions posed.

#### Research Question #1

At the post-five second interval following positive or negative teacher reinforcement, all students achieved higher percentages of on-task behavior following positive reinforcement. Student percentages averaged 88.6% following positive reinforcement, 79.2% following negative reinforcement. Deviation between these percentages came to 9.4%. Statistical analysis using the Walsh Test for nonparametric statistics concluded that the overall on-task percentages following positive reinforcement were significantly higher beyond chance deviation than the overall on-task percentages following negative reinforcement at the post-five second interval. Results of this investigation conclude that positive, rather than negative reinforcement, produces significantly higher on-task student behavior at the post-five second interval.

#### Research Question #2

At the post-ten second interval following positive or negative teacher reinforcement, 9 of 11 students maintained higher on-task percentages with positive reinforcement. Students' time-on-task behavior averaged 88.2% following positive reinforcement, 81.0% following negative reinforcement. Deviation between these percentages averaged 8.2%. Statistical analysis using the Walsh Test concluded that the overall

on-task percentages following positive reinforcement were significantly higher than the overall on-task percentages following negative reinforcement at the post-ten second interval. The findings indicated that positive, rather than negative reinforcement, produces significantly higher on-task student behavior at the post-response ten second interval.

### Research Question #3

At the post-response twenty second interval, all 11 students maintained higher levels of on-task behavior following positive teacher reinforcement. Average on-task behavior following positive reinforcement was 88.9%, higher than the average on-task percentages at preceding levels. Four of 11 students achieved higher on-task behavior percentages at this interval over their post-five and post-ten second intervals. Five of 11 students maintained an on-task percentage within 2% of their post-five second response percentage.

At the post-response twenty second interval, negative reinforcement produced considerably lower levels of on-task student behavior. Student on-task behavior averaged 67.8%, 11.4% lower than the average on-task percentage following negative reinforcement at the post-five second interval, and 13.2% lower than the average student on-task percentage following negative reinforcement at the post-ten second

interval. Deviation between positive and negative reinforcement on-task percentages at this interval was 21.1%. Statistical analysis using the Walsh Test concluded that the overall on-task percentages following positive reinforcement were significantly higher than the overall on-task percentages following negative reinforcement at the post-response twenty second interval.

Results indicated that not only does positive reinforcement maintain significantly higher student attending behavior over a 20 second time frame, negative reinforcement decreases student attending behavior on average by 12.9% over the same 20 second time frame.

Findings of research questions one, two, and three are in agreement with those of Thomas, Becker, and Armstrong (1968) who concluded that (a) approving teacher responses serve as a positive reinforcing function in maintaining appropriate on-task student behavior, and (b) on-task percentages decrease following the removal of approving teacher responses.

#### Research Question #4

For the purposes of this research question, teacher reinforcement was broken down into three categories: positive reinforcement, negative reinforcement, and combined positive/negative reinforcement.

#### Positive Reinforcement

Ten of 11 students observed during the course of this

study achieved higher time-on-task percentages after exposure to positive teacher reinforcement. Percentages ranged from 74.7% to 91.9% before positive reinforcement, and 78.9% to 96.4% after positive reinforcement. Deviations in attending behavior following positive reinforcement were from -1.2% to +9.5%. Data analysis using the Walsh Test indicated that the overall on-task percentages following positive reinforcement were significantly greater than the on-task percentages prior to positive reinforcement.

#### Negative Reinforcement

Nine of 11 students observed during this study achieved lower time-on-task percentages after exposure to negative reinforcement. Percentages of on-task behavior ranged from 61.7% to 93.3% prior to negative reinforcement, and 57.4% to 84.6% after negative reinforcement. Deviations in attending behavior following negative reinforcement were from -9.2% to +4.6%. Data analysis using the Walsh Test indicated that there were no statistically significant decreases in overall student time-on-task percentages before and after negative reinforcement.

#### Combined Positive/Negative Reinforcement

During the course of this study, all students had an increase in attending behavior following combined reinforcement. On-task percentages ranged from 70.7% to 91.1% before combined reinforcement, and 73.6% to 92.0% after combined reinforcement. Deviations in attending

behavior following combined reinforcement were from 0.9% to 4.6%. Data analysis using the Walsh Test indicated that there were statistically significant increases in student time-on-task percentages following combined positive/negative reinforcement.

Findings of research question four are in agreement with those of Becker, Madsen, Arnold and Thomas (1966), who concluded that positive reinforcement is an effective means of improving student time-on-task behavior.

#### Research Question #5

Past research has consistently shown that high levels of teacher approval in the classroom can increase student attending behavior (Forsythe, 1975; Hall, Panyan, Rabon, & Broden, 1968; Madsen & Alley, 1979). Researchers have shown that positive reinforcement levels set at 75% or higher are most effective for maintaining student attention (Forsythe, 1975; Kuhn, 1975; Madsen & Alley, 1979). Natural rates of teacher reinforcement in music education have had limited study. Kostka (1984) found that natural rates of approval responses in the private piano studio varied on average from 41% to 54%, with no apparent effect on student attentiveness.

Over the course of this study, natural rates of teacher approval responses varied from 40.0% to 81.8%. Student on-task percentages after combined reinforcement averaged on various days 94.5% with teacher approval at 81.8%, 89.4%

with teacher approval at 62.5%, 77.6% with teacher approval at 77.7%, and 84.5% with teacher approval at 50.0%. From the data gathered from this study, it was not determined that higher percentages of positive teacher reinforcement yielded higher percentages of student on-task behavior for each day of the study. This study supports Kostka's (1984) findings that natural rates of teacher approval have no apparent effect on student attentiveness.

In summary, this study seems to suggest that students maintain significantly higher percentages of time-on-task behavior after exposure to positive teacher reinforcement, and that natural rates of teacher approval have no apparent effect on the amount of on-task behavior in the beginning strings class.

#### Suggestions for Further Research

Further research investigating positive/negative reinforcement in string education might consider the following suggestions:

1. Determine whether the type of analysis used in this study would produce similar results when the subjects are selected from a lower socio-economic school district.
2. Determine whether increased positive/negative reinforcement in public school string education would have an effect on the attrition rate.
3. Determine whether higher levels of positive

reinforcement in public school string education would accelerate student performance skill levels.

It is hoped the suggestions presented for further research will be considered and that research will be continued in this area, so that all the ramifications of reinforcement of behaviors in the public school string education setting may be further revealed.



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APPENDIX A

APPENDIX A

OBSERVATION CHART

Response Time	Given To	20	10	5		5	10	20
_____	_____	___	___	___	P N	___	___	___
_____	_____	___	___	___	P N	___	___	___
_____	_____	___	___	___	P N	___	___	___
_____	_____	___	___	___	P N	___	___	___
_____	_____	___	___	___	P N	___	___	___
_____	_____	___	___	___	P N	___	___	___
_____	_____	___	___	___	P N	___	___	___
_____	_____	___	___	___	P N	___	___	___
_____	_____	___	___	___	P N	___	___	___
_____	_____	___	___	___	P N	___	___	___
_____	_____	___	___	___	P N	___	___	___
_____	_____	___	___	___	P N	___	___	___
_____	_____	___	___	___	P N	___	___	___
_____	_____	___	___	___	P N	___	___	___
_____	_____	___	___	___	P N	___	___	___
_____	_____	___	___	___	P N	___	___	___
_____	_____	___	___	___	P N	___	___	___
_____	_____	___	___	___	P N	___	___	___
_____	_____	___	___	___	P N	___	___	___
_____	_____	___	___	___	P N	___	___	___
_____	_____	___	___	___	P N	___	___	___

DAY \_\_\_\_\_ STUDENT \_\_\_\_\_

APPENDIX B

APPENDIX B

DAILY PERCENTAGES OF ON-TASK BEHAVIOR

DAY \_\_\_\_\_ STUDENT \_\_\_\_\_

Total Teacher Responses \_\_\_\_\_ ( \_\_\_\_\_ + \_\_\_\_\_ -)

Daily Approval Percentage \_\_\_\_\_

<u>Student On-Task %</u>	Before	After
To Combined Reinforcers	_____	_____

<u>Interval On-Task %</u>	20	10	5	5	10	20
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Positive	_____	_____	_____	_____	_____	_____
Negative	_____	_____	_____	_____	_____	_____

<u>Average On-Task %</u>	Before	After
Positive	_____	_____
Negative	_____	_____

APPENDIX C

APPENDIX C

OVERALL PERCENTAGES OF ON-TASK BEHAVIOR

STUDENT \_\_\_\_\_

Total Teacher Responses \_\_\_\_\_ ( \_\_\_\_\_ + \_\_\_\_\_ - )

Overall Approval Percentage \_\_\_\_\_

<u>Student On-Task %</u>	Before	After
To Combined Reinforcers	_____	_____

<u>Interval On-Task %</u>	20	10	5	5	10	20
---------------------------	----	----	---	---	----	----

Positive	_____	_____	_____	_____	_____	_____
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Negative	_____	_____	_____	_____	_____	_____
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<u>Average On-Task %</u>	Before	After
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Positive	_____	_____
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Negative	_____	_____
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